Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Akee, Copeland et al (2010)	Natural Experiment	U.S	Difference-in-difference regression: compares the effect of four additional years of higher household incomes on young adult outcomes. Also uses fixed effect panel regression for the outcome of child's school attendance. Incomes have increased exogenously and permanently through government transfer program – casino that opened up and redistributed profits every 6 months to all adult tribal members.	**Household income from casino transfer, unequivalised.** The average annual amount of income distributed by the casino per person was approximately $4,000, so $8,000 for households with two eligible parents. Nominal prices 1997-2000.	School attendance. Probability of high school graduation age 19. Years of education aged 21.	P	$4,000 leads to an increase of 1.1 school year at age 21; sd of schooling is 2.62, so that's 43% of an sd.	Biggest effect on poorest households and gendered effect: if mother received the money improved educational outcomes but not for fathers. N.B. Costello et al (2003) use same data and note that casino opening also caused increase in jobs for which American-Indians were given special treatment. But this study finds no difference in labour force participation or employment before and after treatment starts.
Black, Devereux et al (2012)	Exogenous Income Variation	Norway	Uses a sharp discontinuity in the price of childcare to isolate the effects of childcare subsidies on outcomes for parents and children. The subsidies do not appear to affect labour force participation or use of childcare so in practice operate as a positive shock to disposable income. Families just below and just above the cut-off point for receiving the childcare subsidy are compared.	**Household income, unequivalised (does not state that it is equivalised).** Disposable income is defined as family income (income of both parents, including all taxable benefits) minus the childcare price faced by the family. Uses data from municipalities as childcare prices and subsidy cut-off points vary by area. Families below the cut off pay on average 9000NOK ($USD1500 according to the paper) less for childcare each year. Authors say this is 11% of average disposable income at age 5. Children were born 1986-1992 so subsidy around 1993-97.	Performance in junior high school national written and oral exams and grade point average. The grade point average is an average of the 10th grader's performance in all 12 graduating subjects. The written exams could be in either Math, Norwegian or English, randomly assigned to schools. The oral exam can be in any of the 12 subjects they have been studying, randomly allocated.	P	Effect on test scores in junior school about 40% of an sd, so a 1% increase would be about 4% of a sd. But partly because seems to increase income later. So overall they think a permanent 1% change means a 3% sd change in test scores.	Due to the increased disposable income, families that receive the childcare subsidies have significant and large improvements in educational outcomes and the effect is greater for municipalities with larger subsidies and larger effects for municipalities with lower income. Also find long-term effects: receiving the child care subsidy at age 5 also leads to higher family income at ages 6 - 15. N.B results show intention to treat effect as can identify those eligible but take up rate is 55-60% so results under-state the effect. Include a number of robustness checks.

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Blanden and Gregg (2004)	Fixed Effects	UK	Ordered probit models and sibling fixed effects, using data from the British Cohort Study (1970) and the British Household Panel Survey to compare young people who reached 16 in 1986 with young people who reached 16 in mid-late 1990s.	**Household income, equivalised (does not state that it is equivalised); banded for one dataset.** BCS contains a banded income measure at ages 10 and 16; authors use Family Expenditure Survey to set each band to the median income value. BHPS contains annual household income measured continuously (but smaller sample size).	Probability of not obtaining GCSE A-C; staying on at school at age 16; obtaining a degree.	P	Lower bound estimates (which net out permanent income) suggest a 1/3 reduction in family income from the mean (around £140 pw or £7,000 pa in 2000 prices) reduces the chances of securing a degree by around 4%; found effects of a similar magnitude for obtaining no GCSE A-C grades and staying on at school.	Find income does have an impact on educational attainment in the UK and that the relationship has been strengthening over time. Although not all estimates are significant but the consensus from the different approaches is that income does affect educational outcomes.
Blau (1999)	Fixed Effects	U.S	OLS, three alternative fixed effects models (grandparent, mother and child fixed effects) and a random effects model. Only fixed effects reported here.	**Household income, unequivalised (does not state that it is equivalised)** Current total household income, measured by summing the responses to questions about income received during the previous calendar year from a large number of sources, then converted to tens of thousands of 1979 dollars using the consumer price index. Also presents estimates using permanent income (average income over all years). Separates income into total income, wage income and non-wage income. Mean non-wage income is £9400, sd £10,800. Mean total family income is £14500, sd £11700. Effect size calculated for $10,000 1979 prices.	Peabody Individual Achievement Tests of Mathematics and Reading Recognition measuring academic achievement of children aged 5+. Peabody Picture Vocabulary Test of verbal intelligence and scholastic aptitude, for children aged 3 and above. Verbal Memory Parts A and B measuring short-term memory in response to words and sentences spoken by the interviewer to children aged 3-6.	P	A £10,000 change in non-wage income means 28.1% sd PIATmath; 31.3% sd PIATreading; 29.3% PPVT; no significant effect on verbal memory.	Uses an extensive list of controls and a range of different income measures. Results from the fixed effects models depend on which measure of income was used: there were significant but small effects for some measures of income on maths, reading and vocabulary, but for the majority of income measures used results were not significant and permanent wage appeared to have a negative association. Verbal memory was the only outcome that did not have a significant result for any income measure. Nearly all measures of income showed significant and stronger effects on home environment.

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Burnett and Farkas (2009)	Fixed Effects	U.S	Multilevel regression models, fixed effects and a hybrid method of fixed effects combined with random effects to test whether poverty status and family structure have an impact on school achievement.	**Poverty status, using equivalised household income.** Poverty status measured as a dichotomous variable. Child said to be in poverty if mother's data shows total net family income falling below the yearly defined poverty line for their particular family size.	Peabody Individual Achievement Test of Mathematics Performance.	P	Coefficient on maths score is -0.528. All age sd is 16.947 so size of coefficient is 3% sd. This is the effect of being "in poverty".	Significant effects only for younger children and only of modest size. Found family structure mostly insignificant for maths achievement and conclude the apparent negative effect of family structures other than married biological parents are largely spurious.
Clark-Kauffman, Duncan and Morris (2003)	Randomised Controlled Trial	U.S	Pooled data for children aged 0-15 from families enrolled in 14 different random-assignment welfare and work programmes. Compares outcomes for children from different welfare programmes to see if programmes that boost income as well as employment benefit children more than programmes that boost employment only.	**Household income, unequivalised? (does not state that it is equivalised).** Administrative data provided information on monthly cash assistance and benefits and quarterly earnings in jobs covered by the unemployment insurance system. For the study uses average annual earnings and average total income (sum of earnings and AFDC/TANF payments and food stamps) over the 2 years after random-assignment. Earnings supplement programmes brought between $1500 and $2000 increase in family income (only $250 for the other programmes). $1535 for 0-2 age group. $1673 for 3-5. Mid-1990s nominal prices.	Cognitive development/school achievement was measured 2- 5 years after their parents' entry into the programmes. Assessed via maternal report, teacher report and test scores depending on the study. Some studies included multiple measures and some included measures from multiple points in time. All achievement scores were standardized using study-specific control group means and SDs for comparability.	P	Assignment to project group ($1500-$2000 change in income) brought about a 5.1% (age 3-5) to 7% (0-2) sd increase in cognitive development. No significant effect for other age groups. Earnings programmes brought 8% for 0-2 and 3-5, not significant for other groups.	Find only programmes that increase income have significant positive effects, and this is only for the two youngest age groups (0-2 and 3-5).

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Conley and Bennett (2001)	Fixed Effects	U.S	Sibling fixed effects on longitudinal data - so focusing on part of income that changes between sibling births.	**Household income in relation to poverty line, equivalised.** Income-to-needs ratio calculated by dividing the total family income for a given year by the U.S. poverty threshold for the family size and type. Total family income includes all forms of cash including government transfers and investment income. Examines impact of a one unit change in income to needs ratio (so going from poverty line to twice the poverty line). For years 1986-1992.	High-school graduation by child's 19th birthday.	0		Significant in OLS models but not fixed effects.
Dahl and Lochner (2012)	Natural Experiment	U.S	Instrumental variables and child fixed effects. Makes use of changes in EITC payments that increased incomes of low to middle income families in late 1980s and mid-1990s. Compares to higher income families that did not benefit from these increases in income.	**Household income, unequivalised? (does not state it is equivalised).** Family income measures relating to previous calendar year. Includes many components of income which authors aggregate into 3 categories of pre-tax/EITC income: earned income, unearned income and non-taxable income. Data includes a number of components of family income, but does not ask participants how much they received in EITC payments or paid in taxes. The authors implicitly assume full take up. Families gained by up to $2,100 1993-97 (in 2000 USD). Median income rose from $23,463 in 1988 to $38,390 in 2000.	Maths and reading achievement based on standardised scores on Peabody Individual Achievement Tests	P	A $1,000 increase in income is associated with an increase in combined maths and reading scores of 6.1% sd: Maths 5.8%, Reading recognition 3.6%, and Reading comprehension 6.1%.	For comparison: having a mother who is a highschool graduate, not drop out, is worth 17% sd. Results are larger for boys; slightly larger for younger children and lower maternal education

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Duncan, Brooks-Gunn et al (1998)	Fixed Effects	U.S	Sibling fixed effects models.	**Household income, unequivalised** (choose not to equivalise by income-to-needs ratio because of restrictions it imposes on the size of the separate effects of income and family size. Do include family size as a separate variable)**.** Total pre-tax income of all family members, inflated to 1993 price levels using CPI and averaged over all the years of childhood/over all the years within the given childhood stage under consideration (e.g. averaged over 0 - 5 years, 6- 10 years and 11-15 years). Family income ages 0-15 $44,900, sd $29,100.	Years of completed schooling.	P	Coefficient is 0.2 on years of schooling in sibling fixed effects model for a $10,000 change in income (1993 prices). Mean of schooling is 13.5 and sd is 2.1, so $10,000 brings 9.5% of an sd.	Life stage matters: family income in early childhood had a bigger impact on completed schooling than did family income during middle childhood.

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Duncan, Morris and Rodrigues (2011)	Randomised Controlled Trial	U.S and Canada	Using samples from programmes that used random assignment, compares results from programmes that only aimed to increase employment with programmes that also gave an income supplement.	**Household income, unequivalised.** Average quarterly parental income based on all income for each quarter following random assignment. The measure was adjusted using 2001 CPI and Canadian dollars converted to American dollars before being adjusted for inflation. Average annual income (in $1000s) and log average annual income were then computed for the time between random assignment and the child assessment. For U.S respondents details on income were taken from administrative data and for Canadian respondents from employment and administrative records. Income adjusted to 2001 USD. Programmes boosted family income for younger children by $800-$2,200 a year (5% to 12% of an sd)	School achievement/cognitive performance measured by parent (on a 5 point scale of how well children were doing at school) or teacher reports or test scores (Academic Subscale of Social Skills Rating System and various different tests)	P	IV estimates suggest that a $1,000 increase in annual income sustained for between 2 - 5 years boosts child achievement by 6% of a SD. Log-unit change in annual income with 60% sd change.	N.B. sample primarily single parent low-income families so cannot generalize to other family types. Also authors note that increased income was tied to increases in employment, which may bring psychological benefits and so may not get the same effect from cash increases not tied to employment.

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Fernald, Gertler and Neufeld (2008)	Randomised Controlled Trial	Mexico	In 1998 506 low-income communities were randomly assigned to be enrolled in a CCT programme Oportunidades (formerly Progresa), either immediately or 18 months later. Authors exploit variation in total cumulative amounts of cash received by the families (determined by year of programme and family structure), to determine the effect of the cash component. Uses linear and logistic regression. Authors describe the analytical framework as more a dose-response analysis than a treatment-control analysis.	**Household income from cash transfers, unequivalised (does not state it is equivalised)** Examines effect of doubling of cash transfers from median of 7500 pesos to 15000 pesos (equivalent to an increase from $806 to $1612) in 1998-99.	Children 36 months plus were assessed on 3 subscales: long-term memory, short-term memory and visual integration from the Spanish language version of the Woodcock-Munoz test. Language was assessed with the Spanish version of the Peabody picture vocabulary test.	P	Doubling of transfers associated with an increase of 12% sd in long term memory, 13% short term memory, 8% visual integration.	
Gennetian and Miller (2002)	Randomised Controlled Trial	U.S	Compares outcomes for children of mothers randomly assigned to different groups in the Minnesota Family Investment Program: those that received financial incentives only (i.e. increased income); those that received financial incentives and mandatory employment services; and the control group.	**Household income, unequivalised (does not state that it is equivalised) And self-reported material hardship.** Combined data on average annual earnings, average annual welfare benefits and average rates of welfare receipt over 3-year follow-up period to calculate annual average income from benefits and earnings. A measure if material hardship was also constructed based on questions about being able to meet basic needs such as paying the rent. MFIP increased average annual income by $1,078, including $1,138 from welfare benefit (nominal 1994-97 prices).	Maternal response to question about how well their child was doing in school overall (responses ranging from not well at all to very well). Also asked 4 questions about child's level of engagement at school.	P	Program participation ($1,078 on average increase) associated with improved performance in school of 14% sd. Engagement in school up 20% sd. Bigger effect on boys' performance in school (27%, girls not sig).	Sample was restricted to single mother families who had a focal child age 2 - 9 years, who were long-term recipients of welfare. The sample entered the programme between April 1994 and October 1994. Analysis was limited to children that were at least 5 and less than 13 at the time of the 3 year follow-up interview.

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes								
Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Johnson and Schoeni (2011)	Fixed Effects	U.S	Used sibling fixed effects and extensive controls on a child and adult sample from the PSID to analyse the effect of low-birth weight.	**Household income, unequivalised (does not state that it is equivalised).** Total family income measured 'at various points in childhood'. The analyses for outcomes included here are based on income during pregnancy. (Expressed in 1997 dollars using the CPI-U).	Measures of reading and math achievement - passage comprehension and applied problems.	0		
Løken (2010)	Natural Experiment	Norway	IV. Uses Norwegian oil shock in 1970s as instrument to test the long term effect of family income on educational attainment. Compares children born in Rogaland in the years before the oil shock (1967-69), to children born in an unaffected area (Sor-Trondelag) from 1967-1969, and to children born in and Rogaland and Sor-Trondelag between 1975 and 1977, when effects of oil shock had faded. Authors argue that oil shock was entirely incorporated into the economy by time children chose higher education so only effect came through earlier exposure to family income.	**Household income, unequivalised (does not state that it is equivalised).** Data on fathers' and mothers' income streams from 1967- 2000 added together to create one variable, family income. This measure was taken from tax register and includes wages, income from business activity and benefits (deflated to real 1999 income using CPI). Define income during childhood as the average family income from age 1 until age 11.	Years of obtained higher education.	0		

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Appendix 3: Details of Main Studies for Children's Outcomes

Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Løken, Mogstad and Wiswall (2012)	Natural Experiment	Norway	Re-examines the data from Løken (2010), exploiting same time and regional variation but using more advanced statistical techniques and adding a quadratic specification that allows for non-linear effects in their IV and sibling FE estimates.	**Household income, unequivalised (does not state that it is equivalised).** Same definition as in Løken (2010). Family income during childhood defined as the average annual income from age 1- 11. Mean is NOK 252,000 of USD $43,450 (IV sample) and 275,000 (FE sample); sd is NOK 101,000, USD $17,414.	Years of education obtained by time respondents were 29+ years. Whether respondent dropped out of high school. For males only (via military records) IQ between 18th and 20th birthday.	P	FE estimates say sd change in income ($17,414) produces 0.22 additional years of education if income NOK 150,000, or 0.02 years if income NOK 300,000. IV estimates say sd change produces 0.74 for the poorer family and 0.05 for the richer family. Sd for years of education is 2.5 years, so IV gives 29% of sd for poorer households and 2% for richer. FE gives 9% sd for poorer and 1% for richer.	The non-linear IV and FE estimates show an increasing concave relationship between family income and children's educational outcomes.

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Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Milligan and Stabile (2011)	Exogenous Income Variation	Canada	Exploits variation in child benefit levels due to province, time and family type as instrument. Simulates the benefits that a random sample of families (taken from SLID) would be eligible for in each province-year-number of children combination between 1994 and 2004. Then using NLSCY as estimation sample imputes eligible child benefits for each family, using all available family characteristics in the NLSCY.	**Household income, unequivalised (does not state that it is equivalised).** SLID contains detailed information on income and benefits received over the past year, with the income measures taken from the respondent's income tax records; the NLSCY also contains detailed information on income over the past year (but not benefit receipt hence the simulation/tax calculator). Mean of benefit levels is $2,396 (sd $2,778). 1996-2004 (all values in 2004 constant Canadian dollars).	Whether child repeated a grade in past 2 years. Whether child has been diagnosed with learning disabilities (reported by most knowledgeable person). The Peabody Picture Vocabulary test was given to children ages 4-6. The Mathematics tests (based on the Canadian Achievement Tests) were given to children in grades 2-10 (although low response rate).	P	Increase of $1000 leads to 6.9% sd increase in maths score for low education sample (insignificant for entire sample), i.e. respondent has high school or less (23.1% sd boys, nothing girls). For PPVT for low education sample is 36.5% boys, nothing girl (not significant in full sample). Increase of $1000 leads to 2.7 percentage point increase in probability of having repeated a grade (full sample, results do not persist in low education sample) and 2.8 pp increase in never having been diagnosed with a learning difficulty (low education only as not significant for full sample, also driven by result for boys).	NB looks like non-linearity, but actually many of the higher education families won't have received anything - this is an instrumental approach.

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Cognitive Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Morris and Gennetian (2003)	Randomised Controlled Trial	U.S	Instrumental variable and random assignment experimental design (so different approach than Gennetian and Miller, 2002, which uses same data). Compares outcomes for children of mothers randomly assigned to different groups in the Minnesota Family Investment Program: those that received financial incentives only (i.e. increased income); those that received financial incentives and mandatory employment services; and the control group. Each parent completed a survey, as well as their children, three years after the assignment. Employment and income both had two measures, one for the first year, post-random assignment and one for the average over three years post-random assignment.	**Household income, unequivalised (does not state that it is equivalised).** Used 2 measures of income: one for 1st year post-random assignment, which took place in 1994, and one for average income in the first 3 years post-random assignment). Income was measured as the combination of earnings, food stamps and welfare benefits for the single parent taken from unemployment insurance and public assistance benefit records. MFIP increased average annual income by $1,200 (mix of earnings and welfare income). They note that Income is not adjusted for inflation.	Academic achievement and engagement in school, both self-reported by mothers.	P	$1000 increase in income in the first year post assignment linked to 26% sd change in school engagement (but marginally significant - 10% level). Results for school achievement not significant.	Author acknowledges employment effects may have contributed to the income effects as the increase in income parents experienced was accompanied by increases in employment - some of this is controlled for by including parents' employment in the model but some of the effect might be due to the way income was increased.
Shea (2000)	Exogenous Variation	U.S	Uses variation in father's earnings that argues represents luck, such as variations due to union status, industry and involuntary job loss due to plant closing etc. Argues that can estimate the impact of parents' income by comparing children of union or high-wage industry fathers to the children of non-union of low-wage industry fathers with similar observable skills.	Measure income using fathers' labour earnings and parent's total income (consisting of labour earnings, asset income and trasnfer income of head and spouse). Average fathers' earnings and parents' income over all years in which the father is household head aged 25-64 and in which the child is less than 23 and potentially still dependent on parental support.	Years of completed schooling.	0		

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Cognitive Outcomes								
Author	**Study type**	**Country**	**Study methods**	**Financial resources measure**	**Outcome measures**	**Effect summary***	**Effect sizes as given by authors**	**Notes**
Tominey (2010)	Exogenous Income Variation	Norway	Estimates the effect of income shocks during childhood (age 1- 16), by exploiting the annual deviation from lifecycle profile which is uncorrelated with parental traits, using average income for 99 cohort-labour market cells- 90 travel to work areas for each of 11 cohorts).	**Household income, unequivalised (does not state that it is equivalised).** Income is defined as the sum of paternal and maternal income if both parents are known, or one parent otherwise. If families break up income is still measured as the sum across biological parents. Income is deflated to 2000 prices.	Completed years of schooling. Whether or not dropped out of high school. Whether attended college/university. Also IQ score measure for males only (measured for military service at age 18).	P	A sd increase in permanent income shock at age1 raises schooling by 0.0866 sds, probability of completing high school by 0.0599 and college attendance by 0.659. (the effects are smaller at older ages as you would expect). A sd transitory income increase at age 1 results in a 0.0327 sd increase in schooling, 0.0364 for probability of completing high school and 0,0234 for college attendance, and is relatively constant across child age. For male IQ 1 sd increase in permanent income at age 1 results in 0.0859 sd increase in IQ and for 1sd transitory income shock, 0.0280 increase in IQ.	N.B significance levels not stated in results tables.

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Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Violato, Petrou et al (2011)	Fixed Effects	UK	OLS and fixed effects (only fixed effects reported here). However, fixed effects model control for parenting and home environment, which are likely to be mediating mechanisms between income and outcomes.	**Banded household income, equivalised.** Respondents report which of 18 annual income bands their total income from employment, government sources and other sources fits into. The banded income measures were converted into continuous variables using interval regressions. Annual family income at each wave was then equivalised for each family and then expressed in logarithmic form. Uses both a lagged measure of transitory income and a measure of permanent income (averaged over all waves, adjusting for inflation).	The only measure used in the fixed effects analysis is the BAS naming vocabulary score.	0	Doubling of CTC and CB (£3125) at average income (£29500 at 2006 prices) increases naming vocab by 1% sd two parent family, 2.4% one parent family. But these are results from cross-section, as fixed effects model control for parenting and home environment. In the fixed effects models income was only significant for vocabulary test for children from lone-parent families.	
Votruba-Drzal (2006)	Fixed Effects	U.S	Used change models and residualised change models.	**Household income, unequivalised (does not state that it is equivalised).** Total net family income each year, based on reported income from a variety of sources including wages, government transfers and income received from other household members. From this the authors created 2 cumulative income variables: the average family income from early childhood (birth to 5-6) and the average family income over middle childhood (from 5-6 to 11-12 years). Used the natural log of income, thereby fitting a steeper slope at lower income levels. Mean income is $46,723 ages 3-4 rising to $48,887 ages 7-8. No sd given. Income seems to be measured in 2000 USD.	Peabody Individual Achievement Tests in Reading Recognition and Mathematics for children aged 5 plus.	P	Early childhood income has a significant impact on change in middle childhood maths and reading skills. Log unit increase in early childhood income means gains of 2.64 points reading and 2.09 maths. That's 23% sd reading and 23% sd maths Middle childhood income does not have a significant effect on change in middle childhood maths/reading skills.	N.B 25% of the sample had missing data which were imputed using expectation maximization; tests showed children who had missing data were more disadvantaged across a number of dimensions.

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	**Study type**	**Country**	**Study methods**	**Financial resources measure**	**Outcome measures**	**Effect summary***	**Effect sizes as given by authors**	**Notes**
Akee, Copeland et al (2010)	Natural Experiment	U.S	Difference-in-difference regression: compares the effect of four additional years of higher household incomes on young adult outcomes. Also uses fixed effect panel regression for the outcome of child's school attendance. Incomes have increased exogenously and permanently through government transfer program – casino that opened up and redistributed profits every 6 months to all adult tribal members.	**Household income from casino transfer, unequivalised.** The average annual amount of income distributed by the casino per person was approximately $4,000, so $8,000 for households with two eligible parents. Nominal prices 1997-2000.	criminal arrests: any crime, any minor crime, any violent crime and ever dealt drugs	P	Effects differ by initial household poverty status. An additional $4,000 per year for the poorest households increases educational attainment by one year at age 21, and reduces the chances of committing a minor crime by 22% for 16 and 17 year olds.	Also improved relationship with mothers, reduced probability of parents being arrested and improved parental supervision. N.B. Costello et al (2003) use same data and note that casino opening also caused increase in jobs for which American-Indians were given special treatment. But this study finds no difference in labour force participation or employment before and after treatment starts. Biggest effect on the poorest households.

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	**Study type**	**Country**	**Study methods**	**Financial resources measure**	**Outcome measures**	**Effect summary***	**Effect sizes as given by authors**	**Notes**
Blau (1999)	Fixed Effects	U.S	OLS, three alternative fixed effects models (grandparent, mother and child fixed effects) and a random effects model. Only fixed effects reported here.	**Household income, unequivalised (does not state that it is equivalised)** Current total household income, measured by summing the responses to questions about income received during the previous calendar year from a large number of sources, then converted to tens of thousands of 1979 dollars using the consumer price index. Also presents estimates using permanent income (average income over all years). Separates income into total income, wage income and non-wage income. Mean non-wage income is £9400, sd £10,800. Mean total family income is £14500, sd £11700. Effect size calculated for $10,000 1979 prices.	A Behaviour Problems Index measuring the frequency, range and type of behaviour problems of children aged 4+ as reported by the mother. A Motor and Social Development test for children ages 0 -3.	P	$10,000 leads to 22.0% reduction in BPI Behaviour Problems Index in GFE model, and to 21% sd in Motor and Social Development.	Results from the fixed effects models are mixed, depending on which measure of income was used, but there were significant effects for some measures of income on both behaviour problems and motor social development. The magnitudes of the results that are significant are so small that the author concludes that income transfers would have a negligible impact on improving child outcomes. NB finds no evidence of non-linearities so treats the effects as linear (so scales down from $10,000 to get the effect of $1,000).

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Costello, Compton et al (2003)	Natural Experiment	U.S	Uses data collected before and after casino opened up and distributed a proportion of profits to every American Indian. Among the recipients compare never-poor, persistently poor and ex-poor children's psychiatric symptoms.	**Above and below a poverty line, calculated using household income, equivalised** Parent provided information about total family income and sources of income. Calculated mean family income for the 4 years before and after casino opened and used this to define whether families were poor (if below the federal poverty line for that year). Families were then classified into: persistently poor, ex-poor and never poor (newly poor excluded because n = 8).	The Child and Adolescent Psychiatric Assessment - a structured interview with both children and parents. Results in 2 categories - (emotional disorder) and behavioural disorder.	P	Ex-poor children showed a 40% decrease in behavioural symptoms. There was no significant change for emotional symptoms.	N.B. explains the opening of the casino also created more jobs, for which American-Indians were given preferential treatment (but see notes for Akee et al, 2010). Only 50 children in the ex-poor group. Children whose families moved out of poverty showed a significant decrease in the mean number of psychiatric symptoms after the casino opened. When broken down into categories behavioural symptoms were significant but for emotional symptoms less marked. The extra income had no effect on the frequency of psychiatric symptoms for never-poor families. Parental supervision was found to be the main mediator.

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	**Study type**	**Country**	**Study methods**	**Financial resources measure**	**Outcome measures**	**Effect summary***	**Effect sizes as given by authors**	**Notes**
Dearing, McCartney and Taylor (2006)	Fixed Effects	U.S	Use 5 multilevel models with longitudinal data to analyse the within child variation of income and externalising/internalising problems. Include extensive controls.	**Household income, equivalised using income-to-needs ratio.** Mothers reported total household income annualized at 24, 36 and 54 months, at kindergarten and first grade (5 observations). Total household income was divided by 10,000 so that estimated coefficients represented the estimated change in outcomes associated with a $10,000 change in income. Families' income-to-needs ratios calculated with those experiencing poverty 3 or more times defined as chronically poor, those only 1 or 2 times as transiently poor and the rest as never poor. Mean family income first grade $67,255, sd $51,295. Measured 1991-97; no information given about indexing.	2 versions of Child Behaviour Checklist/ Teacher Report Form were used to assess child externalising and internalising problems, reported by childcare providers/teachers. Measured at 24, 36, 54 months and first grade.	P	$10,000 brings 1.3% of sd change in externalising behaviour overall, but non-linear: never poor $10,000 means 1% sd change; chronic poor $10,000 means 14.8%. For chronic poor and partnered $10,000 means 34.6% sd change, and 24.5% sd for internalising behaviour (but for single mothers no impact). Mothers' employment also matters: if employment 1sd below mean, no effect. If 1sd above mean on employment hours and chronically poor, $10,000 meant 22.8% change in externalising and 19.8% change in internalising.	Effect size small when constrained to be equal across all children in the sample. The effect of income on externalizing problems was significantly larger for chronically poor children (15 times larger than for children who were never poor). No association of income with children's internalizing problems when income estimates were averaged across family structure and employment contexts. The effects of income also varied by partner status and employment.
Dooley and Stewart (2007)	Fixed Effects	Canada	Use OLS estimates and estimated a child-specific fixed effects model and a family-specific fixed effects model. Due to lack of statistical results from fixed effects models use other strategies for estimating income effects: looking at income before and after an outcome; looking at consumption activities; looking at welfare income. N.B. p-values not reported in results tables.	**Household income, unequivalised (does not state that it is equivalised).** Permanent income is measured by average income over the 3 cycles. N.B. Only have 3 measures of income and take the average as permanent measure of income - authors acknowledge this is a disadvantage compared to other longer panel data.	Scores taken from 5 - 8 questions on four problem areas: hyperactivity disorder, conduct disorder, emotional disorder and property offense. A higher score on a question means the event occurs more often/ a higher aggregate score means more behavioural/emotional problems. Reported by teacher for 4 - 11, parent for 4 -11 and child for 11- 15.	0		There is little evidence of an effect of income on behavioural-emotional scores. Only OLS results are significant and these do not use longitudinal measure of income. Individual FE model only significant for self-reported score. N.B controls for parenting style in fixed effects models but this could mediate the effect of income.

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Gennetian and Miller (2002)	Randomised Controlled Trial	U.S	Compares outcomes for children of mothers randomly assigned to different groups in the Minnesota Family Investment Program: those that received financial incentives only (i.e. increased income); those that received financial incentives and mandatory employment services; and the control group.	**Household income, unequivalised (does not state that it is equivalised) And self-reported material hardship.** Combined data on average annual earnings, average annual welfare benefits and average rates of welfare receipt over 3-year follow-up period (from 1994) to calculate annual average income from benefits and earnings. A measure of material hardship was also constructed based on questions about being able to meet basic needs such as paying the rent. MFIP incentives only increased average annual income by $1,078, including $1,138 from welfare benefit (nominal 1994-97 prices).	Mothers' response to questions relating to measure from the Behavioural Problems Index. Total score was given from the sum of responses to all 28 questions and then divided into 2 subscales for externalizing and internalizing behaviours. Mothers also asked a series of questions from the Positive Behaviour Scale with three subscales for compliance, social competence and autonomy. Mothers were also asked if they had been contacted by the school regarding their child's behavioural problems since random assignment.	P	Looking at incentives only programme: BPI down 15% sd (internalising 15% externalising 13%). Positive Behaviour up 18% including Compliance 18%. Performance in school up 14%. Engagement in school up 20%. Bigger impact on behaviour for girls: BPI 26% down (and boys not sig); compliance sub-scale 26% up (boys not sig). But bigger effect on boys' performance in school (27%, girls not sig).	

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Milligan and Stabile (2011)	Exogenous Income Variation	Canada	Exploits variation in child benefit levels due to province, time and family type as instrument. Simulates the benefits that a random sample of families (taken from SLID) would be eligible for in each province-year-number of children combination between 1994 and 2004. Then using NLSCY as estimation sample imputes eligible child benefits for each family, using all available family characteristics in the NLSCY.	**Household income, unequivalised (does not state that it is equivalised)** SLID contains detailed information on income and benefits received over the past year, with the income measures taken from the respondent's income tax records; the NLSCY also contains detailed information on income over the past year (but not benefit receipt hence the simulation/tax calculator). Mean of benefit levels is $2,396 (sd $2,778). 1996-2004 (all values in 2004 constant Canadian dollars).	Questions about emotional and mental health are asked to the person most knowledgeable. Questions are categorized by disorder and then added together to determine hyperactivity score, emotional behaviour score, aggressive behaviour score, indirect aggression score and prosocial behaviour score.	P	Hyperactivity-inattention: $1000 brings 6.8% sd decrease. Emotional disorder-anxiety 9.6% decrease. Conduct disorder and physical aggression 10.0% decrease including 16.4% low education girls. Indirect aggression only significant for low education group: 15.3% sd decrease, including 21.7% girls, nothing for boys. Bigger effects for girls than boys. Some bigger effects for low education sample, but not always significant (large standard errors).	

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Morris and Gennetian (2003)	Randomised Controlled Trial	U.S	Instrumental variable and random assignment experimental design. Compares outcomes for children of mothers randomly assigned to different groups in the Minnesota Family Investment Program: those that received financial incentives only (i.e. increased income); those that received financial incentives and mandatory employment services; and the control group. Each parent completed a survey, as well as their children, three years after the assignment. Employment and income both had two measures, one for the first year, post-random assignment and one for the average over three years post-random assignment.	**Household income, unequivalised (does not state that it is equivalised)** Used 2 measures of income: one for 1st year post-random assignment, which took place in 1994, and one for average income in the first 3 years post-random assignment). Income was measured as the combination of earnings, food stamps and welfare benefits for the single parent taken from unemployment insurance and public assistance benefit records. MFIP increased average annual income by $1,200 (mix of earnings and welfare income). They note that Income is not adjusted for inflation.	Measures of problem behaviour and positive behaviour scale taken from mothers' self-report.	P	$1000 change in income associated with 29% sd change in positive behaviour. 26% sd change in school engagement (but marginally significant - 10% level).	Marginally significant favourable effects of income on positive social behaviour. Favourable but not significant for problem behaviour.

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	**Study type**	**Country**	**Study methods**	**Financial resources measure**	**Outcome measures**	**Effect summary***	**Effect sizes as given by authors**	**Notes**
Violato, Petrou et al (2011)	Fixed Effects	UK	OLS and fixed effects (only fixed effects reported here). However, fixed effects model control for parenting and home environment, which are likely to be mediating mechanisms between income and outcomes.	**Banded household income, equivalised.** Respondents report which of 18 annual income bands their total income from employment, government sources and other sources fits into. The banded income measures were converted into continuous variables using interval regressions. Annual family income at each wave was then equivalised for each family and then expressed in logarithmic form. Uses both a lagged measure of transitory income and a measure of permanent income (averaged over all waves, adjusting for inflation).	At ages 3 and 5 maternal report of behavioural outcomes, using the Strengths and Difficulties questionnaire - a Total Difficulty Score was generated by summing the scores from the emotional, conduct, peer problems and hyperactivity subscales.	0		

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Appendix 3: Details of Main Studies for Children's Outcomes

Social and behavioural outcomes								
Author	**Study type**	**Country**	**Study methods**	**Financial resources measure**	**Outcome measures**	**Effect summary***	**Effect sizes as given by authors**	**Notes**
Votruba-Drzal (2006)	Fixed Effects	U.S	Used change models and residualised change models.	**Household income, unequivalised (does not state that it is equivalised)** Total net family income each year, based on reported income from a variety of sources including wages, government transfers and income received from other household members. From this the authors created 2 cumulative income variables: the average family income from early childhood (birth to 5-6) and the average family income over middle childhood (from 5-6 to 11-12 years). Used the natural log of income, thereby fitting a steeper slope at lower income levels. Mean of income $34,774.84, sd $21,788.74 (early childhood). $40,784.08, sd $25,517.55 (middle childhood). Income seems to be measured in year 2000 USD.	Socioemotional development was measured each year for children 4 or older using the Behaviour Problem Index. Parental response to 28 questions about certain types of behaviour exhibited in the past 3 months, relating to internalising and externalising behaviours.	P	Log unit increase in middle childhood income brings down BPI by -10.9, 12% of sd.	N.B 25% of the sample had missing data which were imputed using expectation maximization; tests showed children who had missing data were more disadvantaged across a number of dimensions. In both the simple and residualized change models middle childhood income had a significant impact on change in middle childhood behaviour problems, but early childhood income was only significant for the residualised change model. Home environment was found to mediate the impact of behaviour problems.

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Appendix 3: Details of Main Studies for Children's Outcomes

Child Physical Health Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Conley and Bennett (2001)	Fixed Effects	U.S	Sibling fixed effects on longitudinal data - so focusing on part of income that changes between sibling births.	**Household income in relation to poverty line, equivalised.** Income-to-needs ratio calculated by dividing the total family income for a given year by the U.S. poverty threshold for the family size and type. Total family income includes all forms of cash including government transfers and investment income. Examines impact of a one unit change in income to needs ratio (so going from poverty line to twice the poverty line). 1986-1992. [Poverty line not given by authors. In 2011 poverty threshold for couple and one baby was $18,106. (US Census Bureau).]	Birth weight	P	No effect across all births, but if parent was LBW 1 unit change in income to needs ratio raises BW by 8.6 oz. (sd =20.6 oz.) so that's 41.7% sd.	
Fernald, Gertler and Neufeld (2008)	Randomised Controlled Trial	Mexico	In 1998 506 low-income communities were randomly assigned to be enrolled in a CCT programme Oportunidades (formerly Progresa), either immediately or 18 months later. Authors exploit variation in total cumulative amounts of cash received by the families (determined by year of programme and family structure), to determine the effect of the cash component. Uses linear and logistic regression. Authors describe the analytical framework as more a dose-response analysis than a treatment-control analysis.	**Household income from cash transfers, unequivalised (does not state that it is equivalised.** Examines effect of doubling of cash transfers from median of 7500 pesos to 15000 pesos (equivalent to an increase from $806 to $1612) in 1998-99.	Height and weight measures to calculate growth faltering, stunting, height-for-age scores and BMI/overweight. Haemoglobin concentration was measured and mothers reported the number of sick days the child had had in the 4 weeks previous to the survey. Gross motor development measured for those over 36 months.	P	Height for age z score up 20% sd; proportion stunted down 10%; BMI down -2.85; percentage overweight down 8%. Not significant for number of sick days, motor development or haemoglobin concentration.	

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Appendix 3: Details of Main Studies for Children's Outcomes

Child Physical Health Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Johnson and Schoeni (2011)	Fixed Effects	U.S	Used sibling fixed effects and extensive controls on a child and adult sample from the PSID to analyse the effect of low-birth weight.	**Household income, unequivalised (does not state that it is equivalised).** Total family income measured 'at various points in childhood'. The analyses for outcomes included here are based on income during pregnancy.	General health status measured at both waves (1997 and 2002/3) in response to question 'would you say your health in general is excellent, very good, good, fair or poor?' Use the Health and Activity Limitation index to scale the responses.	P	For families with $15 - $50,000 a $10,000 increase leads to a 0.48 percentage point increase in self-reported health, with no effect among highest income families and unexpected negative effect among lowest income families. No effect on wealthier families.	
Meyers and Frank (1995)	Exogenous Income Variation	U.S	Compare height and weight of children from families that are receiving housing subsidies, with families that are on the waiting list to receive housing subsidies.	**Differences in disposable household income.** Captures differences in disposable income as a result of housing subsidy receipt, but no evidence on size of these differences.	Weight and height measured by nurses.	P	Children whose families received housing subsidies were significantly less likely to have low growth indicators than children whose families were on the waiting list for housing subsidies (despite those receiving housing subsidies being likely to be more deprived). But no way to calculate effect size as we do not know scale of income difference between the two groups.	A number of controls were included and differences between the demographics of the groups tested: the only difference between them should be that one group is receiving extra financial help in the form of housing subsidies (and if anything those already receiving the subsidies are likely to me be more deprived). N.B small convenience sample and low response rate (49%).

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Appendix 3: Details of Main Studies for Children's Outcomes

Child Physical Health Outcomes								
Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Milligan and Stabile (2011)	Exogenous Income Variation	Canada	Exploits variation in child benefit levels due to province, time and family type as instrument. Simulates the benefits that a random sample of families (taken from SLID) would be eligible for in each province-year-number of children combination between 1994 and 2004. Then using NLSCY as estimation sample imputes eligible child benefits for each family, using all available family characteristics in the NLSCY.	**Household income, unequivalised (does not state that it is equivalised).** SLID contains detailed information on income and benefits received over the past year, with the income measures taken from the respondent's income tax records; the NLSCY also contains detailed information on income over the past year (but not benefit receipt hence the simulation/tax calculator). Mean of benefit levels is $2,396 (sd $2,778). 1996-2004 (all values in 2004 constant Canadian dollars).	Maternal report of a 5 point scale from excellent to poor (authors combine bottom 3 measures as very few parents report their child to be in poor health). Parental report of height and weight measures, injuries in the past 12 months.	0	Child health measures insignificant by conventional standards. 4.3% sd increase in height, including 12.8% for boys (nothing for girls). No weight change.	

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Appendix 3: Details of Main Studies for Children's Outcomes

Child Physical Health Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Strully, Rehkopf and Xuan (2010)	Natural Experiment	U.S	Difference-in-difference modelling with state fixed effects. Used variation in EITC payments over time as a natural experiment to estimate effects of prenatal poverty on infant health. Compares unmarried mothers with high school degree or less living in a state with EITC, with similar mothers in a state without EITC.	**Household income, unequivalised:** Women's total pre-tax income from wages and salary in the previous year, logged to account for EITC's diminishing returns for higher earners.	Birth weight	P	No dose-response calculation possible. But state EITCs increase birth weight by on average 16gm (around 34% of the magnitude of the association between birth weight and having a high school degree). Including the control variable for maternal smoking during pregnancy reduces the EITC-birth weight association by about 3gm. Effect of EITC on birth weight varies by maternal age - largest estimate is for the lowest risk group, age 18-34; for 18 or younger it was smaller at around 8gm; and for older age group of 35+ the effect of state EITC is negative, decreasing birth weight.	N.B. EITC increases poor mothers' incomes in two ways: both as a tax credit, reducing tax liability and because of it generates employment incentives so can raise income by increasing labour market participation. It is difficult to empirically separate out these 2 separate effects and estimates of this study reflect their combined effects. On the other hand the study uses an 'intent-to-treat' analysis – cannot know whether particular women filed for and received EITC, so women who are likely to be eligible for, but might not have received EITC are included in the treatment group. This necessarily involves measurement error and may cause downward bias.
Tominey (2010)	Exogenous Income Variation	Norway	Estimates the effect of income shocks during childhood (age 1- 16), by exploiting the annual deviation from lifecycle profile which is uncorrelated with parental traits, using average income for 99 cohort-labour market cells- 90 travel to work areas for each of 11 cohorts).	**Household income, unequivalised (does not state that it is equivalised).** Income is defined as the sum of paternal and maternal income if both parents are known, or one parent otherwise. If families break up income is still measured as the sum across biological parents. Income is deflated to 2000 prices.	Measure of physical health for males only (measured for military service age 18). Measured on 9 point scale with 9 indicating perfect health.	0		

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Appendix 3: Details of Main Studies for Children's Outcomes

Child Physical Health Outcomes

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Violato, Petrou and Gray (2009)	Fixed Effects	UK	Uses 3 waves of the MCS (when children 9 months, 3 years and 5 years), both cross-sectionally using probit models and also longitudinally using a linear probability fixed effect model. Only fixed effects reported here.	**Household income, equivalised** Continuous household income measure from main and partner respondents reported net-pay/ take home pay/ income from other sources. Omitted values from the 0.5th percentile and above the 99.5th percentile to remove very large or small income values that could bias results. Averaged income across the 3 waves for permanent income measure and also measure 'lagged transitory income'.	Maternal report regarding asthma and wheezing.	0	The fixed effects model found income to be insignificant by conventional standards (only significant at 13%) for childhood asthma. The authors explain this may be due to a lack of statistical power given the limited variability of income across the three waves.	

Future Earnings

Author	Study type	Country	Study methods	Financial resources measure	Outcome measures	Effect summary*	Effect sizes as given by authors	Notes
Shea (2000)	Exogenous variation	U.S	Uses variation in father's earnings that argues represents luck, such as variations due to union status, industry and involuntary job loss due to plant closing etc. Argues that can estimate the impact of parents' income by comparing children of union or high-wage industry fathers to the children of non-union of low-wage industry fathers with similar observable skills.	Measure income using fathers' labour earnings and parent's total income (consisting of labour earnings, asset income and trasnfer income of head and spouse). Average fathers' earnings and parents' income over all years in which the father is household head aged 25-64 and in which the child is less than 23 and potentially still dependent on parental support.	Future earnings - measured using wages, labour earnings and total income (expressed in 1998 dollars). Average wages and earnings over all years in which the child is a household head or spouse aged 25 or older.	P		These results are for the low poverty sample only. Explains estimates may be upward biased for 2 reasons: luck may be correlated across generations (union fathers may be able to secure union jobs for their children) and the instruments may be correlated with unobserved ability.

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