

## Appendix 5: Studies Using Structural Equation Modelling

Author	Title	Journal/ Book	Country	Theory Tested	Outcome	Mechanisms	Results
I. Altschul (2012)	Linking Socioeconomic Status to the Academic Achievement of Mexican American Youth Through Parent Involvement in Education	Journal of the Society for Social Work and Research	U.S	Investment Model and Family Stress Model	Educational achievement  Measurement: students took 4 standardised tests in reading, maths, science and history. Test scores were combined into a single composite test score.	Parental involvement  Measured parental involvement in education by 6 measures: discussion of school-related issues between parent/child; help with homework; parental involvement in school organizations; educational resources in the home; extra-curricular activities; parent/child enriching activities.	First model results, found mother's occupation, family income and mother's education significant direct predictors of education achievement (father's education and occupation not significant direct predictors but both had significant indirect relationships via income). 2nd model results found parental involvement in education mediates the effects of income and mother's education on educational achievement and both variables are no longer significant predictors of educational achievement once measures of parental involvement are included. But parental involvement did not appear to mediate effects of mother's occupation and father's education. All 6 parenting measures were significantly predicted by SES but only 2 were significant mediators of the effects of family income on educational achievement: educational resources (0.028) and extracurricular instruction (0.014).
G. L. Burrell and M. W. Roosa (2009)	Mothers' Economic Hardship and Behavior Problems in Their Early Adolescents	Journal of Family Issues	U.S	Family Stress Model (not referenced by name)	Social and behavioural outcomes  Measured mother and child reports of problem behaviour using the externalizing grouping of the Child Behaviour Checklist and the Youth Self-Report.	Maternal depression and parental monitoring  Mother's depressive symptoms were measured by self-report using the Centre for Epidemiological Studies Depression Scale (CES-D). Parental monitoring was measured using the Parental Monitoring Scale of how often mother's knew where their child was and reported by adolescents and mothers.  (also measured deviant peer relations and attitude towards school)	Initially the model was not a good fit (and only use adolescent report model rather than mother's report model). After a number of adjustments, including adding a direct pathway from economic hardship to behaviour problems and from parental monitoring to behaviour problems (not via peer affiliations or attitudes towards school) the model was a good fit, but the indirect effect of economic hardship on problem behaviours (via peer affiliations and attitude towards schools) was slightly below conventional significance levels but explained 49% of the variance in adolescent problem behaviour. The indirect effect of economic hardship on behaviour problems was still significant via maternal depression and parental monitoring though (still supported Family Stress model)

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<p>A. Dickerson and G. Popli (2012)</p>	<p>Persistent Poverty and Children's Cognitive Development: Evidence from the UK Millennium Cohort study</p>	<p>CLS Cohort studies Working Paper</p>	<p>UK</p>	<p>Investment Model and Family Stress Model (not referenced by name)</p>	<p>Cognitive development  Use scores from the 2 tests in second wave and three tests in third and fourth wave. 6 different British Ability Scales tests including naming vocabulary, pattern construction, picture similarity and word reading. Also administered the Bracken School Readiness Assessment (BSRA) and NFER Progress in Maths test.</p>	<p>Parental investment and parenting style  Parental investment measured by a number of variables, including how often child is read to, paints or draws at home, is helped with reading, writing and maths and visits to the library. Parenting style measured by whether the child has a regular bedtime, how much TV the child watches and whether parents smack or shout at the child when naughty. Also use the Pianta parenting scale in MCS2.</p>	<p>Find persistent poverty has larger cumulative negative impact than episodic poverty. Poverty adversely effects parental investment, which in turn has a negative impact on child cognitive development. Poverty still has direct effect on cognitive development even when include parental investment. N.B also find evidence of 'strong persistence in cog development so any detrimental impact of poverty on cognitive development has a legacy effect well beyond the episodic incidence of poverty.</p>
<p>M. K. Eamon (2000)</p>	<p>Structural model of the effects of poverty on externalizing and internalizing behaviors of four- to five-year-old children</p>	<p>Social Work Research</p>	<p>U.S</p>	<p>Investment Model and Family Stress Model</p>	<p>Social and behavioural outcomes  Externalising and internalising behaviours were measured by the Behavioural Problem Index (BPI)</p>	<p>Parenting practices  Items from the HOME-SF measured parenting: emotional responsiveness, stimulating experiences, physical punishment and quality of home environment from maternal report and interviewer observation.</p>	<p>Aside from emotional responsiveness and externalizing behaviour, the parental behaviours directly impacted children's externalising and internalising behaviours. Persistent poverty is related to internalising behaviours indirectly through parenting but is mediated only by the quality of the physical home environment. Recent poverty was related to externalising problems via lower quality physical environment and fewer stimulating experiences, and to internalising behaviours via lower quality physical environment, fewer stimulating experiences and emotional unresponsiveness. The impact of poverty transitions was opposite to expected - an increase in the number of transitions as a % of the child's life, while controlling for persistent poverty is associated with more stimulating experiences and a better quality physical environment, which in turn affects externalising and internalising behaviours.</p>

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<p>M. K. Eamon (2002)</p>	<p>Effects of Poverty on Mathematics and Reading Achievement of Young Adolescents</p>	<p>Journal of Early Adolescence</p>	<p>U.S</p>	<p>Investment Model and Family Stress Model (not referenced by name)</p>	<p>Cognitive development  Measured by PIAT maths assessment and PIAT reading achievement.</p>	<p>Home environment and school behaviour problems  Cognitive stimulation and emotional support subscale scores of the HOME short form (HOME -SF) School behaviour problems measured by whether ever been suspended from school and whether during previous 3 months had a problem of being disobedient at school.</p>	<p>Revised model to improve fit (adding direct paths from poverty to school behaviour problems etc.). Found poverty was related indirectly to maths and reading achievement through its associations with less cognitively stimulating and emotionally supportive home environments, which in turn were related to school behaviour problems. Poverty was also associated indirectly with maths and reading achievement through its direct relation with school behaviour problems. The cognitive home environment mediated the relation between poverty and reading achievement but was not directly related to maths achievement. N.B path coefficients for relations between poverty and home environment were relatively large but the total effects of poverty on maths and reading achievement were small, particularly relative to the effects of mother's intellectual resources.</p>
<p>G. W. Evans, L. Boxhill and M. Pinkava (2008)</p>	<p>Poverty and Maternal Responsiveness: The Role of Maternal Stress and Social Resources</p>	<p>International Journal of Behavioural Development</p>	<p>U.S</p>	<p>Family Stress Model (not referenced by name)</p>	<p>Maternal responsiveness  Maternal responsiveness reported by child rating 11 items relating to both instrumental (e.g. help with homework) and emotional responsiveness (willingness to talk)</p>	<p>Maternal stress and maternal social networks  Maternal stress was self-reported using the Perceived Stress Scale. Maternal social networks measured by the Social Network Index which evaluates participation in 12 types of social relationships.</p>	<p>Found income significantly associated with maternal responsiveness via maternal stress and maternal social networks.</p>

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<p>E. T. Gershoff, J. L. Aber, C. C. Raver and M. C. Lennon (2007)</p>	<p>Income is not enough: incorporating material hardship into models of income associations with parenting and child development</p>	<p>Child Development</p>	<p>U.S</p>	<p>Investment Model and Family Stress Model</p>	<p>Cognitive development and social and behavioural outcomes</p> <p>Cognitive development measured by maths, reading and general knowledge were measured by ECLS-K assessment based on the Peabody Individual Achievement test, Peabody Picture Vocabulary Test, Primary Test of Cognitive Skills and the Woodcock-Johns Psycho-Educational Battery-Revised. Social and behavioural outcomes measured by Parents and teachers provided ratings of children's social-emotional competence adapted from the Social Skills Rating Scale. These scores were mostly combined to measure social competence, self-regulation, internalizing mental health problems and externalizing behaviour problems (for this measure, teacher/parent reports were kept separated).</p>	<p>Material hardship, parent stress, parent investment, positive parenting behaviour</p> <p>Material hardship measured by food insecurity, residential instability, inadequacy of medical care and months of financial troubles. Parent stress was measured by marital conflict, parenting stress and depressive symptoms. Parent investment measured by purchase of cognitively stimulating materials, parent activities with child out of home, extracurricular activities, parent involvement in school. Positive parenting behaviour was measured by warmth, cognitive stimulation, physical punishment and rules and routines.</p>	<p>Found material hardship partially mediated the relationship between income and the three parenting measures. Found both direct and indirect paths (partially mediated through parent stress) from income and material hardship to parent investment and positive parenting. Found the three parenting factors partially mediated the relationship between income and material hardship and the child outcomes. As well as some surprising results in opposite direction to expected, the path from family income to parent investment, to child social-emotional competence was not significant. Also found the negative relationship between income and parent stress is accounted for by their associations with material hardship - allowing income to be positively associated with stress when this is accounted for. Also found association between material hardship and stress stronger in bottom 2 quintiles. Authors emphasise that their results show importance of material hardship.</p>
<p>B. J. Goosby (2007)</p>	<p>Poverty Duration, Maternal Psychological Resources, and Adolescent Socioemotional Outcomes</p>	<p>Journal of Family Issues</p>	<p>U.S</p>	<p>Family stress Model (not referenced by name)</p>	<p>Social and behavioural outcomes</p> <p>Measured by maternal report using the Behavioural Problems Index to measure internalising and externalising behaviours. Draw on a subset of items to create the latent variables: a) depression and anxiety and b) peer problems/social withdrawal.</p>	<p>Maternal depression</p> <p>Mothers' depressive symptoms measured by self-report using Centre for Epidemiologic Studies Depression Scale (CAES-D), measured biennially from 1992. Mastery Scale measured in 1992 to measure the extent a person feels in control over their life.</p>	<p>Found significant relationship between poverty duration, maternal psychological resources and child social and behavioural outcomes. Maternal psychological resources explain a substantial portion of the effect of poverty duration on child outcomes: approx. 42% of the total effect of poverty on adolescent peer problems operates through the indirect effects of maternal mastery and depression.</p>

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<p>G. Guo and K. M. Harris (2000)</p>	<p>The Mechanisms Mediating the Effects of Poverty on Children's Intellectual Development</p>	<p>Demography</p>	<p>U.S</p>	<p>Investment Model and Family Stress Model</p>	<p>Cognitive development  Measured intellectual development by 4 cognitive tests: the Peabody Reading Recognition Assessment, Reading Comprehension Assessment, Mathematics Assessment and Picture-Vocabulary Test-revised.</p>	<p>Home environment, parenting style, child health and child care quality.  HOME score disaggregated into individual variables to measure subscales of physical environment at home, the level of cognitive stimulation and parenting style. Child health status measured by 2 latent variables - ill health at birth and ill health in childhood. Childcare quality measured by 1 latent variable relating to child care qualifications of carer, how many children receiving childcare in same group and number of care providers in the group.</p>	<p>Once mediating variables are incorporated into the model poverty no longer has a significant direct effect on intellectual development. Cognitive stimulation, physical environment and parenting style are all significant mediators. Cognitive stimulation is the most influential of all mediators considered (and physical home environment smallest and least consistently significant mechanism). Quality of child care was not found to be a significant mediator or associated with poverty or intellectual development. Poverty before birth has a significant effect on ill health at birth, which in turn has a significant effect on both ill-health during childhood and intellectual development; Ill health at childhood is related to intellectual development but does not seem to be affected by poverty.</p>
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<p>K. E. Kiernan and M. C. Huerta (2008)</p>	<p>Economic deprivation, maternal depression, parenting and children's cognitive and emotional development in early childhood</p>	<p>The British Journal of Sociology</p>	<p>UK</p>	<p>Family Stress Model</p>	<p>Cognitive development and social and behavioural outcomes</p> <p>Cognitive development measured at age 3 using 6 tests from the Bracken Basic Concept Scale. Behavioural adjustment was measured at age 3 via maternal report with the Strengths and Difficulties Questionnaire with 25 items along 5 dimensions of children's behaviour. Used the internalising and externalising dimensions.</p>	<p>Maternal depression and parenting style (reading activities, mother-child relations and disciplinary practices)</p> <p>Maternal depression measured when child 9 months from whether mother reported postnatal depression, whether mother diagnosed with depression and 9 items from the Rutter Malaise Inventory. Three measures of parenting collected age 3: reading activities, mother-child relations derived from the Pianta scale reported by mothers, and disciplinary practices including items taken from the conflict tactic scale.</p>	<p>Economic deprivation is directly associated with all three outcomes, with the largest effect on externalising problems, followed by cognitive development (and lastly internalising problems). Mother's depression is more strongly associated directly with externalising problems than internalising and is not associated with cognitive development. Mother's depression also partly mediates the association between economic hardship and internalising and externalising behaviour. Parenting also mediates relationship between economic hardship and child outcomes: parenting represents more than half of the total effect of economic hardship on cognitive development, mostly via reading activities. Similarly around 40% of impact of economic hardship on internalising and externalising behaviours is explained by parenting. Parenting also partly accounts for the relationship between maternal depression and behavioural outcomes, particularly externalising problems. Economic deprivation has different strengths of associations with different parenting constructs: it has a 'moderate' association with reading activities, a smaller association with positive relationship and no association with discipline practices.</p>
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<p>C.-Y. S. Lee, J. R. Anderson, J. L. Horowitz and G. J. August (2009)</p>	<p>Family Income and Parenting: The Role of Parental Depression and Social Support</p>	<p>Family Relations</p>	<p>U.S</p>	<p>Family Stress Model</p>	<p>Parenting  Parenting was assessed by 4 scales from the Parenting Relationship Questionnaire, relating to communication, involvement, parenting confidence and relational frustration.</p>	<p>Parental depression and social support  Parental depression measured using the Brief Symptom Inventory. Social support measured by the Interpersonal Support Evaluation List where parents rate the availability of different types of social support.</p>	<p>Family income was not correlated with any of the parenting variables, so authors state were not able to test whether parental depression mediated the relationship between income and parenting (N.B contradictory results using same data as Lee et al (20011) study). Nevertheless family income was found to have a direct negative relationship with parental depression, which had a direct negative relationship with positive parenting and a direct positive relationship with parent-child relational frustration. Social support was found to mediate the relationship between income and parental depression. Authors still conclude results support their hypotheses and has been included as providing support for Family Stress Model in the mechanisms discussion of this report, because a number of other studies find similar results and concluded this is because once the mechanism variables are included in the model there is no longer a direct effect of financial resources, i.e. the impact of financial resources is fully mediated by the Family Stress Model mechanisms.</p>
<p>C.-Y. S. Lee, J. Lee and G. J. August (2011)</p>	<p>Financial Stress, Parental Depressive Symptoms, Parenting Practices, and Children's Externalizing Problem Behaviors: Underlying Processes</p>	<p>Family Relations</p>	<p>U.S</p>	<p>Family Stress Model</p>	<p>Social and behavioural outcomes  Externalising problem behaviours rated by teachers using the BASC-2 Composite Externalising Problems Scale which relates to disruptive behaviour problems such as aggression, hyperactivity and delinquency.</p>	<p>Parent's social support, parental depression and parenting practices  Parental depression measured using the Brief Symptom Inventory. Social support measured by the Interpersonal Support Evaluation List where parents rate the availability of different types of social support. Parenting behaviour was assessed by asking parents to rate themselves on 4 scales from the Parenting Relationship Questionnaire relating to communication, involvement, parenting confidence and parent-child relational frustration.</p>	<p>Deleted 4 paths that were not significant (between income and depression, social support and relational frustration, depressive symptoms and positive parenting and positive parenting and externalising problems). Found social support, parental depression, and relational frustration (parenting) were mechanisms for the association between income and externalising behaviours. Found aggression severity, academic functioning and developmental strengths of the child moderated the associational pathways. N.B Contradictory results with same data as Lee et al (2009) study.</p>

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<p>J. A. Leinonen, T. S. Solantus and R.-L. Punamäki (2002)</p>	<p>The specific mediating paths between economic hardship and the quality of parenting</p>	<p>International Journal of Behavioural Development</p>	<p>Finland</p>	<p>Family Stress Model</p>	<p>Parenting  To measure quality of parenting used modified scaled from the Iowa Youth and Families Project. Parents answered questions about how often they expressed different feelings towards and discussed different things with the child, how well they knew their whereabouts and how they disciplined the child. Children answered questions about how often they felt their parent listened to their opinion, acted in a loving way, became angry with them or made them unhappy. Used factor analysis: parent-reported scale referred to authoritative, punitive and non-involved parenting. Child-reported scale resulted in authoritative, punitive and guilt inductive parenting.</p>	<p>Economic pressure, parental mental health, marital interaction  Two measures of economic pressure: general economic pressure relating to whether parents felt they could make ends meet (paying monthly bills, loan repayments, money left over at end of month) and specific economic pressures to assess economic adjustments the families had made (new ways of getting money, cut backs family and cut backs child) Parents mental health measured using General Health Questionnaire-28, using the anxiety, depression and social-dysfunction subscales. The quality of marital interaction was measured using a 7 point scale where both parents independently rate one another on 12 items describing how often the partner engaged in hostile behaviours and 8 items measuring how often they engaged in supportive behaviours (used factor analysis to test the items measured different dimensions of the relationship).</p>	<p>Found relationship between economic hardship and parenting quality mediated through economic pressure, mental health and marital interaction and that this differs between the mothers and the fathers in the dimensions of these constructs. For fathers, both general and specific pressures were associated with anxiety and social dysfunction, this was associated with perceived hostility by their wives, and more punitive (self and child-reported), non-involved and less authoritative parenting. Perceptions of their spouse's low support was also associated with punitive, non-involved and less authoritative parenting. For mothers only specific economic pressures were related to mental health measures - they were positively related to symptoms of anxiety and depression. Anxiety was further related to spouse's perceived marital support and self-reported non-involved parenting. Maternal depression was negatively associated with self-reported authoritative mothering. Mother's perceptions of high received spousal hostility was positively related to self-reported punitive parenting.</p>
<p>J. D. Lempers, D. Clark-Lempers and R. L. Simons (1989)</p>	<p>Economic Hardship, Parenting, and Distress in Adolescence</p>	<p>Child Development</p>	<p>U.S</p>	<p>Family Stress Model (not referenced by name)</p>	<p>Social and behavioural outcomes (emotional distress)  Emotional distress was measured by the Beck's Depression Inventory, a Loneliness Questionnaire, a Delinquency Questionnaire and a Drug Use Questionnaire.</p>	<p>Parenting practices  Parenting measured by a parenting questionnaire - reported by adolescents consisting of 29 items relating to nurturance, monitoring, and consistency in parental discipline.</p>	<p>For depression and loneliness all path coefficients were significant. Economic hardship had both a direct association with adolescent depression/loneliness and an indirect association via parental nurturance and inconsistent parental discipline. For delinquency/drug use the direct association with economic hardship was not significant, nor was the association with parental nurturance. Economic hardship was found to be indirectly associated with delinquency/drug use via inconsistent parental discipline.</p>

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<p>M. R. Linver, J. Brooks-Gunn and D. E. Kohen (2002)</p>	<p>Family Processes as Pathways from Income to Young Children's Development</p>	<p>Developmental Psychology</p>	<p>U.S</p>	<p>Investment Model and Family Stress Model</p>	<p>Cognitive development and social and behavioural outcomes  For cognitive development measure children were assessed with the Stanford-Binet Intelligence Scale Form at age 3 and with the Wechsler Preschool and Primary Scale of Intelligence at age 5. Combined both measures using factor analysis. Behavioural competence was measured at age 3 and 5 with the age appropriate versions of the Child Behaviour Checklist. Combined both measures using factor analysis.</p>	<p>Home environment, parenting practices and maternal mental health  Maternal mental health measured using General Health Questionnaire when the child was 1 and 2 - (use average). Parenting coded using the Classification of Parenting Styles in Freeplay based on videotapes of freeplay and problem-solving behind a one-way mirror. This assessed dimensions of warmth, control and punitiveness and authoritative and authoritarian parenting styles. (Variables combined as latent structure). Cognitive stimulation in the home was measured with the preschool version of the HOME from interview and observation.</p>	<p>For cognitive development found family investment model supported - home environment partially mediated the relationship between income and cognitive development - direct and indirect effects (not via maternal mental health as this was not correlated with home environment). The relationship between income and behaviour problems was fully mediated (i.e. reduced to nonsignificance) by maternal mental health, parenting practices and home environment. (Again maternal mental health was not associated with home environment.) Less of the variation was explained in the behaviour problems model.</p>
<p>R. S. Mistry, J. C. Biesanz, L. C. Taylor, M. Burchinal and M. J. Cox (2004)</p>	<p>Family Income and Its Relation to Preschool Children's Adjustment for Families in the NICHD Study of Early Child Care</p>	<p>Developmental Psychology</p>	<p>U.S</p>	<p>Family Stress Model</p>	<p>Cognitive development and social and behavioural outcomes  At age 3 cognitive development was measured with the School Readiness Subscale of the Bracken Scale of Basic Concepts and language development was measured with the Reynell Developmental Language Scales. A latent construct representing a composite score of these 2 measures was created. At age 3 behavioural problems were measured via maternal report using the Child Behaviour Checklist and the Adaptive Social Behaviour Inventory. A latent construct of internalising, externalising and disrupt subscales was created. Child competence was also assessed using the ASBI using the Expressive Behaviour and</p>	<p>Maternal depression and maternal sensitivity/responsiveness  Maternal depression was measured at 6, 15, 24 and 36 months with the Centre for Epidemiological Studies Depression Scale. Maternal sensitivity and responsiveness was measured during the same time points with video recorded semi-structured 15 min interaction tasks.</p>	<p>Found the impact of income on social/behavioural outcomes was fully mediated by family processes (no direct effect) also found this mediated relationship was non-linear (strength diminished as income increases). For cognitive outcomes income was found to have both direct and indirect effects, resulting in a 'strong' overall association (again with nonlinear pattern). Both measures of income (linear and quadratic) were associated directly with perception of financial resources and maternal depression and sensitivity. Perception of financial resources were then indirectly related to child outcomes via maternal depression and sensitivity. As well as its indirect path to child outcomes through maternal sensitivity, maternal depression was also directly related to both behavioural outcome measures. From both rate-of-change analyses and variability in income-to-needs analyses found stability/instability of income not systematically related to child outcomes.</p>

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					Compliant Behaviour subscale and a latent construct was created based on these 2 subscales.		
R. D. Parke, S. Coltrane, S. Duffy, R. Buriel, J. Dennis, J. Powers, S. French and K. F. Widaman (2004)	Economic Stress, Parenting, and Child Adjustment in Mexican American and European American Families	Child Development	U.S	Family stress Model	Social and behavioural  Children's internalising and externalising behaviours were measured using parent report versions of the Child Behaviour Checklist	Economic pressure, parental depression, marital problems and hostile parenting  Economic pressure measured by ability to pay bills/money left over at end of month, enough money to meet basic needs and economic adjustments. Parental depression measured by the Beck Depression Inventory completed by both parents. Marital problems measured by each spouse answering questions separately about marital quality and marital instability. Hostile parenting was measured by parents and children completing Schaefer's (1965) 59-item parental practices questionnaire - measures formed 2 subscales: the hostile/rejecting factor and passive/inconsistent subscale. The 2 subscales were combined for the SEM analysis. (Also measured Mexican American parents' level of acculturation as a mediating factor).	Results for the first model for the European American sample were as expected: low income, high income instability and unstable work were significantly related to both maternal and paternal economic pressure, which then affected maternal and paternal depression as expected. Results for this first model were mostly identical for the Mexican American sample, although family income had a much lower but still significant impact on economic pressure. For the second model, maternal and paternal depression had equal effects on marital problems. Parental depression affected hostile parenting (again equally for mother and fathers) and paternal hostile parenting had a large significant effect on child social and behavioural outcomes. However marital problems and maternal hostile parenting did not have a significant effect on children's behaviour outcomes. For the Mexican American sample marital problems were also increased by maternal levels of acculturation. Maternal acculturation also reduced both maternal and paternal hostile parenting. Also paternal hostile parenting had a small significant effect on children's behavioural outcomes, but marital problems had a large significant effect on children's outcomes.

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<p>T. Raviv, M. Kessenich and F. J. Morrison (2004)</p>	<p>A Mediation Model of the Association between Socioeconomic Status and Three-Year-Old Language Abilities: The Role of Parenting Factors</p>	<p>Early Childhood Research Quarterly</p>	<p>U.S</p>	<p>Family Stress Model (not referenced by name)</p>	<p>Cognitive development  At age 3 children's language abilities were assessed using the Reynell Developmental Language Scales which measures expressive language and verbal comprehension. Children's receptive verbal conceptual skills were also assessed using the Bracken Basic Concept Scale.</p>	<p>Maternal sensitivity and cognitive stimulation  Maternal sensitivity was measured using the Structured Interaction, a semi-structured mother-child play session conducted in the lab. Cognitive stimulation was measured using the HOME score.</p>	<p>Test combined model (which includes direct effects from income to outcomes) and indirect path model - used cross-validation analysis to compare fit of both models - The combined model was the strongest fit. Income-to-needs had both direct impact on language outcomes and indirect impact through home cognitive stimulation and maternal sensitivity. The only direct path that was not significant was from income to the Reynell Expressive Language score.</p>
<p>M. L. Skinner, G. H. Elder and R. D. Conger (1992)</p>	<p>Linking economic hardship to adolescent aggression</p>	<p>Journal of Youth and Adolescence</p>	<p>U.S</p>	<p>Family Stress Model (not referenced by name)</p>	<p>Social and behavioural  Adolescent aggression measured by self-report based on statements from the BD Hostility Inventory. Also measured by parents' reports which were assessed using the Conduct Disorder Scale from the Revised Quay Problem Behaviour Checklist.</p>	<p>Economic pressure, marital relationship, irritable parenting  Economic pressure measured by felt constraints (difficulty paying bills and money left over at end of month) and specific adjustments (e.g. borrowing, postponing big expenditures). Marital relationship measured by husband and wives' negativity during interaction and problem-solving tasks (wives and husbands were scored based on hostility towards each other and negative mood during the tasks). Irritable parenting was measured by observational score (ratings of hostility towards the adolescent summed across all family interaction tasks) and adolescent's report (responses about parents behaviour in the past month).</p>	<p>Find effects of hardship and pressure on family interaction are indirect via hardship adaptations of constraint and adjustment. This causes fathers but not mothers to have increased hostility and negative behaviour towards their partner. Negativity within the marital relationship links financial difficulty with irritable parenting, which in turn affects adolescent aggression. N.B model tested in 2 phases although intermediate model tested and found no direct links from economic hardship and parenting or adolescent aggression.</p>

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<p>L. B. Whitbeck, R. L. Simons, R. D. Conger, F. O. Lorenz, S. Huck and G. H. Elder Jr (1991)</p>	<p>Family Economic Hardship, Parental Support, and Adolescent Self-Esteem</p>	<p>Social Psychology Quarterly</p>	<p>U.S</p>	<p>Family Stress Model (not referenced by name)</p>	<p>Social and behavioural  Self-esteem measured by adolescents completing Rosenberg's self-esteem scale (1965) and Pearlin's mastery scale.</p>	<p>Parental support and involvement  Parental support and involvement was reported by the target child and parents - questions related to how often parents talked to child, gave them a voice in family decisions and showed trust and caring towards their child. Parental support was also measured by 2 independent observers that rated parental behaviour towards the child during 35 minute videotaped family interaction exercise.</p>	<p>Family income and debt-to-asset ratio was significantly associated with adolescent self-esteem via economic pressure and parental support and involvement. There was no significant difference for boys and girls. Direct effects economic pressures were minimal although not clear whether significant.</p>
<p>L. B. Whitbeck, R. L. Simons, R. D. Conger, K. A. S. Wickrama, K. A. Ackley and G. H. Elder Jr (1997)</p>	<p>The Effects of Parents' Working Conditions and Family Economic Hardship on Parenting Behaviors and Children's Self-Efficacy</p>	<p>Social Psychology Quarterly</p>	<p>U.S</p>	<p>Family Stress Model</p>	<p>Social and behavioural  Adolescents' self-efficacy was measured at year 4 using Pearlin's mastery scale (relating to how much control they felt they had over things that happened to them, how helpless they felt in dealing with problems in their lives etc.). The second measure related to adolescent's sense of control over their environment.</p>	<p>Economic pressure, parental mental health and parenting style  Economic pressure measured by ability to make ends meet, ability to afford basic goods and measure of economic adjustments. Parental mental health or 'negative affect' was measured by observers' ratings of parents' verbal and nonverbal behaviours that suggested emotional distress such as anxiety, from three videotaped tasks. Parenting style was measured as the sum of adolescent and parents' reports at year 3 on two measures: harsh parenting (the degree to which parent loses control of temper and yells at adolescent, how often spanked or slapped etc.) and whether used inductive parenting techniques (whether gave the adolescent reasons for their decisions, degree to which parent used reasoning and explaining in disciplining etc.).</p>	<p>For both mothers and fathers (modelled separately) economic pressure had both a direct effect on parenting style and indirect effect via parent's negative effect. Parenting style was then related to adolescent's self-efficacy.</p>

Appendix 5: Studies Using Structural Equation Modelling

<p>W. J. Yeung, M. R. Linver and J. Brooks-Gunn (2002)</p>	<p>How money matters for young children's development: Parental investment and family processes</p>	<p>Child Development</p>	<p>U.S</p>	<p>Investment Model and Family Stress Model</p>	<p>Cognitive development and social and behavioural outcomes  Cognitive achievement was assessed using the Woodcock-Johnson Achievement Test-Revised. Used q age-standardised subscales for study: applied problems and letter-word. Externalising behaviour problems were assessed via maternal report, using the Behaviour Problems Index. (Did not include internalising behaviour problems in study as was found to be unrelated to income.)</p>	<p>Home environment and parenting  2 sets of measures relating to investment model: one to do with materials and services and the other relating to time spent with the child in stimulating activities (monetary vs. time investments). Physical home environment, cognitively stimulating materials assessed with the HOME. Child care cost was also included as an indicator of financial investment in the child. Parents also reported on their activities with the child relating to 7 items. Measures relating to the 'family stress model' included economic pressure, maternal depressive affect (measure by Composite International Diagnostic Interview) and parenting (warm parenting measured by HOME observation and punitive parenting measured by 2 self-report measures re spanking &amp; discipline and 2 observational measures)</p>	<p>The impact of income on applied problem scores was primarily through the physical home environment, as well as other investment mediators. The investment mediators also had a positive effect on maternal psychological wellbeing and parenting practices (in fact a larger effect than economic pressure). For the letter-word score cognitively stimulating materials and activities were equally related directly. The physical home environment was related to letter-word score through punitive parenting practices. Economic pressure also affected letter-word score through maternal distress and punitive parenting. For externalising behaviour problems higher emotional distress was associated both directly and indirectly, via punitive parenting practices. Physical home environment, childcare environment and cognitively stimulating materials were indirectly related to problem behaviours through maternal distress and parenting practices. Maternal depressive affect among all variables had the strongest association with externalising problems. Once all mediators included the effect of income was insignificant for the applied-problem score and externalising behaviour score (no direct effects). Income instability had a direct effect on applied problem scores and an indirect effect on letter-word scores and externalising problem behaviours via maternal distress and more punitive parenting. The authors conclude the investment model and family stress model should be considered together.</p>
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