

Does Money Affect Children's Outcomes?

A systematic review

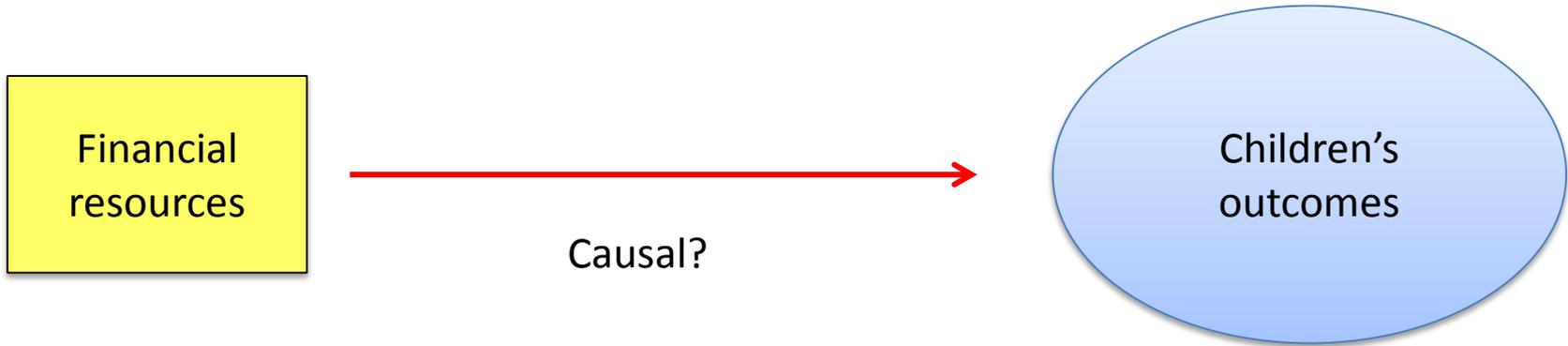
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Overview

- What is the project about?
- What did we do?
- What did our main studies find?
- What did we find out about our secondary questions?
(including mechanisms)

Background



- **Confounding factors:** genetic endowment? Parental education?
- **Implications for policy:** cash benefits vs investment in schools or parenting classes
- **Current context** (Labour's focus on income poverty, the Field Report (2010), consultation on child poverty measurement.)

This Project



Aim:

To review the evidence which seeks to identify whether the impact of financial resources on wider outcomes for children is causal.

Research Question:

How much does money matter for children's outcomes?

Outcomes we looked at

Children's Outcomes:

- Cognitive and school achievement
- Social, behavioural and emotional development
- Physical health
- Subjective wellbeing
- Social inclusion

Intermediate Outcomes:

- Home learning environment
- Parenting behaviours
- Parental physical and mental health
- Nutrition and material hardship
- Spending on children's items

Secondary Research Questions

Research Questions:

How much does money matter for children's outcomes?

Non-linearities?

Importance of timing?

Mechanisms?

Duration?

Source?

Who receives the income?

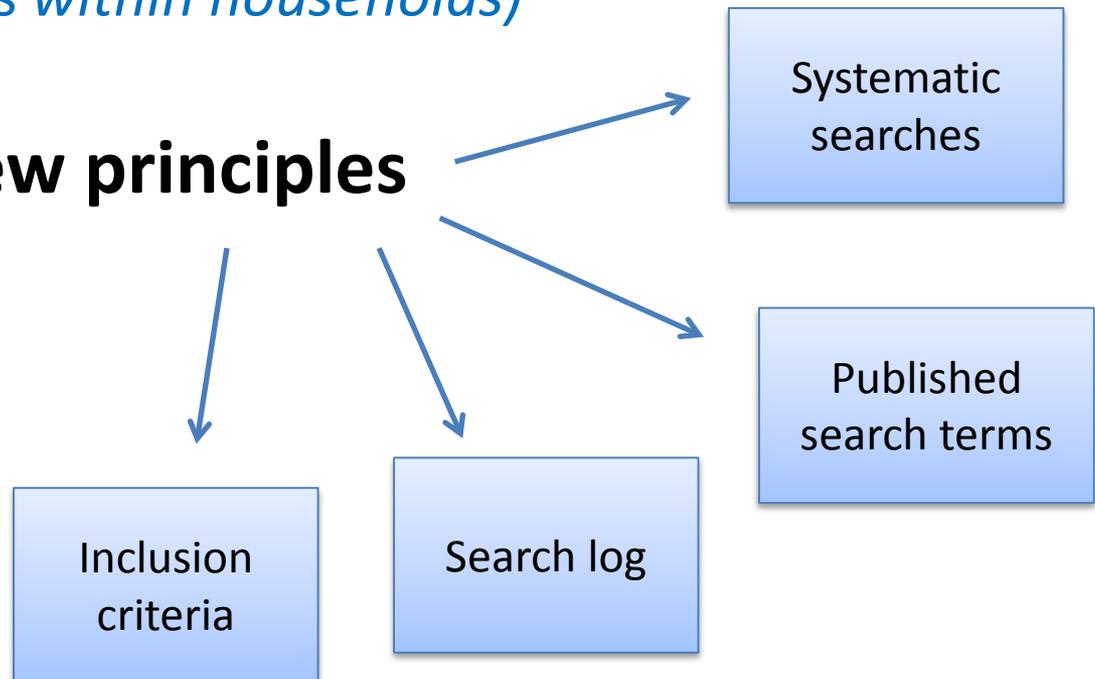
Methodology

1) Methods:

- RCTs
- Natural experiments
- Instrumental variables
- Fixed effects (or other techniques that measure changes in resources and outcomes *within households*)

2) Systematic review principles

(But publication bias)



Methodology - Systematic Searches

Financial resources

AB(wealth* OR assets OR salary OR salaries OR earning* OR wage* OR pension* OR income* OR "socio-economic status" OR "socioeconomic status" OR SES OR poverty OR poor OR depriv* OR disadvantag* OR hardship OR money OR cash* OR expenditure OR spending OR "standard* of living" OR "living standard*" OR "cost of living")

Method/causal relationship

AND AB(caus* OR effect* OR determin* OR impact* OR influenc* OR associat* OR correlat*)

Age group

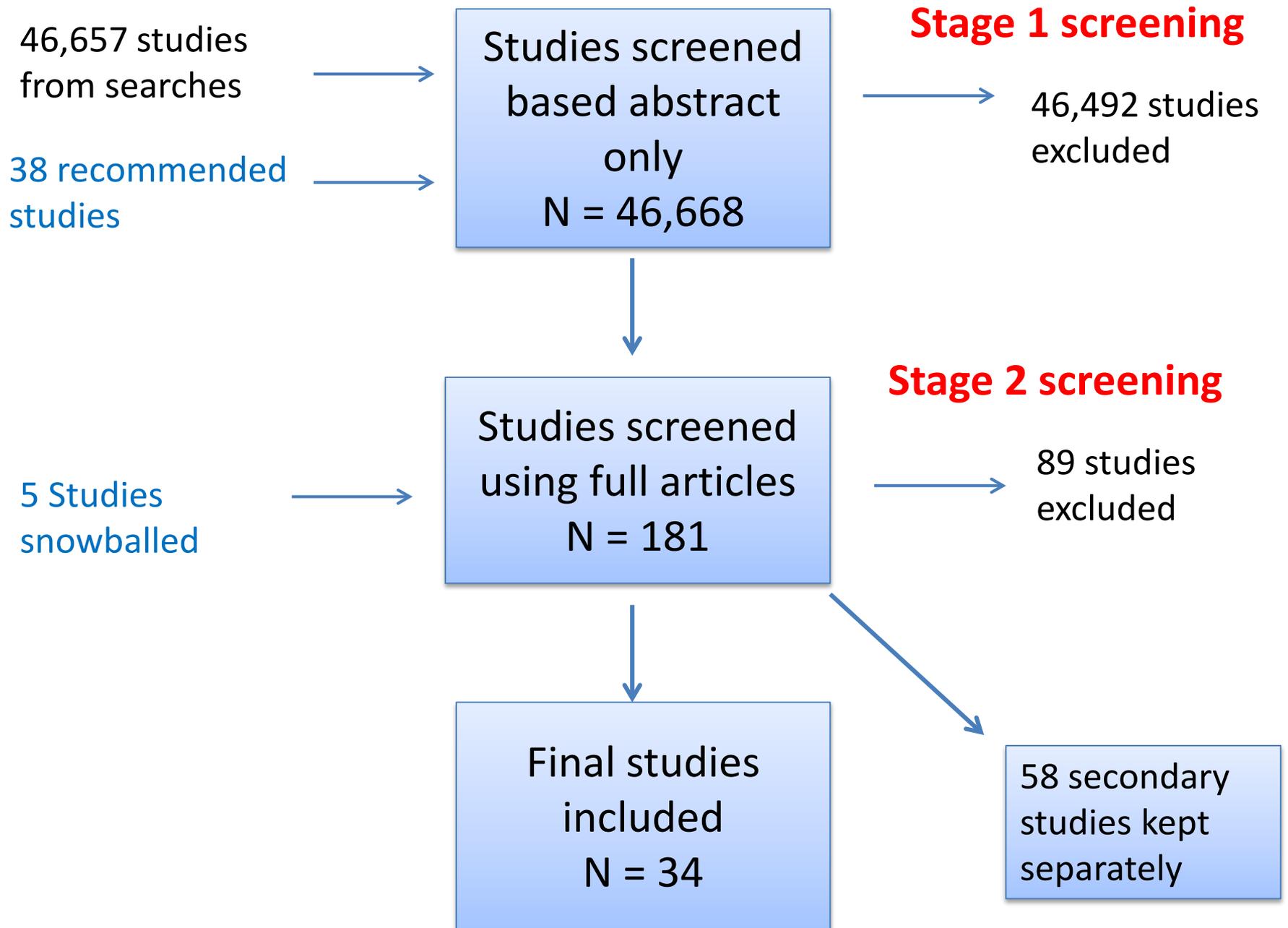
AND AB(child* OR teenage* OR adolescen* OR infan*)

Outcome terms e.g.
Cognitive
Development

AB(Cognitive OR Development* OR "school readiness" OR Reading OR Math* OR Writing OR vocabulary OR Test score* OR IQ OR Attainment OR Performance OR "School outcome" OR Qualification* OR "Exam* result*" OR "Exam* score*" OR Proficiency OR Achiev* OR Abilit* OR "Key stage" OR college OR "sixth form" OR NEET OR post-compulsory OR postcompulsory OR post-16)

Inclusion Criteria

- ✓ **Credible methods.**
- ✓ EU or OECD
- ✓ English abstract
- ✓ Post-1988 and unpublished post-2009
- ✓ Stated aim to show effect of income on one or more outcome of interest
- ✓ Income measured at individual or household level.



Final Studies – Example RCT

Gennetian and Miller (2002)

- Minnesota Family Investment Program- random assignment to 3 research groups : AFDC/control, financial incentives, incentives + work activity
- Incentives group - significant effects on positive behaviour and compliance, engagement in school and reduction in maternal depression and domestic abuse.
- Employment activities made no difference to most outcomes, but decreased children's social competence and autonomy.

Final Studies – Example Natural Experiment

Akee et al (2010)

- Opening of a casino on Eastern Cherokee reservation, rural Carolina
- Longitudinal study already in progress when Casino distributes profits to all adult tribal members – increase in income of around \$4,000 per adult.
- Increased income led to increased education, reduced teenagers crime and parent arrests, increased parental supervision and positive interactions with mother.

Final Studies – Example Instrumental Variables

Black et al (2012)

- Changes in childcare subsidies, not found to affect labour force participation or use of childcare instead acting as boost to disposable income.
- Using administrative data on entire Norwegian population compare families just below and just above the cut off for subsidies.
- Find significant positive effects of subsidies on test scores in junior school.

Final Studies – Example Fixed Effects

Violato et al (2011)

- Use first three waves of MCS (9 months, 3 years and 5 years)
- Track changes in income and children's cognitive and social-behavioural outcomes *within* households
- Found income was only significant for the vocabulary test and only for children from lone-parent families.

Our Final Studies - by Evidence Type

Studies by Method Type	Positive Results	Mixed Results	No Significant Results	Total
Randomised Controlled Trials	5	1		6
Natural Experiments	7		2	9
Exogenous Variation (IV)	2	3		5
Fixed Effects	9	2	3	14
TOTAL	23	6	5	34

Our Final Studies - by Outcome Type

Nature of outcomes	Studies including outcome	Positive	No effect
Children's Outcomes			
Cognitive development and school achievement	21	16	5
Social, behavioural and emotional development	9	7	2
Physical health	8	5	3
Subjective wellbeing and social inclusion	0	n/a	n/a
Future earnings	1	1	0
Mediating Outcomes			
The home learning environment	4	3	1
Maternal mental health	4	4	0
Nutrition and material hardship	3	2	1
Maternal physical health	3	2	1
Parenting and parental behaviours	3	2	1
Family expenditure on children's items	2	1	1
Total studies included*		34	

Our Final Studies – by Country

Studies by Country	Positive Results	Mixed Results	No Significant Results	Total
U.S	17	4	1	22
UK	2		2	4
Norway	2	1	1	4
Canada		1	1	2
U.S and Canada	1			1
Mexico	1			1
TOTAL	23	6	5	34

HOW MUCH does Money Matter?

‘Effect size’: marginal effect of income change as a percentage of standard deviation.

Or: if income was boosted by a given amount, how much of the average variation between any given child and the mean score would we expect to see eliminated?

Challenges in calculating effect sizes

- Missing standard deviations
- Studies use different currencies at different times
 - We adjust to \$1000 US 2000 using PPP and US CPI
 - No adjustment for differences in average incomes
- Different approaches to equivalisation (norm is unequivalised income, with controls for household size in regression calculation)

HOW MUCH does Money Matter?

- **Methods make a difference!**

**+ \$1,000
in 2000
(=£900
2013)**

Fixed Effects

**1-2% sd improvement in cognitive outcomes
1-3% sd change in social/behavioural**

**+ \$1,000
in 2000
(=£900
2013)**

**Experimental
Studies**

**5% - 27% sd for cognitive outcomes
9% - 24% sd for social and behavioural outcomes
14-15% sd for maternal depression**

HOW MUCH does Money Matter?

- An annual income boost of £6,000 might be expected to *halve* the KS2 gap between FSM and non-FSM children (using conservative end of experimental effect sizes).
- Effect sizes for school education expenditure in England similar to these lower end estimates: £1,000 increase annual expenditure per child = 2-7% sd on test scores.
- EPPE pre-school effects: 12% reading, 33% numbers, 47% language (current government annual spend £2,300)
- Evidence income affects multiple outcomes: ‘the ultimate “multi-purpose” instrument’? (Mayer 1997).

What did we find out about our other questions?

Non-linearities?

Importance of timing?

Duration?

Source?

Who receives the income?

Mechanisms?

Income has a non-linear effect

Study type	Evidence of nonlinearities	Mixed evidence of nonlinearities	No evidence of nonlinearities	Total
Main study	11	2		13
Secondary study	6		2	8
Total	17	2	2	21

Non-linearities: main studies only

		Effect larger in lower income?	How much larger?	Significant effect at higher income levels?	Outcomes
Separate regressions for higher and lower income groups					
Akee et al 2010	NE (Casino)	Yes	2-3 times	No	Educational, crime
Costello et al 2003	NE (Casino)	Yes		No	Socio-emotional
Dahl and Lochner 2012	NE (EITC)	Yes	2-3 times	Yes (but all are EITC)	Cognitive
Shea 2000	Instrument (unions)	Yes		No	Schooling, wages
Black et al 2012	Instrument (childcare subsidy)	Yes		Yes	Schooling
Dearing and Taylor 2007	FE	Yes	5 times	Yes	Home environment
Dearing et al 2006	FE	Yes	15 times	Yes	Social-behavioural
Dearing et al 2004	FE	Yes	1.5 times	Yes	Maternal depression
Blau 1999	FE	Yes/No	Effects largest at middle incomes.		Cognitive, behavioural, HE
Spline function (allowing relationship to vary at different income points)					
Johnson and Schoeni 2011	FE	Yes/No		Not at highest income	Health status (yes), cognitive (no)
Duncan et al 1998	FE	Yes	10 times	Yes	Schooling
Non-linear functional forms					
Loken et al 2012	NE (Norwegian oil shock)	Yes		No	Educational
Votruba-Drzal 2003	FE	Yes	4 times	Yes	Home environment

Does money matter more at particular stages of childhood?

Type of study	Evidence timing is important	Mixed evidence timing is important	No evidence timing is important	Total
Main studies	4		1	5
Secondary studies	7	1	1	9
Secondary within early childhood (0-4 years)		1	1	2
Total	11	2	3	16

At which stage of childhood does money matter most?

	Timing not important	Mixed results	Early childhood	Middle childhood	Adolescence	Total
Health	1	1				2
Cognitive/ education	3 (1)	1	4 (3)	1 (1)	2	11
Behavioural	1			2 (1)	1	4
Home Env/ parenting	1			1		2

Note: Number of main studies is given in red brackets

- Weak story that early childhood matters most for cognitive outcomes and later childhood/adolescence for social-behavioural outcomes

Does the duration of low income matter?

Challenge: income is measured with less error if averaged over two or more periods than at one point in time.

- 23 secondary studies, 18 of which find that more years in poverty is worse for a range of outcomes than a short-term experience
- 4 of our main studies: all find stronger effects for longer periods of higher income.
- However, there are exceptions (among secondary studies), e.g.:
 - [Miller and Davis \(1997\)](#): recent experience of poverty nearly as large an impact on home environment as long-term poverty
 - [Pagani et al \(1999\)](#): persistent financial hardship predicts grade repetition, but transitions in and out of poverty between 10 and 16 most associated with delinquency at 15-16.

Does the *source* of income matter?

- None of our studies looked at this directly
- Most of the studies exploiting an exogenous income change look at benefit changes (14 out of 19)
- 17 of the 19 find positive income effects.
- **No obvious differences in size of effects** between studies looking at benefits and studies looking at other sources

Does the *source* of income matter?

- Do income changes have less positive effects if linked to mandatory employment?
 - Benefit increases spent on children's goods in UK ([Gregg et al 2006](#)) but on transport and adult clothing in US ([Kaushal et al 2007](#))
 - Minnesota Family Investment Program RCT ([Gennetian and Miller, 2002](#); [Morris and Gennetian, 2003](#)): increased income had positive effects on behaviour, school engagement, maternal depression, but no extra gains for families who had to increase work participation, while there were some negative effects of mandatory employment on children's social competence and autonomy.

Who receives the income?

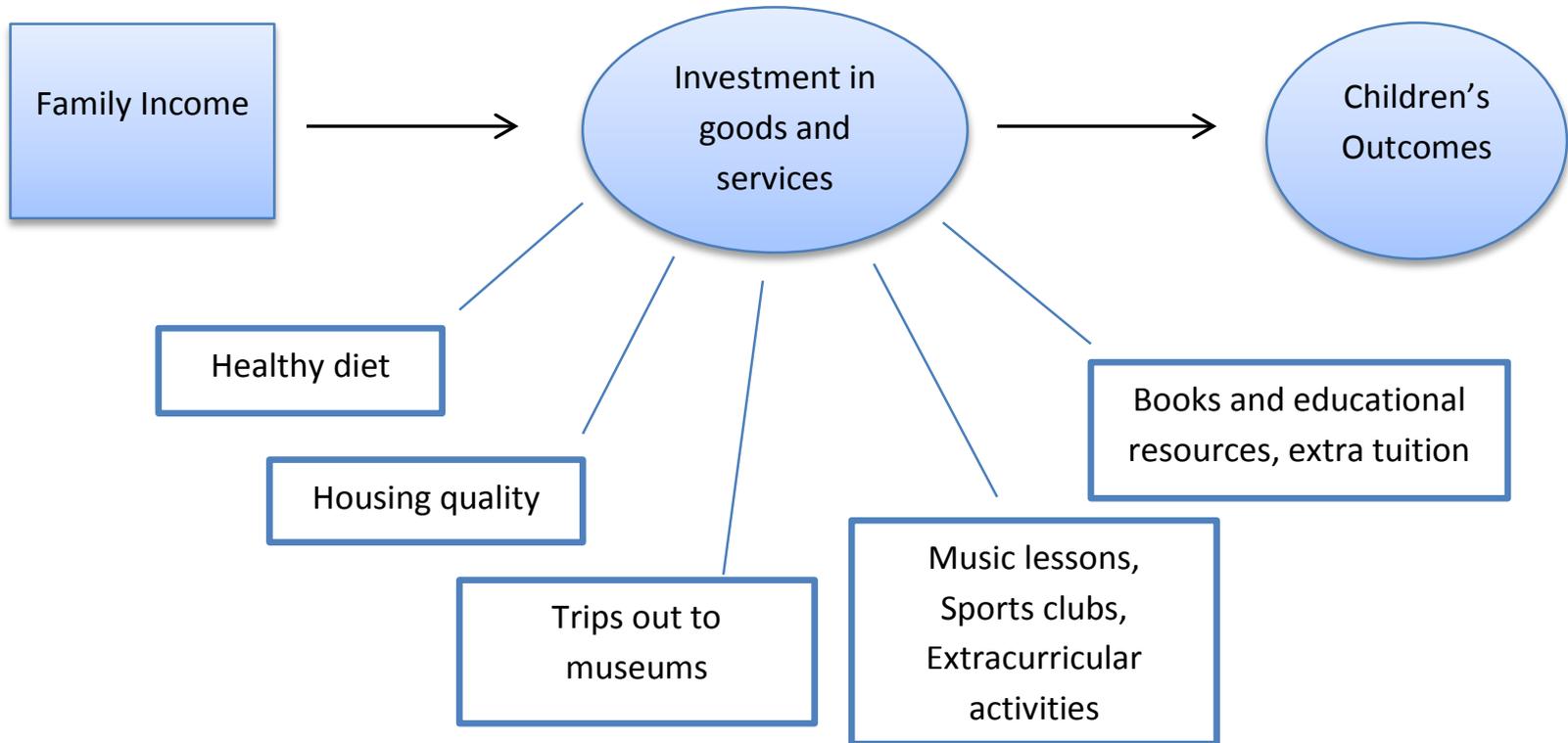
Just one of our studies examines this:

- [Akee et al \(2010\)](#) casino natural experiment: When mothers receive the income from the casino it has a positive effect on children's educational outcomes, but not if fathers receive it.

This fits with wider evidence from South Africa (Duflo, 2003) and the UK (Lundberg et al, 1997).

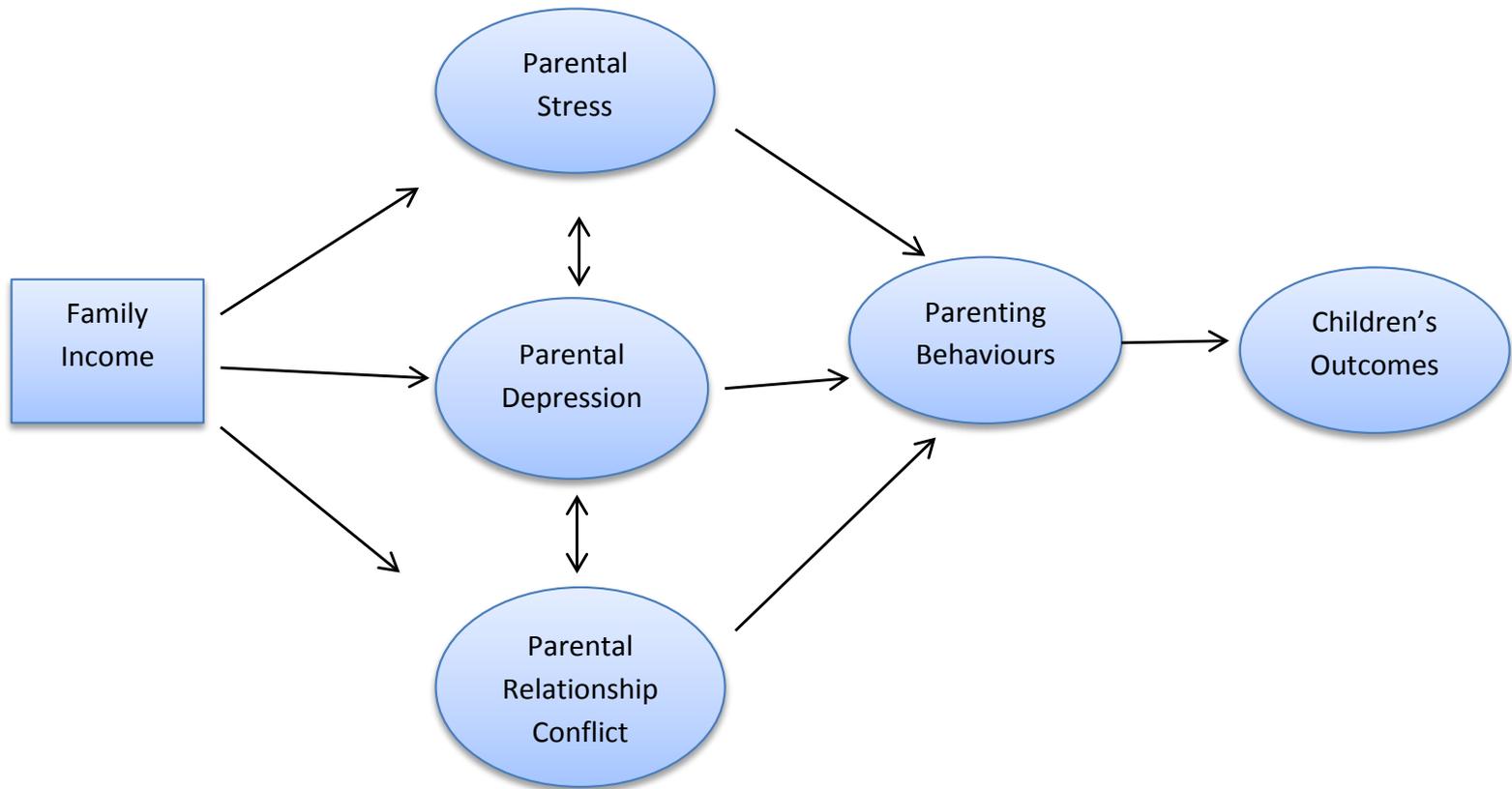
Mechanisms

The Investment Model



Mechanisms

The Family Stress Model



Evidence for Mechanisms

- 1) Main studies with intermediate factors as outcomes
 - 2) Main studies testing role of potential mediators as controls
 - 3) Studies using SEM
- Implications for findings from US

Conclusions 1

- **Strong evidence money has a *causal* impact on children's outcomes and a *bigger* impact for those with less.**
- **Effect sizes comparable to other interventions, but impact multiple outcomes at once**
- **Many gaps and need for more research (taking into account findings re methods)**

Conclusions 2

- **Non-linear effect?** Strong evidence of bigger effect for those with less
- **Importance of timing?** Not conclusive - some evidence early more important for cognitive outcomes and later more important for behavioural
- **Duration?** Difficult to test but findings from our secondary studies that long-term poverty has a greater effect supported by main studies
- **Source?** Not tested directly but majority of evidence makes use of benefit changes and find no difference in effect size. Some negative effects of mandatory work conditions.
- **Who receives the income?** 1 study only but in-line with wider literature finds more beneficial to children if mothers receive the income
- **Mechanisms?** Support for both investment model (increased spending on children's goods/services) and family stress model (parental mental health and parenting behaviours). More evidence and stronger evidence for family stress model.
- Implications for current austerity measures.

Full report available at

<http://www.jrf.org.uk/publications/does-money-affect-childrens-outcomes>

Ongoing research focusing on adult outcomes

Questions and comments welcome