

Three papers on childhood disadvantage and child policy in
Canada

by

Annie McEwen

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School of Public Policy and Administration Ottawa,
Faculty of Public Affairs, Carleton University

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Abstract

Over the past twenty years, child and family policy has become one of the most active areas of Canadian social policy. However, our understanding of whether children's lives have actually improved is limited. This dissertation addresses this research gap in three papers that examine the politics of Canadian child policy, evaluate child policy outcomes, and explore the determinants of child well-being that policy attempts to affect.

The first paper examines the evolution and politics of child policy in Canada from 1995-2015. During this period, federal government spending targeted to families with children has more than doubled in real terms with a focus on increasing family income. To explain this focus, I identify four perspectives on the child in the Canadian political discourse: child as family responsibility, child as deserving poor, child as rights bearer, and child as investment. I argue that the scope of child policy in Canada has been constrained to a family income paradigm that sits at the intersection of these perspectives.

The second paper evaluates the significant expansion of Canadian child benefits from 1994 to 2010. Using data from the National Longitudinal Survey of Children and Youth (NLSCY) and the Survey of Labour and Income Dynamics, I compare measures of poverty and inequality with indicators of young children's well-being. I find young Canadian children have not seen significant change in their relative economic position. Indicators of children's physical, emotional, developmental well-being and family context remain essentially stable, as do gaps between the outcomes of poor and rich children.

Understanding *how* household income and socioeconomic (SES) status affect child outcomes is crucial for designing effective public policies to reduce the disadvantage of growing up in poverty. In the third paper, I use structural equation modeling of NLSCY data to disentangle the different pathways of income's and other elements of SES's effect on children's cognitive, socio-emotional, and behavioural outcomes. Applying theories of family stress and family investment, the analysis examines children's activities, parenting, and family functioning as potential mediators. I find that SES has a consistently larger effect on child outcomes than income, with parenting emerging as a key mediation pathway.

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Table of Contents

Front Matter:

Abstract	ii
Acknowledgements	iii
Table of Contents	v
List of Tables	vii
List of Figures	vii
List of Appendices	ix

Introduction: Public policy to improve children’s lives

1 Introduction	2
2 Motivation	4
3 Overview of papers	8
4 Dissertation aims	12
References	14

Paper #1: Shifting perspectives and paradigmatic constraints in Canadian child policy 1995-2015

Abstract	22
Table of Contents	23
1 Introduction	24
2 Child policy as family income policy	26
3 The role of ideas in child policy	38
4 Four policy perspectives on children	41
5 The Family Income Paradigm	44
6 Conclusion	56
Appendix A: Provincial Child Benefits	59
References	61

Paper 2: How are the kids doing?: Canadian child well-being during a period of prosperity and policy attention

Abstract	71
Table of Contents	72
1 Introduction	74
2 Measuring Child Well-being	77
3 Economic and Policy Context	80
4 Description of Data	85

5	Child poverty	89
6	Child income inequality	99
7	Child outcomes	107
8	Child outcomes by income.....	113
9	Summary of child well-being measurement	119
10	Discussion and conclusion.....	121
	Appendix A: Definitions of child outcomes, from National Longitudinal Survey of Children and Youth.....	126
	Appendix B: Child outcomes, univariate analysis tables.....	130
	Appendix C: Child outcomes by income quintile analysis tables.....	134
	References.....	140

Paper 3: How do Income and Socio-Economic Status Matter? Disentangling Pathways of Effect on Child Well-Being and Development

	Abstract.....	147
	Table of Contents.....	148
1	Introduction.....	150
2	Literature Review.....	152
3	Methodology.....	162
4	Data and samples	163
5	Measures	166
6	Model Specification.....	169
7	Modeling Results	172
8	Discussion.....	186
9	Conclusion	195
	Appendix A: Structural Equation Modeling Methodology	197
	Appendix B: Measures, descriptive statistics and measurement model	219
	Appendix C: Tables of structural model results	242
	References.....	252

Conclusion: Towards an evidence-based ‘disadvantage’ approach to child policy

1	Introduction.....	260
2	Summary of findings	260
3	Limitations and forward research directions	264
4	Discussion & Policy implications.....	265
	References.....	272

List of Tables

Paper 1

Table 1. Federal Expenditures on Children (\$ millions, 2015 constant)	27
Table 2. Four perspectives on child policy	46

Paper 2

Table 3: Sample sizes.....	87
Table 4: Poverty Rates 1994-2010.....	93
Table 5: Average ratio of income to low-income line	96
Table 6: Average Gap from low income line, CPI 2008\$	97
Table 7: Income percentile ratios.....	103
Table 8: Mean household equivalized income, bottom 20%, middle 60%, and top 20% of income distribution (\$2008 CPI)	105
Table 9: Child outcomes, univariate	109
Table 10: Child outcomes, by income	114
Appendix B.1 Physical outcomes	130
Appendix B.2: Socio-emotional outcomes	131
Appendix B.3: Developmental outcomes	132
Appendix B.4: Family context outcomes.....	133
Appendix C.1 Physical outcomes by income quintile	134
Appendix C2: Socio-emotional outcomes by income quintile	136
Appendix C3: Developmental outcomes by income quintile	137
Appendix C.4: Family context by income quintile	138

Paper 3

Table 11 Sample Sizes	165
Table 12: Outcome correlations with income and SES	174
Table A.1: Classification of variables within SEM models.....	205
Table B.1 Early childhood models descriptive statistics	233
Table B.2 Middle childhood models descriptive statistics	235
Table B.3 Adolescent models descriptive statistics.....	237
Table B.4 Early childhood latent measurement.....	239
Table B.5 Middle childhood latent measurement	240
Table B.6 Adolescence latent measurement	241
Table C.1 Early childhood model results (main)	242
Table C.2 Early childhood model results (controls)	243
Table C.3 Middle childhood model results (main)	246
Table C.4 Middle childhood model results (controls)	247
Table C.5 Adolescent model results (main).....	249
Table C.6 Adolescent model results (controls).....	250

List of Figures

Paper 1

Figure 1: Federal expenditures on children	28
Figure 2: Maximum Federal Child Benefit Amounts (cash transfers), 1944-2015, one child	30
Figure 3: Maximum provincial child benefits, one child under age 6, 2014/2015	37

Paper 2

Figure 4: GDP growth and unemployment rate 1990-2012.....	80
Figure 5: Federal child benefits for two parent, two child family, various incomes 1994 and 2010	84
Figure 6: Poverty rates, LIM and LICO, 1994-2010	93
Figure 7: Average gap from low income lines.....	98
Figure 8: Gini coefficients for market income and after-tax income 1994-2010	101
Figure 9: Mean PPVT-R score by income quintile.....	117
Figure 10: Mean family functioning score, by income quintile (infant).....	118
Figure 11: Social Support, by income quintile (Preschool).....	118

Paper 3

Figure 12: Generalized model specification	169
Figure 13: Early childhood model results.....	175
Figure 14: Middle childhood model results	176
Figure 15: Adolescent model results.....	177
Figure A.1: SEM diagram of measurement model	202
Figure A.3: SEM path diagram of simplified middle-childhood Socio-emotional well- being model (one mediation pathway, no controls)	204

List of Appendices

Paper 1

Appendix A: Provincial Child Benefits	59
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Paper 2

Appendix A: Definitions of child outcomes, from National Longitudinal Survey of Children and Youth.....	126
Appendix B: Child outcomes, univariate analysis tables.....	130
Appendix C: Child outcomes by income quintile analysis tables.....	134

Paper 3

Appendix A: Structural Equation Modeling Methodology	197
Appendix B: Measures, descriptive statistics and measurement model	219
Appendix C: Tables of structural model results	242

Introduction: Public policy to improve children’s lives

Table of Contents

1. Introduction	2
2. Motivation	4
3. Overview of papers	8
3.1. Paper 1: Shifting perspectives and paradigmatic constraints in Canadian child policy 1995-2015	8
3.2. Paper 2: How are the kids doing?: Canadian child well-being during a period of prosperity and policy attention	9
3.3. Paper 3: How do Income and Socio-Economic Status Matter? Disentangling Pathways of Effect on Child Well-Being and Development	10
4. Dissertation aims.....	12
References14

1. Introduction

Nearly 400,000 children are born in Canada every year, each starting off on a unique life path. At birth, these infants, the very image of hope and promise, are already endowed with many of the traits and circumstances that will shape their lives to come. One does not have to be a fortune teller to predict a child's future by looking at her parents. However, alongside individual conditions, all young Canadians are born into a shared circumstance that will moderate those individual differences and shape their future. Public policies, the actions governments do or do not take, affect every child's life.

Childhood development is a complex and multifaceted process. In exploring what matters to children's well-being and development, often public policy is treated as fixed in favour of examining more proximal factors, including parental background and home environment. This approach is practical: focusing on effects closer to the individual child gives a clearer identification of a causal mechanism and thus more purchase on finding individual interventions to improve outcomes. However, in focusing on the proximal factors, we risk ignoring that the very nature of these effects can be altered by the context in which they occur, or indeed through direct policy interventions. A child's literacy is less determined by their parents' education when there is high quality public education. The impact of childhood illness can depend on quality of health care available. Even basic nutrition and shelter are determined for the poorest children by social assistance and housing policy. It is often difficult to isolate policy effects from the proximal factors with which they interact. However, cumulatively—across individual factors and at a population level—governments have considerable potential to influence child

development and well-being. This potential can be seen in the wide cross-national variation in child outcomes among similarly wealthy countries (OECD, 2009; UNICEF, 2013, 2014).

Beyond the influence of general welfare state architecture, governments actively work to improve children's lives with policy aimed at children or families with children—what I term here 'child policy'. In this capacity, public policy specifically aims to influence children's outcomes, from basic health and cognitive development, to life satisfaction and educational attainment. While multiple social policy goals may be pursued through what is ostensibly child policy (for instance increased employment, gender equality, general redistribution, etc.), two aims tend to be central: 1) improving population child well-being, and 2) equalizing the childhood experiences and future life chances of children from different backgrounds. Effective child policy towards either of these goals depends on understanding what matters to children's development and well-being, and finding opportunities for policy to influence these determinants. Particularly for policy attempting to equalize opportunity, identifying what constitutes disadvantage is key to designing policy to reduce it.

This dissertation is motivated by the need for better evidence to inform child policy in the Canadian context. The three independent papers of this dissertation contribute to answering the question: how can Canadian child policy improve children's well-being and equalize the lives of children born into different family circumstances? The dissertation takes an interdisciplinary approach to this research question, examining the political framework for Canadian child policy, evaluating policy outcomes, and investigating the phenomena child policy attempts to affect. The first paper examines the

recent landscape of child policy in Canada and the political foundations that underlie it. The second offers a quantitative analysis of the outcomes of a significant expansion of government spending on child benefits from 1994-2008, comparing measures of household income, poverty, and inequality with indicators of children's well-being and development. Finally, the third paper moves from a national-level analysis to statistical modeling of the individual determinants of children's cognitive, socio-emotional, and behavioural outcomes. To identify opportunities for policy interventions, I look at how income and socio-economic status's effects on these outcomes are mediated by family stress and investments. Each paper provides a different insight on Canadian child policy and child well-being. Taken together they begin to develop an evidence base to inform future policy efforts to improve child well-being. I review some of the key motivations for this dissertation before providing an overview of the three papers.

2. Motivation

The question of how to improve child outcomes has become increasingly important to liberal welfare states, including Canada, since the late 1990s, as they move towards a 'social investment' model of social policy (Banting, 2005; Esping-Andersen, 2009; Esping-Andersen, Gallie, Hemerijck, & Myles, 2002; Giddens, 1998; Jenson, 2004, 2006; Jenson & Saint-Martin, 2006; Morel, Palier, & Palme, 2012). The social investment model presents a shift in policy logic. Rather than providing a social safety net, social investment policies support child development, human capital accumulation, and labour activation to reduce the need for a safety net. Thus social policy moves from 'repairing' to 'preparing' (Morel et al., 2012) or 'reactive' to 'active' policy (OECD, 1996). Child policy is central to this approach (Esping-Andersen, 2002; Jenson, 2006;

Jenson & Saint-Martin, 2003). From a social investment perspective, childhood is an opportunity to intervene early and invest to prevent costly poor outcomes in adulthood (e.g. unemployment, ill-health, crime) and thus reduce costly social supports later in life (e.g. social assistance, health care, prison). In principle, investing in children can shift the welfare state from equalizing outcomes to equalizing opportunity. While adoption of a social investment model in Canada and across the OECD has been uneven (Banting, 2005; Nikolai, 2012; White, 2012), child policy has taken on a more prominent role within social policy (OECD, 2009, 2011). In Canada this increased importance can be seen a doubling of expenditure on child benefits since the mid-1990s (see paper #1).

The social investment focus on child policy is based on an understanding that childhood sets the trajectory for the rest of the life course. Crucially, it is predicated on policy being able to influence children's development in a manner that will change their life course. While the relationship between childhood and later in life outcomes is well established (Attree, 2006; Bowles, Gintis, & Osborne Groves, 2005; Case & Paxson, 2011; Corak, 2013; D'Addio, 2007; Duncan & Brooks-Gunn, 1997; Heckman, Stixrud, & Urzua, 2006), the knowledge base for this second assumption—that policy interventions can alter this relationship—is less well established. In this respect, 'investing' in children presents an interesting case of social policy motivated by sound social scientific evidence, but accelerating faster than the research base informing it. The idea of investing in children is commonly presented as evidence-based policy, but often what is meant by 'evidence' is extrapolated from observational studies of the relationship between childhood and adult outcomes, developmental neurobiology, or a few small, context-specific policy experiments (e.g. the Perry preschool project (Schweinhart, 1993)).

Across the disciplines of human development, psychology, sociology, and economics, social scientists are still working to unpack the complex phenomenon of child development and to find opportunities for influence. A growing body of literature links this research to policy, with the goal of building a body of evidence that not only *motivates* policy investments, but also informs their design and improves effectiveness (S. Jones, Aber, & Raver, 2003; Shonkoff & Bales, 2011). This dissertation contributes to this body of research, aiming to provide evidence on the Canadian experience with a child policy approach focused on income transfers.

Canada offers a particularly interesting case for examining the potential of policy to improve and equalize child outcomes. Canada has both one of the lowest expenditure levels on child policy (OECD, 2015), and one of the highest levels of intergenerational social mobility (measured by male earnings) in the developed world (Corak, 2013; D'Addio, 2007). On this second measure, Canada is closer to the Scandinavian countries than fellow liberal welfare states such as the United States and United Kingdom. However, when it comes to direct measures of child well-being—during childhood—Canada is middle-of-the-pack (OECD, 2009; UNICEF, 2012, 2013; UNICEF Canada, 2013). This puzzling position in international comparisons, suggesting Canada has neglected child policy, yet still succeeds in fostering high equality opportunities, makes it a compelling case for study.

To a much greater extent than in similar liberal welfare states, Canadian child policy focuses on income transfers to families rather than programs or services (the first paper of this dissertation describes and explains this focus). The value of income transfers has also increased significantly since the mid-1990s, during a period of otherwise

restrained social spending) (see paper #1). Given that child poverty is nearly universally appreciated as a circumstance of disadvantage for children, the Canadian experience offers an opportunity to explore the outcomes of an income-focused approach to child policy. This theme, exploring income's role in child outcomes, and income-based policy approaches in tackling disadvantage, runs through all three papers.

Although recent Canadian child policy has gone through a major expansion it has not been the subject of significant academic inquiry. The federal-provincial negotiation of child policy through the late 1990s sparked interest among political scientists regarding what the changes signaled about general welfare state politics, but these scholars tended to not focus on the details of policy or outcomes for children (Dobrowolsky & Jenson, 2004; Jenson, 2004, 2009; Jenson & Saint-Martin, 2006; Mahon, 2008; Mahon & Brennan, 2012; McKeen, 2001, 2006, 2007). In contrast, economists have evaluated the effects of individual child policies including various child benefits (L. Jones, Milligan, & Stabile, 2015; Milligan & Stabile, 2007, 2009, 2011; Phipps, 1995; Schirle, 2015), parental leave (Baker & Milligan, 2010), and Quebec's child care policy (Baker & Milligan, 2008; Beaujot, Jiangqin Du, & Ravanera, 2013; Kohen, Dahinten, Khan, & Hertzman, 2008; Kottelenberg & Lehrer, 2013; Lefebvre & Merrigan, 2008; Lefebvre, Merrigan, & Roy-Desrosiers, 2011). But economists have failed to provide an overarching view of how child policies have evolved, or their combined effects. In the three papers that follow, I seek to build on these literatures and to make connections between them to better evaluate the overall effect of a period of income-focused child policy.

3. Overview of papers

3.1. Paper 1: Shifting perspectives and paradigmatic constraints in Canadian child policy 1995-2015

The first paper explores the current child policy landscape in Canada, describing its recent history and analyzing its political foundations. The paper focuses on the 1995 to 2010 period, during which time children have been a social policy priority and federal government spending on children has more than doubled in real terms. Sorting through the various types of government expenditure and policy, I find an overwhelming majority of spending—and increase in spending—has been directed to policies which primarily serve children by increasing the incomes of their parents, a previously unremarked feature of Canadian child policy.

Drawing on the literature on ideas and public policy (Béland, 2005; Blyth, 2002; Campbell, 2002; Chong & Druckman, 2007; Hall, 1993), I seek an explanation of why a family income approach has dominated Canadian child policy. In the Canadian political debate on child policy I find four key policy perspectives on the child: child as family responsibility, child as deserving poor, child as rights bearer, and child as investment. I argue that a political consensus among these perspectives has forged a family income policy paradigm, in the sense of Hall's (1993) classic definition. This paradigm problematizes family income as the key concern of government in relation to children, and constrains the scope of politically legitimate child policy in Canada to a focus on income instruments.

I find that there have been shifts over time in the dominance of the various perspectives, most notably from investment under a Liberal federal government to a family responsibility view under the Conservative government. These shifts have

influenced policy design, including a move from targeted to universal child benefits. However, the income paradigm has not been fundamentally questioned. I show this enduring paradigmatic constraint by discussing two key child policy debates: the National Children's Agenda and the child care issue in the 2006 federal election. The paper closes with a discussion of how a family income paradigm constrains the scope of child policy, reducing potential effectiveness.

3.2. Paper 2: How are the kids doing?: Canadian child well-being during a period of prosperity and policy attention

The second paper evaluates Canadian children's well-being over the course of the significant expansion of child policy from the mid-1990s to early 2000s. This evaluation looks beyond simple headline measures, to examine the conflicting story told by two major poverty measures. The most common Canadian measure of child poverty (the Low Income Cut Offs After-Tax (LICO)), was halved between 1994 and 2008, falling to 9 percent in 2008, after peaking at 18.4 percent in 1996. However relative child poverty (measured by the Low Income Measure (LIM)), remained essentially stable between 13 and 15 percent (Statistics Canada, 2013). These conflicting poverty rates compel a questioning of whether the lives of children (particularly those of the least well-off) were meaningfully improved over this period. The paper thus questions whether policies increasing family income and economic prosperity trickled down to improvements in the lives of children, and finds little substantive effect.

I answer the question "how are the kids doing?" by taking four different approaches to measuring Canadian child well-being: 1) child poverty, 2) childhood income inequality, 3) early child and family outcomes, and 4) examining the relationship

between household income and these child outcome indicators. Data are drawn from the National Longitudinal Survey of Children and Youth (1994-2008) and the Survey of Labour and Income Dynamics (1994-2010). These four different approaches give a multidimensional picture of how Canadian children have fared during a period of economic prosperity and significant expansion of child policy. The analysis and discussion in this paper demonstrate the importance of using multiple measures of children's outcomes alongside family-level economic indicators to evaluate child policy.

In examining and comparing multiple income measures of poverty and inequality I find that, despite significant changes in income supports to families with children, young Canadian children have not seen significant change in their *relative* economic positions. Indicators of children's physical, emotional, and developmental well-being, as well as family context, remain essentially stable over this period, as do gaps between the outcomes of poor and rich children. The findings of this paper suggest that, at a population level, young Canadians have not greatly benefited from an era of expanded child policy focused on income transfers.

3.3. Paper 3: How do Income and Socio-Economic Status Matter? Disentangling Pathways of Effect on Child Well-Being and Development

The third paper of the dissertation moves from a population level analysis of child policy and child well-being to an examination of the determinants of child well-being at an individual level. Following the identification of a focus on income in Canadian child policy in the first two papers, this paper specifically questions income's effect on child outcomes. The paper uses structural equation modeling of data from the National Longitudinal Survey of Children and Youth (years 2000-2008) to disentangle the

different pathways of effect of income and socio-economic status (as measured by occupational standing and parents' educational level) on socio-emotional well-being, cognitive development, and behavior outcomes at three stages in childhood.

While there is a general consensus that low-income in childhood is negatively correlated with a range of developmental outcomes from health and happiness to educational attainment, the magnitude and causal process of income's effect is disputed (Blau, 1999; Dooley & Stewart, 2004; Hoddinott, Lethbridge, & Phipps, 2002; Mayer, 1997; Yeung, Linver, & Brooks-Gunn, 2002). Central to the debate is *how* income has an effect and whether factors correlated with family income—namely non-income elements of SES—are in fact driving the association between income and outcomes. Answering this question and understanding the process by which family characteristics and circumstances have their effect on children's well-being and development is crucial to designing effective public policies to tackle childhood inequality.

This paper advances research on the determinants of child outcomes by distinguishing between income and SES and investigating the mediation pathways of either's effect. Two central theories of mediation from the child development literature posit that income has its effect on children either by influencing family material goods and activities ('family investment') or by affecting parenting and family functioning ('family stress') (Guo & Mullan Harris, 2000; Yeung et al., 2002). These mediating pathways also offer alternative policy targets to income as a means to improve child development. Drawing on the theories of family stress and family investment, the analysis examines children's participation in activities, parenting behavior, and family functioning as potential mediators of income and SES.

The analysis finds that the effects of income and SES vary between different child age groups and outcome measures. In nearly all models, household SES has a stronger influence than income on outcomes, either directly or through mediating pathways. Cognitive outcomes have the closest direct association with SES, mostly unexplained by mediators in the model. In line with prior research, I find income has a very minor, though positive, effect on a limited range of child outcomes. Parenting behavior, a mediating variable in the model, is found to have the largest effect of any influence on socio-emotional and behavioural outcomes. Children's participation in extra-curricular activities in middle childhood and high school is found to be a significant mediating factor in SES's affect on children's socio-emotional well-being. The paper discusses the study results in terms of how policy can intervene to moderate the experience of low-income and SES, as well as gives directions for future research in this area. Read in complement to the other two papers, the analysis offers insight into why an expansion of an income-centered child policy could be failing to affect Canadian child outcomes.

4. Dissertation aims

In the past twenty years Canada has invested heavily in child policy; children growing up in Canada today do so with significantly more government spending in their name than they did a generation ago. However, whether this spending increase has resulted in measureable improvements in children's lives has been an open question, subject to little research. Without an answer, governments at both the provincial and federal level continue to pursue an income-focused approach to child policy, introducing and expanding child benefits. The three papers of this dissertation offer an evaluation of Canada's income focus in child policy. Each of the three papers stands independently, but

taken together they offer guidance for moving forward evidence-based policy to improve Canadian children's lives.

Through policy, governments can change children's lives. They can alter the circumstances in which children grow up, and moderate the inequalities that result in some children starting life at a disadvantage. However, in order to do so effectively, policymakers must have a solid understanding of what matters to children's development and well-being. To design successful policies, they require evidence on how different policy approaches can influence child outcomes. To adjust and improve child policy on an on-going basis they require information regarding how children are faring and an evaluation of existing policies. Additionally, they must confront the political constraints inherent to policymaking. For child policy, this requires an understanding of the public consensus on the state's role in children's lives. The overall aim of this dissertation is to inform each of these requirements to contribute to the public policy project of improving children's lives.

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Shifting perspectives and paradigmatic constraints in Canadian child policy 1995-2015

Abstract

Child policy has become one of the most prominent and dynamic areas of Canadian social policy over the past twenty years. Over this time federal government spending on families with children has more than doubled in real terms. This paper describes this expansion and finds an overwhelming focus has been on policies to increase family income. To explain this focus, I turn to the literature on ideas and public policy and identify four key policy perspectives on the child in Canadian political discourse: child as family responsibility, child as deserving poor, child as rights bearer, and child as investment. I argue that in finding a political consensus among these perspectives, the scope of child policy in Canada has been constrained to a family income policy paradigm. This policy paradigm problematizes family income as the key concern of government in relation to children, and sets income policies as the chief legitimate approach to child policy. I present the development of the National Children's Agenda in the late 1990s and the 2006 federal election debate on child care as two cases where this paradigmatic constraint has been apparent. While a family income focus has provided the political support for significant spending increases, it has also potentially limited the effectiveness of child policy.

Table of Contents

Abstract	22
Table of Contents	23
1. Introduction	24
2. Child policy as family income policy	26
Table 1. Federal Expenditures on Children (\$ millions, 2015 constant)	27
Figure 1: Federal expenditures on children	28
2.1. Child benefits	28
Figure 2: Maximum Federal Child Benefit Amounts (cash transfers), 1944-2015, one child	30
2.2. Tax expenditures	31
2.3. Parental leave	32
2.4. Programmatic expenditure	33
2.5. Federal-Provincial Transfers	34
2.6. Provincial Child Policy	35
Figure 3: Maximum provincial child benefits, one child under age 6, 2014/2015	37
3. The role of ideas in child policy	38
4. Four policy perspectives on children	41
4.1. Child as family responsibility	41
4.2. Child as deserving poor	42
4.3. Child as investment.....	42
4.4. Child as rights bearer	43
5. The Family Income Paradigm	44
Table 2. Four perspectives on child policy	46
5.1. The National Children’s Agenda	47
5.2. The 2006 federal election child care debate	50
5.3. Limitations of family income child policy.....	54
6. Conclusion	56
Appendix A: Provincial Child Benefits	59
References	61

1. Introduction

Over the past twenty years, child and family policy has been one of the most dynamic areas of Canadian social policy. Despite ongoing fiscal restraint in social spending, federal government spending and tax expenditure on children has more than doubled in real terms since 1995. In Fall 2014, when the federal government announced the first major spending expansion since the 2008 recession, child benefits were the first priority with the introduction of more than \$4.5 billion in new spending and tax cuts annually (Department of Finance, 2014a). Heading into a Fall 2015 federal election, policy targeted at families with children became a major theme of political party platforms and campaigning. Whether seen as vote-buying politicking, or an earnest effort to improve the lives of Canadians, child policy has continued to be a rare opening for expansion of social policy amid austerity.

This paper examines the expansion of Canadian child policy over the past twenty years, exploring the policy perspectives that have shaped this area of social policy. While a range of goals are pursued through policies that serve children, in this paper I take a child-centred approach, focusing on understanding policy as it affects children rather than parents or family units. I define ‘child policy’ as policies that are either programs/services for children exclusively or for which eligibility is primarily defined by parenthood or presence of children in the household (child benefits, parental leave); universal programs that include children-specific services (e.g. health care) are excluded.

Looking at the past 20 years, the overwhelmingly majority of expanded child policy in Canada has been delivered as income transfers families. To explain this policy

focus, I examine the political foundations of child policy in Canada, applying theory on the role of ideas in public policy development and stability. I identify four child policy perspectives evident within the Canadian policy discourse: child as family responsibility, child as deserving poor, child as rights bearer, and child as investment. While the dominance of these perspectives has shifted over the years, each provides a justification for policy to increase family income or reduce child poverty. I argue that this shared support has constrained child policy to a focus on family income that has become a ‘policy paradigm’ in the sense of Hall’s (1993) conceptualization: “a framework of ideas and standards that specifies not only the goals of policy and the kind of instruments that can be used to attain them, but also the very nature of the problems they are meant to be addressing” (p 279). Further, the family income paradigm has limited the scope of evidence-based child policy.

Though rarely acknowledged as such, federal Canadian child policy has been transformed over the past 20 years from a relatively token recognition of the costs of raising children, to a major—and rapidly growing—category of social expenditure. This paper begins to fill a gap in Canadian social policy analysis by providing a picture of this policy transformation and the politics driving it. In exploring how child policy choices have been shaped by political debate over the role of government in children’s lives, the paper also contributes to understanding the scope and potential for future child policy. Finally, understanding the recent expansion in child policy is an initial step of evaluating how, or whether, Canadian children have benefited.

The paper proceeds in three sections. The first section presents a history of recent child policy, showing the significant expansion of spending on children since the

mid-1990s and the extent of policy related to family income. I focus my attention at the federal level, along with an overview of trends in provincial child policy. The implications and justification for this federal focus are discussed. The second section searches for an explanation of the family income focus by considering the importance of ideas in public policy. I describe four perspectives of the child evident within the Canadian policy discourse, and argue a family income paradigm is the product of the commonalities of these perspectives. The power of this paradigm is explained with analysis of major child policy episodes during this period in which different perspectives were in ascendancy: the National Children's Agenda in 1998, and the child care debate of the 2006 federal election. The final section discusses the limitations of a family income focus in child policy by assessing its fit with an evidence-based understanding of child well-being.

2. Child policy as family income policy

In 2015-2016 federal expenditure on children will total \$24.8 billion, more than double the \$10 billion expended on children in 1995 (adjusted 2015 dollars). Growth has occurred in all categories of spending, including cash benefits, tax expenditures, employment insurance leave benefits, programs, and transfers to provinces and territories. Table 1 and Figure 1 gives a breakdown of the major federal expenditures on children in 1995, 2000, 2005, 2010, and projected spending for 2015, based on new child and family policies announced in 2014. I briefly describe the policy growth in each of the categories and the family income focus of these policies, prior to reviewing concurrent trends provincial spending.

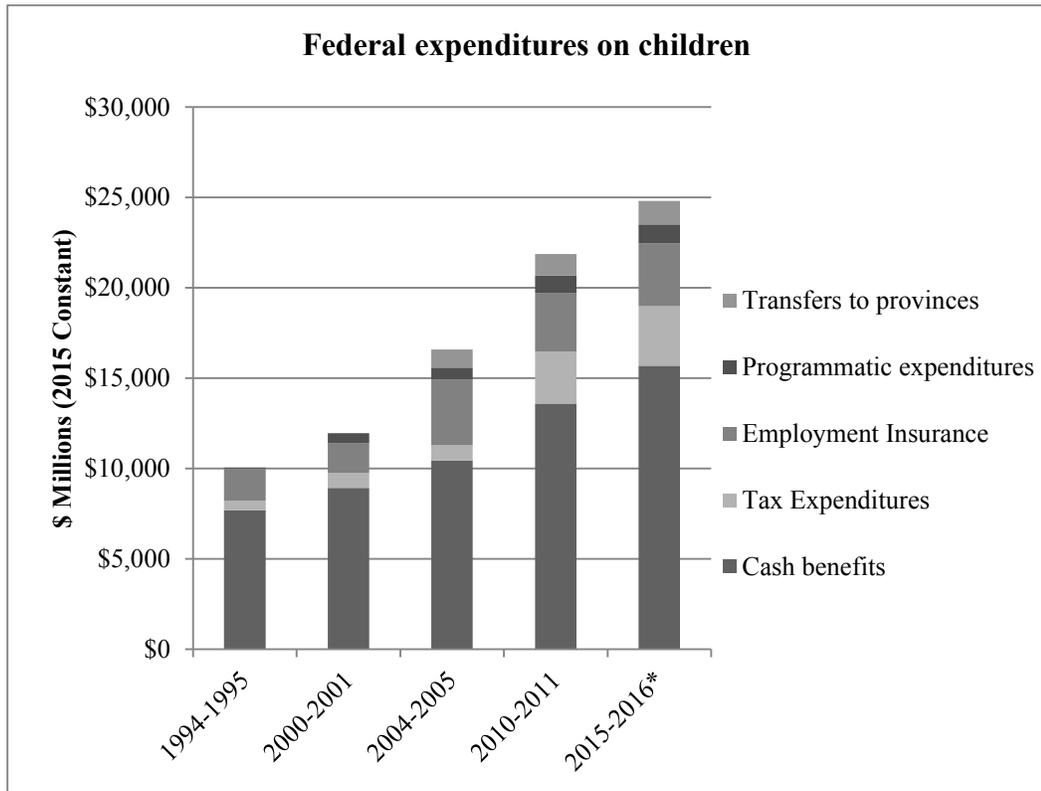
Table 1. Federal Expenditures on Children (\$ millions, 2015 constant)

	1994- 1995	2000- 2001	2004- 2005	2010- 2011	2015- 2016*
Cash benefits					
Canada Child Tax Benefit including National Child Benefit Supplement and Child Disability Tax Benefit	7,639	8,792	10,255	10,566	10,402
Universal Child Care Benefit (UCCB)	--	--	--	2,797	4,935
Child special allowances (cash benefits to non-family child care-givers)	56	133	188	234	358
Total	7,695	8,925	10,443	13,597	15,695
Tax Expenditures					
Child care expense deduction	524	684	673	950	1,015
Registered Education Savings Plans		155	177	169	155
Adoption Tax credit	--	--	--	3	4
Children's Arts Tax Credit	--	--	--	34	42
Children's Fitness Tax Credit	--	--	--	116	130
UCCB as income of dependant	--	--	--	5	5
Child Tax Credit	--	--	--	1,593	--
Family Tax Cut (Income Splitting)					1,935
Total	524	839	850	2,870	3,286
Employment Insurance Leave					
Maternity Leave	1,098	971	1,092	961	1,035
Parental Leave	679	648	2,493	2,267	2,428
Adoption Leave	9	9	37	23	22
Total	1,786	1,627	3,621	3,251	3,485
Programmatic expenditures					
Community Action Plan for Children (grants to community groups to support early childhood programs)	50	86	99	88	85
Child care research funding	7	18	--	--	--
Aboriginal Head Start Program		36	78	97	92
Registered Education Savings Plans	--	432	502	712	761
Canada Learning Bond				70	106
Total	57	573	679	967	1,043
Transfers to provinces for children					
Total	--	--	1,003	1,180	1,296
Total Federal Spending on Children					
	10,061	11,964	16,597	21,865	24,805

*2015-2016 figures are projections either 2014 figures or projections given by sources

Sources: (Department of Finance, 1996, 2002, 2006, 2012a, 2012b, 2014a, 2015a, 2015b; Receiver General for Canada, 1995, 2001, 2005, 2011, 2014)

Figure 1: Federal expenditures on children



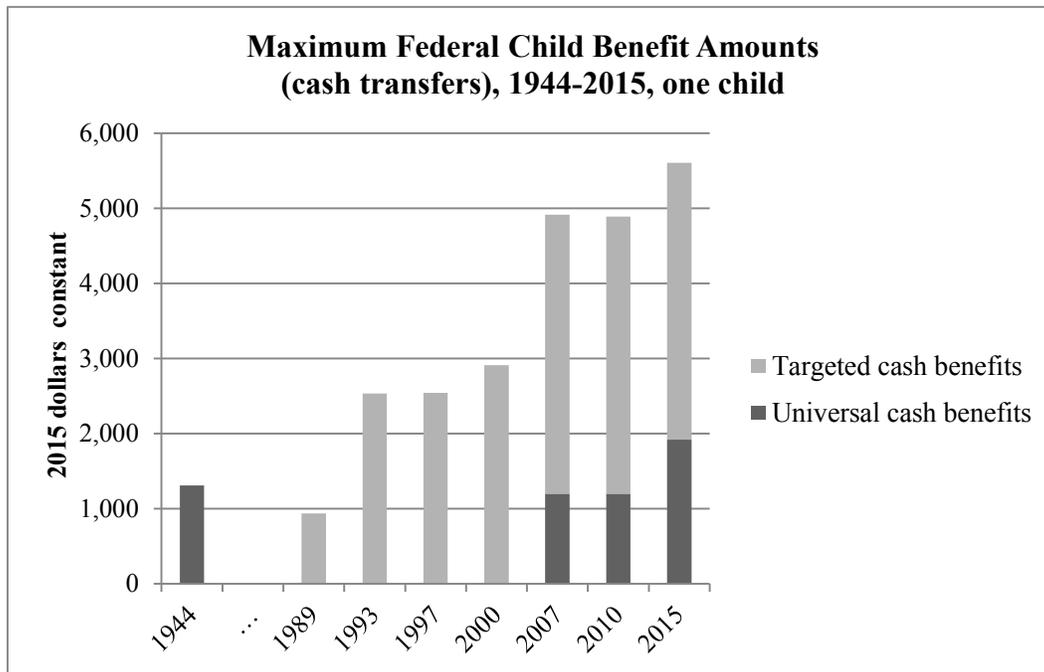
2.1. Child benefits

Child benefits, by which I mean cash transfers to families with children, account for the majority of federal expenditure on children, at \$15.7 billion in 2015-2016, a growth of 203 percent since 1994. Child benefits are now a major category of government expenditure, accounting for approximately six cents of every federal tax dollar spent, which is on par with Employment Insurance (Department of Finance, 2014b).

Supporting families with the costs of raising children via cash transfers has been a core feature of the Canadian welfare state since the introduction of the Family Allowance in 1944. As the first universal welfare program in Canada, the Family Allowance was

worth between \$60 and \$96 per child per year, depending on child age and number of children, adjusting for inflation that would be \$820 to \$1,311 in 2015 dollars (Blake, 2009). Without indexing, and infrequent updating, the value of the allowance eroded. In 1972 the Family Allowance was made taxable (introducing progressivity). In 1978, the allowance was supplemented with a refundable Child Tax Credit, for which the majority of families were eligible. Through the late 1980s the allowance and tax credit were partially indexed to inflation and eligibility restructured. In 1989, the universality of the allowance was ended in favour of targeting to lowest income families. At that point the maximum benefit was worth \$549 per year per child, or \$939 in 2015 dollars (Caledon Institute, 2015). In 1992 the allowance and credit were restructured into the current Canada Child Tax Benefit (CCTB), a monthly, non-taxable cash benefit (indexed to inflation) based on net family income in the prior tax year and tapering to zero as income increases. The majority of families are eligible for the CCTB, with a family net income ceiling of approximately \$120,000 for a one or two child family in 2015 (Canada Revenue Agency, 2015). Figure 2 shows the growth in the maximum value of federal child benefits 1944 to present.

Figure 2: Maximum Federal Child Benefit Amounts (cash transfers), 1944-2015, one child



Sources: (Blake, 2009; Canada Revenue Agency, 2015; Department of Finance, 1999, 2014a; Human Resources and Skills Development Canada, 2013)

Since 1992, the major additions to the federal cash benefits for children have been the introduction of the National Child Benefit Supplement (NCBS) in 1998 and the Universal Child Care Benefit (UCCB) in 2006. The NCBS is a supplement to the CCTB available to low-income families with children regardless of their source of income, designed with the provinces to replace provincial social assistance benefits for children (discussed further below). Initially costing \$850 million (\$1.2 billion in adjusted 2015 dollars), the NCBS now accounts for more than \$3.5 billion in child benefits (Human Resources and Skills Development Canada, 2013). By the year 2000, after full scale up of the NCBS, the maximum federal child benefit was \$2,188, or \$2,910 in 2015 dollars (Department of Finance, 1999).

Introduced in 2006, the UCCB is a flat-rate, per-child, cash benefit, delivered monthly and taxable in the hands of the lower income parent. When introduced the UCCB was \$100 per month per child under age six. The 2015 expansion increases this amount to \$160 per month per child under age six, and \$60 per month per child under age 18. After expansion the UCCB is projected to cost \$4.9 billion annually. In 2015 the maximum Canada Child Tax Benefit amount, including the NCBS is \$3,687 (Canada Revenue Agency, 2015). Adding the enhanced UCCB, the maximum federal cash benefits for a young child in Canada is \$5,607. In real terms, this amount is a more than five-fold increase over 1989 levels, and almost doubling since 2000.

2.2. Tax expenditures

Child-related income tax credits and deductions proliferated in federal child policy since the Conservative government came to power in 2006. These ‘tax expenditures’, or foregone tax revenue, are projected to cost \$3.3 billion in 2015-2016 (Department of Finance, 2015b), more than a six-fold increase from a mere \$524 million in 1994. A general tax deduction for children has come on and off the federal tax code over the years, with the latest version, re-introduced in 2007, repealed in 2015. At \$1.9 billion, the most expensive tax expenditure will be the Family Tax Cut, introduced in 2015, which allows income-splitting for two-parent families.¹ Other tax credits are specific to expense categories, including the non-refundable child care expense deduction (introduced in 1972 and most recently increased in 2015) and the children’s fitness tax

¹ Both the NDP and Liberal Party have pledged to repeal this tax cut if elected during the fall 2015 federal election.

credit, introduced in 2006 was also increased in 2015, and made refundable at the same time.

While relatively small line items in the federal budget, tax expenditures are income policy instruments that allow government to ‘spend’ towards a certain aim (e.g. child care, child fitness) without significant administrative costs. Tax expenditures have a significantly different distributional profile than child benefits. The worth of credits and deductions for a child depends on family income: combined with progressive taxation, depending on design, credit and deductions can be regressive, or worth more to higher income families. Non-refundable credits are of no benefit to low-income families whose income is below the personal exemption for taxation. Further, income splitting via the Family Tax Cut, will only benefit higher income two-parent families who have an income differential between spouses, particularly one-income two-parent families (Office of the Parliamentary Budget Officer, 2015).

2.3. Parental leave

Work leave for parents with a new child, through Employment Insurance (EI) benefits, cost \$3.5 billion in 2014, up from \$1.8 billion in 1994. Parental leave was significantly extended in 2000, effectively increasing total leave (maternity and parental) from six months to one year. Employment Insurance benefits are a different class of federal expenditure than the other categories, sourced from pay-roll premiums rather than general taxation. Yet, like cash transfers, EI policy redistributes income to families with children. While part of employment insurance program, the expansion of parental leave was presented by the then-Liberal government as “improving support for children”, rather than as an employment policy (Martin, 2000).

Parental leave benefits arguably have a more direct effect on children than cash transfers by supporting parent presence in the first year of life, as the benefits are contingent upon taking leave from work. However, understood as a *child* policy, parental leave does not equally support all children; eligibility is not based on income level or child need, but parents' labour market participation. Insured leave requires that the parent worked 600 insurable hours in the previous year (Service Canada, 2014)². Benefits are only available for workers paying into EI and, because premiums are based on wages, higher income earners received higher benefits. As a result, parental leave is disproportionately taken by higher income families (Human Resources and Skills Development Canada, 2005).

2.4. Programmatic expenditure

Relative to benefits and tax credits, federal expenditures on services and programs specifically for children are minor. The federal government delivers very few programs directly to children, mainly through grants and contributions to community organizations, including the Aboriginal Head Start program. Combined, all programs were worth less than \$200 million in 2014 (Receiver General for Canada, 2014). The largest component of programmatic spending reaches children via another form of cash transfer to parents: the Registered Education Savings Plans (RESP) and associated Canada Learning Bonds, both of which contribute to parents' savings for their child's post-secondary education. The former is a universal program, and the latter a targeted grant for low-income families

² Benefit levels for Canadian provinces other than Quebec are currently set at 55% of insurable earnings to a maximum of \$514 per week. Quebec operates independent parental leave benefits and has slightly higher premiums. Quebec parental leave eligibility is broader and replacement rate is up to 75% of earnings, to a maximum approximately \$1000 per week (Gouvernement du Québec, 2015).

(Human Resources and Skills Development Canada, 2009). The RESP program subsidizes family savings, which, while limited to later spending on post-secondary education, can serve to increase family budgets during childhood. The adult who establishes the RESP retains ownership and control over its expenditure, not the child for whom it was established.

2.5. Federal-Provincial Transfers

Federal transfers to the provinces and territories that are earmarked for spending on children may also be categorized as federal spending on programs for children³. While fiscal transfers from Ottawa to the provinces for social policy programming date back to the 1960s, a nominal allocation for spending on children only emerged as part of Federal-Provincial-Territorial agreements on a National Children's Agenda in the early 2000s. Transfers increased in 2005 to include funding for a national child care strategy. Although the Conservative government cancelled the child care program commitments upon election to office in 2006 (in favour of the UCCB), the federal government has roughly maintained the 2006 level of transfers. Since 2007-08, ten percent of the Canadian Social Transfer is notionally allocated for support for provincial spending on children, amounting to \$1.26 billion in 2014 (Department of Finance, 2015a).

Both the sizable increases in child benefits and overall allocation of expenditures demonstrate the dominance of a family income policy instruments in federal child policy: in 2015-2016, 96 cents of every federal dollar spent 'on children' will be via increases to family income (see Table 1). Under this configuration, 'child policy' might more aptly be

³ Provincial allocation of federal transfers to child policy is not guaranteed, with no reporting or sanction regarding how monies nominally are spent.

called parental income policy.

Some may explain the focus on income as a function of Canadian federalism. Federal jurisdiction over income taxation, but not programmatic matters of social policy, means the child policy instrument constitutionally available to the federal government is income transfers. However, across multiple areas of Canadian social policy, clarity in constitutional jurisdiction does not fully explain federal and provincial government's respective roles (Banting, 1982, 2008). It merits looking beyond formal institutional structures to explain the dominance of income measures in federal policy. Alongside federally delivered programs and services, fiscal transfers to the provinces provide an avenue for a federal role in financing social services. Health care provides the most obvious example of federal spending for provincial jurisdictional programming. Another example is the approximately \$4 billion in the Canada Social Transfer from the federal government to the provinces and territories for post-secondary education (Department of Finance, 2015a). The series of federal-provincial agreements on early childhood at the turn of the millennium demonstrated the potential for a significant role for the federal government in supporting child policy beyond family income. As federal institutionalism alone has not traditionally defined Canadian social policy, to understand both federal and provincial child policy we look to the debates occurring within the institutional settings.

2.6. Provincial Child Policy

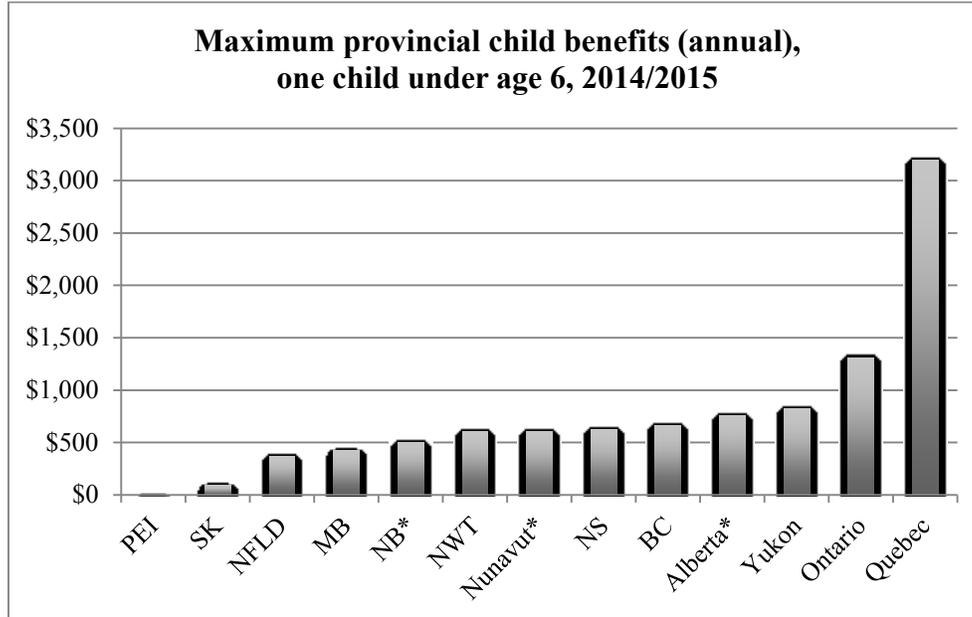
The focus of this paper is on federal policy, where there has been the most significant expansion of child policy over the past 20 years. But evolution in provincial child policy also demonstrates (to a lesser extent) the income focus of child policy in Canada. In line with constitutional jurisdiction over these areas, primary and secondary

education continues to be the major focus of provincial child policy. Over the past ten years expansion of early education has been a key focus of provincial child policy expansion. The policy changes have been incremental, extending formal primary education with full-day kindergarten for children ages four and five, rather than introducing new government provisions of early education and care (McCuaig, 2014)⁴. However investments have been substantial: taken together, provinces increased spending on early childhood education by \$3 billion between 2011 and 2014 (Akbari & McCuaig, 2014).

Provinces have also made increasing family income a priority. Since 2000 there has been both a proliferation and expansion of provincial cash benefits for families with children, which vary greatly in value and eligibility. In the mid-1990s only Quebec offered a child benefit; in 2015 all provinces except PEI have some form of child benefit. As depicted in figure 3, provincial benefits range from zero in PEI, to \$3196 annually in Quebec (Canada Revenue Agency, 2014). In 2014/2015, total provincial and territorial expenditures on child benefits will total more than \$3.5 billion. Appendix A gives more detailed information on the diversity of provincial child benefit schemes.

⁴ The provincial exception in child care policy is Quebec's \$7-a-day child care program, which has been in place since 1997. It should be noted that the policy goals of child care in Quebec have been focused on maternal employment, rather than child well-being (Beaujot, Jiangqin Du, & Ravanera, 2013). Other than Quebec, no province has a major child care program. Provinces have not independently pursued the national child care plan that was unilaterally cancelled by the federal government in 2006 (Ferns & Friendly, 2014).

Figure 3: Maximum provincial child benefits, one child under age 6, 2014/2015



* Maximum benefit contingent upon earned (employment) income
See Appendix A for provincial benefit information and sources.

Looking at Canada in international comparison—taking into account both federal and provincial spending—the dominance of income instruments in Canadian child policy becomes more pronounced. Despite significant increases in all types of spending on children, as of 2001, Canada’s total social expenditure on families with children, was well below the OECD average at 1.43 percent of GDP compared to an average of 2.55 percent (OECD, 2015). Approximately 82 percent of Canada’s spending on children (1.016 percent of GDP) is via cash benefits, the third highest proportion in the OECD (OECD, 2015). Canada ranks second lowest among 36 OECD countries for in-kind and programmatic expenditures on families with children (0.22 percent of GDP); only Turkey spends less. In 2011 spending on programs and services for children was just \$91 per

head compared to an OECD average of \$356 per head⁵ (OECD, 2015). Cross-national comparison also shows Canada's income focus in child and family policy cannot be explained away as a characteristic of a liberal welfare state, which tend to means-tested social provision (Esping-Andersen, 1990). The USA (the archetypal liberal welfare state), allocates nearly all of its child and family spending to in-kind and programmatic expenditure. The UK, like Canada, spends more on cash benefits than programs, but to a much lesser degree, spending a larger percent of GDP on programming than Canada does on income transfers (OECD, 2009, 2011).

Canadian child policy is rare in its overwhelming focus on increasing family income, often through cash transfers. Understanding *why* this policy approach dominates offers potential insight into whether it will persist or what scope there may be for alternatives. To explain the income focus of Canadian child policy, we turn to an examination of the ideas that contribute to child policy choices.

3. The role of ideas in child policy

Ideas and beliefs play an important role in the public policy process. Paired with an understanding of the actors that give them voice, and the institutions that give them power, ideas help explain both stability and change in policy (Béland, 2005; Blyth, 2002, 2003; Campbell, 2002). In any policy debate, alternatives are 'framed' by emphasizing certain considerations over others, which links policy alternatives to different ideas and values. These framings affect both public opinion and (or, in turn) can alter the priorities, or 'agendas', of politicians and policy makers (Chong & Druckman, 2007; Kingdon,

⁵ Current US dollars Purchase Power Parity adjusted

2010). Amid institutional stasis and historical policy legacies, policy change can depend on maintaining consistency with existing dominant ideology (Béland, 2005).

Hall's (1993) theory of policy paradigms provides a useful framework for analyzing the power of ideas in maintaining policy stability. Hall argues that policy instruments and the settings of those instruments can be changed relatively easily provided they correspond to policymakers' underlying conceptualization of the policy problem to be addressed. Hall's framework (an adaption of Thomas Kuhn's (1996) seminal work on scientific revolutions) presents three orders of policy change. First order, adjusting policy settings (e.g. expenditure levels), and second order change, instruments (policy or program type) are relatively common. However, third order change, a 'paradigm shift' in the understanding of a policy problem and the policy goals to be achieved, is less common.

Hall applied his analysis to the dominance of economic theories, which, while not value neutral, are dominated by 'cognitive beliefs': ideas formed by reason and argument or related to instrumental thinking. However, 'normative beliefs', based on values, morals and ideology also have the power to "constrain action by limiting the range of alternatives that elites are likely to perceive as acceptable and legitimate rather than useful means to an end" (Campbell, 2002). Particularly in social policy, cognitive ideas often mix with normative debates. For instance, the debate over universal vs. targeted program delivery often confounds evidence of effectiveness in meeting program aims with normative arguments regarding equal treatment of citizens. Given the diversity of perspectives and multiple policy goals pursued in social policy, we do not necessarily see a dominant and internally consistent paradigm like that found in economic policy. Rather,

policy paradigms in social policy are more akin to prisms, containing a spectrum of views that configure together to form a dominant, though sometimes multifaceted understanding of a policy problem.

Social policy concerning children addresses multiple problems and policy goals apart from aims to improve children's lives. 'Child policy' is often also about parents' employment (particularly that of mothers), gender equality, and broader redistribution across the life course and between family types. While perspectives on these and other issues affect child policy choices, I limit my focus to policy perspectives on *the child*, evaluating child policy ideas in terms of its aims regarding children. The perspectives on children are rarely the only consideration in setting child and family policy, but a clearer understanding of the dominant view of the child can inform how child-centred policy goals interact with other social policy priorities.

Prior literature explaining Canadian family policy has focused primarily on the competing goals guiding family policy. A number of scholars have noted a heightened focus on children and a shift away from mothers and gender equality in the discussion of Canadian family policy since the mid-1990s (Dobrowolsky & Jenson, 2004; Jenson & Stroick, 2000; McKeen, 2001; White, 2011). Analysis by Jenson and Beauvais identified two simultaneous 'paradigms' in Canadian child policy during the 1990s: the 'family responsibility paradigm' and 'investing in children' (Jenson, 2004; Jenson & Beauvais, 2001). They argued that there was evidence of a shift from the former to the latter at the beginning of the new millennium. However, Conservative federal government policy since 2006 has not reflected such a shift, nor was the envisioned shift fully realized under the Liberal government. This paper offers an explanation for this lack of 'shift' by

situating family responsibility and investment in children as co-existing perspectives underlying child policy rather than as alternative coherent paradigms. Further, I identify two perspectives (child as deserving poor, and rights-based perspective) not discussed in the Jenson and Beauvais dichotomy.

4. Four policy perspectives on children

4.1. Child as family responsibility

Any policy concerning children must give consideration to the respective roles of the state and family. Whereas adults have a direct relationship with the state, children are embedded within families as dependants. Children's rights are balanced with respect for the autonomy of the family as the basic unit of society. The role of parents and family in matters concerning the child is recognized in Canadian law: the UN Convention on the Rights of the Child (to which Canada is a party) requires that parents "have the primary responsibility for the upbringing and development of the child" (United Nations General Assembly, 1989). However, the extent of what constitutes as 'primary responsibility' varies in interpretation.

The term 'family responsibility' here refers to a view that raising children is fundamentally a private family responsibility rather than a public concern. From this perspective the government's role is residual to that of the family with no direct relationship between the child and the government. Government responsibility is one of child protection, with direct intervention only merited upon failure of the family. This perspective follows the historical legal treatment of children as property of their parents. From this perspective, any proactive role of government in the lives of children ought to

be indirect through support at the family level, such as child benefits. An example of this perspective has been seen in the Conservative party positioning on child care policy, with slogans included “parents are the real experts in child care” (Prime Minister of Canada, 2014) and “your kids, your way” (Employment and Social Development Canada, 2015).

4.2. Child as deserving poor

A view of children in poverty as innocent and blameless for their situation and thus deserving of charitable support has long been a common theme in social policy. The division of deserving and undeserving poor in policy discourse is at least as old as the Elizabethan Poor Law of 1601 (Will, 1993). While the family may have the primary responsibility for the child, it is seen as unfair to ‘punish’ children for the conditions into which they were born and over which they have no control. From this perspective leaving children in need is morally reprehensible for a rich society such as Canada. In representing children as the recipients of redistributive policy, a moral concern for the ‘deserving’ child trumps public concern about supporting perhaps less-deserving parents. From this perspective, child policy ought to focus on disadvantaged children, through interventions to equalize children’s experiences, e.g. targeted income transfers, program subsidies, free school meals etc..

4.3. Child as investment

In contrast to the normative foundation of family responsibility and deserving poor perspectives, the child as investment perspective is based on cognitive beliefs and instrumental thinking. This perspective takes a future-oriented view of children as adult citizens in-the-making; childhood is an important period of development that sets the

course for outcomes later in life. Child investment is part of a broader move in social policy since the mid-1990s towards developing a “social investment state” (Esping-Andersen, 2009; Esping-Andersen, Gallie, Hemerijck, & Myles, 2002; Jenson, 2006; Morel, Palier, & Palme, 2012). Social investment places emphasis on ‘active social policy’ to build in human capital rather than ‘reactive’ social security and redistributive policy (OECD, 2005). Supporting child development is seen as smart, evidence-based investment to avoid costly social problems later in life including unemployment, crime, and poor health. This perspective has become more prominent as the evidence base on the importance of child development to adult outcomes has accelerated since the 1990s. A wide range of policy for children is supported from an investment perspective, including income transfers. The instrumental nature of an investment perspective gives more room for evidence to guide policy choices, as the focus is on the ends of policy (returns on investment) rather than any normative evaluation of the policy means. Fundamentally, the investment policy interest is in ensuring positive long-term outcomes in a cost-effective manner.

4.4. Child as rights bearer

A ‘child as rights bearer’ perspective sees children as deserving of government policy attention, not as moral obligation or as a smart investment, but as citizens in a liberal democratic society with legal rights. As a vulnerable and inherently dependent population, children are particularly in need of government attention to ensure their rights are upheld. In 1989 Canada signed the UN Convention on the Rights of the Child (CRC), which covers civil, economic, political, health, cultural, and social rights. It was ratified into Canadian law two years later (United Nations General Assembly, 1989). However,

Canada has been chastised by the UN Committee on the Rights of the Child for inadequate attention to child rights, pointing to high child poverty and the condition of Aboriginal children (UNCRC, 2012). Although child rights are part of Canadian law, in practice, the implementation of the Convention is incomplete. The rights-based perspective offers a critique of the child as investment perspective, which in some forms can take an overly utilitarian treatment of the child as a “citizen-worker of the future”, or a “becoming” rather than a “being” (Lister, 2003). Child rights can also conflict with a family responsibility perspective. While child rights recognize a primary role for parents, enshrined rights give government a direct relationship with children through the responsibility to ensure child rights are upheld.

A rights-based perspective lends support to a wide variety of government policies and programs. Under the CRC, government has responsibility to support families when they are not meeting child rights, either due to inability or choice. This responsibility requires targeted policy to respond in individual cases, or subsets of the population. Child rights also give government a broader responsibility to support families and communities in achieving the full development of the child.

5. The Family Income Paradigm

The instruments, and settings, of child policy are constrained by how the public and policy-makers view the role of government in children’s lives. While presented here as ideal types, in reality the identified perspectives overlap and appear together in the Canadian child policy discourse. The prominence of the perspectives has shifted over time as politicians and policy advocates use combinations of the four perspectives to frame, justify, and legitimate policy actions in a manner that resonates with the public.

How the perspectives are layered together determines the paradigmatic boundaries of child policy. Table 2 presents a comparative summary of the perspectives and their policy priorities.

Family income unites all four perspectives. All perspectives view increasing family income to be a legitimate policy goal. From a family responsibility perspective, income supports are a way for government to recognize and support families' responsibility for children, without interfering in family choices (as might be the case with programs or subsidies). Universal benefits reflect a family responsibility view that government should not discriminate based on family choices. From a deserving poor perspective, targeted government redistribution to children to reduce child poverty is a moral good. The child as investment perspective can support increasing families' incomes as a means of investment, allowing parents to purchase goods and provide better environments in which children can development. As an investment, policy to increase family income is likely to be focused on low-income families, where it is likely to have greater returns. Lastly, a child as rights bearer perspective supports family income policy as a means to rights fulfillment. As adequate standard of living is a recognized human right, again the focus would be on the poorest. While different *settings* or even *instruments* for family income policy may be preferred from the different perspectives, all can support increasing family income as a worthy policy goal. This consensus, among what can otherwise be divergent perspectives, gives a strong base of political support to any family income policy.

Table 2. Four perspectives on child policy

	Core policy perspective	Perspective on universal policy vs. targeted policy	Justification for family income policy focus
Child as family responsibility	Families are responsible for raising children, with no direct role for government.	Universal policies, which do not interfere with parental choice.	By increasing family income, government supports children, but respects primary role of family and parental choice.
Child as deserving poor	Children are innocent and blameless for family conditions, thus morally deserving of government support.	Policies targeting poor children, those disadvantaged by luck of birth.	Children are deserving poor, therefore government income redistribution should prioritize children.
Child as investment	Childhood is a critical stage in the life course of the developing next generation. Government policy supporting child development is an investment with long-term returns and cost savings.	Outcome based evaluation of targeted and universal policies to maximize return on investment	Low-income is highly correlated with poor developmental outcomes, increasing family income can would therefore be an investment in children
Child as rights bearer	Children have legally recognized human rights. Government has a duty to ensure these rights are fulfilled.	Universal and targeted policies dependent on how rights must be upheld. Recognition of primacy of family in fulfilling child needs, supports targeted initiatives	Children have the right to an adequate standard of living, low-income and poverty is a barrier to fulfilling this and other rights.

Two key child policy episodes over the past twenty years demonstrate how the policy perspectives interact to constrain policy choices to an income-focused approach: the federal-provincial National Children’s Agenda, from 1996 to the early 2000s, and the debate over child care during the 2006 federal election. Both episodes resulted in major expansion of child benefits (the NCBS and UCCB respectively), despite discussion of alternative policy approaches. These two examples also show the shifting dominance between investing in children and family responsibility and the interaction of child policy perspectives with broader political debates.

5.1. The National Children’s Agenda

In the mid-1990s, after years of cuts to social spending, the Liberal federal government undertook a restructuring of social policy. The renewal was focused on social investment policies through ‘cooperative federalism’ with the provinces (Banting, 2005, 2006; McKeen, 2007). A series of agreements with the provinces and territories on child policy, under the umbrella of a National Children’s Agenda (NCA), were a key element of this restructuring. As part of the broader shift towards a social investment approach, the NCA very much framed child policy as an investment. In 2000, the prime minister and premiers together issued a statement on the NCA:

“affirm[ing] their commitment to the well-being of children by setting out their vision of early childhood development as an investment in the future of Canada. Canada's future social vitality and economic prosperity depend on the opportunities that are provided to children today.” (Canadian Intergovernmental Conference Secretariat, 2000)

However, despite the NCA statements of intent suggesting multiple potential policy approaches to investing in child outcomes (including education, health, community services, etc.), in the policy actions taken, a focus on family income emerged.

The centerpiece of the NCA was a major intergovernmental reworking of provincial social assistance (also known as welfare) for children and federal child benefits into the National Child Benefit initiative. Reflecting the social investment agenda, the restructuring was not only aimed “to help prevent and reduce the depth of child poverty” but also to “promote attachment to the labour market” (Human Resources and Skills Development Canada, 2013, p. iii). The introduction of the National Child Benefit Supplement, in 1998, was designed to replace provincial social assistance allowances for children. The targeted NCB would be available to families regardless of whether their income was earned or from social assistance, thereby reducing disincentives for parents to move from social assistance to paid work, lowering the so-called the ‘welfare wall’. The agreement was for the federal government to pay for the NCBS, and provinces to ‘reinvest’ savings from commensurate reductions social assistance payments (along with additional ‘investments’) into programs and services specifically for low-income families. In principle, the agreement would have seen a significant increase in programmatic spending on child development. However, the political backlash to reducing provincial social assistance payments (the NCBS “claw back”) resulted in many provinces either maintaining social assistance levels and/or reinvesting savings in provincial cash benefits.

In the majority of provinces, under the NCA, there was an expansion of provincial child benefits, rather than a major shift to programming. The NCBS now costs the federal

government approximately \$3.5 billion annually, which is approximately the same value as provincial child benefits (see above). Provincial NCA policies other than child benefits have also been designed to reach children primarily by improving low-income families' financial position, including subsidized child care for low-income families (again, reflecting a pro-employment social investment agenda) and supplementary health benefits for low-income families (Human Resources and Skills Development Canada, 2013).

Although an 'investment in children' view initially motivated the creation of the NCA, the resultant policies changes show the political pull of other perspectives on the child. Income-focused policies allowed for political framing consistent with 'family responsibility' and 'deserving poor' policy perspectives. The strength of this coalition of views laid the ground for major spending expansions, but also limited policies to income-based investments in children. Reflecting the child as family responsibility view, NCA policy interventions were primarily at the family level, indirectly reaching children rather than 'investing' in child outcomes directly. The NCA policies were also structured to improve families' abilities to provide for their children by themselves, by incentivizing employment, subsidizing child-care, and targeting policy to low-income families, rather than improving policy provisions directly for children.

The political saliency of a 'deserving poor' perspective is evident in the priority that was placed on the NCA within broader social policy restructuring. Social spending on children was a justifiable priority at the same time as provinces were cutting back social assistance for singles and childless families (Boychuk, 1998). The clawback of social assistance was incomplete in most provinces (or rendered moot by introduction of

provincial benefits) because reducing provincial spending on the poor (despite commensurate increases in federal benefits) was seen as cruel to poor deserving children. The NCA's targeting of child programs based on family income, rather than universal provision or based on child needs (as might be the case with programming), also reflects the influence of a deserving poor perspective: government spending on poor children can be more easily justified than the full population of children. While an investment view may have been dominant during the NCA period of child policy, alternate views of the appropriate role of government in children's lives led to policy heavily focused on family income.

5.2. The 2006 federal election child care debate

The NCA shows the strength of an income paradigm at the elite level of policy negotiations, whereas the 2006 federal election debate over child care demonstrates the power of *public* support for policies increasing family income. Heading into the 2006 election an incumbent Liberal government had signed bi-lateral agreements with all ten provinces for federal funding directed to provincial child care programs, slated to begin the following year. The Liberal federal government had allocated \$5 billion over five years for this funding initiative. These agreements were based on a 2004 national agreement among federal, provincial, and territorial governments (excluding Quebec) to develop child care provision under the "QUAD" principles of quality, universality, accessibility, and developmental programming, and followed upon the National Children's Agenda focus of investing in children (Cool, 2007).

In contrast to the governing Liberal Party, the Conservative Party campaign during the 2006 election promised cancelling funding to provinces in favour of a "Choice

in Child Care Allowance”: a universal \$100 per month per child under 6 years of age cash transfer (later renamed the Universal Child Care Benefit). Campaign ads positioned Harper as a champion of Canadian families, with messaging taking a very clear ‘family responsibility’ perspective on government role in children’s lives. The Conservative “Standing up for Canada” platform (2006) sold this allowance as an alternative to “massive bureaucracy” stating “the best role for government is to let parents chose what’s best for their children” (p. 31). In this policy proposal it is evident how the family responsibility perspective fits well with a broader small-government agenda: transferring cash to families (or taxing them less) is seen as more efficient than government programs. The UCCB can also be seen as part of a socially conservative agenda to support the traditional single/male-breadwinner model of family, where childcare is provided by a stay-at-home parent/mother.

While no election is determined based on a single issue, child care was one of the most prominent issues in the 2006 election campaign⁶. A key tipping point in the narrative of the campaign was an infamous statement by a Liberal strategist that the Conservative’s child care benefit was just ‘beer and popcorn money’ for parents. This comment threw into sharp relief the differing perspectives of the two major parties about the role of government and family in child policy (CBC News Online, 2005). Conservatives made political hay of this comment, gaining significant media and public traction with the argument that the Liberals did not trust parents. Ultimately, the Conservative party won the 2006 federal election, and immediately cancelled provincial agreements (with one-year grace period) in favour of the UCCB.

⁶ The 2006 election was called after a non-confidence vote in the minority Liberal government, based on early findings of the Gomery commission into the Sponsorship Scandal. Accountability was a major election issue.

The Conservative government has doubled-down on the political popularity and electoral success of the UCCB, with significant expansion of the benefit, expanding age eligibility to reach more families. The Conservative Party continue to differentiate this type of ‘support for families’ from direct government programming and child care proposed by opposition parties:

This is a difference between our philosophy and the others. We have always been clear that money and support to help families raise children should not go into more bureaucracy. It should go to the real experts on child care. That’s mom and dad, and that is what we are doing. (Stephen Harper, Prime Minister of Canada, 2014)

While the UCCB was heavily critiqued by child care advocates (in favour of child care programming) cash transfers to families have proved a difficult policy for opposition. The UCCB finds some support from each of the alternative policy perspectives on the child. The UCCB increases all families’ incomes, including those of the ‘deserving poor’: an extra \$100 per month⁷ for children in poverty is difficult for poverty advocates to oppose. The additional income will likely go some way improve families’ ability to provide the household conditions, acting as both as an investment in children, and improving the chances of realizing those child rights dependent on financial position. From each perspective, other than family responsibility, the policy is also flawed: not focusing specifically on the ‘deserving poor’, not designed to target investment where necessarily the most effective, and not ensuring the child directly benefits from the policy. However, in practice, these independent critiques are overwhelmed by the common denominator support for increasing family income. It is illustrative that despite critiquing the UCCB as ineffective, New Democratic Party (NDP)

⁷ As of 2015 \$160 per child under 6 and \$60 for children age 6 to 18.

leader Thomas Mulcair pledged to maintain the UCCB increases (alongside renegotiating federal support for provincial child care) should the NDP win the 2015 federal election (Mulcair, 2015). Meanwhile the Liberal Party 2015 election platform proposed replacing the UCCB with a restructuring of federal child benefits that would see the vast majority of families receive higher cash benefits than the current structure, to make it more progressive and eliminate benefits for top income families (Liberal Party of Canada, 2015).

The move from increasingly targeted child benefits (through the 1990s and under the NCA) to the introduction of universal benefits (the UCCB), marked a significant change in the *settings* of the primary child policy instrument: child benefits, but did not constitute a policy change at the level of paradigm shift. The child policy problematization remained focused on family income. The changing policy settings, and increased use of tax instruments, reflects a shift in the dominant child policy perspective (or at least that of the government in power), from deserving poor and investment, to family responsibility. Through the NCA negotiations, and later child-care agreements, it appeared for a time that child policy may have been moving away from family income, with some declaring family investment a new paradigm (Jenson, 2004; Jenson & Beauvais, 2001). However the failure to either fulfill the initial intentions of the NCA, or successfully enact early education and child care policy, indicate the shift could not be completed.

5.3. Limitations of family income child policy

The multi-perspective consensus around child policy increasing family income has provided solid political support for a major increase in spending on children in Canada over the past 20 years. However, it has also constrained policy to family income instruments, including child benefits and other programs primarily affecting household income. This constraint on policy instruments has also potentially limited the effectiveness of policy, as evidence indicates income alone may be of limited importance to child well-being and development.

Focusing child policy on family income interventions makes the assumption that increasing family income will benefit children. The effect of family income on children is necessarily indirect, as it depends how the extra income is spent by the parent(s) or influences their behaviour. While correlation between family economic position and a wide range of child development outcomes has long been established, the independent causal role of income is disputed. A gap has grown between income-focused policy and the evidence as research has begun unraveling the income-outcome relationship. Simplifying all the influences on child outcomes that are correlated with family socio-economic status to income effects ignores the richness of the evidence and evolution of understanding what effects children's well-being and development. Research consistently finds of the magnitude of income's direct effect on child outcomes is small once factors related to income (e.g. parental education, family composition, employment, etc.) are considered (Blau, 1999; Bowles, Gintis, & Osborne Groves, 2005; Dooley & Stewart, 2004; Mayer, 1997). Canadian research shows income exerts a statistically significant but minor influence on a range of child outcomes once income is isolated from other family

context factors (McEwen & Stewart, 2014). Research analyzing the effectiveness of child benefit increases through the NCA finds positive yet small effects, for those in low-income who saw benefit increases (Milligan & Stabile, 2011). An evidence-based approach to child policy begins with identifying a problem definition that reflects the evidence on the determinants of child well-being, which includes—but is not limited to—family income (Jones, Aber, & Raver, 2003).

The problematization of family income as the key determinant of children's lives is not only unsupported by evidence, it also leads to policy that is tautological rather than reasoned, blending a policy objective, a course of action, and performance measure. To recall Hall's (1993) conceptualization, a policy paradigm is "a framework of ideas and standards that specifies specifying not only the goals of policy and the kind of instruments that can be used to attain them, but also the very nature of the problems they are meant to be addressing" (p 279). When the policy problem related to children is defined as low family income, the logical policy prescription to increase family incomes. Accordingly, an increase in family income or a reduction of the number of children living in poverty is the obvious performance measure. However, increasing income transfers to any degree (barring significant design flaws) will *necessarily* decrease the number of children living below a fixed poverty line. Increased family income is a guaranteed *output*, but, because income does not directly affect children, it cannot reasonably be considered a child *outcome* measure. Thus family income focused child policy can be measured and judged a success even if it fails to achieve any measurable improvements for children. This cycle of family income policy therefore misses reaching the *child* who is nominal beneficiary of child policy. An example of this tautological cycle is the

ministerial performance measure of the UCCB program (all federal programs have such accountability). Rather than evaluating effect on children, for instance through child care availability or quality, the only performance metric is the delivery of the benefit to the eligible population (Friendly, 2013).

The limited evidence for an income approach to child policy and its potentially tautological nature, suggest the paradigmatic constraints of the family income approach are not benign. Evaluative research of child outcomes is required to assess whether the significant expansion of income transfers to families has improved Canadian children's lives, however, policy solely focused on family income is not an evidence-based strategy for pursuing goals of reduced childhood inequality, improved child development and well-being, or rights enforcement.

6. Conclusion

Over the past 20 years Canadian child policy has been subject to major political attention and significant spending increases. Despite an era of austerity, the political window for child policy has been perennially open: the 2015 election platforms for the major political parties show child policy continues to be one of the most politically prominent social policy issues. Politicians are keen to help the 'squeezed middle-class' as rising income inequality has increased public concern about declining social mobility, and with it the intergenerational transmission of poverty (The Broadbent Institute, 2012). Aside from political popularity, child policy is taking on an increasingly important role in the welfare state architecture. In a move towards a social investment model of social policy, in which equality of opportunity replaces equality of outcome, effective child policy to level the playing field becomes crucial (Banting, 2005).

But how will Canadian policymakers likely use this continued window for child policy? This paper provides some insight by examining the recent past. In contrast to other countries' policy approaches, and straying from what the research on child development would suggest, Canadian child policy has overwhelmingly focused on increasing family incomes. Looking for the political foundation of this income focus, we see that there is a range of perspectives on the legitimate role of government in children's lives. However, a typology of four major perspectives finds general support for policies that increase family income. The strength of this common denominator has developed into a constraining policy paradigm for Canadian child policy, setting family income as the key concern to be addressed by child policy. While dominance of particular perspectives has shifted over time—most prominently from the Liberal's focus on child investment to the Conservative's family responsibility agenda—this has not fundamentally dislodged the income paradigm. As the outcomes of the National Children's Agenda and the 2006 child care debate discussed above show, the strength of the family income paradigm has crowded out alternate policy approaches to improving children's lives.

Policy paradigms tend to become less powerful as the standard approaches supported by the paradigm fail to deliver results (Hall, 1993). For more than twenty years Canadian governments have, consistent with the family income paradigm, taken the approach that children's lives can be improved through increasing the incomes of their parents. Whether the results of this approach constitute success or failure will depend where one looks. If politicians are more attentive to the strategy's pay-off at the ballot

box than in children's lives, the feedback loop on the family income paradigm may be positive, regardless of its failure or success in reaching children.

Appendix A: Provincial Child Benefits

	Name of benefit(s) and year of introduction	Maximum annual benefit 2015-2016, one child under age 6	Annual cost in millions ¹
BC	The B.C. Early Childhood Tax Benefit (1996, restructured 2005 and 2014) Reduced if the family's net income exceeds \$100,000, zero beyond \$150,000 net income	\$660	\$146
Alberta	Alberta Family Employment Tax Credit (1997) Maximum is the lesser of \$1,940 and 8% of family's working income more than \$2,760	\$754*	\$116
Saskatchewan	Saskatchewan low-income tax credit (2000)	\$93	N/A [^]
Manitoba	Manitoba Child Benefit (restructured 2009)	\$420	\$4
Ontario	Ontario Child Benefit (1997, restructured 2005) Partial benefits over \$20,000 net income	\$1,310	\$984
Quebec	The Quebec Child Assistance Payment (restructured 1997 and 2005) Eligibility based on family income, and family type (maximum includes a single parent supplement), minimum assistance payment is \$644 annually	\$3,196	\$2206
New Brunswick	The New Brunswick Child Tax Benefit (1997) Partial benefit above family net income of \$20,000. The New Brunswick Working Income Supplement (*): additional benefit phased in once family earned income is more than \$3,750; maximum benefit at \$10,000.	\$250 +\$250*	\$11
Nova Scotia	Nova Scotia Child Benefit (1998) Partial benefit above family net income between \$18,000 and \$26,000	\$625	\$26.3
PEI	No provincial child benefit	\$0	-
Newfoundland and Labrador	Newfoundland and Labrador Child Benefit (1999) Partial benefit above family net income of \$17,397. Household incomes less than \$24,688, eligible for the mother baby nutrition supplement for each child less than	\$369/ \$1089 (if child <1)	\$7.4

	one year of age.		
Yukon	Yukon Child Benefit (1999) Partial benefit above family net income of \$35,000.	\$820	\$1.8
Northwest Territories	North West territories Child Benefit (1999) Families with earned income of more than \$3,750 may also get the territorial workers' supplement(*) with partial benefit for family net income above \$20,921	\$275 +\$330*	\$1.2
Nunavut	Nunavut Child Benefit (1999) Families with earned income of more than \$3,750 may also get the territorial workers' supplement(*) with partial benefit for family net income above \$20,921	\$275 +\$330*	\$2.055
Total:			\$3,506
¹ Year 2015-2016 estimates where available, or 2014-15 * Benefit dependent on earned/employment income ^ Information not available disaggregated between child recipients and adults			

Appendix Sources:

(Alberta Treasury and Finance, 2015; Canada Revenue Agency, 2014; Department of Finance (New Brunswick), 2015; Department of Finance (Newfoundland and Labrador), 2015; Department of Finance (Nova Scotia), 2014; Department of Finance (Nunavut), 2015; Department of Finance (NWT), 2015; Department of Finance (Yukon), 2015; Finances Quebec, 2014; Government of Manitoba, 2015; Government of Quebec, 2015; Ministry of Children and Family Development, 2015; Ministry of Finance (Saskatchewan), 2013; Ontario Ministry of Finance, 2015)

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How are the kids doing?: Canadian child well-being during a period of prosperity and policy attention

Abstract

Since the mid-1990s, Canadian social policy provisions for children have undergone a major restructuring, with significant increases in government spending on children. This spending expansion has focused on cash transfers to families with children: between 1994 and 2010 benefits to the lowest-income families more than doubled in real terms. This period was also one of general economic growth and prosperity for Canada, with market incomes climbing and unemployment dropping. At first glance, Canadian children have benefited: the child poverty rate has halved since the mid-1990s according to some measures. However, financial measures like the child poverty rate provide only a narrow window on one aspect of child well-being.

This paper answers the question “how are the kids doing?” using four different approaches to measuring Canadian child well-being: 1) child poverty, 2) childhood income inequality, 3) early child and family outcomes, and 4) the relationship between household income and these child outcomes. Data are drawn from the National Longitudinal Survey of Children and Youth (1994-2008) and the Survey of Labour and Income Dynamics (1994-2010). Using these four different approaches gives a multidimensional picture of whether Canadian children have benefited from a period of economic prosperity and significant expansion of child policy. I find that despite considerable government investment, young Canadian children have not seen significant change in their relative economic position. Indicators of children’s physical, emotional, and developmental outcomes, as well as family context, remain essentially stable over this period, as do gaps between the outcomes of poor and rich children.

Table of Contents

Abstract	71
Table of Contents	72
1 Introduction	74
2 Measuring Child Well-being	77
3 Economic and Policy Context	80
Figure 4: GDP growth and unemployment rate 1990-2012	80
Figure 5: Federal child benefits for two parent, two child family, various incomes 1994 and 2010	84
4 Description of Data	85
4.1 Survey of Labour of Income Dynamics (SLID)	86
Table 3: Sample sizes	87
4.2 National Longitudinal Survey of Children and Youth (NLSCY).....	88
5 Child poverty	89
5.1 Low Income Cut Offs (LICO)	90
5.2 Low-Income Measure (LIM)	91
5.3 Poverty rates.....	92
Table 4: Poverty Rates 1994-2010.....	93
Figure 6: Poverty rates, LIM and LICO, 1994-2010	93
5.4 Poverty depth: low income ratio and gap	94
Table 5: Average ratio of income to low-income line	96
Table 6: Average Gap from low income line, CPI 2008\$	97
Figure 7: Average gap from low income lines	98
6 Child income inequality	99
6.1 Gini	101
Figure 8: Gini coefficients for market income and after-tax income 1994-2010..	101
6.2 Income Percentile Ratios 10-50, 50-90, 90-10	102
Table 7: Income percentile ratios	103
6.3 Mean income growth across the distribution.....	104
Table 8: Mean household equivalized income, bottom 20%, middle 60%, and top 20% of income distribution (\$2008 CPI)	105
7 Child outcomes	107
Table 9: Child outcomes, univariate.....	109
8 Child outcomes by income	113
Table 10: Child outcomes, by income	114
Figure 9: Mean PPVT-R score by income quintile.....	117
Figure 10: Mean family functioning score, by income quintile (infant).....	118
Figure 11: Social Support, by income quintile (Preschool)	118
9 Summary of child well-being measurement	119
10 Discussion and conclusion	121

Appendix A: Definitions of child well-being outcomes, from National Longitudinal Survey of Children and Youth.....	126
Appendix B: Child well-being outcomes, univariate analysis tables.....	130
Appendix B.1 Physical outcomes	130
Appendix B.2: Socio-emotional outcomes	131
Appendix B.3: Developmental outcomes	132
Appendix B.4: Family context outcomes.....	133
Appendix C: Child well-being outcomes by income quintile analysis tables	134
Appendix C.1 Physical outcomes by income quintile	134
Appendix C2: Socio-emotional outcomes by income quintile	136
Appendix C3: Developmental outcomes by income quintile	137
Appendix C.4: Family context by income quintile	138
References	140

1. Introduction

To measure the well-being of a country's children is to measure a society's commitment to its most vulnerable—and its future. Yet the major indicators of national progress, from the unemployment rate to gross domestic product, do not tell us much about how children are faring. If children are our most precious resource, then alongside monitoring economic and labour statistics we must continually ask: how are the kids doing? This question is also crucial to evaluating the effectiveness of social policy that seeks to invest in child development. The most commonly used indicator of child well-being, the child poverty rate, gives a limited and often ambiguous picture. To understand how children are doing we must look at multiple dimensions of families' financial conditions, as well as measure children's outcomes more directly.

This paper examines Canadian children's well-being from 1994-2008 asking: have children's lives improved over this period of economic prosperity and significant evolution in child policy? From 1994-2008 median market income of all households grew 20.5 percent in real terms and unemployment dropped nearly three percentage points (Statistics Canada, 2013a, 2013b). Child policy was also restructured with significant increases to cash benefits for families with children: federal expenditures on children nearly doubled as did cash benefits for the lowest income families (see dissertation paper #1).

Given this economic and policy context it may seem safe to assume Canadian children were made better off; however, even a cursory look at poverty measures points to a more complex story. Using the most common measure of poverty in Canada (the Low Income Cut Offs After-Tax (LICO)), the child poverty rate was halved between

1994 and 2008: falling to 9 percent in 2008, after peaking at 18.4 percent in 1996 (Statistics Canada, 2013c). However relative child poverty, measured by the Low Income Measure (LIM), remained essentially stable at between 13 and 15 percent (Statistics Canada, 2013c). These conflicting poverty rates compel a questioning of whether the lives of children (particularly those of the least well-off) were meaningfully improved over this period. Have policies increasing family income and economic prosperity trickled down to substantive improvements in the lives of children? With further multi-billion dollar expansions to federal child benefits made in 2015, an evaluation the effectiveness of past expansions is timely.

Assessing whether children have benefited from prosperity and policy changes is not simply a matter of choosing between poverty definitions and measures. Following the movement to measuring ‘child well-being’ (Ben-Arieh, 2010), I assess Canadian child well-being from 1994 to 2008 using four different approaches: 1) poverty metrics, 2) income inequality metrics, 3) early child and family outcomes (covering physical, socio-emotional, and developmental outcomes, as well as family context), and, 4) measures of the relationship between household income and child and family outcomes. Income data is drawn from the Survey of Labour and Income Dynamics (SLID), and child outcomes data for children ages zero to five is taken from the National Longitudinal Survey of Children and Youth (NLSCY). Although the timespan of the analysis was determined by the data availability, it offers an ideal window for evaluating an era of significant child policy development and economic growth.

The aims of this paper are threefold: the primary aim is to evaluate child well-being in Canada with a detailed description of how family income and child well-being

have changed over a period of child policy expansion and economic prosperity. A secondary aim is to contribute to the literature on child indicators and child well-being by demonstrating the value of using multiple different measures of family financial context alongside measures of child outcomes to monitor child well-being and evaluate policy. Finally, while descriptive in nature, the analysis contributes to understanding the relationship between income and child outcomes by examining whether, at the population level, significant increases in family income trickle-down to improvements in child outcomes. Although this paper does not analyze the causal relationship between individual income policies and child outcomes, child policy and family incomes went through such a transformational change during this period it is reasonable to expect some improvement in child outcomes if children benefited from income increases. While I examine the Canadian case exclusively, the latter two elements of the discussion will be of interest for international or comparative application.

I begin with a discussion of the theory of child well-being measurement, including the limitations of income-based measures. Before moving to analysis of measures, I provide an overview of the economic and policy context of the period of investigation, which motivates the evaluation of child well-being that follows. After a brief introduction of the two data sources, the paper proceeds in four sections measuring child well-being via: a) poverty metrics, b) inequality metrics, c) child outcomes measures, and d) income-gradients in child outcomes. I conclude with a discussion of major findings and policy implications.

2. Measuring Child Well-being

‘Child well-being’ broadly refers to children’s quality of life (Ben-Arieh & Frønes, 2007). Since the mid-1990s there has been an international move by both those studying children and policymakers from “child welfare to child well-being” (Kamerman, Phipps, & Ben-Arieh, 2010). This shift has been marked by a move from a narrow focus on adverse child conditions (such as abuse or poverty) to measuring multiple dimensions of children’s lives that indicate quality of life. The child well-being movement has come alongside changes in how children are viewed and valued. Following the UN Convention on the Rights of the Child, children can no longer be considered simply a private parental concern, but must be recognized as citizens in the here and now, with the right to well-being (Ben-Arieh, 2010; Kamerman et al., 2010; United Nations General Assembly, 1989).

Evolving theoretical and empirical understanding of what affects children’s lives and development has also influenced this movement. Child well-being is now understood as the product of an ecology of factors, including biological, family, community, and environmental influences (Bronfenbrenner & Morris, 1998). As a result, monitoring child well-being requires a multidimensional measurement approach. This approach can be seen in comparative reports by UNICEF (UNICEF, 2010, 2013) and the OECD (2009) on child-well being. These reports include traditional income measures of child poverty and inequality—or ‘material well-being’—alongside health, educational outcomes, risk behaviours, environment, and housing, among others.

The child indicators I use in this paper aim to capture a multidimensional picture of Canadian child well-being. The measures selected also permit a comparison of

traditional monitoring of children via family income measures with more holistic indicators of child well-being. Indicators of material well-being, including poverty and income inequality, measure the direct policy effects of policy changes focused on family income. Indicators of children's physical and emotional well-being, development, and family well-being, measure how these changes have affected children's lives at a more proximal level. While financial context is a component of child well-being, there are challenges in using household income to assess child well-being that bear noting at the outset.

Household income is an inherently indirect measure of an individual's well-being, particularly for children. A child measured as "poor" is, more specifically, a child living in a household with income below an income-threshold set as the poverty line. In using household income to assess ability to meet an individual's needs we assume that individual household members pool income and have claim on an equal share of resources; in other words, all members of the family derive the same level of welfare from the household income. However, households do not necessarily pool all income, divide income equally, or exert equal control over decisions of how income is spent or saved. There are a diversity of household financial management arrangements, varying by gender, employment, and income level (Woolley, 2004). Research on inequality *within* the household has shown that "overall inequality is probably larger than studies using household-level data would suggest" (Burton, Phipps et al. 2007). In the Canadian case, Phipps and Burton (1995) use a series of simulations to find that poverty rates differ greatly when different assumptions are made about the degree of sharing of income within the household.

This issue of allocation of household resources is particularly vexing for assessing children's experiences of poverty and inequality as children have little control (although not necessarily little influence) over how money is spent. Middleton, Ashworth, and Braithwaite (1997) find that some low-income mothers "go without" in order to meet children's needs, "shielding" them from the full extent of the household poverty. Children may not be experiencing the level of deprivation or affluence their income level would suggest. Using size-adjusted household income to assess a child's economic situation has been said to compromise between over- and under-estimating childhood deprivation (Chen & Corak, 2008). However, it must be remembered that this 'compromise' is not based on a solid empirical understanding of children's command over household resources.

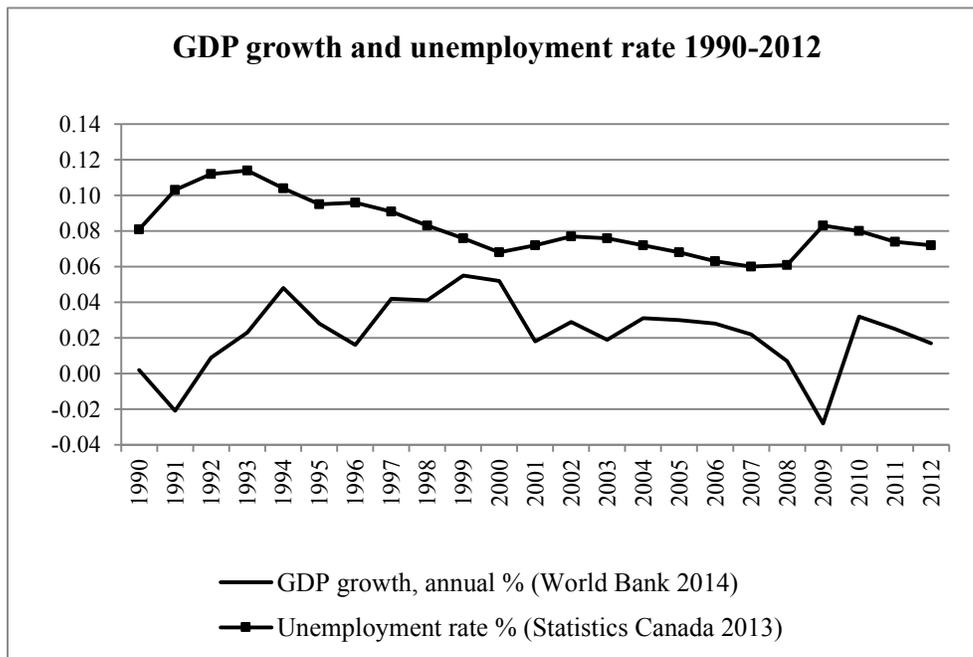
Aside from intra-household assumptions, income is a qualitatively different indicator of well-being for children than for adults. If income is a means and well-being is an end, for children the relationship between means and ends is different than for adults. Many factors of child well-being are not solely determined by family income, and for those that are, not all families have the same ability to transform income into better child outcomes. Sen's (1992) capability approach to welfare measurement provides a particularly useful distinction for measuring child well-being: while income is one aspect of the capabilities afforded to children, more directly measures child outcomes provide an indication of the functionings of children (Biggeri, Ballet, & Comim, 2010; Phipps, 2002). From a policy perspective, the effect of household income or economic position on child well-being can be heavily mediated—or independently affected—by non-income

public policies, including education, health care, and community services. Therefore assessing how well policy is serving children requires going beyond income measures.

3. Economic and Policy Context

The period from 1994 to 2008 was extraordinarily prosperous for Canada. Between the recession of the early 1990s and financial crisis of 2008, the Canadian economy performed exceptionally well. Unemployment fell from 10.4 percent to 6.1 percent (Statistics Canada, 2013a) and annual Gross Domestic Product (GDP) growth averaged 3.1 percent between 1994 and 2008 (World Bank, 2014) (see Figure 4).

Figure 4: GDP growth and unemployment rate 1990-2012



These macro-economic conditions also translated into real growth in Canadians' incomes. In 2011 dollars, median market income between 1994 and 2008 for all economic family types grew 20.5 percent from \$40,900 to \$49,300. For two-parent

families with children, median market income grew 21.1 percent from \$70,100 to \$84,900. And for lone-parent families with children, increases in labour market participation led to median market income more than doubling, from \$14,300 to \$33,500 (Richards, 2010; Statistics Canada, 2013b). Canada became a significantly richer country over our period of interest, but these metrics do not tell us whether this increased prosperity was felt by children.

Canadian child and family policy underwent a significant restructuring and expansion from 1994 to 2008, with a particular focus on cash transfers to families with children (hereafter collectively referred to as child benefits). After cuts to social spending earlier in the 1990s, as the millennium closed, the Liberal federal government turned to renewing social policy with a focus on ‘social investment’ (Banting, 2005; Jenson, 2003, 2004; Jenson & Beauvais, 2001; Jenson & Saint-Martin, 2006). Between 1998 and 2005 a series of federal-provincial-territorial agreements were negotiated under the National Children’s Agenda, resulting in a major reworking of the child benefits system in Canada (Human Resources and Skills Development Canada, 2013). The centerpiece was the introduction of the National Child Benefit Supplement (NCBS), a federal cash benefit targeted to low-income families with children. The NCBS was intended to replace provincial social assistance allowances for children, thereby reducing disincentives for parents to move off social assistance and into paid work, lowering the so-called ‘welfare wall’. Provinces were to ‘reinvest’ savings from commensurate reductions in social assistance payments into programs and services for low-income families⁸.

⁸Due to a political backlash to “clawing back” the NCBS from social assistance recipients, many provinces either maintain social assistance levels and/or reinvested savings into additional provincial cash benefits. By 2008, Prince Edward Island was (and in 2015 continues to be) the only province not delivering some form of cash child benefit to low income families (Canada Revenue Agency, 2014).

The National Children's Agenda was a major expansion of both federal and provincial spending on children. Between 1995 and 2005 federal expenditure on children increased from \$8.97 billion to \$14.8 billion, and by 2010 was \$19.5 billion (2008 dollars constant, see paper 1). Provinces reported spending an additional \$780 million in 2008 on benefits and services for low-income families as part of the National Children's Agenda (Human Resources and Skills Development Canada, 2013). Federal transfers to the provinces earmarked for spending on children were also introduced in the early 2000s, and by 2008 were worth approximately \$1 billion annually⁹.

Another major change during this period was the extension of parental leave in 2000. Legally protected parental leave for newborn or adopted children was effectively doubled from six months to a year. Income replacement during leave, delivered through the Employment Insurance for those eligible, was also extended. This resulted in federal expenditure on parental leave benefits doubling in real terms from \$1.6 billion in 1994 to \$3.2 billion in 2004 (2008 dollars constant, see paper 1).

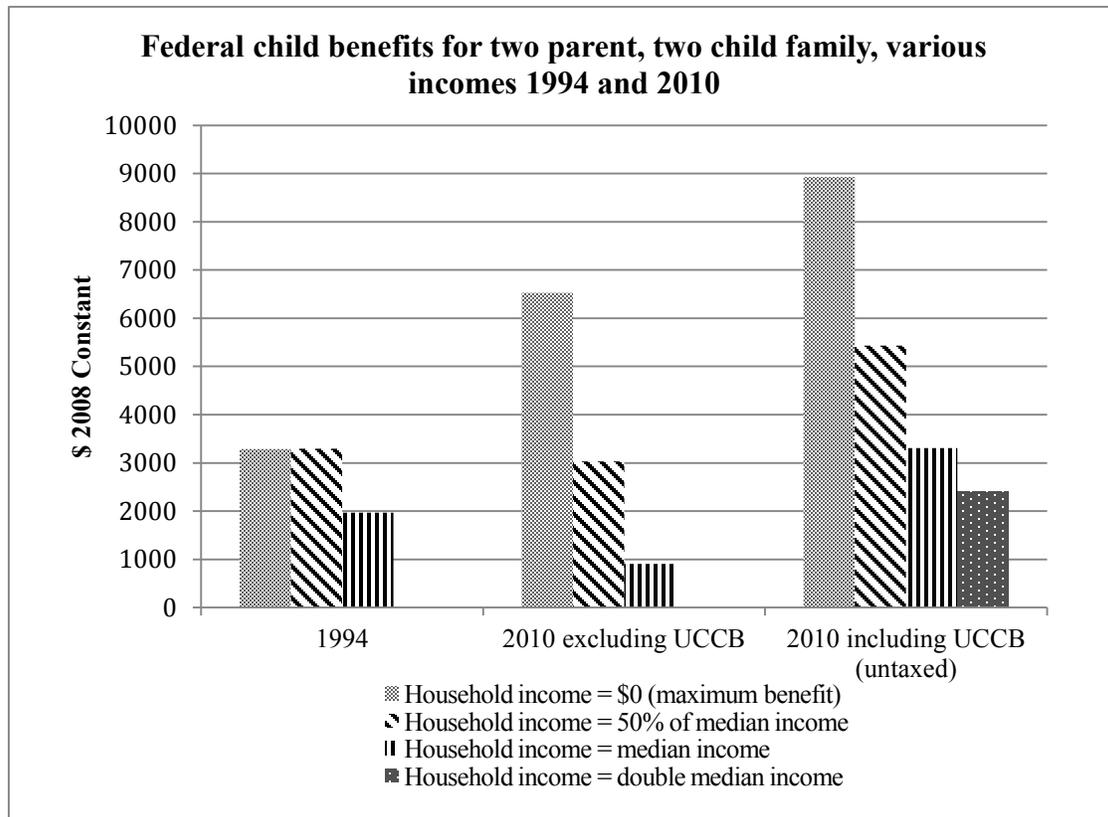
While the era of the National Children's Agenda focused child policy on low-income families, since 2006 federal child policy has favoured more universal policy. Upon election to federal government in 2006, the Conservative government cancelled an agreement with the provinces to launch a national child care program, in favour of introducing the Universal Child Care Benefit (UCCB): a universal cash benefit of \$100 per month for each child age five and under, taxable in the hands of the lower-income

⁹Since 2007-08, these transfers have been rolled into the Canadian Social Transfer as ten percent of the total transfer notionally allocated for spending on children (Department of Finance, 2015). While transfers to the provinces through the Canada Social Transfer may be notionally allocated by the federal government for certain types of expenses, there is no accountability or sanction regarding where funds are spent.

parent. The Conservative government subsequently introduced tax credits that favour higher income families, including the Child Fitness Tax Credit and the Child Tax Credit.

The magnitude of changes to child benefits can perhaps best be appreciated by looking at the increases in child benefit levels at various points in the income distribution. Using the Canadian Tax and Credit Simulator (Milligan, 2012), I calculate the total federal child benefits for a two-parent family with two children less than five years of age at different income levels. Results are depicted in figure 5. Maximum benefits (if the family had zero earned income) increased 172 percent in real terms, from \$3284 in 1994 to \$8930 in 2010 (2008 dollars constant). If that same family earned 50 percent of the annual national household median (the LIM threshold), their maximum federal child benefits increased approximately 65 percent, from \$3291 up to \$5430 in 2010 (provided the UCCB was taxed at 0 percent). If the family's market income was at the annual national median, federal child benefits, excluding the UCCB, *decreased* 53 percent in real terms from \$1968 in 1994 to \$926 in 2010. However, including the UCCB before taxation, their benefits increased 67 percent to \$3304. If the family's income was twice the annual national median, the UCCB gave the family \$2400 annually in taxable child benefit, whereas prior to the UCCB that family would have received no cash benefits for children. The change in child benefit levels at different points in the income distribution show that, while the redesign of the Canada Child Tax Benefit and NCBS increased progressivity and generosity for the lowest income families, the UCCB reduced the progressive taper of child benefits.

Figure 5: Federal child benefits for two parent, two child family, various incomes 1994 and 2010



The expansion of child benefits is again on the political agenda. In January 2015, the Conservative government further increased child benefits, with an expansion of the UCCB which will cost approximately \$2.6 billion annually (Department of Finance, 2014). The monthly benefit increased to \$160 per month for children under age five, and \$60 per month for children age six through 17. In 2015 the maximum in federal child benefits for our two-parent two-child family is \$11,076 (\$9,874 in 2008 dollars) (Canada Revenue Agency, 2015).

Aside from improving child well-being, the changes to child policy over this period were driven by a variety of other objectives, including those related to parental

employment and child care arrangements (see the first paper of this dissertation for discussion of the motivations behind Canadian child policy). Regardless of multiple objectives pursued, first and foremost the policy changes resulted in a massive increase in the amount spent on cash transfers to families. Not only did low-income families receive much more financial support from government, by 2006 *all* families with children had incomes boosted by child benefits. There can be no question that changes to child policy between 1994 and 2008 made Canadian *families* better off in absolute financial terms. However this does not necessarily mean policy made Canadian *children* better off. Given the significant expansion of Canadian child policy between 1994 and 2008 (with most significant changes midway through this period), we may expect that children's well-being has improved. But to truly evaluate this, we must look beyond the immediate policy *output*, higher family incomes, to examine the core *outcomes* of child policy: children's well-being.

4. Description of Data

This paper uses micro-data from two Statistics Canada datasets: the Survey of Labour and Income Dynamics (SLID) and the National Longitudinal Survey of Children and Youth (NLSCY). Both datasets were analyzed at the Carleton Ottawa Outaouais Research Data Centre, which is part of the Canadian Research Data Centre Network. The SLID is used for poverty and inequality measures (sections 1 and 2) and the NLSCY is used for child and family outcomes (sections 3 and 4). Both datasets are weighted to give nationally representative results for their sample populations, which exclude Northern Canada (the three territories) and children living in institutions or on First Nations reservations.

4.1. Survey of Labour of Income Dynamics (SLID)

SLID was the primary source for detailed data on Canadians' incomes from 1993 to 2010, and has since been replaced by the Canada Income Survey. The SLID sample is representative of all Canadian households, and data is structured to allow for household, family, and individual level data. More than 80 percent of SLID respondents permit Statistics Canada to access their tax filings in lieu of the income interview, giving the income data high reliability. The SLID was a panel survey, but for the purposes of this paper, the SLID is used cross-sectionally with Statistics Canada-provided weights. I have used biennial data from the SLID to match the collection years of the NLSCY. As SLID microdata was available for research use up to the year 2010 at time of analysis, this year is included. For analysis using the SLID, individuals (including children) are the unit of analysis. Household income is assigned to individuals and household-size adjusted as appropriate for comparison to low income lines.

In analysis using the SLID I look at the full population (adults and children) and two sub-samples: children under age 18 (U18) and children under age 6 (U6). The two samples allow for analysis of the full child population, as well as matching the ages covered in the analysis of well-being outcomes using the NLSCY. Table 3 gives the sample sizes for the years of the SLID used, both total and for the sub-samples used in the analysis. The smallest sample size is 3,175. The first year of the SLID panel collection was 1994, thus the sample size in this year is much smaller because only one cohort (of three) had entered the survey at this point. Averaging over the nine years of SLID data used, 24 percent of households include at least one child under age 18, and 12 percent have at least one child under age six. For the full population, 23 percent of the

sample is under age 18 and seven percent is under age six. When comparing full population, U18, and U6 samples in the analysis that follows, it is important to remember that they are not independent, but rather overlap.

Table 3: Sample sizes

	1994	1996	1998	2000	2002	2004	2006	2008	2010
<i>Survey of Labour and Income Dynamics (SLID)</i>									
All	38,543	78,489	78,405	76,846	74,479	72,294	70,224	64,167	63,624
Under age 18	10,033	20,285	19,476	18,637	17,376	16,178	15,189	13,696	13,021
Under age 6	3,175	6,203	5,815	5,270	4,894	4,519	4,158	3,940	3,905
<i>National Longitudinal Survey of Children and Youth (NLSCY)</i>									
Infant (Age 0-2)	4,696	4,154	8,126	4,008	3,252	3,521	4,015	4,106	
Toddler (Age 2/3)	3,909	3,887	3,623	6,970	3,475	3,461	3,874	4,372	
Pre-School (Age 4/5)	3,728	2,939	8,927	6,078	6,192	3,532	3,615	4,130	

Throughout this paper ‘income’ is measured as total household income (noted as either total before tax or after-tax, as discussed further below) adjusted for household size by dividing by the square root of household size.¹⁰ This definition allows for comparison among children in households of different family sizes. The only exception to this is when evaluating income against the LICO lines, which requires using unadjusted household income. Throughout the paper, dollar figures are converted using the Consumer Price Index to 2008 dollars (the final year of the NLSCY) for comparability.

¹⁰ Unfortunately, limitations in the data of ages of household members do not allow for sensitivity analysis using alternative equivalency scales.

4.2. National Longitudinal Survey of Children and Youth (NLSCY)

The NLSCY is a longitudinal survey of Canadian children, conducted from 1994 to 2008 by Statistics Canada and what was then called the Department of Human Resources and Social Development. It was the first large, nationally-representative longitudinal survey of Canadian children. The stated objective was “to develop a national database on the characteristics and life experiences of children and youth in Canada as they grow from infancy to adulthood” (Statistics Canada, 2010, p 10). The NLSCY collected data on an original cohort of children (aged 0-11 in 1994) every second year until 2008 to create eight cycles of data. In addition to this initial cohort, Early Childhood Development (ECD) cohorts aged 0-2 were added at each collection cycle and followed until ages 5-7. I use these ECD cohorts for cross-sectional analysis of child outcomes for ages 0-5. Unfortunately, due to attrition, cross-sectional analysis of children aged 6 and over for the duration of the NLSCY is not recommended by Statistics Canada.

The analysis of outcomes is split into three age groups to reflect the different age-sensitive measurement instruments: ‘infant’ (0-24 months), ‘toddler’ (ages 2 and 3) and ‘pre-school’ (ages 4 and 5). The biennial data collection, combined with these sub-sample specifications, allows for each year to be treated as an independent cross-section: no child appears in the same age group sample twice over the survey years. Table 3 gives the sample sizes for the cycles of the NLSCY by age period. Variation in sample size is a product of changing survey design rather than significant differences in response rate.¹¹

¹¹ In 1998 and 2000 (cycles 3 and 4), in addition to the incoming cohort age 0-12 months, there was a “top up” sample of approximately 5000 (in 1998) and 3000 (in 2000) 5-year-olds. Note that for the 1998 ECD cohort, the sample was increased significantly to allow for larger provincial samples for analysis; however, this decision was reversed in the following cycle.

5. Child poverty

The first approach I take to measuring child well-being is using measures based on poverty lines. The child poverty rate, a count of how many children are in households below a set income threshold, is the most commonly used measure of how children are doing in Canada. Despite the ubiquity of the poverty rate as an indicator of social well-being and government policy outcomes, neither federal nor provincial governments in Canada have set an official poverty line. Instead, Statistics Canada has provided multiple measures of “low-income” since the 1960s.¹² The agency now calculates low income rates based on three different measures: the Low Income Cut Offs (LICO), the Low Income Measure (LIM), and the Market Basket Measure (MBM) (Statistics Canada, 2012). The MBM has not been used for this analysis as it was introduced mid-way through the period of interest.

While Canada does not have an official poverty line, Canadian governments, non-governmental organizations, politicians, and researchers use the Statistics Canada low-income lines to measure poverty in Canada and thus the low-income lines currently serve as the standard Canadian measures of poverty. For the purposes of this paper I use the term ‘child poverty’ to refer to headcount poverty rate as measured against LICO or LIM, always specifying which low-income measure is used. Statistics Canada calculates two versions of the LICOs and LIMs for use with before and after tax incomes. The before-tax measures are not particularly useful as they include transfers, thus this paper uses the more commonly cited after-tax measures, although the “-AT” abbreviation is dropped for

¹²For comparison, the USA has an official poverty line using the Federal Poverty Guidelines (an absolute, basket-of-goods approach), and the European Union uses 60 percent of the national median income as an income line at which individuals are “at risk of poverty”. The OECD uses 50 percent of the national median income as a poverty line (same as LIM) to compare across nations.

ease of reading. Using both the LICO and LIM poverty rates, alongside other measures of income distribution, we can better understand what each measures indicates about family income, as well as put these common measures in context of other well-being indicators.

5.1. Low Income Cut Offs (LICO)

The Low Income Cut Offs (LICO) are calculated using expenditure survey data to find the income thresholds at which a family would spend 20 percentage points more of their income on food, clothing, and shelter than the average family of the same size living in the same size city. The LICOs were last “rebased” on expenditure survey data in 1992 at 63 percent, with dollar amounts varying by family size and population level of city. While the LICO captures a relative aspect of poverty by using survey data to reflect population spending norms, only certain basic needs are included in the calculation formula. It excludes transportation, utilities, and any number of other categories of goods that many Canadians would see as essential to an adequate standard of living in modern Canadian society. In arbitrarily setting the margin at 20 percentage points above the average expended on certain categories, the LICOs do not have a clear operationalization of standard of living (Mendelson, 2005).

Since 1992 the LICO thresholds have only been updated using the consumer price index to adjust for inflation. The longer the LICOs go without ‘rebased’ on expenditure surveys, the less the set income amounts reflect the original conceptualization of a low-income measure based on survey data. Inflation adjustments do not capture changes in the proportion of income households spend on basics, nor do they reflect the changing norms of what are considered basic expense categories. A poverty line is no longer relative if it remains fixed while societal norms change: while a home computer and

internet access may have been a luxury in 1992, today it may be considered a necessity for a child's education and participation in society. Because the LICOs were not rebased during our period of interest they are in essence a fixed poverty line. As Chen and Corak (2008) point out, a fixed poverty line, adjusted only for inflation, is 'the least challenging standard by which to judge progress'.

5.2. Low-Income Measure (LIM)

The Low-Income Measure (LIM) is a relative poverty measure, set at 50 percent of median household size-adjusted income. A more straightforward methodology than that of the LICO, the LIM is effectively 'rebased' every year based on annual median income. As a result, the LIM is a moving poverty line that in times of economic growth generally outpaces inflation. In order for a family at the LIM threshold to stay above the LIM line, their income must increase at the same rate as the median, rather than only inflation. The 'percentage of median' methodology is a common approach to poverty measurement internationally, and makes for easy international comparison (e.g. the EU uses 60 percent of median, the OECD 50 percent of median).

These two poverty measures will, by their definitions, result in different degrees of change in their respective poverty rates over time. As the LIM threshold moves with median income, and the LICO threshold only with inflation, in a period of economic growth the increase in LIM will outpace the increases in LICO. From 1994 to 2010 the LIM threshold for a four-person household increased \$16,500 whereas the LICO threshold for four-person urban household increased only \$9,377 (unadjusted dollars) (Statistics Canada, 2012). Due to rising median income, the LIM threshold increased \$7,123 beyond inflation alone. The Canadian Child Tax Benefit and NCBS, but not

UCCB, are indexed to inflation, which means they maintain their value relative to the LICO over time. However, the value of benefits relative to the LIM threshold will erode as median income increases. In order to simply maintain a stable poverty rate by a relative, moving poverty measurement such as the LIM, policies like child benefit would have to increase at a pace consistent with median income. This different relationship between the two poverty measures and child benefits is crucial to understanding the ability of income transfer policies to reduce poverty.

5.3. Poverty rates

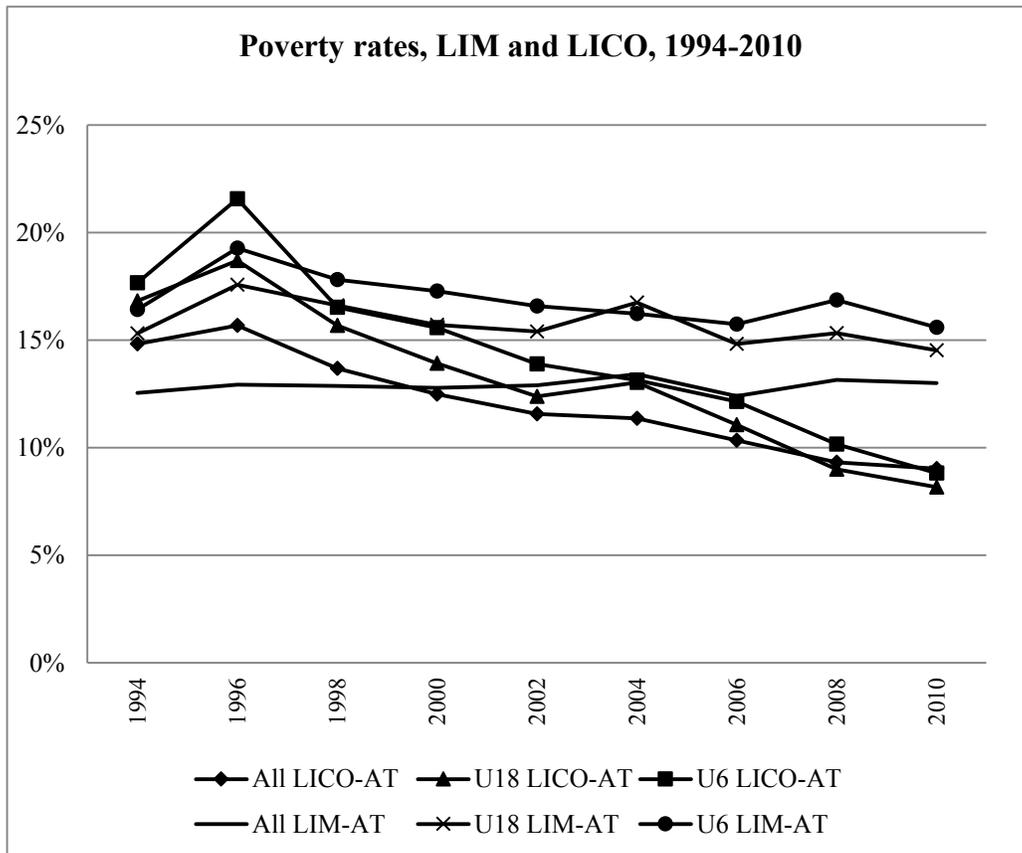
Which low-income measure one uses matters greatly: the child poverty rate between 1994 and 2010 either dropped by 50 percent or 5 percent depending on which low-income line one uses. Table 4 reports LICO and LIM rates using the SLID for the three age groups: total population (“All”), under age 18 (“U18”), and under age 6 (“U6”). Using the LICO, the U18 low-income rate dropped nearly nine percentage points from 1994-2010: from 16.8 percent to 8.2 percent, as seen in Figure 6. Using the LIM, the rate dropped less than one percentage point: from 15.3 percent to 14.5 percent. In population figures, the gap between these measures is significant: by LICO, in 2010 approximately 550,000 children were in low-income households. Using the LIM measure the number is nearly double, just shy of one million children at 990,000. The difference between LICO and LIM increases significantly from the year 2000 onward. Child poverty measured by a fixed line continues to decrease while relative child poverty remains more or less constant.

Table 4. Poverty Rates 1994-2010

	1994	1996	1998	2000	2002	2004	2006	2008	2010
Low Income Cut Off, After Tax (LICO)									
All	14.8	15.7	13.7	12.5	11.6	11.4	10.3	9.3	9.0
Std Error	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Under 18	16.8	18.7	15.7	13.9	12.4	13	11.1	9.0	8.2
Std Error	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Under 6	17.7	21.6	16.5	15.6	13.9	13.1	12.2	10.2	8.8
Std Error	1.1	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.8
Low Income Measure, after tax (LIM)									
All	12.6	12.9	12.9	12.8	12.9	13.4	12.4	13.2	13.0
Std Error	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Under 18	15.3	17.6	16.6	15.7	15.4	16.8	14.8	15.3	14.5
Std Error	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Under 6	16.4	19.3	17.8	17.3	16.6	16.2	15.7	16.9	15.6
Std Error	1.0	0.8	0.9	0.8	0.8	0.8	0.9	1.0	1.0

Note: Standard error of mean estimate of dichotomous 'poor' variable

Figure 6: Poverty rates, LIM and LICO, 1994-2010



With the exception of 2010, using either measure, children consistently have higher poverty rates than the total population, and younger children (U6) consistently have higher poverty rates than all children. However, by either measures, child poverty has declined more than the overall population poverty rate. Between 1994 and 2010, the child poverty rate measured by the LICO dropped 2.9 percentage points more than the total population rate, and the LIM child poverty rate dropped 1.2 percentage points more than the total population rate. Considering the overlap of populations in households, disaggregating would likely attenuate these differences further: having children in the household increases the likelihood of being in poverty, though the increased risk has declined somewhat as child poverty rates declined to a greater degree than overall population rates.

5.4. Poverty depth: low income ratio and gap

Even using a single poverty measure, the poverty rate can be an ambiguous measure of progress over time. Poverty rates are a dichotomous assessment of a household's financial situation: one dollar above the set threshold is 'not poor'. There is no distinction between one dollar and thousands of dollars below threshold, which can mask increases or decreases in income for those below the poverty line. For instance, for a fixed measure such as LICO, the poverty rate would remain stable if all incomes above the poverty line remained the same, but decreased for all below the line. Likewise, the rate would remain stable if the very poorest had their incomes increase but not enough to cross the poverty threshold. Getting households just across a threshold to reduce the poverty rate is not a particularly meaningful policy goal, particularly if those income lines

are arbitrarily determined. Thus we must look at other measures to contextualize movement in the poverty rate.

A richer picture of where individuals sit relative to the low income lines is given by continuous measures of the depth of poverty: the average low-income *ratio* and average low-income *gap*. The average low-income ratio takes the average of the ratio of each household income to the appropriate low-income line for that household (confined to households with income below the low-income line). An increasing average *ratio* indicates that those in low income are, on average, getting closer to the low-income line. The average low-income *gap* is the average of the difference between household income and the appropriate household low-income line. The low-income poverty gap is given in dollars, which also gives a tangible sense of how far short of the line those in low-income incomes tend to fall.

The low-income ratios for both LIM and LICO display less movement over the time period than the poverty rates. Table 5 gives the low-income ratio statistics for 1994-2010 using the LICO and LIM for both U18 and U6 samples. Setting aside the jump between 2008 and 2010 for all measures and age groups, the poverty ratio appears relatively stable, ranging from 0.71 to 0.77 for both measures. This indicates that the poverty rate reduction has not necessarily come from increasing all incomes under the low-income lines, pushing those with the highest incomes across the threshold.

Table 5. Average ratio of income to low-income line

	1994	1996	1998	2000	2002	2004	2006	2008	2010
Low Income Cut Off (LICO)									
Under 18	0.7210	0.7148	0.7129	0.7348	0.7265	0.7363	0.7484	0.7176	0.7629
Std Error	0.0058	0.0038	0.0043	0.0044	0.0047	0.0049	0.0057	0.0073	0.0071
Under 6	0.7466	0.7255	0.7188	0.7461	0.7406	0.7388	0.7535	0.7316	0.7688
Std Error	0.0089	0.0063	0.0067	0.0078	0.0081	0.0091	0.0098	0.0127	0.0115
Low Income Measure (LIM)									
Under 18	0.7310	0.7327	0.7321	0.7330	0.7166	0.7301	0.7268	0.7256	0.7574
Std Error	0.0052	0.0034	0.0038	0.0037	0.0037	0.0038	0.0042	0.0047	0.0047
Under 6	0.7561	0.7220	0.7401	0.7291	0.7122	0.7129	0.7216	0.7278	0.7558
Std Error	0.0080	0.0061	0.0060	0.0066	0.0064	0.0073	0.0077	0.0080	0.0077

Rather, it appears there has been a reduction in the number of children in all positions below the low-income line, thus maintaining a stable ratio of income to the low-income lines for individuals who are in poverty. More detailed analysis would need to be done to ascertain whether the reduction in poverty is indeed across a random selection, or whether there has been a demographic change in the low-income population. For instance, from 1996 to 2007, the LICO poverty rate for individuals in lone-parent families was reduced by more than half, due in part to increased labour force participation (Richards, 2010). If progressive benefits expansion was the primary driver of falling LICO poverty rates, we would expect the average low-income ratio would rise as those with lowest incomes receive greater benefit, pulling their incomes up more than those higher in the income distribution.

The low-income gap measure confirms the low-income ratio analysis: while poverty rates have declined, the general position of those under the low-income line has remained fairly constant, or widened. Table 6 gives the average gap from low-income line for 1994-2010 using the LICO and LIM for both U18 and U6, and Figure 7 provides a corresponding graph. Aside from looking at trends, the average gap puts a dollar figure

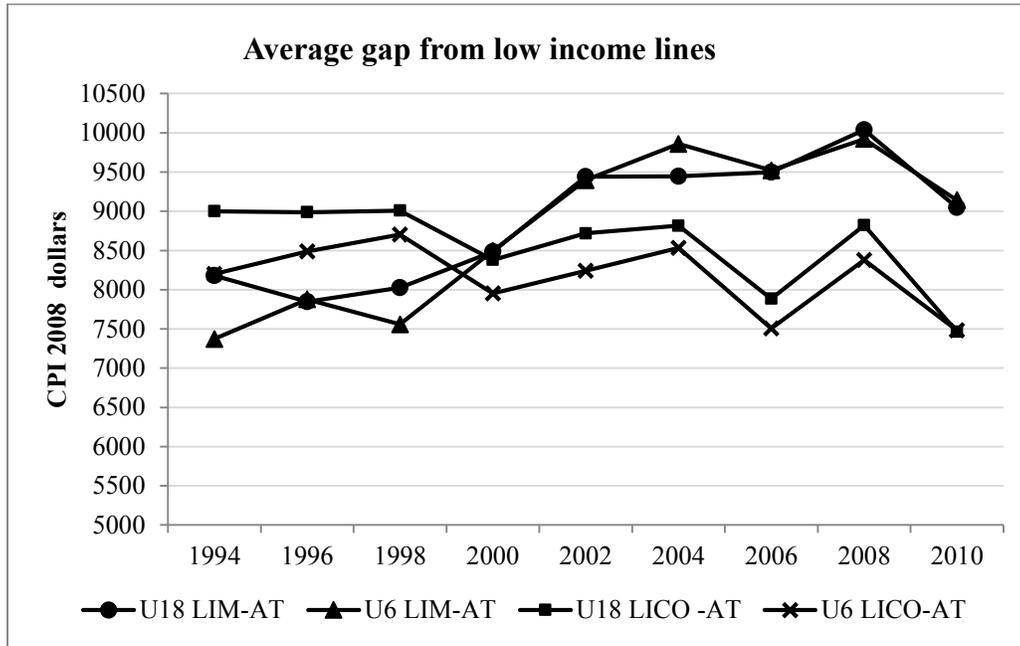
on the severity of child poverty in Canada. The average child of low-income in Canada is not merely a few hundred dollars away from being ‘out of poverty’, their household’s equivalized income is approximately \$7500 or \$9000 below the LICO or LIM, respectively. For a four-person household with an after-tax income below the LIM threshold, it would take, on average, a transfer of more than \$18,000 to move them above the LIM poverty line.

Table 6: Average Gap from low income line, CPI 2008\$

	1994	1996	1998	2000	2002	2004	2006	2008	2010
Low Income Cut Off (LICO)									
Under 18	9001	8988	9008	8380	8718	8816	7884	8822	7465
Std Error	258	164	182	177	185	201	191	233	218
Under 6	8201	8489	8703	7952	8239	8532	7508	8380	7483
Std Error	417	265	274	308	329	366	311	420	373
Low Income Measure (LIM)									
Under 18	8178	7847	8025	8485	9442	9446	9498	10039	9048
Std Error	193	180	182	174	170	178	162	169	154
Under 6	7371	7876	7559	8495	9397	9858	9521	9922	9142
Std Error	354	232	223	249	250	297	272	299	288

Looking first at the LICO poverty gaps, we see the gaps for both age groups range between \$7500 and \$9000, with no major drop in the gap to correspond with halving of the poverty rate by this measure between 1996 and 2010. Again, if the decline in poverty rates corresponded to an increase in income for all households in low income, or for those at very bottom, we would expect the gap to decrease more noticeably.

Figure 7: Average gap from low income lines



Looking at LIM measures, we see at the beginning of the period the average gap from the LIM is smaller than the gap from the LICO. However, this average gap grows steadily through the late 1990s and 2000s. Here the stability of the LIM poverty rate measure masks the growing gap.

When we focus our attention on those below the poverty line, via poverty ratio and gap, we see a different picture than that painted by the poverty rate alone. Looking at the LICO poverty rate, there are fewer children living in poverty, but the ratio and gap show those who are left behind are as far below the thresholds as ever; lowered poverty rate has not meant all low-income households' incomes have risen. Using the relative poverty, the LIM, there has been very little progress on reducing the poverty rate. Not only has there been little change in the number of children under the LIM threshold, but the average gap for those below the LIM threshold has widened; the depth of relative poverty has increased.

6. Child income inequality

Poverty measures, which focus exclusively on the bottom of the income distribution, give limited information about inequality among the full income distribution. To understand how the full distribution of income has shifted over time we must look at measures of inequality. Inequality during childhood is of particular interest due to its relationship with social mobility. International comparative research shows a correlation between countries' levels of income inequality (measured by the Gini—defined in the next section) and intergenerational mobility (elasticity between earnings of parents and grown children): higher income inequality tends to increase the likelihood children will maintain the same economic position as their parents' in adulthood (Corak, 2013).¹³ Aside from future outcomes, Pickett and Wilkinson (2007) have also shown that the level of societal inequality may be more predictive of child well-being than absolute poverty: countries with lower income inequality tend to have better population-level child well-being outcomes.

Income inequality in Canada has risen substantially over the last 30 years. Between 1980 and 2007, market inequality, measured by the Gini, rose 18 percent, with after-tax inequality rising by 13 percent (Fortin, Green, Lemieux, Milligan, & Riddell, 2012). Rising inequality in North America has largely been driven by growth in the very top incomes, the so-called one percent or 0.1 percent, although to a lesser extent in Canada (Atkinson, Picketty, & Saez, 2011; Frenette, Green, & Milligan, 2007; Saez & Veall, 2007; Veall, 2012). The ability of the Canadian tax and transfer system to reduce

¹³Recent work challenges this connection: a major study finds social mobility in the USA remained stable for birth cohorts from 1971 to 1993, despite rising income inequality (Chetty, Hendren, Kline, Saez, & Turner, 2014).

market inequality via redistribution has also decreased over the 1990s (Frenette, Green, & Milligan, 2009).

Given the different demographic characteristics of households with children, and the increased tax and transfer redistribution towards families, it merits investigating whether children have experienced the same rising income inequality trends as the overall population. Households with children, particularly young children, are not as likely to contain members of the top one percent driving increases in inequality. Fortin et al. (2012) describe some of the characteristics of the top 1 percent including older age (only 4.5 percent are under age 35), and high average working hours. While there are exceptions, these characteristics do not fit with our expectations of households with children. Market inequality has also increased much more for men than women (Fortin et al., 2012). We would expect children's economic inequality more closely related to women's equality as approximately 13 percent of families with children are headed by a female lone-parent

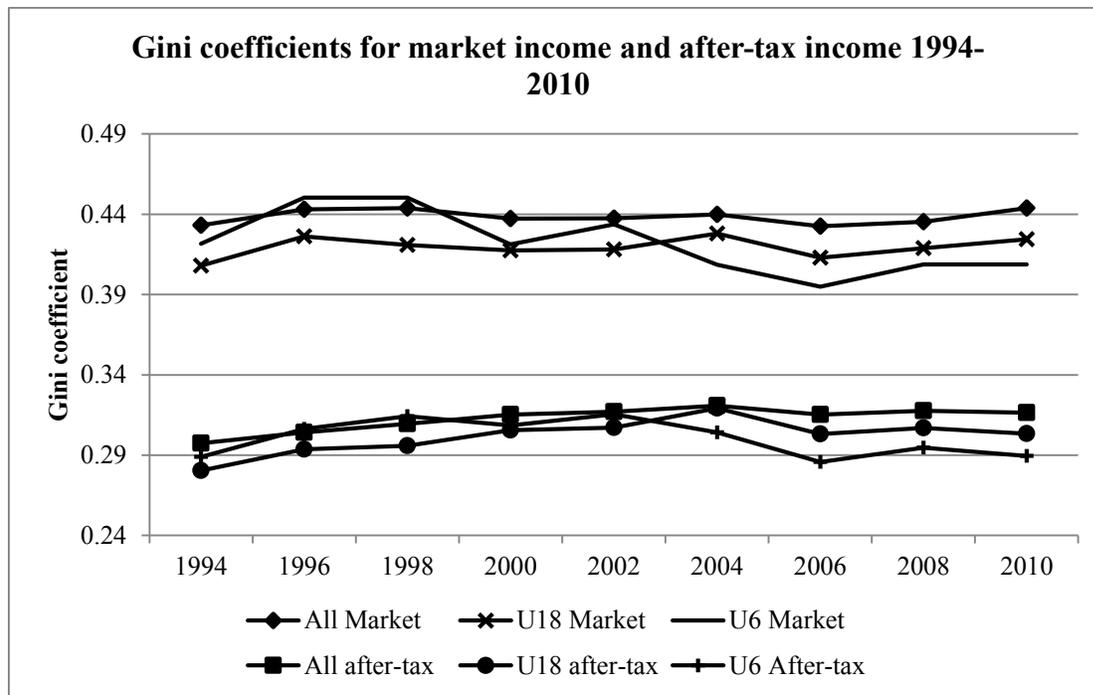
In one of the very few Canadian studies on children's income inequality, Phipps and Lethbridge (2006) find different inequality trends differ for children than the full population from 1973 to 1997. In contrast to rising after-tax inequality for the full population during this time, they find a small *reduction* in after-tax child inequality (Gini decreasing from 0.288 to 0.276). This reduction was in spite of a significant increase in market inequality for children (Gini increasing from 0.314 to 0.392). Looking at where children sit *within* the larger Canadian population rather than inequality *amongst* children, Phipps and Lethbridge (2006) find children are much more likely to be at the

bottom: Canadian “children were approximately 3.5 times more likely to be in the bottom than in the top decile” (p. 228).

6.1. Gini

The Gini coefficient is the most commonly used statistical measure for inequality of income, measuring the distribution of income among the population. It is useful as a single-number metric of distribution. However, a limitation of the Gini index is that it does not uniquely describe a distribution: two or more different distributions can have the same Gini. Thus changes in the income distribution are not necessarily reflected by a change in the Gini and a lower Gini does not always reflect what might normatively be judged a more egalitarian distribution (Cowell, 2011).

Figure 8: Gini coefficients for market income and after-tax income 1994-2010



We find relative stability in Gini-measured child inequality over our period of interest. Figure 8 depicts the Gini coefficients for market income and after tax income for

the total population (“All”), those under age 18, and those under age six. There were slight increases in both market and after-tax Gini for all Canadians and all children (U18), but a small decrease in both these measures for young children (U6). Between 1994 and 2010 the market income Gini increased from 0.433 to 0.444 (SE 0.002) for the total population. There was a larger increase, from 0.408 points to 0.424 (SE 0.006) points, for all children. However, for children under age 6 the market Gini actually decreased, from 0.422 to 0.409 (SE 0.009).

After-tax inequality increased more than market inequality, demonstrating a weakening of government redistribution. The after-tax Gini was up 0.019 points to 0.316 (SE 0.002) for the total population, up 0.023 points to 0.303 (SE 0.005) for all children, and up just 0.001 to 0.290 (SE 0.007) for children under age 6. In all years, the difference between market and after-tax Gini was slightly larger for the full population than either sub-sample of children. In 2010 the after-tax Gini for children was 0.013 points lower than the total population, and for young children it was 0.027 points lower.

6.2. Income Percentile Ratios 10-50, 50-90, 90-10

Despite its popularity, the Gini coefficient can be difficult to meaningfully interpret as it does not reveal where in the income distribution changes are occurring. Looking at simpler—and perhaps more intuitive—descriptive metrics of income inequality gives the Gini context. To examine where the income distribution is changing I order the population by household income (equivalized for size), take income levels at key percentiles (10th, 50th, 90th), and look at three key ratios between income at these percentiles. The ratio between the 10th percentile and the 50th percentile (p10p50) will increase if the bottom of the distribution pulls closer to the middle. The ratio between the

50th percentile (median) and 90th percentile (p50p90), shows how the middle of the distribution relates to top incomes. Lastly, the ratio, between the 90th percentile and the 10th percentile (p90p10), gives us an overall measure of spread leaving out the extreme tails: the full gap between the poorest and richest. Table 7 reports these three ratios from 1994 to 2010 for equivalized market and after-tax income, both for under age 18 and under age six.

Table 7: Income percentile ratios

	1994	1996	1998	2000	2002	2004	2006	2008	2010
Bottom ratio: p10p50									
U6 Market	0.075	0.043	0.107	0.168	0.176	0.212	0.211	0.209	0.199
U6 After-tax	0.480	0.455	0.461	0.453	0.443	0.443	0.484	0.450	0.477
U18 Market	0.099	0.093	0.112	0.188	0.198	0.214	0.221	0.221	0.200
U18 After-tax	0.460	0.445	0.452	0.460	0.461	0.454	0.471	0.464	0.476
Upper ratio: p90p50									
U6 Market	2.078	2.212	2.190	2.090	2.176	2.044	2.176	2.187	2.138
U6 After-tax	1.818	1.858	1.861	1.835	1.880	1.792	1.842	1.819	1.807
U18 Market	2.065	2.104	2.120	2.099	2.148	2.196	2.211	2.187	2.148
U18 After-tax	1.780	1.798	1.802	1.817	1.858	1.893	1.876	1.862	1.826
Spread ratio: p90p10									
U6 Market	27.842	51.314	20.401	12.446	12.339	9.648	10.295	10.482	10.747
U6 After-tax	3.790	4.085	4.033	4.048	4.247	4.048	3.809	4.039	3.790
U18 Market	20.938	22.690	18.846	11.141	10.852	10.248	10.027	9.888	10.716
U18 After-tax	3.873	4.043	3.989	3.952	4.028	4.171	3.980	4.014	3.838

As expected, the percentile ratios show major redistribution through the tax and transfer system, with large differences between the market and after-tax income ratios. I find no major differences between the income ratios of the U18 and U6 groups. Most notably, over the 16-year period the after-tax income ratios show no substantial changes. This stability is more remarkable when we look at the market income ratios. The market

income of those with the lowest earnings (indicated by p10) rose significantly with respect to both the median income (p50) and top incomes (p90). From 1994 to 2010, the U6 p10p50 ratio increased from 0.075 to 0.199, with the majority of movement in the first 6 years. Over the same time, the U6 p90p10 decreased from 27.842 to 10.747. These gaps are further shrunken by transfers to those with the lowest incomes prior to taxation. However, after taxation those relative gains disappear. While there have been minor fluctuations, for the U6 population the after-tax p10p50 ratio has remained essentially constant at 0.48, and the p90p10 ratio at 3.79. In other words, those children at the 10th percentile of household income have approximately half the income of those at the median, and those at the 90th percentile have nearly four times the household income as those at the 10th percentile. Some of the distance between the bottom, middle, and upper ranks of the income distribution has been closed via higher market earnings, and increased government transfers. But any closing of the gaps has been undone by less redistributive taxes and transfers that have allowed the middle and higher income groups to retain their relative distance after tax. Using percentile ratios we see no progress on children's after-tax income inequality.

6.3. Mean income growth across the distribution

The final approach I take to examining child income inequality is looking at changes in the mean income for three segments of the income distribution of children: the bottom 20 percent (B20), middle 60 percent (M60), and top 20 percent (T20), looking at market, before-tax, and after tax income. Rather than relying on median growth or relative positioning, these means give a sense of where in the income distribution absolute gains have been made over time, and some sense of whether the growth is driven

by market or government policy changes. Table 8 reports the mean market, before-, and after-tax income for these divisions for the under six and the under 18 population.

Table 8. Mean household equivalized income, bottom 20%, middle 60%, and top 20% of income distribution (\$2008 CPI)

	1994	1996	1998	2000	2002	2004	2006	2008	2010	1994-2010 growth
Under Age 6										
Mean income bottom 20%										
Market	3516	2637	3816	5387	5419	6558	6447	6513	6532	86%
Before tax	12086	10743	11915	12580	12962	13478	14190	14752	15631	29%
After tax	11762	10623	11688	12341	12830	13212	13924	14554	15470	32%
Mean income middle 60%										
Market	27979	26293	29115	32167	30970	32590	31964	34160	33804	21%
Before tax	31646	30245	32499	34953	34713	36058	36499	39075	39164	24%
After tax	26034	25257	26935	29123	29646	30782	31303	33919	34123	31%
Mean income top 20%										
Market	69958	70742	81012	83598	84966	82950	77479	85626	84606	21%
Before tax	71751	72476	82435	84904	87476	85249	79985	88295	87765	22%
After tax	52932	53152	59077	62296	65564	64768	62406	68537	69319	31%
Under Age 18										
Mean income bottom 20%										
Market	3861	3384	4255	6112	6274	6535	7135	7434	6940	80%
Before tax	12107	11382	12168	13181	13551	13541	14629	15312	16000	32%
After tax	11739	11170	11894	12873	13280	13255	14328	15059	15840	35%
Mean income middle 60%										
Market	29069	28373	30773	32918	32643	33431	34165	35980	35862	23%
Before tax	32390	31786	33690	35399	35601	36371	37660	39692	40085	24%
After tax	26628	26329	27863	29565	30480	31131	32330	34448	35043	32%
Mean income top 20%										
Market	69192	70922	77200	85826	85881	91274	89480	95927	95792	38%
Before tax	70407	72185	78061	86625	86995	92342	90793	97406	97548	39%
After tax	51852	53064	56727	63143	65552	69417	68959	73898	74984	45%

As with the previous measures, we see this period has been one of significant income growth across the income distribution. Looking at after-tax income for the under

6 population, all three income groups fared similarly, with 32 percent growth for the B20 and 31 percent growth for both the M60 and T20. For the under 18 population, growth was slightly higher, with significantly higher growth for the T20, at 45 percent. When we compare these after-tax incomes and growth with market and before-tax mean incomes for these groups, we see market growth has been moderated by transfers and taxation.

Most children in the bottom income group fall below low-income thresholds¹⁴, yet this group had the largest growth in mean market income between 1994 and 2010: 86 percent for the under age 6 sample, and 80 per cent for the U18 sample. This increase in market income appears to be driven by an increase in the labour force participation of households with children, outpacing the total population, rather than higher earnings. In 1994, 6.5 (SE 0.72) percent of the under age six population reported no market income, and by 2010 that figure was down to 2.9 (SE 0.45) percent. This compares to 5.6 (SE 0.2) percent of the total Canadian population reporting no household earnings in 1994, and 4.1 (SE 0.13) percent in 2010. Because earned income makes up only the minority of income at the bottom of the income distribution, despite higher market growth, the after-tax income for the B20 only grew at a similar pace to the mean income of the M60 and T20 segments.

For the middle 60, increases in cash benefits and lower taxes resulted in 21 and 26 percent growth in mean market income translating into 31 and 32 percent increases in after-tax income, for under age 6 and under age 18 samples respectively. The highest income segment, the top 20 percent, also saw transfers and lower taxes further their mean income growth, translating a 21 and 38 per cent growth in mean market income to a 31

¹⁴Household size-equivalized market income *at* the 20th percentile for the U6 sample in 2010 was \$10,664 (SE 201).

and 45 percent increase in mean after-tax income, for under age 6 and under age 18 samples respectively.

The income growth for the various segments of the income distribution confirms findings of the other measures of inequality. After-tax income growth has been fairly even across the income distribution of children, resulting in no significant *relative* increases for children at the bottom of the income distribution. We do not find the bottom of the distribution pulling upward, despite absolute gains. Despite the substantial increases in government expenditure on cash transfers, we do not see any gains for the poorest children when considered relative to children in the middle or upper income households. The near doubling of targeted child benefits for the poorest appears to be offset, in relative terms, by universal child benefits as well as lower taxation and new tax deductions for middle and higher income families.

7. Child outcomes

The two previous sections on poverty and inequality measure how Canadian children are doing using their household income as a proxy for well-being. The indicators cover four domains of child well-being: a) physical outcomes, b) socio-emotional outcomes, c) developmental outcomes, as well as d) family context, including parenting. Although the family context variables analyzed are not direct measures of how a child is faring, they provide insight into a crucial context of child development and well-being, not unlike material well-being. Research shows that family context can mediate the relationship between household income and child outcomes (Duncan and Brooks Gunn 1997, Guo and Harris 2000). Given this mediation role, we might expect larger increases in these measures, related to the increase in family income over this time period.

In this section I look at the outcome indicators individually, and in the following section the relationship between outcomes and household income. All data for this and the following two sections are drawn from the NLSCY. Appendix A provides the detailed definitions of each child well-being outcome measure used. For dichotomous measures (e.g. low birth weight) I give sample proportions. For continuous measures (e.g. social support score) I report the average as well as quintile averages when a quintile trend differs statistically significantly from the average. The quintile measures check whether the distribution of these measures is concentrating or becoming more dispersed. If we are concerned with increasing the equality of children's outcomes, improvement in the worst performing quintiles to lift the average would mark a larger success than uniform improvement. I focus on change and stability over time in interpretation, and report changes in score points rather than percentage change. Percentage change can be misleading for these types of scales: scales have a small range and are based on questions with discrete rather than continuous responses, thus score points allow for more meaningful interpretation of what a change means.¹⁵ Within the text I only discuss differences over time when statistically significant at the 95 percent confidence level.

¹⁵ Unlike categorical outcomes, the continuous scales are not easily interpretable for a judgment of what constitutes a negative outcome. A one point increase on an outcome scale means a one point move on a likert scale within one question among a series of questions: the difference between a parent responding that a child 'sometimes' or 'often' "has angry moods". The threshold on a behavioral scale like this at which the score indicates "bad" behavior is not easily apparent.

Table 9: Child outcomes, univariate

	Infant (0-2)	Toddler (2-3)	Preschool (4-5)
<i>Physical well-being</i>			
Birth weight	×		
Injury	×	×	×
General Health	×	×	×
Chronic health condition	×	×	×
<i>Socio-emotional well-being</i>			
Hyperactivity Score		×	×
Anxiety Score		×	
Emotional disorder-anxiety Score		×	×
Physical aggression/conduct disorder		×	×
<i>Developmental well-being</i>			
Motor and Social Development Score	×	×	
Pearson-Peabody Vocabulary Test- Revised			×
<i>Family context</i>			
Family functioning	×	×	×
Parenting: hostile/ineffective	×	×	×
Parenting: positive interaction	×	×	×
Social support	×	×	×
×	Outcome measure age coverage		
	Worsening outcome trend 1994-2008		
	Improving outcome trend 1994-2008		

Overall there was a great degree of stability in outcomes over the survey period, with only small improvements. Table 9 gives the age coverage of observed indicators (Xs) with shading indicating a degree of change, either improving (green/striped) or worsening (red/dotted) over the 1994-2008 period. Appendix B contains tables reporting the annual estimates for each outcome domain by each age group.

The vast majority of young Canadian children in the NLSCY population are reported to be in good health, and there was a measurable decline in the small proportion of children in reported to be in ill health over the period of study. The proportion of infants reported to have fair or poor health fell from 2.1 percent in 1994 to 0.9 percent in 2008. For toddlers the proportion declined from 2.2 percent to 1.0 percent, and for preschoolers from 2.0 percent to 1.1 percent. Low birth weight rates remained stable from

1994 to 2008 with, 6.3 percent of infants reported to have low birth weight in 2008. However, putting this rate in comparison with other rich countries, Canada fares well. Only five countries have low birth weight rates below 5 percent (UNICEF, 2013).

The injury rate is one measure of physical outcomes in which Canada lags behind internationally, and shows no improvement. Unintentional injury is the leading cause of death for Canadian children ages one to 14, killing more children than all forms of disease (Pamela & Amy, 2011). Canada ranks 22 out of 29 OECD countries for injury rate (Leitch, 2007). For all age groups examined in our analysis there was no statistically significant change in the injury rate. In 2008, 4.8 percent of infants, 10.5 percent of toddlers and 9 percent of preschoolers were reported to have had at least one injury requiring a hospital visit. The rate of chronic health conditions for children also did not improve over the course of the survey. In 2008, 10.7 percent of infants and 15.2 percent of toddlers were reported to have a chronic health condition.

Socio-emotional outcomes of toddlers and preschoolers are measured using psychometric scale measures of hyperactivity, emotional-anxiety, and physical aggression as well as anxiety for toddlers. I find little change in these scores, although there is some slight convergence as worst quintiles averages pull toward the mean. Hyperactivity scores saw the most movement in this domain. The average hyperactivity-inattention score for toddlers declined (improved) slightly over the course of the NLSCY, from 4.3 in 1994 to 3.7 in 2008. Looking at averages within quintiles of the toddler distribution, there is also some convergence in scores, with the top (worst) quintile declining 1.5 points. For preschoolers, the average hyperactivity-inattention scores also dropped slightly more than the margin of error from 4.9 in 1994 to 4.2 in 2008. These are

very small magnitude changes, with a full point being the difference between ‘not true’ and ‘somewhat true’ on one of seven questions.

The emotional-anxiety score for both toddlers and preschoolers remained stable in all quintiles across the 16 years, with no statistically significant change. Average toddler aggression scores fell approximately half a point from 1994 to 2008, driven by the top (worst) quintile pulling in toward the mean, dropping more than a full point. However, for preschoolers there was no change in the aggression measure. The mean anxiety score for toddlers declined only slightly, driven by the highest (worst) quintile of scores, dropping 0.9 points from 6.7 to 5.8.

Outcomes on the earliest child development measures worsened between 1994 and 2008. The Motor and Social Development (MSD) score captures early developmental milestones for children. For the infant age group (0-24 months), MSD scores declined during the last three cycles of the NLSCY, from a mean of 100 in 1994 (the expected average after standardization to a reference group), to 95 in 2008, or approximately a fifth of a standard deviation. The decline in scores is apparent across all quintiles. For the toddler age group, the MSD score remained more stable, declining only slightly more than the margin of error.

The Pearson-Peabody Vocabulary Test – Revised (PPVT-R) is a direct measure of children’s receptive (oral) vocabulary and is commonly used to measure school readiness. There was no statistically significant change in the PPVT-R scores over the period of interest: from 99.5 in 1994 to 100.3 in 2008. Quintile averages displayed the same stability.

I look at four measures of the family environment in which the child grows up: family functioning (a measure of how the family gets along), two measures of parenting behaviour, and a perception of social support score for the survey respondent (the child's mother in approximately 90% of cases). Average family functioning scores for infants and toddlers increased slightly during the mid-years of the survey, but returned to the 1994 average by 2008. For preschoolers, the scores were stable across all years.

Parenting practices changed little over the course of the survey years. The average ineffective parenting score for toddlers and preschoolers was essentially unchanged over the period, with slight worsening (increase) in scores for infants, with no separate quintile trends. Average positive parenting scores were stable across the survey time period for infant and toddlers. However, the average score for bottom quintile in both age groups increased (improved) significantly between 1994 and 2008: from 12.5 to 14.8 for infants, and from 12.6 to 13.7 for toddlers. For preschoolers the average positive parenting scores also increased slightly, from 14.6 in 1994 to 15.2 in 2008.

Due to changes in the social support scale over the course of the NLSCY, I only look at years 2000-2008 in which the scale remains the same. For all the age groups, the average social support score increased from approximately 18 to 19 points from 2000 to 2008. Across all ages, all quintiles saw an increase in average scores, except the first quintile of infant scores. However, the second quintile for infants saw the largest increase, closer to two points on the scale.

Overall, there is very little change in the child outcomes examined here. The outcomes that do show improvement generally have improvement across all quintiles, which may mean an improvement for all children, or could reflect a shift over time in

what the measure captures. Many of the measures are relative: if over the 16 years of the survey average respondent impressions of what constitutes “often” misbehaving change, the measure could indicate change despite the behavior of children remaining the same.

8. Child outcomes by income

The final approach to measuring child well-being is an analysis of children’s outcomes by income quintile. Even if population level outcomes have not improved significantly over time, a narrowing of gaps in outcomes between high and low income children (where apparent) would mark a successful reduction in inequality among children. This analysis should not be mistaken for assuming a causal relationship between income and any child outcome indicators. There are many non-financial reasons why lower income children may have different outcomes than higher income children (e.g. lower parental education, lone-parenthood, neighbourhood effects). These factors correlated with income are not controlled for in this analysis. Nonetheless, differences in outcomes by income level can still be used to assess fairness of children’s experiences. Regardless of whether household income is the *cause* of outcome, differences in outcome by income is an indication that not all Canadian children are equally at risk of negative outcomes.

A child’s income quintile is determined by household total income, including government transfers, before taxes, adjusted for household size.¹⁶ Table 10 provides a summary of the income-outcome analysis from 1994 to 2008. Red shading indicates a

¹⁶ This is the only income measure consistently available through all years of the NLSCY. Because the NLSCY is restricted to early childhood development for cross-sectional analysis, the relative income position is relative to other children under age six rather than all children or the full population. While after-tax income would be a preferred measure, in most cases progressive taxation would not change the rank ordering of individuals to an extent that would affect their income quintile.

statistically significant difference between the lowest income quintile average outcome and the highest income quintile average outcome. Appendix B contains tables reporting average outcomes by income quintile.

Table 10: Child well-being outcomes, by income

	Infant age (0-2)	Toddler (2-3)	Preschool (4-5)
<i>Physical well-being</i>			
Birth weight	×		
Injury	×	×	×
General Health	×	×	×
Chronic health condition	×	×	×
<i>Socio-emotional well-being</i>			
Hyperactivity Score		×	×
Anxiety Score		×	
Emotional disorder-anxiety Score		×	×
Physical aggression/conduct disorder		×	×
<i>Developmental well-being</i>			
Motor and Social Development Score	×	×	
Pearson-Peabody Vocabulary Test- Revised			×
<i>Family context</i>			
Family functioning	×	×	×
Parenting: hostile/ineffective	×	×	×
Parenting: positive interaction	×	×	×
Social support	×	×	×
×	Outcome measure age coverage		
	No gap in outcomes between lowest and highest income quintiles		
	Statistically significant gap in mean outcome between lowest and highest income quintiles		

Poor health is much more common for children in the lowest income quintile, in all age groups, and across most years. For all ages, the proportion of fair and poor health in the top income quintile was less than two percent in every year, whereas for infants in the lowest income quintile it is as high as seven percent. There is no clear trend of improving or declining health for the lowest income quintile; the overall population improvement in general health does not appear to be the result of improved health for low-income children. Low birth weight is also much more prevalent in the lowest

income quintile than the richest throughout all survey years. The proportion of low-birth weight infants for all incomes was 6.3 percent in 2008; however, for the lowest income quintile that proportion was 8.8 percent and for the highest income quintile it was just 1.0 percent.

Injury rates and chronic disease measures were not significantly different for the various income levels. However, in the last four cycles of the survey, rate of preschool injury in the top income quintile was in fact higher than the lowest income quintile. The wording of the question ‘injury requiring a hospital visit’, may explain the difference: higher income families may be more likely to visit a hospital, regardless of difference in injury.

Hyperactivity scores are higher for toddler and preschoolers in the bottom income quintile than all other quintiles; however, the gap appears to be closing somewhat. For toddlers, in 1994 the difference between average scores between the top and bottom quintiles was 1.3 points; in 2008 it was 0.6 points. For preschoolers, the gap between quintiles also fell from 1.2 points to 0.1.

For all years of the NLSCY, on average, low-income toddlers have higher anxiety scores than their higher income peers, by one point in all years (approximately a third of a standard deviation). For this outcome there appears to be a clear gradient by income for all quintiles. Toddlers and preschoolers in the lowest income quintile consistently have higher average emotional/anxiety disorder scores than higher income children. Though this difference is very small, it is persistent. The gap between top quintile and bottom quintile average scores shows very slight narrowing over the course of the NLSCY,

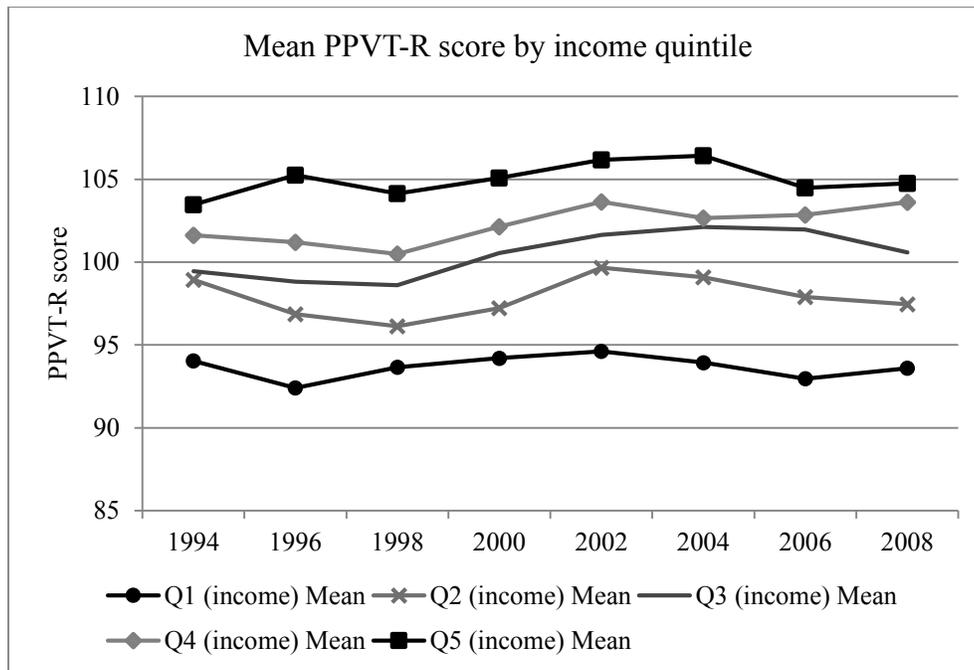
though the reduction appears to be driven more by the increase in top quintile average scores than the decrease in low income average scores.

While the average physical aggression scores of the lowest-income quintile toddlers and preschoolers are not higher (worse) than middle three quintiles in all years, they are consistently, and statistically significantly, higher than average scores of the top income quintile. This gap is statistically significant, but not large, at less than half a point in most years.

Differences in developmental outcomes by income quintile only become clearly apparent after the first two years of childhood. There was no pattern in MSD scores by income level for the infant group. However, low-income toddlers consistently had worse scores than those in higher income quintiles. The gap between high- and low-income toddlers MSD average score increased, from 3.7 points in 1994 to 6.0 (approximately a quarter of a standard deviation) in 2008. In 2008, the bottom income quintile of toddlers had an average MSD score of 94.4, compared to 100.4 for high-income toddlers. The decline in the overall average MSD scores seen in the previous section appears to be driven by MSD scores of low-income children getting worse.

For PPVT-R scores, in every year of the NLSCY, average score increased with every income quintile, as seen in Figure 9. The magnitude of the gap between highest- and lowest-income children's PPVT-R scores remains stable. In 2008, lowest-income preschoolers had an average PPVT-R score of 93.6, whereas the highest-income quintile had an average score of 104.8, a difference of a little over a third of a standard deviation.

Figure 9: Mean PPVT-R score by income quintile



Income gradients are clearly apparent in two of the four family context measures. In all years of the NLSCY, family functioning scores are higher (worse) for lower income quintiles, with no major differences between age groups. Figure 10 depicts this clear gradient for the infant age sample. There is no significant convergence among the income quintiles functioning scores. The gap between the average social support score of the highest income quintile and the lowest income quintile also shows no sign of narrowing for any age group between 2000 and 2008, as shown in figure 11. In 2008, for children in the lowest income quintile the average social support score for was 17.9 for infants and toddlers and 18.5 for preschoolers. This compares to average scores of 20.0 for both infants and toddlers and 20.9 for preschoolers in the top income quintile. Parenting behaviour measures do not display the same income gradients as functioning or support scores. For all age groups, there is no significant income gradient in either ineffective parenting score or positive interaction score.

Figure 10: Mean family functioning score, by income quintile (infant)

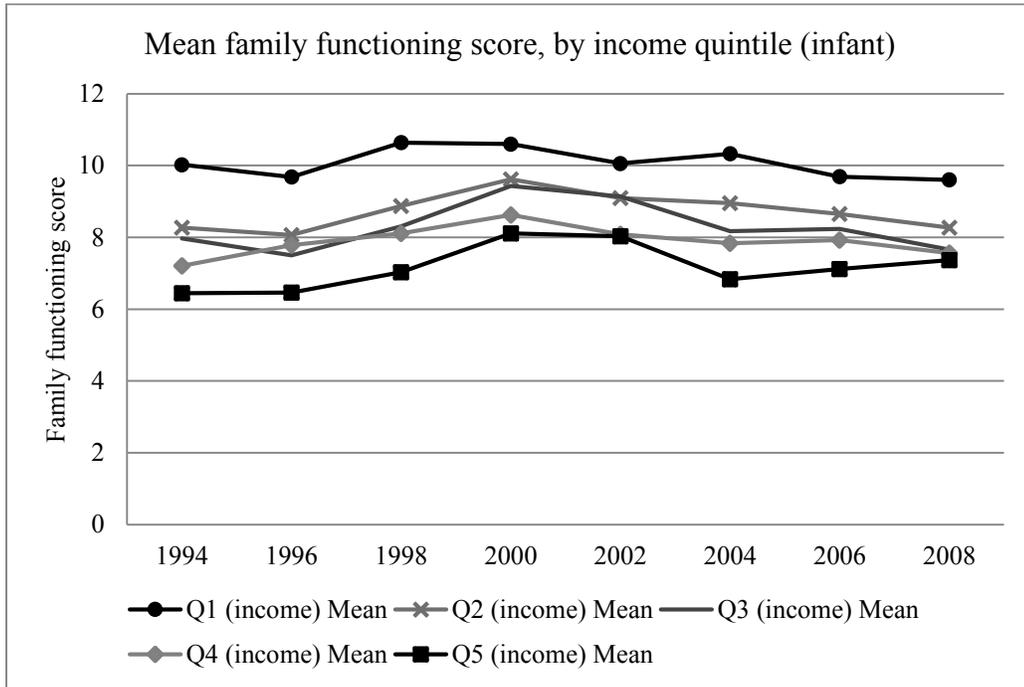
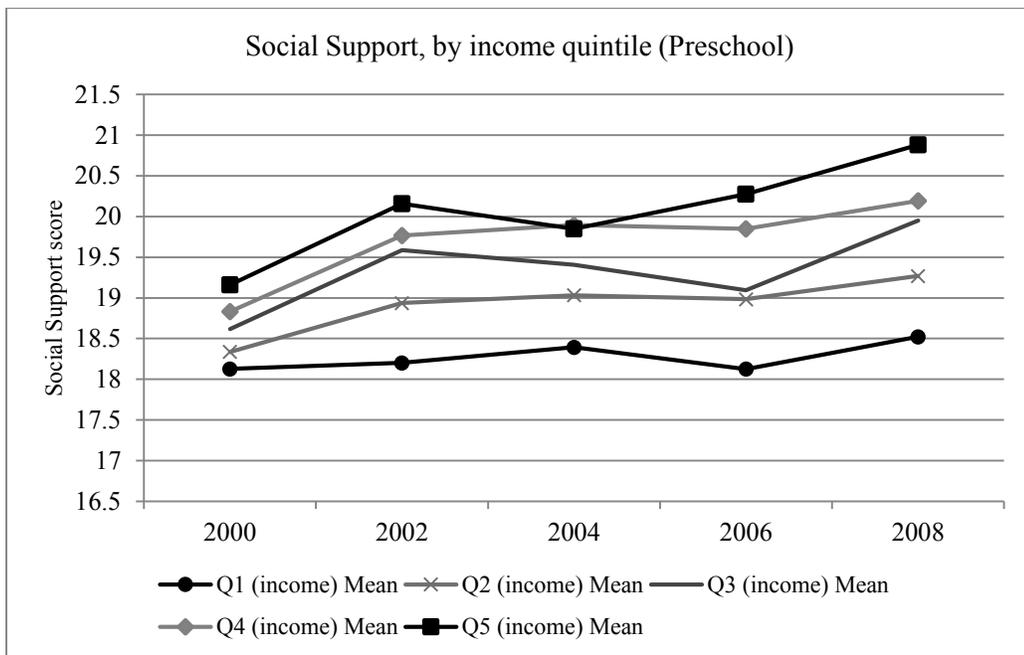


Figure 11: Social Support, by income quintile (Preschool)



The small improvements in population average child outcomes found in the previous section are overshadowed by the finding of persistent income gradients in all four dimensions of child well-being examined. Of the 32 indicators reviewed, 17 displayed a statistically significant gap in outcomes between low-income and high-income children and only slight signs of narrowing gaps in one indicator: hyperactivity. The lack of continuous or significant income gradient in some outcomes, including early MSD scores and two of the behavioural scales, is a positive finding. Unfortunately, the average improvements seen in the last section, such as that in general health, show continuing income gradients; marginal improvements have not come from closing the gap between poor and rich children.

9. Summary of child well-being measurement

Whether one looks at poverty, income inequality, or non-material measures of child well-being, things have not improved much for Canadian children at the turn of the millennium. Canadian child poverty can only be considered reduced when using an arbitrary poverty line: the LICO-measured child poverty rate fell from 17 percent to 8 percent between 1994 and 2010. Relative child poverty, as measured by the LIM, has remained stable at around 15 percent. While absolute incomes have increased, increases to low income have been outstripped by median income growth, thus low-income children's relative position has not improved. Looking at the average gap from, and ratio to, the poverty lines, we see that even as the headcount of child poverty either dropped (LICO), or remained stable (LIM), those children left in poverty were further from either poverty line in 2010 than in 1994. Children below the poverty line are getting relatively poorer.

Canadian children have been somewhat shielded from the rising income inequality seen at the population level over the past three decades. However, this distinction appears to be weakening. Between 1994 and 2008 the after-tax Gini for those under age 18 rose slightly more than that for the total population. Despite *market* income of those below the 10th percentile increasing relative to the median, after taxes and transfers relative positions remained static. Looking at the different average income growth for the bottom 20 percent, middle 60 percent, and top 20 percent of the income distribution, I find that taxation has regressively evened out the growth rates among the different segments. Corresponding to trends in the full population, growth in top incomes for the under-18 population has outstripped the rest, with a decline in moderation of the gap via government redistribution. The 6.3 percentage point gap in growth between the bottom 20 percent and top 20 percent *before-tax*, widens *after-tax* to a 11.3 percentage point gap. Inequality is rising for children, though the early years appear to still be somewhat sheltered.

Moving from measures of material well-being to indicators of children's physical, socio-emotional, developmental, and family well-being, the pattern of stability continues. The 32 indicators of well-being for children under age six drawn from the NLSCY show remarkable stability between 1994 and 2008. There have been a few improvements: the proportion of children reported to have fair or poor health has decreased, as has hyperactive behaviour, and families report slightly higher social support. There has also been one notable, yet slight decline: motor and social development scores for infants have worsened.

Perhaps more troubling than the stability of population level outcomes is the stability in gaps between the poorest and richest children on approximately half the outcomes. It is not a novel finding that poorer children tend to fare poorer. However, during a period when early childhood development was a policy priority, with a significant increase in spending on children, the lack of movement on gaps between rich and poor (with the exception of hyperactivity scores) is notable. While the indicators chosen are a limited window on child well-being and only cover early childhood, I find very little evidence of either significant general improvement or equalization among children of different income levels over this time frame.

10. Discussion and conclusion

How are the kids doing? For both the general population and low-income children, the answer is ‘not all that differently than twenty years ago’. Significant expansion of government spending on children and general economic growth through the late 1990s and early 2000s has not translated into observed improvements for Canadian children’s early well-being by the multiple measures examined here. A multi-dimensional approach to measure Canadian child well-being shows that a simple narrative of expanded child and family benefits reducing child poverty (measured by LICO), and thus benefiting children is a tenuous read of the evidence. Comparisons of the LICO and LIM poverty rates, contextualized with measures of poverty depth, income inequality metrics, and child outcome measures, show how little of child well-being is revealed through looking at increases in family income alone.

There are some important limitations to this analysis that merit reflection and a bounding of the conclusions. A population level analysis does not provide a clear picture

of the effect of policy changes on the most marginalized and disadvantaged populations. In this case, children in state care, Aboriginal children on reserve, and those living in the North are excluded from the data. Therefore this analysis can offer no read on how these populations fared over the period. The lowest income quintile is also a crude measure by which to capture the experiences of children in the very poorest families, and as a result the analysis of child outcomes by household income may miss changes at the very bottom of the income distribution. We also have no counterfactual: child-well being on any of the measures may have deteriorated under different policy conditions, in which case stability could be interpreted as success. Certainly the material well-being of low-income children would have declined without child benefit expansions that allowed the poorest to keep pace with the market prosperity of the rest of Canada: relative child poverty (LIM), the poverty gaps, and income inequality would have all risen had child benefits not been increased. However, given the extent of increased government spending, maintenance of status quo would seem a conservative measure of policy success.

Explaining the stability despite heavy government investment in children requires an examination of *how* the policy changes affected children. Here I return to the analysis of the policy context at the outset. Assessing magnitude of child benefit expansion simply by government expenditure or dollar value of benefits in a way overstates the policies' potential impact. While the absolute value of Canadian child benefits increased substantially between 1994 and 2008, the value of government transfers for those with the lowest incomes remained fairly stable *relative* to average incomes. Increasing market income along with universal child benefits, tax credits, and tax cuts for middle and upper income families meant that the relative position of children in lowest-income households

slightly worsened despite increases in both earned income and benefits. This distributional effect of combined policy changes is often missed when looking at policies individually, and without the economic context into which they are delivered.

Based on the finding that family income increases did not significantly change the income distribution, I offer two potential explanations for the stability in non-financial child outcomes that merit further research. The first explanation is that increases in family income (both by policy and economic growth) fail to affect child outcomes. This possibility is supported by research finding the causal relationship between family income and child outcomes is relatively minor when isolated from the effects of other socio-economic factors closely related to income, such as parental education, occupation, and family type (Blau, 1999; Mayer, 1997; McEwen & Stewart, 2014). Stability in the Canadian case is also predicted by research finding that a child's relative income *position* may be more important than absolute income in determining outcomes (Pickett & Wilkinson, 2007). Following this research, the stability found in child outcomes is to be expected if family income increases did not change broader measures socio-economic status, or change the distribution of income.

A second potential explanation of stability is that increased family incomes may have improved child well-being, but improvements were offset by countervailing changes that reduced child well-being. This potential explanation is supported by research showing positive effects of policy-driven income increases on child outcomes (Gordon & Lochner, 2012; Milligan & Stabile, 2011; Morris, Duncan, & Rodrigues, 2004) and increased spending on education and basic needs (Jones, Milligan, & Stabile, 2015). Key to this explanation is identifying countervailing influences that had the potential to either

significantly negatively effect children, or moderate the effectiveness of income transfers. For instance, the increase in parents' labour market participation over this period (particularly for mothers and low-income households (Milligan & Stabile, 2007)) may have negatively affected child's well-being independent of the positive effects of employment-related income increases. Factors moderating the benefit of higher family incomes may include the costs of children's needs rising faster than inflation, including the increased use and cost of paid child care (Bushnik, 2006; Ferns & Friendly, 2014) over this period. Again, this explanation draws attention to the need to evaluate the effects of child policies and changes in child well-being holistically.

Given the limitations of a descriptive analysis, the policy implications of this paper are focused on future policy evaluation. If child well-being is the policy goal, more than a single child poverty rate is needed to evaluate policy outcomes. At the moment this evaluation requirement is not satisfied in Canada. Since the termination of the NLSCY, Canada has had no regular system for either collecting or reporting national data on child well-being, stunting evaluation of national child policy after 2008¹⁷. Child monitoring in Canada will have to return to a 'child welfare' approach if national multidimensional data on child well-being is not forthcoming. The use of material well-being (via family income) to infer overall child well-being is limited. As we have seen, significant increases in family incomes do not necessarily correspond with well-being on other measures. If a headline poverty measure is to be used for monitoring child well-being, the analysis here indicates that a relative measure of poverty (the LIM) more closely reflects

¹⁷ This gap was highlighted as a failing by the UN Committee on the Rights of the Child in response to Canada's third and fourth report on implementation of the Convention on the Rights of the Child (UNCRC, 2012).

the trends across multiple measures of child well-being that an absolute or fixed measure (the LICO).

After twenty years of significant evolution, child and family policy remains a priority in Canadian politics. To evaluate past effectiveness and guide future child policy, Canada must seriously consider ‘how are the children doing’? Further evaluation of the past child policy, taking into account the interaction of different policies and contextual changes, will be important if Canada is to move past stability and improve child well-being.

Appendix A: Definitions of child outcomes, from National Longitudinal Survey of Children and Youth

	Infant (age 0-2)	Toddler (age 2-3)	Preschool (age 4-5)
Physical well-being			
Birth weight	Birthweight in kilograms and grams; based on international standards, children with a reported birth weight lower than 2.5 kg (5.5 pounds) were classified in NLSCY as low birth weight		
Injury	"Has the child had an injury in the past year requiring a hospital visit?"		
General Health	"In general, would you say the child's health is Excellent? Very good? Good? Fair? or Poor?" Excellent, Very Good, and Good health categorized as "Good general health" and Fair or Poor as "Not good health"		
Chronic health condition	The presence of a chronic health condition is a derived variable based on a series of eighteen questions asked of the PMK regarding professionally diagnosed allergies, chronic diseases, disabilities, or long-term health conditions.		
Socio-emotional well-being			
Hyperactivity Score		Using the answers never or not true, sometimes or somewhat true, or often or very true, how often would you say this child: ...Can't sit still or is restless? ...Is easily distracted, has trouble sticking to any activity? ...Can't concentrate, can't pay attention for long? ...Has difficulty waiting for his turn in games or groups? ...Cannot settle on anything for more than a few moments? ...Is inattentive? ...Is impulsive, acts without thinking? *Preschool only	
Anxiety Score		Using the answers never or not true, sometimes or somewhat true, or often or very true, how often would you say this child: ...cries a lot? ...clings to adults or is too dependent? ...constantly seeks help? ...gets too upset when separated from parents? ...doesn't want to sleep alone?	

	Infant (age 0-2)	Toddler (age 2-3)	Preschool (age 4-5)
Emotional disorder-anxiety Score		Using the answers never or not true, sometimes or somewhat true, or often or very true, how often would you say this child: ...seems to be unhappy or sad? ...is not as happy as other children? ...is too fearful or nervous? ...is worried? ...is nervous, high strung or tense? ...has trouble enjoying himself? ...cries a lot? * <i>Preschool age only</i>	
Physical aggression/conduct disorder		Using the answers never or not true, sometimes or somewhat true, or often or very true, how often would you say this child: ...is defiant? ...gets into many fights? ...punishment doesn't change his behaviour? ...has temper tantrums or hot temper? ...doesn't seem to feel guilty after misbehaving? ...when somebody accidentally hurts him, he reacts with anger and fighting? ...has angry moods? ...kicks, bites or hits other children?	Using the answers never or not true, sometimes or somewhat true, or often or very true, how often would you say this child: ...gets into many fights? ...when somebody accidentally hurts him, he reacts with anger and fighting? ...physically attacks people? ...threatens people? ...bullies or is mean to others? ...kicks, bites or hits other children?
<i>Developmental well-being</i>			
Motor and Social Development Score	The Motor and Social Development scale is made up of 48 questions, 15 of which are asked depending on the age of the child measured in months. For the 0-47 month range 8 different age groupings are used. Scores are standardized across one-month age groups of a reference group in order to facilitate comparison across different ages.		
Pearson-Peabody Vocabulary Test-Revised			A direct assessment of receptive (hearing) vocabulary. Standardized scores based on norm sample are used.

	Infant (age 0-2)	Toddler (age 2-3)	Preschool (age 4-5)
Family context			
Family functioning	<p>Level of agreement with the following statements using "Strongly agree, agree, disagree, strongly disagree":</p> <p>Planning family activities is difficult because we misunderstand each other.*</p> <p>In times of crisis we can turn to each other for support.</p> <p>We cannot talk to each other about sadness we feel.*</p> <p>Individuals in the family are accepted for what they are.</p> <p>We avoid discussing our fears or concerns.*</p> <p>We express feelings to each other.</p> <p>There are lots of bad feelings in our family.*</p> <p>In our family we feel accepted for what we are.</p> <p>Making decisions is a problem for our family.*</p> <p>We are able to make decisions about how to solve problems.</p> <p>We don't get along well together.*</p> <p>We confide in each other.*</p> <p>*reverse coded</p>		
Parenting: hostile/ineffective	<p>Response to following question using the frequency scale: Never, Less than half the time, About half the time, More than half the time, or All the time:</p> <p>How often do you get annoyed with this child for saying or doing something he is not supposed to?</p> <p>How often do you tell this child that he is bad or not as good as others?</p>	<p>Response to following question using the frequency scale: Never, Less than half the time, About half the time, More than half the time, or All the time:</p> <p>How often do you get annoyed with this child for saying or doing something he is not supposed to?</p> <p>Of all the times that you talk to this child about his behaviour, what proportion is praise?*</p> <p>Of all the times that you talk to this child about his behaviour, what proportion is disapproval?</p> <p>How often do you get angry when you punish this child?</p> <p>How often do you think that the kind of punishment you give this child depends on your mood?</p> <p>How often do you feel you are having problems managing this child in general?</p> <p>How often do you have to discipline this child repeatedly for the same thing?</p> <p>*reverse coded</p>	
Parenting: positive interaction	<p>Response to following question using the frequency scale: Never, Less than half the time, About half the time, More than half the time, or All the time:</p> <p>How often do you praise this child, by saying something like 'Good for you!' or 'What a nice thing you did!' or 'That's good going!'?</p> <p>How often do you and this child talk or play with each other, focusing attention on each other for five minutes or more, just for fun?</p> <p>How often do you and this child laugh together?</p> <p>How often do you do something special with this child that he enjoys?</p> <p>How often do you play sports, hobbies or games with this child?</p>		

	Infant (age 0-2)	Toddler (age 2-3)	Preschool (age 4-5)
Social support	<p>Do you strongly disagree, disagree, agree or strongly agree with the following statements:</p> <p>...if something went wrong, no one would help me?*</p> <p>...I have family and friends who help me feel safe, secure and happy?</p> <p>...there is someone I trust whom I would turn to for advice if I were having problems?</p> <p>...there is no one I feel comfortable talking about problems with?*</p> <p>...I lack a feeling of closeness with another person?*</p> <p>...there are people I can count on in an emergency?</p> <p>...I feel part of a group of people who share my attitudes and beliefs?</p> <p>...there is no one who shares my interests and concerns?*</p> <p>*reverse coded</p>		

Appendix B: Child outcomes, univariate analysis tables

Appendix B.1 Physical outcomes

	1994	1996	1998	2000	2002	2004	2006	2008
Birth weight (proportion low) (-)								
Infant	0.058	0.062	0.070	0.057	0.066	0.062	0.059	0.063
SE	(0.005)	(0.006)	(0.005)	(0.005)	(0.007)	(0.006)	(0.006)	(0.006)
Injury (proportion injured) (-)								
Infant	0.048	0.044	0.045	0.057	0.055	0.049	0.035	0.048
SE	(0.005)	(0.004)	(0.002)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Toddler	0.123	0.109	0.112	0.117	0.106	0.089	0.094	0.105
SE	(0.008)	(0.008)	(0.007)	(0.005)	(0.007)	(0.006)	(0.007)	(0.009)
Preschool	0.090	0.093	0.095	0.101	0.111	0.092	0.090	0.090
SE	(0.007)	(0.009)	(0.005)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
General Health (proportion fair/poor) (-)								
*Infant	0.021	0.026	0.016	0.017	0.011	0.012	0.011	0.009
SE	(0.003)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
*Toddler	0.022	0.020	0.021	0.018	0.012	0.019	0.019	0.011
SE	(0.003)	(0.004)	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)
*Preschool	0.020	0.015	0.019	0.017	0.012	0.020	0.008	0.011
SE	(0.004)	(0.003)	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)	(0.003)
Chronic condition (proportion with condition) (-)								
Infant		0.099	0.111	0.125	0.112	0.127	0.112	0.107
SE		(0.006)	(0.005)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
Toddler		0.145	0.153	0.165	0.160	0.154	0.164	0.152
SE		(0.008)	(0.008)	(0.006)	(0.008)	(0.009)	(0.009)	(0.009)
Preschool		0.186	0.178	0.202	0.198	0.195	0.194	0.187
SE		(0.012)	(0.006)	(0.009)	(0.007)	(0.010)	(0.010)	(0.010)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement * Indicates the measure displays statistically significant change over the course of the time period at the 95% confidence level (though not necessarily in every year).								

Appendix B.2: Socio-emotional outcomes

	1994	1996	1998	2000	2002	2004	2006	2008
Hyperactivity Score (-)								
*Toddler	4.312	4.261	4.107	3.609	3.687	3.649	3.667	3.673
SE	(0.073)	(0.076)	(0.068)	(0.041)	(0.052)	(0.062)	(0.060)	(0.061)
*Toddler top quintile mean	9.516	9.383	9.458	8.044	7.821	8.078	8.065	8.035
SE	(0.103)	(0.107)	(0.106)	(0.068)	(0.081)	(0.085)	(0.105)	(0.085)
*Preschool	4.890	4.833	4.729	3.865	4.075	4.103	4.118	4.211
SE	(0.088)	(0.111)	(0.060)	(0.064)	(0.048)	(0.069)	(0.072)	(0.075)
*Preschool top quintile mean	10.571	10.766	10.791	8.405	8.266	8.336	8.386	9.534
SE	(0.105)	(0.137)	(0.088)	(0.097)	(0.059)	(0.0971)	(0.107)	(0.113)
Anxiety Score (-)								
*Toddler	2.788	2.827	2.813	2.672	2.794	2.563	2.559	2.564
SE	(0.050)	(0.056)	(0.051)	(0.035)	(0.047)	(0.051)	(0.050)	(0.050)
*Toddler top quintile mean	6.715	6.935	6.722	5.942	6.664	5.791	5.863	5.827
SE	(0.068)	(0.102)	(0.098)	(0.049)	(0.072)	(0.064)	(0.067)	(0.075)
Emotional disorder-anxiety Score (-)								
Toddler	1.133	1.120	1.113	1.283	1.517	1.272	1.222	1.305
SE	(0.034)	(0.038)	(0.038)	(0.028)	(0.038)	(0.038)	(0.040)	(0.043)
Preschool	2.082	2.135	1.978	1.910	2.110	2.048	2.018	2.127
SE	(0.056)	(0.073)	(0.038)	(0.040)	(0.036)	(0.048)	(0.051)	(0.050)
Physical aggression/conduct disorder (-)								
*Toddler	5.008	5.025	4.958	4.726	5.105	4.733	4.671	4.535
SE	(0.074)	(0.076)	(0.070)	(0.047)	(0.067)	(0.077)	(0.081)	(0.081)
*Toddler top quintile mean	10.639	9.701	9.659	9.487	9.562	9.454	9.820	9.534
SE	(0.107)	(0.088)	(0.108)	(0.068)	(0.105)	(0.104)	(0.174)	(0.134)
Preschool	1.591	1.634	1.592	1.472	1.719	1.680	1.623	1.624
SE	(0.046)	(0.060)	(0.035)	(0.043)	(0.035)	(0.049)	(0.052)	(0.049)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement * Indicates the measure displays statistically significant change over the course of the time period at the 95% confidence level (though not necessarily in every year).								

Appendix B.3: Developmental outcomes

	1994	1996	1998	2000	2002	2004	2006	2008
Motor and Social Development Score (+)								
*Infant	100.021	100.121	100.642	99.596	100.484	98.436	94.979	95.575
SE	(0.337)	(0.356)	(0.252)	(0.333)	(0.371)	(0.384)	(0.390)	(0.370)
*Toddler	100.147	100.333	99.589	101.485	100.325	98.407	98.239	98.578
SE	(0.375)	(0.387)	(0.389)	(0.246)	(0.328)	(0.390)	(0.366)	(0.382)
Pearson-Peabody Vocabulary Test- Revised (+)								
Preschool	99.488	98.999	98.756	100.235	101.088	101.172	100.338	100.334
SE	(0.432)	(0.510)	(0.301)	(0.386)	(0.303)	(0.398)	(0.450)	(0.483)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement * Indicates the measure displays statistically significant change over the course of the time period at the 95% confidence level (though not necessarily in every year).								

Appendix B.4: Family context outcomes

	1994	1996	1998	2000	2002	2004	2006	2008
Family functioning (-)								
Infant	8.001	7.888	8.638	9.292	8.870	8.468	8.333	8.129
SE	(0.112)	(0.111)	(0.091)	(0.103)	(0.125)	(0.123)	(0.125)	(0.117)
Toddler	8.170	8.255	8.584	8.943	9.029	7.949	8.350	7.893
SE	(0.137)	(0.143)	(0.135)	(0.086)	(0.115)	(0.134)	(0.133)	(0.137)
Preschool	7.881	8.229	7.999	8.502	7.970	7.978	7.830	7.663
SE	(0.137)	(0.160)	(0.091)	(0.115)	(0.091)	(0.124)	(0.143)	(0.141)
Parenting: hostile/ineffective (-)								
*Infant	1.520	1.583	1.604	2.190	2.269	2.220	1.926	2.018
SE	(0.036)	(0.035)	(0.027)	(0.038)	(0.042)	(0.043)	(0.044)	(0.038)
*Toddler	9.073	9.035	8.882	8.844	8.796	8.709	8.566	8.495
SE	(0.094)	(0.105)	(0.080)	(0.057)	(0.083)	(0.093)	(0.092)	(0.093)
*Preschool	8.947	9.091	8.834	8.581	8.446	8.535	8.566	8.676
SE	(0.095)	(0.125)	(0.066)	(0.073)	(0.059)	(0.089)	(0.092)	(0.090)
Parenting: positive interaction (+)								
*Infant	17.305	17.450	17.599	17.669	18.070	17.859	17.732	17.880
SE	(0.062)	(0.071)	(0.053)	(0.058)	(0.046)	(0.051)	(0.060)	(0.046)
*Infant bottom quintile mean	12.507	13.783	14.287	14.300	15.734	14.752	14.522	14.833
SE	(0.142)	(0.151)	(0.118)	(0.133)	(0.064)	(0.087)	(0.101)	(0.081)
*Toddler	16.241	16.403	16.064	16.791	16.992	16.457	16.564	16.575
SE	(0.064)	(0.064)	(0.063)	(0.037)	(0.052)	(0.064)	(0.058)	(0.061)
*Toddler bottom quintile mean	12.582	12.713	12.590	13.740	13.847	13.599	13.661	13.733
SE	(0.088)	(0.080)	(0.077)	(0.049)	(0.070)	(0.081)	(0.074)	(0.078)
*Preschool	14.570	14.630	14.412	14.466	15.020	15.102	15.080	15.181
SE	(0.075)	(0.083)	(0.052)	(0.059)	(0.045)	(0.063)	(0.067)	(0.064)
Social support (+)								
*Infant				18.058	18.471	18.873	18.879	19.142
SE				(0.080)	(0.084)	(0.086)	(0.090)	(0.081)
*Second Quintile Infant Mean				15.213	15.516	15.476	15.547	17.000
SE				(0.032)	(0.050)	(0.058)	(0.062)	(0.046)
*Toddler				18.214	18.402	19.210	18.997	19.276
SE				(0.068)	(0.081)	(0.091)	(0.088)	(0.094)
*Preschool				18.649	19.314	19.342	19.306	19.795
SE				(0.079)	(0.068)	(0.088)	(0.097)	(0.099)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement * Indicates the measure displays statistically significant change over the course of the time period at the 95% confidence level (though not necessarily in every year).								

Appendix C: Child outcomes by income quintile analysis tables

Appendix C.1 Physical outcomes by income quintile

	1994	1996	1998	2000	2002	2004	2006	2008
Birth weight (proportion low) (-)								
\$Infant Q1	0.066	0.098	0.081	0.058	0.088	0.088	0.092	0.088
SE	(0.010)	(0.018)	(0.012)	(0.011)	(0.017)	(0.017)	(0.019)	(0.016)
Infant Q5	0.048	0.046	0.066	0.026	0.062	0.035	0.040	0.049
SE	(0.010)	(0.010)	(0.010)	(0.008)	(0.015)	(0.010)	(0.010)	(0.010)
Injury (proportion injured) (-)								
\$Infant Q1	0.040	0.046	0.042	0.051	0.048	0.038	0.027	0.048
SE	(0.008)	(0.011)	(0.005)	(0.008)	(0.009)	(0.008)	(0.006)	(0.010)
Infant Q5	0.065	0.045	0.044	0.060	0.068	0.050	0.043	0.059
SE	(0.012)	(0.010)	(0.005)	(0.012)	(0.014)	(0.010)	(0.010)	(0.012)
Toddler Q1	0.134	0.111	0.135	0.116	0.104	0.076	0.115	0.089
SE	(0.019)	(0.019)	(0.021)	(0.011)	(0.015)	(0.014)	(0.018)	(0.018)
Toddler Q5	0.096	0.103	0.105	0.095	0.112	0.081	0.093	0.085
SE	(0.015)	(0.016)	(0.016)	(0.010)	(0.015)	(0.014)	(0.015)	(0.016)
Preschool Q1	0.087	0.081	0.095	0.111	0.102	0.056	0.068	0.058
SE	(0.014)	(0.016)	(0.011)	(0.017)	(0.011)	(0.010)	(0.013)	(0.012)
Preschool Q5	0.091	0.106	0.083	0.086	0.112	0.117	0.115	0.103
SE	(0.018)	(0.023)	(0.010)	(0.013)	(0.014)	(0.019)	(0.018)	(0.017)
General Health (proportion fair/poor) (-)								
\$Infant Q1	0.044	0.070	0.027	0.024	0.026	0.017	0.025	0.007
SE	(0.011)	(0.017)	(0.004)	(0.006)	(0.008)	(0.005)	(0.007)	(0.003)
Infant Q5	0.003	0.010	0.006	0.018	0.002	0.004	0.010	0.006
SE	(0.001)	(0.005)	(0.003)	(0.009)	(0.002)	(0.002)	(0.004)	(0.005)
\$Toddler Q1	0.033	0.019	0.046	0.030	0.009	0.033	0.041	0.011
SE	(0.008)	(0.005)	(0.011)	(0.008)	(0.004)	(0.012)	(0.011)	(0.003)
Toddler Q5	0.021	0.004	0.004	0.013	0.007	0.010	0.008	0.003
SE	(0.009)	(0.002)	(0.004)	(0.006)	(0.003)	(0.005)	(0.004)	(0.001)
\$Preschool Q1	0.035	0.024	0.046	0.028	0.020	0.020	0.013	0.023
SE	(0.007)	(0.010)	(0.011)	(0.008)	(0.005)	(0.008)	(0.007)	(0.012)
Preschool Q5	0.010	0.005	0.010	0.012	0.001	0.010	0.001	0.002
SE	(0.005)	(0.003)	(0.002)	(0.007)	(0.001)	(0.005)	(0.001)	(0.002)

Appendix C.1 Physical outcomes by income quintile, continued

	1994	1996	1998	2000	2002	2004	2006	2008
Chronic condition (proportion with condition) (-)								
Infant Q1		0.140	0.125	0.135	0.106	0.161	0.141	0.095
SE		(0.017)	(0.011)	(0.015)	(0.013)	(0.019)	(0.021)	(0.014)
Infant Q5		0.076	0.111	0.141	0.104	0.118	0.096	0.115
SE		(0.013)	(0.013)	(0.017)	(0.016)	(0.017)	(0.015)	(0.017)
Toddler Q1		0.146	0.186	0.186	0.147	0.159	0.201	0.172
SE		(0.017)	(0.021)	(0.014)	(0.017)	(0.021)	(0.023)	(0.025)
Toddler Q5		0.130	0.131	0.144	0.141	0.153	0.124	0.131
SE		(0.019)	(0.018)	(0.013)	(0.018)	(0.020)	(0.017)	(0.017)
Preschool Q1		0.207	0.196	0.216	0.220	0.207	0.211	0.217
SE		(0.029)	(0.013)	(0.020)	(0.016)	(0.026)	(0.026)	(0.028)
Preschool Q5		0.180	0.167	0.222	0.179	0.182	0.201	0.215
SE		(0.029)	(0.014)	(0.021)	(0.015)	(0.019)	(0.024)	(0.023)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement \$ Indicates the measure displays statistically significant difference between the bottom (Q1) and top (Q5) income quintile at the 95% confidence level for majority of years								

Appendix C2: Socio-emotional outcomes by income quintile

	1994	1996	1998	2000	2002	2004	2006	2008
Hyperactivity Score (-)								
\$Toddler Q1	4.997	4.846	4.661	4.085	4.122	3.977	4.022	4.040
SE	(0.173)	(0.173)	(0.168)	(0.107)	(0.126)	(0.164)	(0.128)	(0.145)
Toddler Q5	3.684	3.849	3.764	3.205	3.311	3.280	3.376	3.380
SE	(0.163)	(0.173)	(0.154)	(0.084)	(0.110)	(0.124)	(0.130)	(0.146)
\$Preschool Q1	5.483	5.379	5.260	4.364	4.642	4.463	4.731	4.192
SE	(0.171)	(0.221)	(0.141)	(0.158)	(0.118)	(0.186)	(0.205)	(0.164)
Preschool Q5	4.287	4.254	4.396	3.556	3.754	3.644	4.055	4.043
SE	(0.219)	(0.240)	(0.142)	(0.157)	(0.096)	(0.138)	(0.150)	(0.155)
Anxiety Score (-)								
\$Toddler Q1	3.277	3.268	3.290	3.160	3.152	2.883	3.040	3.116
SE	(0.125)	(0.123)	(0.111)	(0.085)	(0.113)	(0.128)	(0.120)	(0.116)
Toddler Q5	2.416	2.496	2.510	2.370	2.568	2.363	2.258	2.178
SE	(0.117)	(0.115)	(0.124)	(0.071)	(0.102)	(0.113)	(0.114)	(0.093)
Emotional disorder-anxiety Score (-)								
\$Toddler Q1	1.448	1.339	1.355	1.411	1.625	1.347	1.301	1.370
SE	(0.094)	(0.105)	(0.083)	(0.073)	(0.088)	(0.098)	(0.094)	(0.132)
Toddler Q5	1.110	0.973	1.073	1.181	1.460	1.170	1.097	1.265
SE	(0.078)	(0.078)	(0.124)	(0.050)	(0.087)	(0.076)	(0.078)	(0.080)
\$Preschool Q1	2.441	2.505	2.004	2.009	2.310	2.190	2.259	2.210
SE	(0.130)	(0.177)	(0.081)	(0.092)	(0.094)	(0.135)	(0.135)	(0.122)
Preschool Q5	1.679	2.003	1.903	1.838	2.095	1.948	1.922	2.105
SE	(0.122)	(0.196)	(0.085)	(0.090)	(0.081)	(0.095)	(0.098)	(0.103)
Physical aggression/conduct disorder (-)								
\$Toddler Q1	5.432	5.250	5.034	5.185	5.448	5.028	4.960	4.660
SE	(0.158)	(0.177)	(0.163)	(0.109)	(0.168)	(0.186)	(0.181)	(0.190)
Toddler Q5	4.594	4.806	4.682	4.425	4.910	4.430	4.362	4.139
SE	(0.169)	(0.143)	(0.166)	(0.100)	(0.128)	(0.162)	(0.170)	(0.165)
\$Preschool Q1	1.728	1.850	1.770	1.752	2.013	1.773	2.089	1.743
SE	(0.100)	(0.149)	(0.080)	(0.114)	(0.097)	(0.132)	(0.155)	(0.118)
Preschool Q5	1.361	1.475	1.422	1.235	1.589	1.506	1.449	1.371
SE	(0.110)	(0.120)	(0.074)	(0.089)	(0.067)	(0.104)	(0.105)	(0.092)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement \$ Indicates the measure displays statistically significant difference between the bottom (Q1) and top (Q5) income quintile at the 95% confidence level								

Appendix C3: Developmental outcomes by income quintile

	1994	1996	1998	2000	2002	2004	2006	2008
Motor and Social Development Score (+)								
Infant Q1	101.964	99.957	101.656	100.186	99.963	98.912	96.755	97.072
SE	(0.678)	(0.903)	(0.598)	(0.734)	(0.846)	(1.037)	(0.988)	(0.849)
Infant Q5	100.128	101.996	101.018	100.170	99.409	98.563	93.865	95.539
SE	(0.763)	(0.710)	(0.548)	(0.721)	(0.795)	(0.745)	(0.776)	(0.833)
\$ Toddler Q1	98.064	97.197	97.622	99.042	98.324	96.208	96.923	94.371
SE	(0.914)	(1.003)	(0.893)	(0.594)	(0.786)	(1.060)	(0.849)	(1.167)
Toddler Q5	101.769	102.030	102.460	103.279	102.682	99.736	100.603	100.391
SE	(0.952)	(0.805)	(0.879)	(0.544)	(0.680)	(0.849)	(0.700)	(0.717)
Pearson-Peabody Vocabulary Test- Revised (+)								
\$ Preschool Q1	94.045	92.411	93.658	94.203	94.617	93.939	92.968	93.605
SE	(1.081)	(0.940)	(0.676)	(0.906)	(0.689)	(1.025)	(0.936)	(1.233)
Preschool Q5	103.470	105.251	104.137	105.073	106.175	106.419	104.479	104.754
SE	(0.897)	(1.326)	(0.584)	(0.747)	(0.582)	(0.731)	(0.991)	(0.919)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement \$ Indicates the measure displays statistically significant difference between the bottom (Q1) and top (Q5) income quintile at the 95% confidence level								

Appendix C.4: Family context by income quintile

	1994	1996	1998	2000	2002	2004	2006	2008
Family functioning (-)								
\$Infant Q1	10.023	9.684	10.641	10.599	10.060	10.330	9.692	9.603
SE	(0.266)	(0.311)	(0.192)	(0.238)	(0.268)	(0.259)	(0.260)	(0.251)
Infant Q5	6.445	6.459	7.034	8.108	8.030	6.831	7.117	7.365
SE	(0.227)	(0.235)	(0.199)	(0.233)	(0.295)	(0.278)	(0.310)	(0.265)
\$Toddler Q1	9.798	10.054	10.468	10.089	10.420	9.215	9.648	9.345
SE	(0.306)	(0.321)	(0.298)	(0.187)	(0.262)	(0.297)	(0.294)	(0.336)
Toddler Q5	7.018	6.853	7.424	7.817	7.829	7.183	7.349	6.883
SE	(0.363)	(0.276)	(0.266)	(0.195)	(0.256)	(0.307)	(0.273)	(0.315)
\$Preschool Q1	9.543	9.403	9.422	9.231	8.995	9.124	9.182	8.992
SE	(0.308)	(0.445)	(0.168)	(0.238)	(0.203)	(0.301)	(0.338)	(0.345)
Preschool Q5	6.438	7.600	6.607	7.859	6.978	7.587	6.935	6.212
SE	(0.307)	(0.363)	(0.206)	(0.279)	(0.196)	(0.293)	(0.323)	(0.275)
Parenting: hostile/ineffective (-)								
Infant Q1	1.498	1.656	1.571	2.174	2.193	2.246	1.950	1.877
SE	(0.073)	(0.086)	(0.059)	(0.086)	(0.100)	(0.112)	(0.095)	(0.088)
Infant Q5	1.618	1.584	1.529	2.296	2.248	2.265	2.061	1.884
SE	(0.094)	(0.080)	(0.063)	(0.094)	(0.092)	(0.100)	(0.093)	(0.081)
Toddler Q1	9.212	8.777	9.072	8.898	8.664	9.073	8.655	8.671
SE	(0.200)	(0.240)	(0.183)	(0.130)	(0.196)	(0.240)	(0.249)	(0.271)
Toddler Q5	8.627	8.742	8.408	8.896	8.676	8.379	8.364	8.110
SE	(0.238)	(0.225)	(0.149)	(0.125)	(0.176)	(0.190)	(0.200)	(0.166)
Preschool Q1	9.306	9.338	9.027	8.476	8.463	8.118	8.655	8.212
SE	(0.200)	(0.252)	(0.148)	(0.150)	(0.143)	(0.245)	(0.249)	(0.210)
Preschool Q5	8.419	9.010	8.773	8.395	8.351	8.724	8.364	8.509
SE	(0.221)	(0.280)	(0.157)	(0.171)	(0.125)	(0.181)	(0.200)	(0.171)
Parenting: positive interaction (+)								
Infant Q1	17.183	17.188	17.263	17.322	17.868	17.701	17.280	17.684
SE	(0.135)	(0.169)	(0.166)	(0.173)	(0.106)	(0.125)	(0.154)	(0.116)
Infant Q5	17.678	17.796	17.915	18.071	18.289	18.012	18.089	17.987
SE	(0.118)	(0.113)	(0.081)	(0.097)	(0.100)	(0.096)	(0.106)	(0.118)
Toddler Q1	16.150	16.414	15.760	16.792	16.835	16.022	16.448	16.332
SE	(0.125)	(0.155)	(0.166)	(0.085)	(0.147)	(0.190)	(0.141)	(0.165)
Toddler Q5	16.434	16.290	16.063	16.926	17.016	16.645	16.596	16.886
SE	(0.131)	(0.149)	(0.121)	(0.081)	(0.104)	(0.126)	(0.120)	(0.113)
Preschool Q1	14.555	14.670	14.223	14.549	14.845	14.976	14.996	14.920
SE	(0.177)	(0.186)	(0.119)	(0.150)	(0.105)	(0.182)	(0.185)	(0.185)
Preschool Q5	14.903	14.807	14.644	14.522	15.140	15.050	15.402	15.341
SE	(0.162)	(0.160)	(0.103)	(0.127)	(0.091)	(0.115)	(0.135)	(0.113)

Appendix C.4 Family context by income quintile, continued

	2000	2002	2004	2006	2008
Social support (+)					
\$Infant Q1	17.150	17.460	17.598	17.710	17.885
SE	(0.162)	(0.182)	(0.169)	(0.187)	(0.170)
Infant Q5	18.870	19.347	20.027	19.879	20.048
SE	(0.187)	(0.204)	(0.194)	(0.212)	(0.185)
\$Toddler Q1	17.418	17.277	17.952	17.793	17.861
SE	(0.135)	(0.186)	(0.210)	(0.188)	(0.240)
Toddler Q5	19.091	19.276	19.951	19.829	20.052
SE	(0.146)	(0.178)	(0.201)	(0.190)	(0.229)
\$Preschool Q1	18.126	18.202	18.392	18.125	18.521
SE	(0.184)	(0.163)	(0.222)	(0.202)	(0.251)
Preschool Q5	19.160	20.158	19.850	20.275	20.881
SE	(0.176)	(0.137)	(0.183)	(0.211)	(0.186)
(-) Indicates measure is negative, a decrease in measure would be an improvement (+) Indicates measure is positive, an increase in measure would be an improvement \$ Indicates the measure displays statistically significant difference between the bottom (Q1) and top (Q5) income quintile at the 95% confidence level					

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How do Income and Socio-Economic Status Matter? Disentangling Pathways of Effect on Child Well-Being and Development

Abstract

A wide body of multidisciplinary research has established the correlation between socio-economic status (SES) or income and children's developmental and well-being outcomes. However, understanding *how* household income and SES affect child outcomes is crucial for designing effective public policies to reduce the disadvantage of growing up with low-SES and break the intergenerational transmission of poverty. A range of factors mediate the effects of low-SES, and low-income, on child outcomes. Identifying these pathways of effect presents alternative policy approaches to income transfers for interventions to mitigate disadvantage. Additionally, there are clear policy implications of a differentiation between the effect of relatively fixed parental characteristics, such as educational level, and that of income, which is directly affected by government policy.

This study uses data from the Canadian National Longitudinal Survey of Children and Youth (NLSCY 2000-2008) to disentangle the different pathways of effect of income and parental background on child outcomes during three stages of childhood: preschool (age 0-5), middle (age 8-13), and high school (age 12-16) ($N=1800$ to 4302, dependent on age group and outcome measure). Drawing on theories of family stress and family investment, the analysis uses structural equation modeling to examine measures of children's activities, parenting behavior, and family functioning as potential mediators of income and non-income elements of SES. Taking a multi-dimensional approach to measuring child well-being, age-appropriate measures of socio-emotional well-being, cognitive development, and behavior are used as outcomes.

The analysis finds that the effects of income and SES, as measured by occupational standing and parental education level, vary between different child age groups and outcome measures. In nearly all models, household SES has a stronger relationship with outcomes than permanent income, either directly or through mediating pathways. Cognitive outcomes have the closest direct association with the measure of SES. Parenting behavior is by far the strongest mediator and has the largest direct effect on child outcomes for non-cognitive outcomes. In the majority of models, family functioning's effect is significant but indirect, serving as mediator between SES and parenting behavior. Children's participation in extra-curricular activities in middle childhood and high school is also found to be a significant mediating factor in SES's affect on children's socio-emotional well-being. The paper discusses the study results in terms of implications for policy design as well as highlighting lessons for future research, including the importance of multiple indicators of 'child outcomes' and differentiation between effects at different stages of childhood.

Table of Contents

Abstract	147
Table of Contents	148
1 Introduction	150
2 Literature Review	152
2.1 Mediation Theories	153
2.2 Empirical studies of mediation theories	155
2.3 Gaps in the Literature	160
3 Methodology	162
4 Data and samples	163
Table 11 Sample Sizes	165
5 Measures	166
6 Model Specification	169
Figure 12: Generalized model specification	169
7 Modeling Results	172
Table 12: Outcome correlations with income and SES	174
Figure 13: Early childhood model results	175
Figure 14: Middle childhood model results	176
Figure 15: Adolescent model results.....	177
7.1 Income and SES	178
7.2 Parenting.....	178
7.3 Child Activities	179
7.4 Outcomes.....	180
7.4.1 Socio-emotional well-being	180
7.4.2 Cognitive development	181
7.4.3 Behavioural problems	182
7.5 Early childhood results.....	182
7.6 Middle childhood results	184
7.7 Adolescence	185
8 Discussion	186
8.1 Relationship with prior research	186
8.2 Implications for Policy	190
8.3 Limitations & future research directions.....	193
9 Conclusion	195
Appendix A: Structural Equation Modeling Methodology	197
A.1 Introduction.....	197
A.2 Measurement model: Latent variables	199
Figure A.1: SEM diagram of measurement model	202
Figure A.2: Composite measure of Socio-economic Status (SES).....	204

A.3 Specification of full SEM model	205
Table A.1: Classification of variables within SEM models.....	205
Figure A.3: SEM path diagram of simplified middle-childhood Socio-emotional well-being model (one mediation pathway, no controls).....	208
A.4 Model fitting: Maximum Likelihood Fitting Function	209
A.5 Weights	213
A.6 Model Fit.....	213
A.7 Structural parameters: direct, indirect, and total effects	214
A.8 Assumptions and limitations of SEM	217
Appendix B: Measures, descriptive statistics and measurement model	219
B.1. Household Income	219
B.2 Household Socio-Economic Status	221
B.3 Occupational class (using all cycles of data)	222
B.4 Education level.....	224
B.5 Parenting Practices	225
B.6 Family functioning.....	226
B.7 Child activities	226
B.8 Socio-emotional well-being	228
B.9 Cognitive development	229
B.10 Behavioural problems	230
B.11 Controls (covariates)	231
B.12 Latent Variables Measurement	232
Table B.1 Early childhood models descriptive statistics	233
Table B.2 Middle childhood models descriptive statistics	235
Table B.3 Adolescent models descriptive statistics.....	237
Table B.4 Early childhood latent measurement.....	239
Table B.5 Middle childhood latent measurement.....	240
Table B.6 Adolescence latent measurement	241
Appendix C: Tables of structural model results	242
Table C.1 Early childhood model results (main).....	242
Table C.2 Early childhood model results (controls).....	243
Table C.3 Middle childhood model results (main).....	246
Table C.4 Middle childhood model results (controls)	247
Table C.5 Adolescent model results (main).....	249
Table C.6 Adolescent model results (controls).....	250
References	252

1 Introduction

Children who grow up in poverty generally fare poorer than richer children on a wide range of developmental and well-being measures, both during childhood and later in life. However, it does not necessarily follow that increasing family income will improve child outcomes. Because children are dependants without independent access to resources, the effect of family income on children is inherently indirect. To explain any effect of a family's economic condition on child outcomes, we must examine *how* money matters to children, either via spending or its effect on parents. While the correlation between poverty and child outcomes is well-established in the research literature, these pathways of transmission, or mediation, between a family's social and economic position and a child's outcomes are less well studied.

Understanding how household income and other elements of SES affects child outcomes is essential for designing public policies that can effectively reduce childhood inequalities and potentially reduce the intergenerational transmission of poverty. The question of how to improve child development has become increasingly important to liberal welfare states, including Canada, that are moving from reactive social policy to proactive 'social investment'. Under this model of social policy, governments attempt to prevent adverse adult outcomes before they occur by 'investing' during childhood to make these outcomes less likely (Morel et al. 2012, Esping-Andersen 2009, OECD 2005, Banting 2005, Jenson 2004).

Untangling the different pathways of effect of income and parental background on child outcomes can help inform such investment policies by providing evidence-based expectations of the potential effect of different policy approaches. Broadly speaking,

policy addressing the disadvantage of low-SES can be thought of in two categories: a) income transfers (i.e. child benefits) that reduce the disadvantage of poverty by increasing income, and b) programs that mitigate the effects of low-income without changing household income. Understanding the potential effectiveness of either policy approach depends on an understanding of the relationship between income, family characteristics and child outcomes. Identifying how family's financial position affects children is also key to identifying opportunities for disadvantage-mitigation policies.

This paper uses Canadian data from the National Longitudinal Survey of Children and Youth (NLSCY) to explore mediating pathways of income and non-income SES on child outcomes at three stages of childhood: early childhood, middle school entry, and high school. Drawing on theories of family stress and family investment, this paper examines children's activities, parenting behavior and family functioning as mediating pathways of income and SES's affect on child outcomes. Three cycles of longitudinal data are used for each child to give temporal order to the mediation processes. Taking a multi-dimensional approach to measuring child well-being, age-appropriate measures of socio-emotional well-being, cognitive development, and behavioral problems are used as outcomes. The analysis is structured to compare income and non-income SES's effect on child outcomes, by mediating pathway (parenting and family functioning vs. child activities), by type of child outcomes, (socio-emotional, cognitive, behavioural), and by age group.

The paper begins by positioning itself within the existing theoretical and empirical literature on mediation in the relationship between household socio-economic status, income and child outcomes. I then give an overview of the NLSCY data and

sample structure. After presenting the model specification based on theory and available data, the measures are described, the modeling results are presented, and discussed for their theory and policy implications.

2 Literature Review

Childhood is the beginning of the life course, a critical staging ground for all that follows. A full appreciation of the importance of these early years has been a relatively recent development in academic study and, even more recently, public policy. In both camps there has been increasing interest in understanding childhood from a multi-disciplinary perspective, viewing child development as not only a biological process, but also a complex social phenomenon with determinants and consequences beyond the individual. Alongside this future-oriented interest in childhood, a school of child studies (the 'new' sociology of childhood) emphasized approaching childhood as a period of life worthy of study irrespective of future implications, advocating for appreciation of the immediate rights and interest of children (Qvortrup, 1994). Within this context, there has been a growing body of 'child indicators' research measuring multiple aspects and determinants of children's well-being and development (Ben-Arieh, 2010). This paper builds upon, and contributes to these literatures.

Childhood outcomes, measures of well-being and development, are the result of multi-faceted and interacting processes of nature (i.e. biological development, genetic heredity) and nurture (by parents, families, schools, communities and society), as well as circumstance and chance. Bronfenbrenner and Morris's (1998) highly influential ecological model of child development provides a useful framework for thinking about the complexity and the inherently interconnected nature of influences on child outcomes,

from proximal factors such as a child's parents or home environment to more distal factors such as community and social policy supports. The ecological model gives limited weight to any one factor in isolation. It also recognizes the inherently probabilistic nature of influences, which may have different effects for different individuals and may be suppressed or inflated by other factors or contexts (Huston & Bentley, 2010). Taking this approach to child development highlights the importance of understanding these interactions or *how* factors work together at various levels to influence child outcomes. This paper contributes to untangling an important facet of those interactions: the influence of household social and economic circumstances as mediated by family relations and children's participation in organized activities.

2.1 Mediation Theories

The effect of a family's economic condition on children's outcomes is necessarily indirect, as children generally do not have control over their family's financial resources. Two theories of how economic conditions affect child outcomes dominate the literature: family investment theory and family stress theory. Family investment theory focuses primarily on the material advantages of higher income: the ability to purchase goods and experiences to improve child outcomes, as well as ability to invest more time in child rearing. Family stress theory focuses on the effects of income and social status on family functioning and parenting behaviours, with the theory that lower-income living is higher stress. These two theories are not mutually exclusive and neither model theorizes that the one mediation pathway explains the full correlation between income and outcomes.

The family investment perspective is rooted in an economic approach to the question of child development. Most closely associated with Gary Becker's theory of

family production, this perspective approaches child outcomes as economic goods valued and produced by families (Becker 1981, Becker and Tomes 1986). Families dedicate resources or 'invest' to produce child outcomes. Resources might include material goods, such as books, educational toys, and nutritious food, or experiential goods, such as lessons, sports and cultural experiences, or time dedicated to parent-child interaction. While families' valuation of child outcomes may vary, the theory is that lower family income will reduce the amount of resources available for allocation to production of child outcomes. Under the household production function, lower investments will result in worse child outcomes. Recent evidence on expenditure of increased child benefits in Canada gives some empirical credence to at least the first step of a family investment mediation theory. Lowest income families were found to spend higher incomes on basic goods (nutrition, housing), and educational goods (L. Jones, Milligan, & Stabile, 2015).

An important inclusion in family production models is the consideration that not only the preference, but the *ability* of families to turn income into child investments varies: one family may be more able to turn income into child outcomes than another family due to non-resource factors, such as education or opportunities for investment (e.g. availability of educational experiences).

While the family investment theory is rooted in an economic approach, the family stress model (also known as family process) comes from a sociological perspective, placing primacy on family relations rather than resource allocation (K. J. Conger & Elder, 1994; R. D. Conger, Conger, & Martin, 2010; R. D. Conger & Donnellan, 2007). Financial condition is theorized to effect child outcomes through its empirically demonstrated effect on family relationships including overall family functioning and

child-parent interactions. Some models specifying this theory also include an additional mediating step of parental emotional problems or parent relationships (i.e. marriage) prior to family functioning or parenting. The family stress theory is less limited than family investment theories in specification of what constitutes economic stress: not only income level, but also lower social class and status, unemployment, and income drops, are theorized as economic conditions affecting child outcomes via family stress.

2.2 Empirical studies of mediation theories

Mediation theories are well cited in the extensive, multi-disciplinary empirical research on the relationship between family background and child outcomes. However, most research has simply cited these theories to explain an unexamined ‘black box’ of the causal path of association between income and child outcomes. Only a limited number of studies have focused specifically on testing these mediation models against data. This paper aims to contribute to this latter area of the child development literature, and, in turn, inform interpretation of the more numerous studies that do not examine mediation pathways but infer their existence.

Related to analysis of *how* income effects child development outcomes, much empirical research effort has been put into identifying income’s causal effect, controlling for observed and unobserved parental characteristics that affect both income and child outcomes. Random assignment of family income through experimentation is not an ethical or practical method for long term child development studies, thus a variety of techniques have been used to identify income’s effect apart from related factors: moving from correlation to multivariate time-series regression, to sibling studies and instrumental variable approaches. In general, this line of inquiry has found that the causal effect of

income on child outcomes is small compared to what simple correlations would suggest. Non-income elements of family background and socio-economic status (associated with income) appear to explain much of the relationship between income and child outcomes (Blau, 1999; Bowles, Gintis, & Osborne Groves, 2005; G. Duncan, Kalil, Mayer, Tepper, & Payne, 2005; Haveman & Wolfe, 1995; Mayer, 1997; McEwen & Stewart, 2014).

Mayer's influential study on this subject *What money can't buy: family income and children's life chances* (1997) finds that after very basic needs are met, additional income does not translate into better outcomes. Mayer concludes parental characteristics are more important than any goods that money might buy. Blau (1999) echoes these findings with analysis showing family background and child characteristics have a much greater influence than income on child cognitive, social and emotional outcomes in early childhood (under age five). However, Blau does find support for family investment theory. Higher income is associated with a greater supply of goods associated with child outcomes, although Blau concludes effects of additional goods on outcomes are insufficient to make income increases an efficient intervention to improve outcomes. Dooley and Stewart (2007) find similarly small income effects using Canadian data (NLSCY cycles 1-3) when applying various techniques to control for observed and unobserved factors related to income. Exploiting policy-driven changes to family incomes in Canada, Milligan and Stabile (2011) find evidence of small, though significant, positive effects of higher income via child benefits on a number of child outcome measures.

Mediation analyses that examine the black box of *how* families' economic conditions affect child outcomes vary greatly in terms of their model specification and

the economic concept, mediators, and outcomes examined. The majority of these studies—and those most relevant to this analysis—use American survey datasets. I review these prior to the relevant Canadian literature.¹⁸

A key variation among studies is the income or economic concept for which mediation is tested. Appreciation of these differences has critical implications for the policy application of research, as policies to increase income and policies to reduce income instability are not necessarily the same. The relationship with child outcomes and mediation by family investment and family stress is strongest when the economic concept is poverty/low-income status, rather than continuous income measures. Mediation research to date has primarily focused on such *poverty* effects, rather than income effect across the full population. In this respect the mediation literature diverges somewhat from the economic literature trying to isolate income's effect.

Guo and Mullan Harris (2000) use a longitudinal measure of poverty (the proportion of prior three years in which household was below the US poverty line), and find a strong relationship with early childhood cognitive development outcomes. They find family stress and investment pathways explain the full association between poverty and outcomes once mother's education and cognitive ability (measured by direct testing) and standard demographic control variables are taken into account. Using a longitudinal latent construct of income level and stability (a type of poverty measure), Linver, Brooks-Gunn, and Kohen (2002) find the relationship between this construct and behavioural outcomes is completely mediated by measures of family stress and investment, while there is only partial mediation for cognitive outcomes. Yeung, Linver, and Brooks-Gunn

¹⁸ American datasets used include the National Longitudinal Survey of Youth child supplement, the Infant Health and Development Program, the Panel Survey of Income Dynamics child supplement, and The Early Childhood Longitudinal Study 1998-1999. Most of these surveys oversample disadvantaged populations.

(2002) compare the mediation of two different income measures; average income over two to four years prior to outcome and a measure of income stability over that same time. They find the two measures have distinct relationships with outcomes. Income stability affected both cognitive and behavioural outcomes through maternal depression, whereas average income retained an effect on cognitive, not behavioural outcomes, once mediation constructs were included in the model. Gershoff, Aber, Raver, and Lennon (2007) distinguish between income (categorical) and material hardship (lack of basic goods) in their mediation model of family stress and parental investment's effect. They find the material hardship a key pathway of income's effect on kindergarten children's cognitive skills and socio-emotional intelligence. While income retains a direct effect on cognitive skills, material hardship has a direct effect on socio-emotional intelligence. Material hardship is found to explain much more of family stress, and, in turn, its effect on child outcomes, than income alone.

The operationalization of the mediation pathways also differs throughout the research, driven in part by the limitations of secondary data analysis. The different specifications of family stress and family investment may explain some of the variation in degree of mediation found. These specifications also matter for policy application, as some mediation pathways (e.g. chosen disciplinary style or child care expenses) may be more amenable to intervention than other (e.g. maternal depression or parental time spent playing with child).

One of the key findings of the literature is that the effect of family economic conditions, and mediation of this effect, varies by child outcome. In general family stress has a greater effect on social, emotional, and behavioural outcomes, while cognitive

outcomes are more closely related to family investment. Yeung et al. (2002) find investments in home environment are significant in mediating income for cognitive development whereas for behavioural outcomes, maternal depression and parenting practices are the key mediators. Linver et al. (2002) find income/poverty's effects on behavioural outcomes is non-significant once the family stress and investment mediators are introduced, with parenting having the largest influence, followed by home environment. In contrast, for cognitive outcomes the effect of income/poverty is not fully mediated by the specified pathways and is only partially explained by home environment mediation and parenting effects. Gershoff et al. (2007) also find a differentiation in the mediation of income's effect on cognitive skills and socio-emotional intelligence: parent investment is not a significant mediating pathway for socio-emotional intelligence in their model. Less of the variation in cognitive skills than socio-emotional intelligence is explained by their family investment and family stress model.

The Canadian literature on mediation is particularly limited, with only a few studies explicitly using mediation theories in empirical specifications. C. Jones et al. (2002) examine long-term poverty's effect on child physical, emotional, and cognitive outcomes at ages four to 15 (using NLSCY cycles 1-3) modeling both family stress and neighborhood as mediating factors. They find long-term poverty has a statistically significant effect on all outcomes, with depression and family dysfunction playing a mediating role. Although parenting measures are associated with outcomes, their relationship with poverty is too weak to constitute mediation between poverty and outcomes. Beiser, Hou et al. (2002) use cross-sectional data from the first cycle of the NLSCY to test the family process model as a differential mediator of the effects of

poverty (treated dichotomously) for foreign-born immigrant children, children of immigrants, and children of non-immigrant parents. They look at the effect of ineffective parenting, parental depression and family dysfunction on mental health outcomes for children age 4-11. Their findings indicate that family process is a significant mediator for Canadian-born children, but is insignificant for foreign born/recent immigrant children. Their model shows complete mediation (no residual relationship) between poverty and emotional outcomes for Canadian born children.

Lastly, Kohen, Leventhal, Dahinten, and McIntosh (2008) also use the NLSCY (cycles 1-3) to examine family functioning, maternal depression, and parenting as mediators for the effect of *neighbourhood* socio-economic status and cohesion on early childhood verbal abilities and behavioural problems. Despite a weak association between the neighbourhood and child measures, they find the specified mediation pathways provide a significant pathway of effect: neighbourhood SES affecting neighbourhood cohesion, which in turn has a significant affect on family functioning and maternal depression, both of which affect parenting practices, which, in turn, affect child outcomes.

2.3 Gaps in the Literature

The analysis undertaken in this paper contributes to filling gaps evident within the existing literature as well as building on previous findings. A consistent result of prior research is that the pathways of income's effect are different for different child outcome domains; based on this finding, I retain a multiple-outcome approach in this analysis and interpret the outcomes independently. As noted above, one of the key variations in the studies are the family economic condition measures used. Current income, permanent (or

average) income, poverty status, relative income status and various different constructions of socio-economic status scales all capture something slightly different about a family's economic condition. In absence of multiple measures, each of these measures serve as a broad measure of family economic condition which can inflate the apparent association with outcomes. What source of variation the 'economic condition' measure is actually capturing is particularly important for interpreting results in terms of policy applicability. Responding to this gap, and building on the income-material hardship distinction in Gershoff et al. (2007), I distinguish between socio-economic status and income.

Research to date has been heavily focused on the earliest years of childhood, with all key mediation studies discussed above looking at outcomes at age six or prior. Similar to how mediation pathways vary for different outcomes, income and mediating pathways may have a different effect at different stages of childhood. Non-mediation studies have shown that income appears to have a greater effect on child outcomes at earlier ages (Brooks-Gunn & Duncan, 1997; G. J. Duncan, Kalil, & Ziol - Guest, 2010; Heckman, 2000; Hoddinott, Lethbridge, & Phipps, 2002; Phipps & Lethbridge, 2006). Running the models with three age groups will allow for a cross-age comparison to uncover age-specific effects.

Lastly, there has been very little use of Canadian data to specifically assess the mediation of income's effect on child outcomes. Given that policy environments vary between countries in ways that affect the costs of raising a child (e.g. parental leave and health care) and the equality of childhood experiences (e.g. education funding and geographic concentration of poverty), we would expect different mediation pathways or

strength of mediation in different countries. Comparative research has shown that Canadian children's early outcomes are more equal than those in the United States, and that Canadian children have up to three times as much social mobility as their American peers, suggesting the effects of parental background on child outcomes are possibly weaker in Canada (Burton, Phipps, & Zhang, 2013; Corak, Curtis, & Phipps, 2011). Examining the hypothesized models with Canadian data is thus essential to informing Canadian policy, and offers a chance to test the soundness of extrapolating research using international samples to Canadian children.

3 Methodology

This paper uses a Structural Equation Modeling (SEM) technique of path analysis with latent variables. The analysis was conducted in Stata version 13, using the "sem" command structure and maximum-likelihood (ML) estimation, with robust standard errors. Full details of the method are given in Appendix A. SEM techniques are a natural choice for testing mediation models where there are multiple endogenous variables, rather than a single dependent variable, and multiple pathways among these variables. SEM is particularly suited for models that specified are based on well-developed theory. Family stress and family investment are well-established theories of how we expect income to have an effect on child outcomes. Through SEM I include these causal hypothesizes of the two theories explicitly in the specification and find the quantitative implications of accepting the assumptions explicit in the models (Bollen & Pearl, 2013, 309).

One of the major advantages of using a SEM technique is the use of latent variables: constructs measured indirectly via multiple observed indicators. While control

variables such as sex and age can be measured with high validity, constructs like socio-emotional well-being or effective parenting can only be measured by multiple observations. Creating a latent variable measurement model allows use of multiple observed indicators to measure the hypothesized constructs. Unlike simple scales or score aggregation, through latent measurement, elements of measurement error are differentiated from omitted factors, which allows for both a better measure of the construct, and a clearer interpretation of the model's pathway effects.

4 Data and samples

The NLSCY is a national longitudinal survey of Canadian children, jointly conducted by Statistics Canada and what was then called the Department of Human Resources and Social Development. The NLSCY collected data on a cohort of children aged 0-11 in 1994 every second year until 2008, creating eight cycles of data. In addition to the initial cohort, samples of children aged 0-24 months (Early Childhood Development Cohorts) were added at each collection cycle and followed for three cycles. The NLSCY uses a variety of collection instruments. In this analysis I use survey responses from the child's Person Most Knowledgeable (PMK), child self-complete questionnaires (available from ten years of age), and direct assessments of the children.

The NLSCY used a unique sampling approach via the mandatory Labour Force Survey to include households with children within the target ages, which constitute less than 26 per cent of Canadian households. The NLSCY does not cover children in institutions, or living on Indian reservations (approximately 0.5% of Canadian children). While the NLSCY did sample the three territories for some data collection cycles, those children are excluded from this analysis due to inconsistency of coverage. As a result of

the sampling design, and oversampling of small provinces, statistical inferences to the national population are not accurate without using the Statistics Canada provided weights. For this paper the provided longitudinal funnel weights were used. Weighted in this manner, the NLSCY is nationally representative of Canadian children living in the ten provinces at the time of initial surveying, excluding children in state care or on reserves¹⁹.

I use three cycles of data for each child, spanning five years of a child's life, to temporally order mediation, and build multi-cycles measures (I do not model longitudinal changes in measures). Three age groups were chosen for analysis based on availability of appropriate outcome measures. The youngest group's outcomes are measured at age 4/5, approximately the age of school entry, with data from the two cycles prior. The middle age group has outcomes measured at age 12/13, approximately coinciding with the completion elementary schooling. The oldest age group, adolescents, has outcomes measured at age 16/17, or nearing high school completion. For each age group two 'cohorts' (four birth years) have been pooled in order to increase sample size, and improve robustness of results, as such four cycles of data are used (i.e. cycles 5, 6, 7 for cohort one and cycles 6, 7, 8 for cohort two). All analyses control for cohort effects and child age in months. With three age groups and three outcome measures modeled separately (socio-emotional well-being, cognitive development, and behavioural problems), there are nine models presented in this paper.

The sample size for the analysis varies between age groups and cycles due to variations in initial cohort sample sizes, response rates, supplemental sampling and

¹⁹ In discussion of descriptive statistics, I discuss sampling, missing data and attrition issues that make the samples used for analysis somewhat more privileged than the overall population.

changes in inclusion criteria over the course of the longitudinal survey. Table 4.1 reports the sample size for all nine models. For the purpose of this analysis, a child must be a respondent in all three cycles in order to be included. In order to clarify interpretation of the parenting measures the sample is also restricted to children for whom the Person-most-knowlegeable (PMK) in all cycles was either the mother or father of the child (including biological, step, or adoptive). Children of same-sex two-parent households were also dropped due to difficulty differentiating reporting PMK and spouses' employment and education levels; this is a very small exclusion.

Table 11: Sample Sizes

	Ages	NLSCY Cycles	Sample sizes				
			Initial	Total after restrictions	Socio-emotional model	Cognitive model	Behaviour model
Early Childhood	0/1 to 4/5	Cohort 1: 5-7 Cohort 2: 6-8	9106	5200	4809	4132	4688
Middle Childhood	8/9 to 12/13	Cohort 1: 4-6 Cohort 2: 5-7	5567	4042	2732	2943	2805
Adolescence	12/13 to 16/17	Cohort 1: 5-7 Cohort 2: 6-8	4140	2846	1782	1834	1848
Total net of restrictions based on list-wise deletion							

Listwise deletion was used for each analysis model resulting in nine different samples. While a missing completely at random (MCAR) assumption is too strong for this data, a missing at random (MAR) assumption is taken. That is, missingness is related to observed variables, and not dependent on the value of the missing variable (Allison, 2003). Variables potentially predictive of missing values, such as language spoken at

home or which parent is the respondent are included as controls in the analysis²⁰. The large degree of missing data is in part a product of the large number of variables in the models. Each models has approximately 30 measured variables, including variables from self-complete paper questionnaires for children, increasing the likelihood of at least one individual missing value (criteria for list-wise deletion) being missing truly at random.

Samples used for analysis (after listwise deletion restriction) have children with slightly higher incomes, higher status household occupational codes, and they are more likely to have English as a mother tongue. They are less likely to have a lone parent or father responding as the person-most-knowledgeable respondent, and have fewer siblings than the overall sample. The univariate descriptive statistics of the full weighted sample are given in Appendix B along with those for the model analysis samples after listwise deletion to allow for comparison.

5 Measures

The main measures used in the analysis are income and a non-income measure of SES; mediating factors of family functioning, parenting, and child activities; and, socio-emotional, cognitive, and behavioral outcomes. I provide a brief explanation of these measures and outcomes prior to explaining the model specification. Appendix B provides a more detailed explanation the measures, including covariates and descriptive statistics. Income is measured as average household income over three cycles of data, equivalized for household size. The non-income measure of SES used within this analysis approaches SES as a hierarchical status within the society denoted by occupation and educational

²⁰ Any attempt at imputation would have used these same variables, meaning imputation would not have resulted in significant changes to the results, and possibly biasing error estimates.

level, closely related to but not dependent on, the annual flow of income that comes from this status. This non-income based SES measure (hereafter referred to as SES for ease of discussion) is a household composite determined by each parents' highest reported educational level and highest reported occupational classification. Using the highest parental occupational code, I assign a Boyd-Nam-Powers (BNP) SES score which has been determined using census data on that occupation's average educational and income profile (Boyd 2008).

Mediating factors aim to operationalize the family stress and investment pathways of income and SES's effect on child outcomes. Family functioning is a latent variable based on answers to 12 questions concerning the trust, communication, and mutual support among family members. The latent parenting measure varies by age (see Appendix B), and is based on scales of positive, ineffective, and rational parenting practices. Child activities is a manifest (non-latent) variable. In early childhood there is both a home activities scale and out-of-home activities scale. In the middle and adolescent age groups, the measure is constructed using a scale of frequency of participation in activities out of school hours.

The outcome measures vary greatly based on child age, and include both parent- and child-reported variables. Socio-emotional well-being attempts to capture the immediate well-being of the child, as well as the potential for future negative outcomes. In all models it is a latent variable outcome. For the youngest age group, socio-emotional well-being is measured on three dimensions reported by the PMK: unhappiness, anxiety and peer relations. For the middle age group, this outcome is measured along four dimensions using child-respondent questions: emotional-anxiety disorder (reverse coded),

self-esteem, emotional quotient, and subjective happiness. For the adolescents, socio-emotional well-being is measured along four dimensions, using child-responder questions: self-esteem, emotional quotient, subjective happiness, and depression (reverse coded).

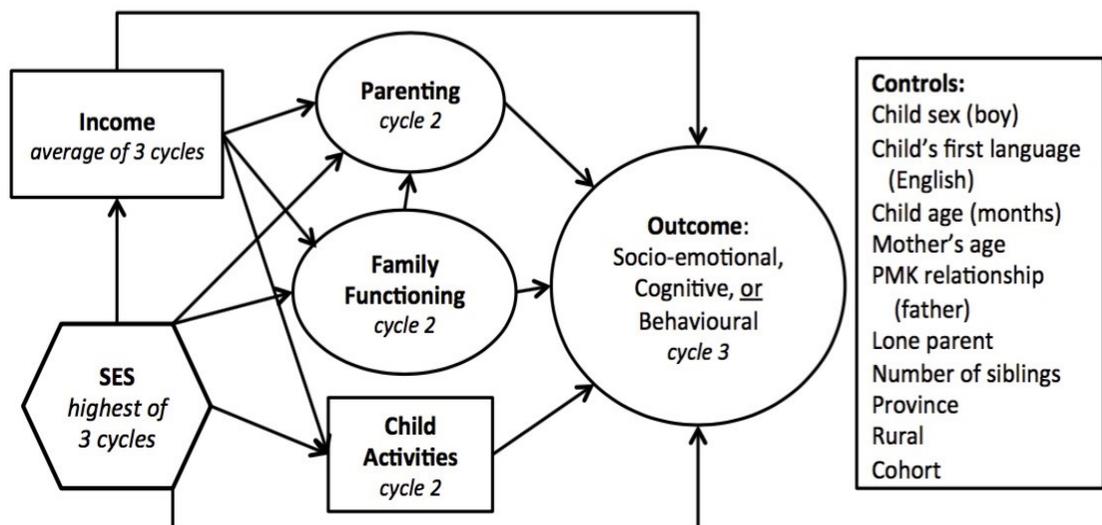
The measures of cognitive development outcomes are limited in the NLSCY. For the youngest age group, it is measured as a latent variable defined by three direct-measures of early cognitive development. The Pearson Picture Vocabulary Test- Revised (PPVT-R), the “Who am I?” assessment, and a 30-point Number Knowledge assessment. For the middle age group the cognitive development outcome is the Mathematics Computation Exercise, which measures the student's ability to do addition, subtraction, multiplication and division operations on whole numbers, decimals, fractions, negatives and exponents. Cognitive development for the adolescents is measured using the Problem Solving Exercise, a 18-item self-complete assessment of reading comprehension, basic math skills, and decision making.

Behavioural problems for all ages are measured as latent variables with multiple manifest indicators. For the youngest age group behavioural problems are measured using a physical aggression/conduct disorder scale and an indirect aggression scale. Behavioural outcomes for the middle age group are measured using four scales: physical aggression/conduct disorder, indirect aggression, pro-social (reversed), and property offences. The measure of adolescent behavioural outcomes captures a different domain of well-being than the psychometric scales available at younger ages. For this age group, self-reported risk behaviours are parcelled into three scales: criminal behavior, drug use, and violence.

6 Model Specification

The hypothesized models differentiate income and SES's effects on child outcomes, with mediation by both family stress (family functioning and parenting practices) and child investment (extracurricular activities). Figure 5.1 shows a generalized version of the theorized mediation model with all specified pathways, variable types and the cycle in which a measure was taken. Following path diagram conventions, boxes indicate an observed variable, circles/ovals denote latent variables, and a hexagon indicates a composite variable (more detail on SEM path diagrams and variable types is found in the methodological Appendix A). The specification of the models varies slightly by age group and outcome measures due to data variability and source of the measure (i.e. PMK, child, or direct assessment). Appendix B gives descriptions of each of the measures for each age group along with descriptive statistics.

Figure 12: Generalized model specification



For simplicity of depiction, the pathways from control variables are not drawn, but run to each of the endogenous variables (mediators and outcomes). Controls are measured during the third (outcome) cycle, except PMK relationship, which was taken from cycle two to correspond with the parenting variables.

The three different outcomes (socio-emotional well being, cognitive development, and behavioural problems) are analyzed in independent models for each of the age groups. Although SEM allows for multiple dependent variables, there is no firm theoretical basis for specifying how the three outcomes domains are inter-related, and is a question beyond the scope of this paper.

There are three types of effect measured within a mediation model. Direct effects are the single arrow paths between variables $A \rightarrow B$, uninterrupted by mediating variables. For instance the effect of income on family functioning and SES's effect on an outcome not via any mediation variable are direct effects. The direct effects between variables that also have indirect pathways between them (e.g. income to outcome), can be thought of residual direct effects, reflecting that the specified mediation is not expected to capture all pathways of effect²¹. Indirect (or mediated) effects are the effect of a variable via mediating pathway $A \rightarrow B \rightarrow C$ independent (simultaneous) to other pathways of effect. For example, income's effect on an outcome through income's effect on parenting is an indirect effect. To calculate a specific indirect effect one multiplies the direct effect of the primary independent variable on the mediator ($A \rightarrow B$) by the direct effect of the mediator on the outcome ($B \rightarrow C$) (for more detail see the technical Appendix A). We may also total the indirect effect of different pathways, for instance income's indirect effect on an

²¹ The residual direct effects from income to outcomes in the model might be better thought of as mediation-unexplained effects, as we still need a theory to explain *how* these variables might affect children.

outcome in the model includes pathways via parenting and child activities. Because all direct and indirect effects are modeled simultaneously in a SEM, their coefficients are independent of each other. Thus we can total all direct and indirect pathways between two variables, to refer to the ‘total effect’ of one variable on another.

Three cycles of data are used for each child in the analysis, for temporal ordering of the measures to enable stronger inferences about the causal relations in the model (Cole & Maxwell, 2003).²² This analysis does not constitute longitudinal modeling in the sense of looking at *changes* over time: I do not model the effect of a *change* in any of the explanatory variables over time, and the dependent variable is not a *change* in outcome. Income is measured as ‘permanent’, an average of the three cycles. This choice reflects the fact that despite income spikes, families may smooth consumption across the years, or saving from past income or anticipation of future income may also moderate the influence of current income level. Non-income SES is also measured as ‘permanent’, taking the highest educational and occupational levels reported across the three cycles (further information on the operationalization is available in Appendix B). The mediating factors are measured a cycle (two years) prior to outcome measures. The effect sizes will likely be dampened by these time lags; however, they allow for clear causal ordering.

Following previous empirical studies showing the small effect of income and consistent significance of parent characteristics, it is expected that the SES measure has a

²² This model specification using longitudinal data has limitations, however it best fits with the research questions the analysis aims to investigate. A policy increasing family income through a policy measure such as child benefits or an increase in minimum wage would not be a point-in-time intervention, but a stable change to the level of income for families. For the few children who would experience the introduction of the policy, a change would occur, however over time the change would become environmental. Thus we are interested in a change income at a *permanent* level, over the course of childhood, not a limited term *intervention* of increased income or shock of decreased income. Likewise, using observational data, I am not looking at how a *change* in parenting, would effect child outcomes as the observed changes in the data cannot be expected to be the same as would be experienced due to a parenting intervention.

larger effect than income in all models. Among the pathways of effect, I expect that, due to the cost of activities, activity participation will be associated more with income than non-income elements of SES. Parenting is expected to have stronger influence on outcomes than activities. Parenting and family functioning are expected to be related to both SES and income, as income contributes to stress, but fixed characteristics may determine how this stress is manifest in functioning and parenting. In line with prior research, I expect family stress pathways will have a larger effect on children's socio-emotional and behavioural outcomes, whereas family investment will have a stronger effect on child cognitive development. The operationalization of family investment is limited to child activities rather than the more extensive information on investments, available in prior research. Thus I expect the investment pathway may have weaker effects than those found in other studies. While prior mediation analysis has not examined age differences, other research on income's association with child outcomes find a stronger association earlier in childhood, which is expected here as well (Brooks-Gunn & Duncan, 1997; G. J. Duncan et al., 2010; Heckman, 2000; Hoddinott et al., 2002; Phipps & Lethbridge, 2006).

7 Modeling Results

Analysis was conducted in a step-wise fashion in order to view the additional explanatory power of mediation pathways. First measurement of latent constructs was tested through confirmatory factor analysis (see Appendix B for detailed results), next I examined the correlations between income, the SES measure, and outcomes (with and without controls) in each model as the baseline standard analysis of their effect on child

outcomes. Then I fitted the full model with the mediation pathways, both with and without control variables²³.

The first stage of analysis looked at the uncontrolled correlation among income, the SES measure and outcomes. Table 6.1 gives the one-to-one correlations of income and SES with outcomes (analyzed separately). The observed correlations are weaker than the literature would have suggested, though all in the hypothesized direction.

In early childhood income and the non-income SES measure are both significantly correlated with cognitive and behavioural outcomes, but not with socio-emotional well-being. All middle childhood outcomes are correlated with both income and SES. In adolescent models, income and SES are only significantly correlated with cognitive outcomes. While traditional mediation theory would indicate no mediation exists where there is no correlation without mediators (Baron & Kenny, 1986), newer approaches reveal that in more distal processes mediation may exist where bivariate correlation is not immediately apparent (MacKinnon, Krull, & Lockwood, 2000; Shrout & Bolger, 2002). As shown below, introducing mediating pathways and covariates into the models results in significant direct or indirect effect of income or SES, or both, for every outcome and every age.

²³ In only a few models did running the family stress and child investment mediation pathways independent of one another change the overall results, with the child investment pathways being generally overwhelmed by the introduction of parenting and functioning variables and no significant weakening of the family stress paths when taking activities into account. This discussion focuses on the nine full models where all-mediation pathways are specified.

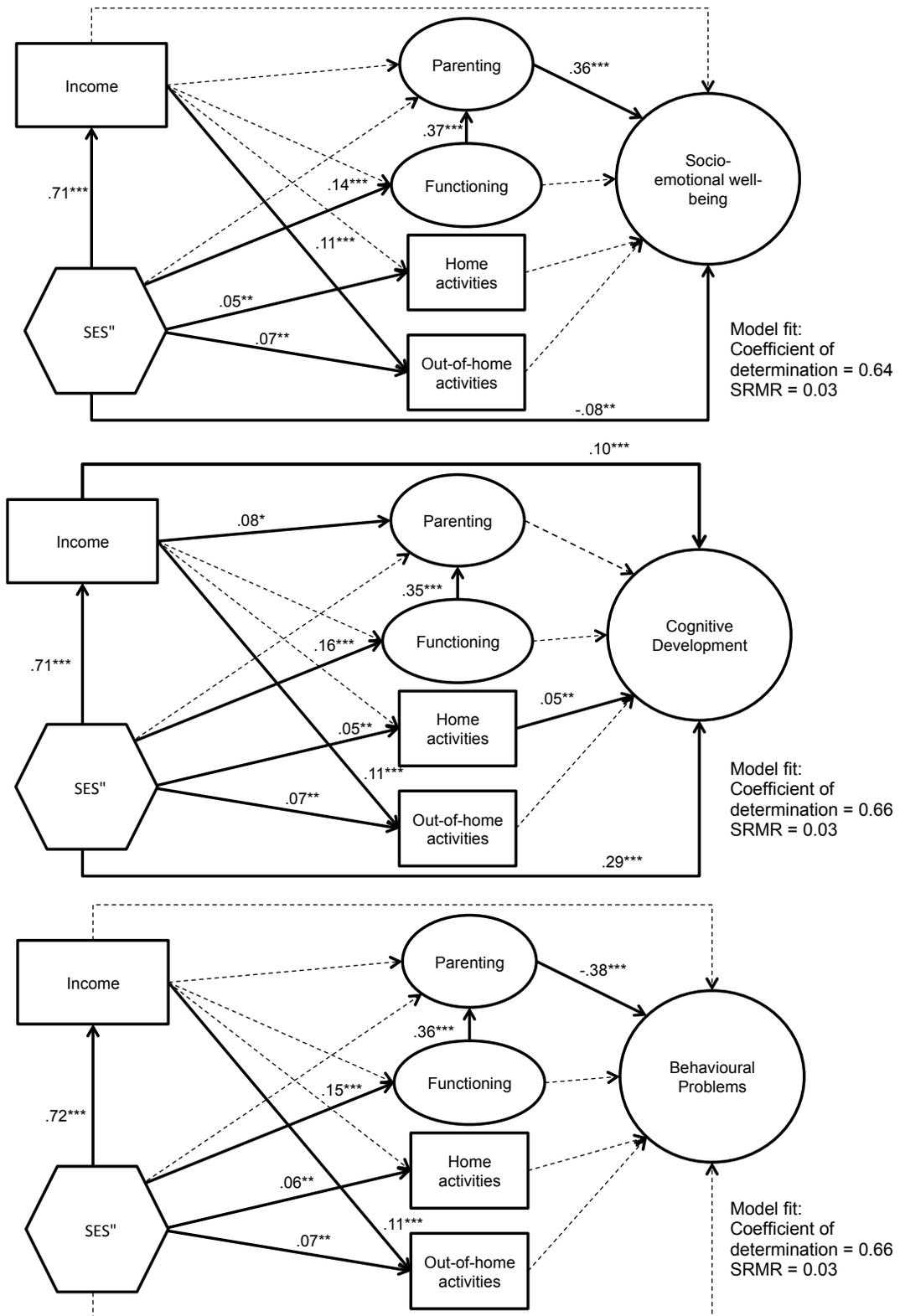
Table 12: Outcome correlations with income and SES

Outcomes	Income			SES		
	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coefficient</i>
Early Childhood						
Socio-Emotional Well-being	0.02	0.03	0.04	0.01	0.00	0.06
Cognitive Development	0.47***	0.05	0.33	0.09***	0.01	0.37
Behavioural problems	-0.07***	0.01	-0.13	-0.02***	0.00	-0.13
Middle Childhood						
Socio-Emotional Well-being	0.49***	0.13	0.18	0.06*	0.03	0.20
Cognitive Development	1.57***	0.31	0.20	0.20**	0.08	0.30
Behavioural problems	-0.27***	0.08	-0.16	-0.04**	0.02	-0.16
Adolescence						
Socio-Emotional Well-being	0.50	0.36	0.07	0.08	0.09	0.06
Cognitive Development	2.50***	0.41	0.24	0.40***	0.11	0.32
Behavioural problems	0.00	0.04	0.00	-0.01	0.01	-0.14

p* < .10; *p* < .05; ****p* < .01

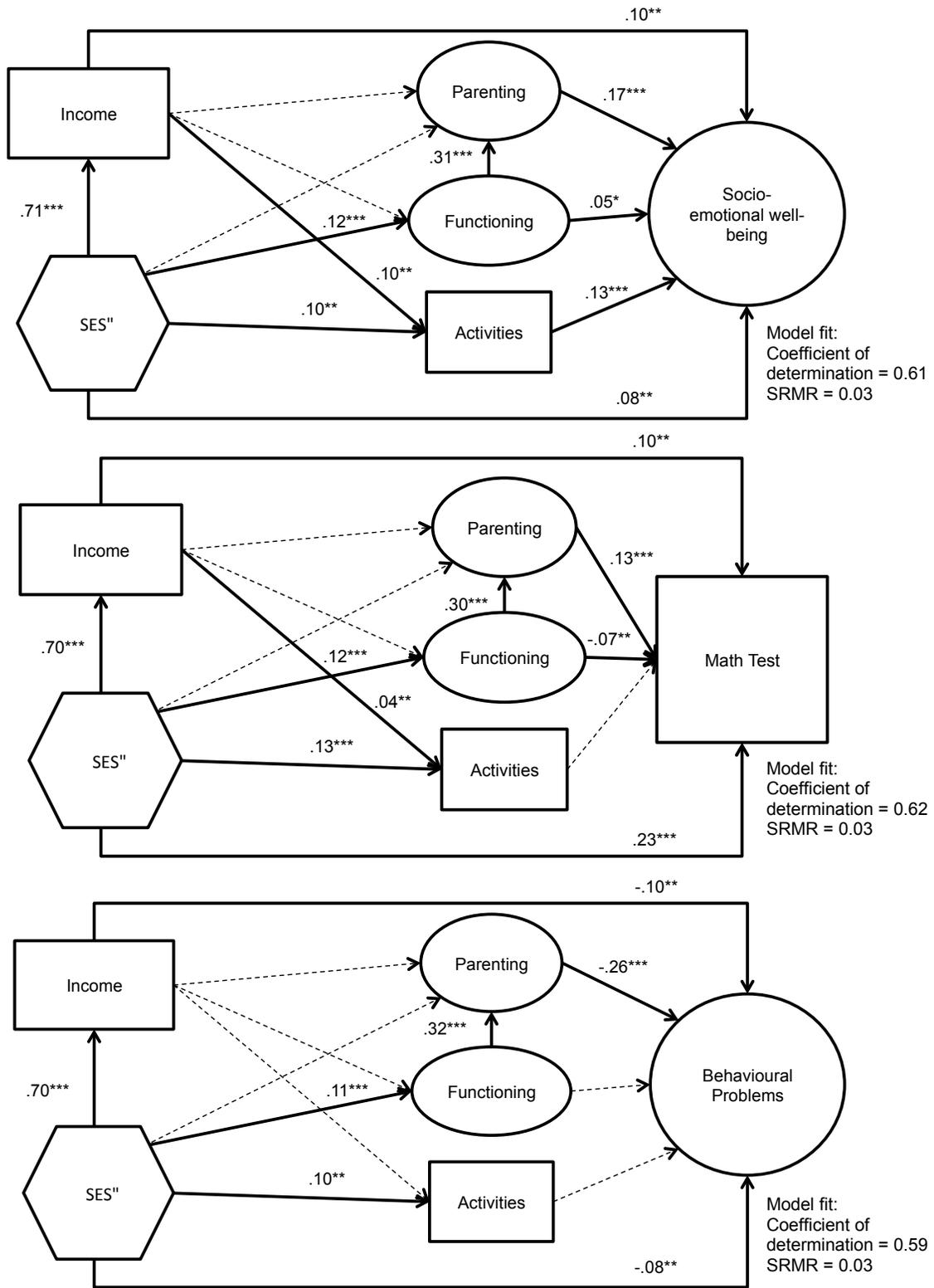
Introducing mediation, I find support for many of the hypothesized relations, with some exceptions and variations across age and outcome domains. First I present the findings by effect and outcome and then give a brief account of age-group specific modeling findings including significant covariate relationships. In the subsequent sections results are discussed for their relation with the prior literature and policy implications. Model results are presented in two formats; Figures 6.1 through 6.3 provide results on schematic diagrams following SEM conventions. The Coefficient of Determination (CD) and Standardized Root Mean Residual (SRMR) are the model fit statistics possible for weighted SEM in Stata (more information on model fit statistics can be found in Appendix A). Appendix C contains tables providing full results of models, including calculated indirect and total effects and tables and control variables.

Figure 13: Early childhood model results



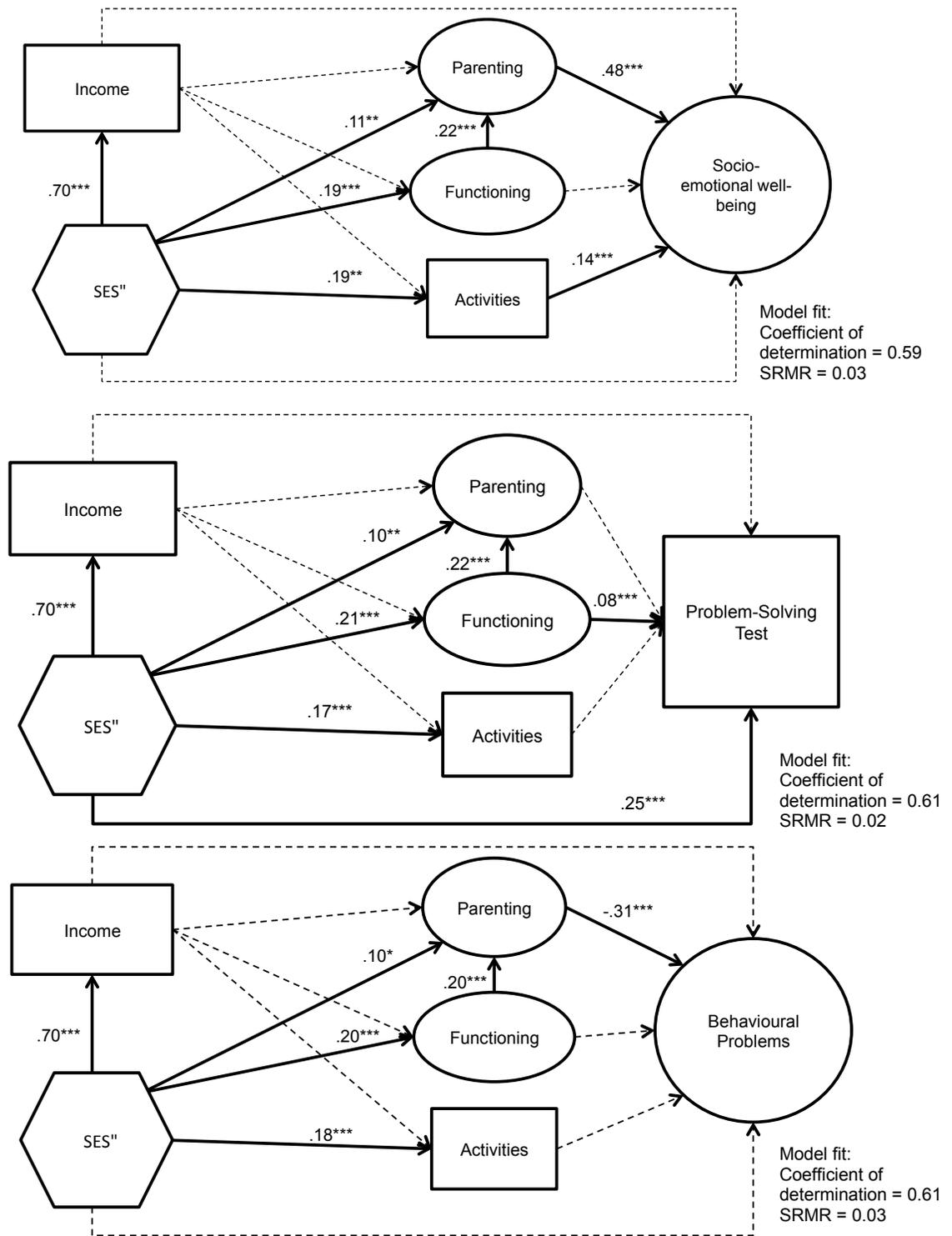
Standardized coefficient with p-value of unstandardized coefficient. *** $p < 0.01$ ** $p < 0.05$ * $p < 0.10$
 Dashed pathways non-statistically significant at $p < 0.10$ level
 Full results, including non-significant coefficients, indirect and total effects, and controls in Appendix C

Figure 14: Middle childhood model results



Standardized coefficient with p-value of unstandardized coefficient. *** p < 0.01 ** p < 0.05 * p < 0.10
 Dashed pathways non-statistically significant at p < 0.10 level
 Full results, including non-significant coefficients, indirect and total effects, and controls in Appendix C

Figure 15: Adolescent model results



Standardized coefficient with p-value of unstandardized coefficient. *** p < 0.01 ** p < 0.05 * p < 0.10
 Dashed pathways non-statistically significant at p < 0.10 level
 Full results, including non-significant coefficients, indirect and total effects, and controls in Appendix C

7.1 Income and SES

As expected, the measure of SES is closely related to household income in all age models, with a standardized coefficient of approximately 0.7, and over 50 percent of variation in income explained by the non-income SES construct as operationalized ($R^2 = .50$, and varies slightly by model sample). Income and SES have different relationships with the mediators and outcomes. The SES measure has a significant total effect in all models and direct effect in six of the nine models. In contrast, income has no statistically significant effect in five out of the nine models, either directly or indirectly. In the models where both income and SES are significant, SES consistently has a larger total effect than income.

Mediation is found to be partial in all of the models as specified; residual direct effects remain. As expected, family functioning, parenting, and child activities tell only part of the story of how income and SES matter to child well-being. The specified mediation pathways explain more of SES's effect than that of income. In the four of the models where income has a statistically significant effect, the majority of effect is direct. Likewise, the residual direct effect of SES in six of nine models, indicates that mediation, as specified, is far from complete. In the three models where both income and SES have only indirect effect, an interpretation of full mediation would be too strong, as the relationship between income and SES and the outcomes is not statistically significant without mediating constructs in the model.

7.2 Parenting

Parenting has the largest effect on outcomes of any variable in all but the three cognitive development outcome models, for which SES has the largest influence on

outcomes. However, much of the parenting construct's variation is independent from income or SES. In no model is income's effect on parenting statistically significant at the $p < .05$ level. Similarly, SES only has a direct effect on parenting in the adolescent age group (notably, when the parenting measures were child-reported). Family functioning was found to mediate the relationship between SES and parenting: higher SES is consistently related to better family functioning (standardized coefficients ranging between 0.11 and 0.20), and better family functioning is consistently related to higher parenting measures (standardized coefficients ranging between 0.20 and 0.37), with both relationships consistently significant at the $p < 0.01$ level. However, family functioning itself only has a small direct effect on cognitive and socio-emotional outcomes in middle childhood, and cognitive outcomes in adolescence. This result suggests that it is particularly the disciplinary and interactive element between parent and individual child that affects outcomes, rather than the overall family environment captured by family functioning.

7.3 Child Activities

In contrast to the consistency of family stress effects, child activities proved to have a less consistent effect on outcomes. In only three of the nine models do child activities have statistically significant relationship with outcomes: participation in activities was associated with both middle childhood and adolescent socio-emotional well-being, and home activities in early childhood were related to cognitive development. In all age groups, child activity participation is higher with measured SES, whereas higher income is only associated with higher participation for early childhood out-of-home activities and middle childhood. This result suggests that cost of activities is less of

a barrier to participation for older children than socio-economic status, potentially indicating parental valuation of participation. The effect of income on participation in middle childhood (at ages 10/11), but not on adolescent participation (ages 14/15), may be a result of persistence of participation from earlier ages, or reflect lower costs for participation in activities for older children, (e.g. low-cost high school extracurricular activities vs. private provision) including fewer requirements for parental involvement.

7.4 Outcomes

A comparison across outcome domains finds a great deal of variation in what affects different child outcomes. However, despite changes in measures, results are relatively stable across the age groups for the same outcome domain. The relative consistency across age groups and cohorts of certain relationships supports the reliability of the results, and suggests that they are not the result of single sample chance variation.

7.4.1 Socio-emotional well-being

Socio-emotional well-being at all ages is most strongly influenced by parenting, with standardized coefficients of total effect 0.17 for middle childhood, 0.36 for early childhood, and 0.48 in adolescence, all significant at the $p < 0.01$ level. Notably, the relationship is strongest when parenting measures are child-reported (adolescence). While low child well-being may have a reverse affect on perception of parenting (poor child well-being either causing, or leading to perception of poor relationship with parent), there is a two-year time-lag between parenting and outcome measures. In middle childhood models, when parenting is parent-reported and well-being child-reported, the relationship is significant and positive. Other than in early-childhood, activities were consistently related to socio-emotional well-being, with standardized coefficients of effect of 0.13 in

middle childhood and 0.14 in adolescence (both significant at the $p < 0.01$ level). Keeping in mind the two-year time lag between activities and outcome measures, participating in activities appears to increase socio-emotional well-being later in childhood. In both early and middle childhood, on average male children had higher socio-emotional well-being than female children, though in all models boys had, on average, lower activity participation.

7.4.2 Cognitive development

The specified mediation models were the least powerful in explaining variation in cognitive development outcomes. For all three age groups, socio-economic status has the largest effect of any measure in the cognitive outcomes models. The standardized coefficients of direct effect were 0.29 in early childhood, 0.23 in middle childhood, and 0.25 in adolescence (significant at the $p < 0.01$ level). Income has a much smaller direct effect on early childhood and middle childhood (but not adolescent) cognitive outcomes, with a standardized coefficient of 0.10 (significant at the $p < 0.05$ level). The activity mediator measures are only weakly related to cognitive outcomes: only for the youngest children's home-activities score, which specifically captures activities closely related to cognition, including literacy and motor skills. Parenting only has a relationship with cognitive outcomes for the middle age group, with standardized coefficient of 0.13 (significant at the $p < 0.01$ level). While family functioning has an unanticipated small negative direct effect on middle childhood math tests, it has a small positive direct effect on adolescent cognitive outcomes. The family functioning construct measures family closeness, communication and trust, making the interpretation of how it might affect math scores somewhat ambiguous.

7.4.3 Behavioural problems

Behavioural problems are the outcome least influenced by SES and income in the models specified. Higher income is only associated with slightly fewer behavioural problems in middle childhood, with a standardized coefficient of -0.10. SES's effect on behaviour is slight and indirect in early childhood and adolescence, via family functioning and parenting. Parenting is strongly and consistently associated with behavioural outcomes, with standardized coefficients of -0.38 in early childhood, -0.26 in middle childhood, and -0.31 in adolescence (all significant at the $p < 0.01$ level). Particularly for this outcome, there is reason to suspect a non-recursive relationship may exist between the behaviour and parenting measures: parenting practices may be affected by child behaviour. The two-year time lag between the parenting measure and behaviour measure does specify a temporal ordering to this relationship, though prior and persisting behavioural issues could have caused worse parenting practices. In the middle childhood model the parenting is parent-reported, whereas the behavioural problems are child-reported, which reduces the possibility of reporting being responsible for the association. Neither family functioning nor child activity measures have a statistically significant relationship with behavioural problems in any of the age groups.

7.5 Early childhood results

In the youngest age group, income and SES have relatively weak relationships with outcomes other than cognitive development. This is a somewhat surprising finding, given the general research consensus that income and poverty matter more in earlier childhood (G. J. Duncan & Brooks-Gunn, 1997; G. J. Duncan et al., 2010). Income has

no significant direct or indirect effects (via mediation) on early socio-emotional or behavioural outcomes. SES has a minor indirect effect on these outcomes via family functioning, and in turn parenting. SES also has a small indirect negative effect (-.08, significant at the $p < 0.05$ level) on socio-emotional outcomes. This unexpected negative effect might be explained as an indication of an unmeasured underperformance or shock to a family: higher SES without a corresponding higher income, could indicate an illness, family breakdown, or unemployment—all of which would be expected to negatively affect child outcomes, although this pattern does not appear in other age groups. As discussed above, for early childhood cognitive outcomes, mediation pathways explained very little of the relatively large effect of SES on outcomes (standardized direct effect coefficient 0.29, significant at the $p < 0.01$ level)

The covariates in the early childhood models give further context to what influences early outcomes. On average, boys have significantly lower socio-emotional well-being and cognitive development, as well as more behavioural problems. Boys also have, on average, lower home and out-of-home activities scores and worse reported parenting practices. Lone parent families, allophone children (mother tongue not English or French), and older mothers on average have lower family functioning scores in early childhood, whereas children in rural areas have higher family functioning and higher home activities scores. Children of lone parents have worse behavioural outcomes. Francophone children have higher parenting scores. Having more siblings is related to lower cognitive development scores, and higher behavioural problems.

7.6 Middle childhood results

The middle childhood modeling results indicate a bigger role for income and SES in determining outcomes than in the early childhood models. Income's direct effect is fairly consistent across outcomes, with a standard deviation increase in income measure associated with a 0.10 standard deviation improvement in each outcome measure, significant at the $p < 0.05$ level. However income's only indirect/mediated effect during middle childhood is a very minor effect on socio-emotional well-being via activity participation.

Unlike income, SES has both direct and indirect effects in all middle-childhood outcome models. In the socio-emotional well-being model all three mediating factors are significantly associated with SES and outcome, with parenting the largest effect followed by activity participation. For cognitive development, as in other age groups, the mediation is small, with SES's direct effect sizable and significant (standard coefficient 0.23). Parenting also had an effect on cognitive outcomes at this age, but the effect is smaller than on other outcomes. As with other age groups, parenting has the largest association with behavioural problems, though income and SES retain small direct effects on this outcome. The SES measure also retains a significant direct effect in all three middle-childhood outcomes models.

Again the covariates in the middle-childhood models give a further picture of what affects child outcomes. The model results indicate that on average, boys have higher socio-emotional well-being, higher cognitive development, and more behavioural problems than girls. Boys have lower participation in activities than girls. Allophone children (neither French nor English as a first language) have higher well-being and

cognitive development than their anglophone or francophone peers. Both francophones and allophones have, on average, slightly lower participation than anglophones. In this age group, unlike in early childhood, having more siblings is associated with higher cognitive development.

7.7 Adolescence

For the oldest children, income and SES's effects are relatively small and for both socio-emotional and behavioural outcomes are fully indirect. For both of these outcomes, parenting has the largest association, standardized coefficient of 0.48 for socio-emotional well-being, and -0.31 for behavioural problems (significant at the $p < 0.01$ level). This result resonates with research by Burton and Phipps (2008), also using the NLSCY, that found that relationships with adults, rather than peer relations, income, or relative socio-economic position were the most important correlates of teenagers' happiness.

In fact, for the behavioural problems, parenting has the only significant effect in the model. In contrast, for adolescent cognitive development, SES retains a large direct effect, with standardized coefficient of 0.25 (significant at the $p < 0.01$ level), and a small indirect effect through an association between family functioning and the cognitive outcome. In this model, income has no significant effect on adolescent cognitive outcomes.

Analysis of covariates in adolescent models revealed that, on average, boys have more behavioural problems and children of older mothers have less behavioural problems. Allophone children and children with older mothers have, on average, higher cognitive test scores. Older children in the sample (measured in months) reported worse

parenting practices. As in all other age groups, on average, boys had lower activity participation than girls.

8 Discussion

8.1 Relationship with prior research

The modeling results both support and contrast with findings of previous research regarding the socio-economic determinants of child outcomes. The analysis here supports the consensus that household socio-economic position is related to child outcomes. I find smaller association than has been reported in other research. There are important differences between this analysis and prior research, including data, operationalization, and method. Two explanations for the difference merit consideration: national context and sample.

The first is national variation, with much of the prior research coming from the United States and United Kingdom. National specificity of results is not usually discussed, in favor of viewing the relationships modeled as a universal phenomenon of child development. However, the nature of these relationships is in part a product of environmental factors not included in the analysis that may be universal for the sample. Canada has a lower level of earnings inequality than either the US or the UK and higher average education (OECD, 2008), making the SES and income distributions tighter than in comparator countries: the distance in education and earnings between a fast-food worker and a registered nurse are likely less in Canada than in the US. The provision and quality of many social services are also more equal in Canada (universal health care and more uniform public school funding arrangements). We know intergenerational mobility

is higher in Canada than either of these countries (Corak et al., 2011). Thus the finding of lower association within this analysis serves as reminder of the limitations of extrapolating international research to multiple national contexts.

The NLSCY is a nationally representative sample, whereas much of the prior research has used US data that disproportionately samples low-income households, or analyses a 'poverty sample' subset to look at child development in poorer sub-populations. In addition, as the analysis of sample descriptive statistics (appendix B) shows, our model samples are likely somewhat more privileged than the overall population²⁴. One would not expect to find the same degree of association in the full representative population data used here, though both have merits for understanding the effect of family economic situation on development. The important distinction is that while prior studies show the effects of *poverty* on child outcomes, the analysis here is of the effect of income and socioeconomic status across full range within the population.

The stronger effects of the SES measure on child outcomes in these models, as compared to income, resonates with the findings of research attempting to isolate income from non-income effects on child development, which finds small income effects (Blau, 1999; Dooley & Stewart, 2007; Mayer, 1997). Much of income's association with outcomes is a result of being an indicator for other socio-economic factors, rather than a causal effect. Here we see these effects disentangled, with income a less influential factor. While SES and income often implicitly assumed to be interchangeable in many interpretations of research using one measure or the other, this level of association shows non-income elements of SES to be a distinct factor from the cash flow indicated by

²⁴ Multi-group analysis using a low-income subset of the NLSCY could be used to make a clearer comparison, though this is not done here as sample size becomes an issue, causing unreliable estimates.

income measures. Beyond the household measure of SES, household income also depends on number of household earners (i.e. single or dual-parent family), labour supply (i.e. hours of employment), geographic location, earner age, and government benefits, among other factors. In the models analyzed here, family composition, province, and mothers' age are included as covariates, in effect holding these influences independent from income or SES effects.

The results lend moderate support to the child investment and family stress theories of mediation. Mediating constructs did have consistent associations with outcomes, but the associations between mediators and income or SES were weaker than one would expect for a strong mediation path. Compared to direct effects, indirect effects through these pathways were small. For instance, while parenting had a significant effect on the majority of outcomes, at all ages, only a degree of its variation was explained by the model (e.g. $R^2=.14$ in the middle childhood socio-emotional model). The role of family functioning mediating the relationship between SES and parenting is an important finding, as it indicates a distinction between family relations and the parent-child relationship. While on average parenting practices are better with higher family functioning (which tends to be higher with higher SES), parenting is not a direct function of SES, and thus is potentially more mutable than factors determined by SES. Parents may be able to moderate the disadvantage of low SES, or low family functioning through better parenting practices.

The limited operationalization of the child investment theory necessitates limiting interpretation to child activities only, not other expenditures. Child participation in activities affects socio-emotional well-being in middle childhood and adolescence.

Participation is associated with higher SES, as well as income in middle childhood. This finding is in contrast with prior research that tends to find investment has stronger effects on cognitive outcomes than social or behavioural ones (Gershoff et al., 2007; Yeung et al., 2002). However, operationalization and age is clearly the differentiating factor, with most prior research only looking at early development and having much broader measures of investment (such as the HOME scale of home environment). The significance of SES, rather than income to activities, suggests investment choices are determined by more than cost constraints.

The comparison across age groups is one of the key contributions of this study. I find that while SES and income effects are weakest in the oldest age group, there are strong effects past early childhood into the school years. Prior research's emphasis on early childhood may have neglected the importance of income and SES throughout childhood.

The comparison across outcome domains supports prior research findings that income and SES are most strongly associated with cognitive development, with smaller effects on socio-emotional and behavioural outcomes. Cognitive outcomes are affected more by SES than income, which indicates the effect may not be explained as much by the financial position of the family, as it is by social status, expectations, or even genetic transmission. Unfortunately the mediation pathways specified in this model shed no greater light on how SES and income affect cognitive outcomes. Research on parental expectations and aspirations suggest a potential mediation pathway for SES's residual direct effect (Davis-Kean, 2005).

8.2 Implications for Policy

A key policy implication of this paper stems from the finding that SES position, independent from income, has a larger effect than income on child outcomes at all ages both directly and indirectly. While SES's effect has been discussed as independent of income's effect, if income is interpreted as a mediating factor of SES (income's effect is partially an indirect effect of SES), then the importance of SES to child outcomes increases further. The disadvantage of growing up in a lower income household is found to be a result of some of the key causes of low income—less education and lower occupational class—rather than the income level itself. This poses a difficulty for policy interventions to improve child outcomes as SES is much less malleable by policy than income: while child benefits can efficiently increase family income overnight, policy to improve parents education level or occupational class is less efficient. Because the operationalization of SES here is heavily determined by the rank position of parents occupation class (see Appendix B), the effect of SES on child outcomes may also be reduced by increasing equality among different socio-economic positions: the linear effect of SES and child outcomes may be weakened if there was less distance between socioeconomic positions. Pursuing policy to increase societal equality could have an equalizing effect on child outcomes.

The results of modeling mediation pathways of SES's effect on outcomes provide some guidance on policy levers that can affect child outcomes potentially more readily, or in addition to changes to income or SES. Parenting has a strong and consistent relationship with outcomes, but is not directly affected by SES or income. Therefore it may be open to interventions to improve parenting practices as a means to improve child

outcomes. Children's participation in activities was also found to have a significant effect on middle childhood and adolescent socio-emotional well-being. Policies to increase participation (for instance through funding or increased availability) offer another route to mitigate the effect of low-income and SES. Tax incentives (income transfers) such as the Canadian Children's Fitness and Arts Tax Credit may not be enough to increase participation, as SES's association with participation is equal to that of income in middle childhood, and income has no effect on participation in adolescence. Finding policies that increase the participation of children from all backgrounds is an evidence-based path forward to improving child socio-emotional well-being.

A repeated debate in social policy is between targeted and universal programs. The current analysis using a sample representative of the full population does not provide evidence to direct targeting based on income level. However, it does identify the potential for age-based policy targeting. Looking at different age groups revealed different patterns of effects on outcomes; a one-age-fits all child policy, such as the current National Child Benefit is unlikely to be best. Findings from research focused on one age group of children cannot necessarily be applied to other age groups. In addition the finding of gender effects in most models suggest policy-makers must consider gender in policy and program design.

A less immediate policy implication is the demonstration of the importance of using multiple measures of child well-being and development when considering policy instruments, design and evaluations. Not all influencing factors can be expected to affect all types of child outcomes. Had this research only looked at cognitive outcomes, child participation in activities would not have appeared significant to 'child outcomes'. Policy

instruments must align with their aims, which means using evidence specific to the outcome the policy attempts to influence. The models here cover only three domains of child well-being, and with a particular operationalization based on data availability. Attention to this specification must be taken when translating research to action.

There is an important caveat to the policy implications of the minor role observed for income in the models analyzed. The paper models do not examine what might be termed *basic* child outcomes such as lack of hunger, safety from neglect or abuse, or child health. Nor is the analysis using a sample of children living in poverty. Prior research gives good reason to believe that income may matter more for those at the bottom of the income distribution, or that looking at different outcomes would have revealed stronger associations with income and SES. A broader consideration of the research on *multiple* child outcomes, and the effects of poverty status (not only income), must be considered for implications for policy to address child poverty specifically.

Mayer's simple logic on this merits quoting:

The fact that increases in parental income cannot be expected to improve any one outcome greatly does not mean that if we *reduce* cash or noncash transfers children will not suffer as a result. (Mayer, 1997, 152)

The implication of this paper for family income policy is that increased income is not enough to reduce disadvantage, not that income does not matter to child well-being or development. The evidence indicates that a reduction in child poverty through higher incomes alone would be unlikely to result in a significant improvement in child socio-emotional well-being, cognitive development, or behavioural outcomes, as measured in this study.

8.3 Limitations & future research directions

As with any statistical analysis using secondary data, the model and interpretation is limited by the data and analytic techniques. While using SEM and longitudinal data has served to increase the validity and reliability of the estimates, the data used are observational. Additionally, given that the models are not exhaustive in their inclusion of factors theorized to effect child outcomes, no claim of causality can be made. The models' results give income effects due to variations in observed income, independent from SES, and other control variables, which is not necessarily the same as income variation due to policy intervention. Policy experiments would be needed to explore such effects. As the models do not include measures of parental hours of employment or wage, we cannot tell if income's effect is being confounded by the effects of employment on parental time. This interaction merits future analysis.

Key questions for identifying the limitations of the analysis are 'what's missing?' or 'what are alternative explanations?' The models specified explain only a portion of the variation in child outcomes. Some of the key exclusions that are notable based on other research identifying their effect include: household labour supply/employment and related parent time availability for children, neighbourhood or school effects, major events in childhood including family composition change (divorce/re-marriage), trauma, and income changes/poverty spells. Although I do not examine family composition change, I do include both lone and two-parent families in my analysis, with a control for lone-parent status²⁵. Lone parents would be expected to have lower incomes, and less time available for child interaction than their two-parent households, with this second

²⁵ Unfortunately sample size would make multi-group analysis of lone parent vs. two-parent households unreliable.

factor potentially effecting parenting and family functioning, as well as outcomes directly. The coefficients of the lone parent dummy in the mediation models (reported in Appendix C) show lone parenthood to have few effects significant at the $p < 0.05$ level. The only significant negative effect on a child outcome in the fitted models is for the measure of early childhood behaviour, with an effect size equal to the positive effect of a standard deviation higher socio-economic status. Lone parenthood has a small but significant negative effect on family functioning in both early and middle childhood, as well as very small effects on home activities in early childhood. The lone parenthood control has no statistically significant effects in the adolescent models.

Parenting and family functioning capture much, but not all of the family stress theory, which also includes strained relationships between parents, financial worry, and parental depression. Better measures of child investment, such as expenditure on children, detailed information about types (and costs) of activities as well as parent time spent with child, would have also improved model specification.

Future research could work to address some of the questions raised by the analysis, and give more specific guidance for policy application. A more extensive analysis of the determinants of parenting practices would help guide a discussion of how parenting might be improved as a means to improve child outcomes. For cognitive development, the mediation pathways specified in the models tested do not provide a full picture of how SES and income matter. An analysis of which types of child activities (e.g. sports, lessons, arts, team or individual) are most closely associated with higher outcomes could help inform policy designed to use activities as a lever to improve outcomes. The finding that effects varied by outcome measured suggests expanding the

analysis to more well-being or developmental domains which could reveal different effect structures. Lastly, future research that places policy within the model, or experiments with policy interventions are the best way to ascertain how policy might improve child outcomes. Related to this, comparative work to ascertain the role of national or provincial context would contribute to more considered use of extrapolating from international data to local policies.

9 Conclusion

Being raised in a family with low income or socio-economic status, has long been appreciated as a marker of disadvantage for a child. *How* family background and household conditions affect a child's well-being is a multifaceted, complex, and less well-understood process. Despite the inherent complexity, untangling this process is crucial to designing effective and efficient interventions to equalize the life chances of children born into different circumstances, an increasingly important social policy objective. The analysis in this paper contributes to such an understanding with models distinguishing between the effects of socio-economic status and income on three measures of child well-being (socio-emotional, cognitive and behavioural) at three points during childhood, and examining family stress and family investment as mediating pathways of economic conditions effects.

In line with prior research, the results indicate that non-income elements of SES, which are relatively fixed characteristics of a child's family circumstance, have a stronger effect on child outcomes than household income. This finding presents challenges for thinking about how interventions can best improve child outcomes, given that income's minor and indirect effects make it a poor choice for intervention approach, despite it

being politically popular and easy to administer. Tackling the disadvantages facing children in low-SES, low-income household will require addressing the key causes of low income and overall inequality, and—perhaps more likely—finding ways to mitigate the effects of low SES. Here the mediation analysis of *how* economic position has its effects offers some guidance. I find that parenting practices and children's participation in activities outside home mediate SES's effect, particularly on socio-emotional and behavioural outcomes. Interventions to improve parenting and children's participation in activities may offer alternatives to moderate the negative effects of growing up in low-income or low SES families.

Appendix A: Structural Equation Modeling Methodology

A.1 Introduction

This paper uses a Structural Equation Modeling (SEM) methodology to fit mediation models of income and socio-economic status's effect on child outcomes. SEM is a general term that encompasses a broad range of statistical methods for empirically investigating theorized models of structured relations among variables or constructs. The type of SEM used for this paper is the most common: modeling structured relations of continuous latent variables in a recursive model. This method of SEM has been described as “a melding of factor analysis and path analysis into one comprehensive statistical methodology” (Kaplan, 2009). SEM is a natural choice for testing theories of mediated relationships. It allows for explicitly specifying complex pathways of effect among multiple mediation variables as well as specification of variables via multiple observed indicators. A SEM technique is superior to traditional regression-based stepwise approaches to mediation analysis (most influentially set out in (Baron & Kenny, 1986)), in terms of efficiency of estimates particularly for analyzing multiple mediation pathways (Iacobucci, 2008; Iacobucci, Saldanha, & Deng, 2007). The theoretical and statistical superiority of the SEM approach is due to simultaneous estimation of a single model conditional on all variables and parameters rather than estimating a series of equations with different subsets of variables (with potential missing variable bias) and inferring mediation (Iacobucci, 2008; Iacobucci et al., 2007).

All SEM models specified in this paper contain both a measurement component, based on Confirmatory Factor Analysis technique, and a path analysis structure, also known as simultaneous equation modeling or structured regression. A specified SEM

model gives an implied structure of the covariance of the measures in the model. Given this specified structure, the model parameters are fitted and evaluated against observed data using maximum likelihood estimation. While SEM shares traits with simultaneous equations or structured regression of econometrics, the use of latent variables introduces key differences in assumptions and constraints that are essential to interpretation.

The intent of this methodological appendix is to explain the estimation of model parameters, discuss assumptions of the models and technique, as well as help readers unfamiliar with SEM conventions interpret the terminology and path-analysis diagrams used in the main body of the paper. I begin with an explanation of the intuition and specification of measurement via latent variables and then define the specification of the full SEM model (which includes the underlying measurement model). The maximum likelihood function used to fit the model from the observed survey data is presented and explained. I then describe the computation of direct, indirect, and total effects as well as errors on parameter estimates. Lastly I discuss some of the key assumptions and limitations of method. Throughout this Appendix I use the model of socio-emotional well-being in middle-childhood, one of the nine models fitted the paper, as an example. The analysis for the paper was conducted in Stata version 13, using the "sem" command structure and maximum-likelihood (ML) estimation, with longitudinal funnel weights and robust standard errors. The method described in this appendix corresponds with this statistical software package, and notation follows the Stata SEM manual (StataCorp, 2013).

A.2 Measurement model: Latent variables

A key advantage of SEM is the incorporation of a measurement model within the structural modeling using latent variables. This element both increases measurement validity and helps isolate measurement error. Latent variables are unobserved constructs measured via multiple observed 'indicator' variables (also termed 'manifest' variables) that are theorized to be manifestations of the underlying latent construct. While many variables such as sex, age, and income can be measured with high validity using individual questions, many of variables of interest are not directly observable, such as socio-emotional well-being or effective parenting. Valid measurement of these latent constructs requires multiple observed indicators. Latent variables are used for both outcome constructs and explanatory influences in this paper.

Any measure of a construct has three sources of variation: true variance (variance of the intended construct), method variance due to the measurement instrument, and random noise (Little, 2013). Creating a latent variable through Confirmatory Factor Analysis (CFA) technique brings together the shared variance of multiple observed indicators with the residual individual indicator's variation left in an error term for each indicator, as termed a 'disturbance'. This method does not completely eliminate non-construct variance in latent variables (if any variation is shared among all indicators—including measurement bias—the latent variable will be estimated including it) (Little, 2013; Matsunaga, 2008). However, it is a less biased approach than the aggregation of multiple indicators via scores or averages, which reduces random noise but does not allow for alternate sources of individual variable variation, or the use of a single variable, which assumes perfect measurement.

By specifying latent variables within a SEM model, elements of measurement error are differentiated from effects of omitted variables. Whereas in a structured regression/path analysis there is one error term for each equation estimating a dependent variable, in a SEM model this error is differentiated into multiple error terms at the level of the measurement of the construct as well as a ‘disturbance’ factor of unexplained sources of variation in variables to be explained within the model, known as ‘endogenous variables’ variables in SEM terminology. This explicit modeling of measurement error serves to reduce bias in estimating structural parameters (Kaplan, 2009).

In the interests of parsimony, I use parceling which brings together multiple variables prior to factor analysis, in this case resulting in three to four indicator variables per latent variable. Parceling practice is common, though disputed, throughout the SEM literature (Little, Cunningham, Shahar, & Widaman, 2002; Matsunaga, 2008). Parceling is appropriate in this context as the primary purpose of the study is not measurement validation, and the unidimensionality of items parcelled, a key precondition for their parceling, is a fair assumption (Little et al., 2002). My latent variables are conceptualized as having multiple underlying dimensions, and the parceling is conducted along these unitary dimensions (Little et al., 2002). Derived scale variables for psychometric scales available in the NLSCY such as “emotional/anxiety disorder” are used where possible, as these scores are based on prior research empirically confirming scale unidimensionality. In other cases, multiple questions with the same metric are ‘parcelled’ via equal-weighted averaging prior to inclusion in the modeling. Aside from parsimony, parceling together items enhances communality across indicators, reduces random noise, better prepares the

data for modeling which assumes normal distributions, and increases model stability (Matsunaga, 2008).

An example of latent variable measurement in the models is the specification that socio-emotional well-being in middle childhood is indicated by four indicator variables: Emotional Disorder/Anxiety (a reverse-coded score on a seven item scale), self-esteem (a score for a four item scale), emotional intelligence (a score on a 15 item scale), and subjective happiness (a parceling of two questions). Parceling efficiently reduces 28 observed variables (questions) to a manageable four indicators, and through CFA, a single latent variable.

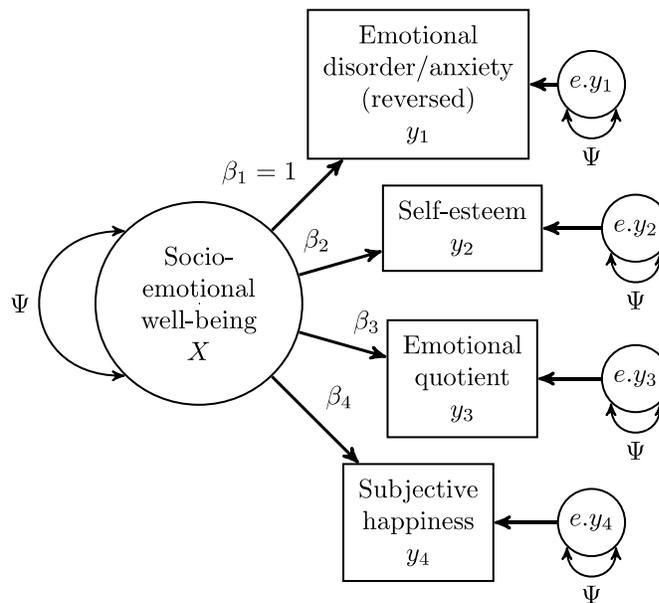
The system of equations for a measurement model for a latent variable X , with four indicator variables (y_1, y_2, y_3, y_4) is:

$$\begin{aligned}y_1 &= a_1 + X\beta_1 + e.y_1 \\y_2 &= a_2 + X\beta_2 + e.y_2 \\y_3 &= a_3 + X\beta_3 + e.y_3 \\y_4 &= a_4 + X\beta_4 + e.y_4\end{aligned}$$

Where $X, y_1, y_2, y_3, y_4, e.y_1, e.y_2, e.y_3, e.y_4$ are random variables assumed to be independent and identically distributed, with mean vector μ and covariance matrix Σ . Where β_i is the factor loading for the i th indicator variable, a_i is the intercept for indicator y_i , and $e.y_i$ the disturbance/error term, which captures the variance of y_i (an individual indicator) unexplained by the latent X (i.e. variation not shared with the other indicator variables, due to true variation, measurement variation or randomness). The μ and Σ are estimated, just as are the factor loads and intercepts. There are a number of constraints on μ and Σ specified to estimate the parameters in the measurement model of a latent variable using observed data. The first is constraining the covariance among disturbance

terms to zero. In essence, this constraint asserts that all positive correlation among the indicators is explained by the latent variable.²⁶ We also constrain one of the $\beta_i = 1$ in order to provide the latent variable with a scale, necessary for estimating mean and variance. Following CFA convention, I fix the beta coefficient of the variable with the highest factor loading. Estimation of the parameters in the measurement model is conducted with maximum likelihood estimation within the full SEM model including structural parameters, as explained in the following section. There is no error term on a latent variable at the CFA stage; all error is held at the level of the individual indicators, with the latent variable fully explained by the shared variance of specified indicator/manifest variables.

Figure A.1: SEM diagram of measurement model



²⁶ It is possible to allow for co-variation amongst pairs of indicator error terms, if for instance there is a theory-driven reason to believe there is a shared covariation between indicators that is not driven by the latent construct, for instance a shared and distinct data collection mechanism. However, no such specifications are made in this analysis because there is no theoretical justification.

Figure A.1 depicts the measurement model for socio-emotional well-being in middle childhood using a conventional SEM diagram. Latent variables are depicted with a circle or oval while observed variables, in this case the indicators, are depicted with rectangular boxes. Error terms are latent as they are unobserved random variables. The latent variable is specified as the *cause* of the majority of the variance in the indicator variables. In a sense the latent variable is the independent variable, not a dependent variable of the indicators: arrows originate from the latent variable, the indicator variables are endogenous to the model.

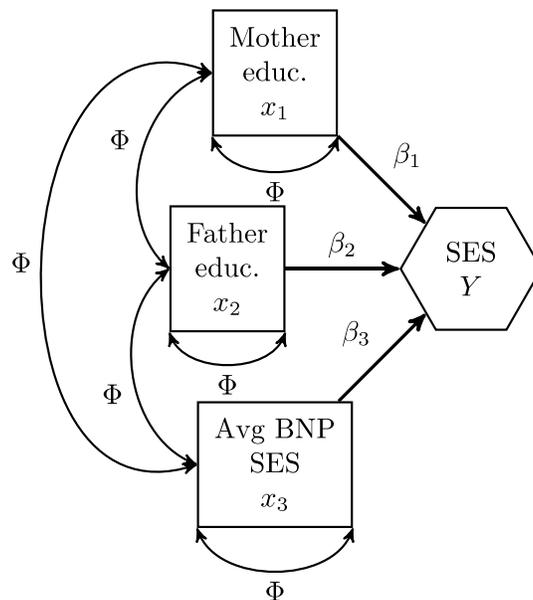
Latent variables may be ‘endogenous’ or ‘exogenous’ (not explained by other variables in the model) depending on their position within the structural model. The models in this paper use latent variables for both endogenous and exogenous measures (SES, mediating constructs, and outcomes). The lack of a pathway drawn between variables signifies a specification of zero covariance among the terms: there are no pathways drawn between error terms, which is equivalent to having pathways fixed to zero: error terms are assumed to be independent. A curved double-headed arrow signifies free variance when pointing to a single variable, and free covariance when pointed to two variables. Within a full SEM model the measurement component of the latent variables is often omitted from the path diagram for visual simplicity, but the existence of measurement is denoted by the oval depiction of a latent variable.

The specification of socio-economic status (SES) across the models is a special case of a latent variable: a composite measure. A composite specification asserts that the indicator variables perfectly determine the composite (Bollen & Bauldry, 2011). The multiple observed variables used to measure SES are not specified as indicators caused by

an underlying latent variable, rather they define the full variance of SES. This specification fits with our theorization of SES: occupation and education determines SES, rather than the reverse. Under this specification, the indicators are exogenous and the composite variable SES is endogenous. Unlike our standard latent variables, the error terms of the indicators are free to co-vary, and there is no disturbance term on the SES composite.

Figure 2 gives the SEM diagram for measurement of SES in our models. Composite measures are depicted as a hexagon in standard SEM path diagrams. Here SES is specified as fully determined by three indicators: mother’s educational level, father’s educational level, and the average Boyd-Nam Powers SES score for the household (see variable descriptions for more detail). SES is linear combination of the indicator variables, where coefficients are best understood as weights, though estimated in the same fashion as coefficients (Bollen & Bauldry, 2011).

Figure A.2: Composite measure of Socio-economic status (SES)



A.3 Specification of full SEM model

A full SEM model contains both measurement specifications (as described above) and structural specifications of the theorized relationships among latent variables, observed variables, and disturbance/error terms. Table A.1 gives the six types of variables within a SEM model, along with the symbol notation used in the equations that follow.

Table A.1: Classification of variables within SEM models

Type of variable	Shape on path diagram	Specification in model	Symbol
Observed	Rectangle	endogenous	y
		exogenous	x
Latent	Oval/circle (hexagon for composite)	endogenous	η
		exogenous	ξ
Disturbance/Error	Circle	on an observed variable	$e.y$
		on a latent variable	$e.\eta$

To simplify notation for model equations, we group the variables into endogenous, exogenous, and error variables:

$$\mathbf{Y} = \begin{pmatrix} \mathbf{y} \\ \boldsymbol{\eta} \end{pmatrix}, \quad \mathbf{X} = \begin{pmatrix} \mathbf{x} \\ \boldsymbol{\xi} \end{pmatrix}, \quad \text{and} \quad \boldsymbol{\zeta} = \begin{pmatrix} e.y \\ e.\eta \end{pmatrix} \quad (1)$$

The model to be fit has the form

$$\mathbf{Y} = \mathbf{B}\mathbf{Y} + \boldsymbol{\Gamma}\mathbf{X} + \boldsymbol{\alpha} + \boldsymbol{\zeta} \quad (2)$$

where we have introduced two matrices of model parameters \mathbf{B} and $\boldsymbol{\Gamma}$ and a vector of model parameters $\boldsymbol{\alpha}$. \mathbf{B} are coefficients that relate the endogenous variables to each other; we set the diagonal elements to 0, i.e. the variables do not cause themselves. $\boldsymbol{\Gamma}$ are the

coefficients of the effect of exogenous variables on endogenous variables. α are the intercepts of the endogenous variables. We assume $E(\zeta) = 0$ and $\text{Cov}(X, \zeta) = 0$, i.e. the errors are unbiased and uncorrelated to the exogenous variables.

Because the values of exogenous and error variables are (by definition) not explained within the model, we label their distribution properties as additional model parameters:

$$\kappa = E(X) \quad \Phi = \text{Var}(X) \quad \Psi = \text{Var}(\zeta) \quad (3)$$

Variances and co-variances of the errors terms (Ψ) are non-zero only on the diagonal (i.e. the covariances are zero). The variance matrices are symmetric, so if Φ is an $n \times n$ matrix, it only represents $n(n + 1)/2$ distinct parameters.

We have defined all the model parameters, which we call θ ,

$$\theta = \{ B, \Gamma, \Psi, \Phi, \alpha, \kappa \} \quad (4)$$

The mean and covariance of the endogenous variables can be determined in terms of the model parameters from Eq. (2):

$$\mu_Y = E(Y) = (I - B)^{-1}(\Gamma\kappa + \alpha) \quad (5)$$

$$\Sigma_{YY} = \text{Var}(Y) = (I - B)^{-1}(\Gamma\Phi\Gamma' + \Psi)\{(I - B)^{-1}\}' \quad (6)$$

$$\Sigma_{YX} = \text{Cov}(Y, X) = (I - B)^{-1}(\Gamma\Phi) \quad (7)$$

The specification of a theorized model involves defining the random variables of each type and the theorized causal structure between the variables by specifying which coefficients in B and Γ are allowed to be non-zero. The standard way to organize and visualize the model definition in SEM is through a path diagram; the full path diagram for a simplified version of the middle childhood socio-emotional well-being model is displayed in Figure 3.

The random variables are represented by ovals, rectangles, and circles for latent, observables, and error variables, respectively. The non-zero matrix coefficients are represented by straight arrows from an exogenous or endogenous variable to endogenous variables (from the model equation (2), we see that there cannot be any straight arrows to exogenous variables). All endogenous variables also have a straight arrow to them from an associated disturbance variable, which represents all sources of variation in the endogenous variable not explained within the model. Curved double-headed arrows indicate variances that need to be estimated. All error variables have such arrows pointing to themselves. Exogenous variables also have curved arrows, in some cases among them if we do not assume them to be independent. Following path diagram conventions, if no arrow connects an exogenous or endogenous to an endogenous variable, their covariance is asserted to be zero. All exogenous variables are assumed to freely to covary amongst themselves if no path is draw amongst them.

In the simplified middle childhood socio-emotional well-being model (Fig. 3), we can see that we have:

- . three exogenous variables, all observable: mother's education level, father's education level, and average BNP SES;
- . two endogenous latent variables: SES and Socio-emotional well-being; and,
- . six endogenous observable variables: income, activity, emotional disorder/anxiety, self-esteem, emotional quotient, and subjective happiness.

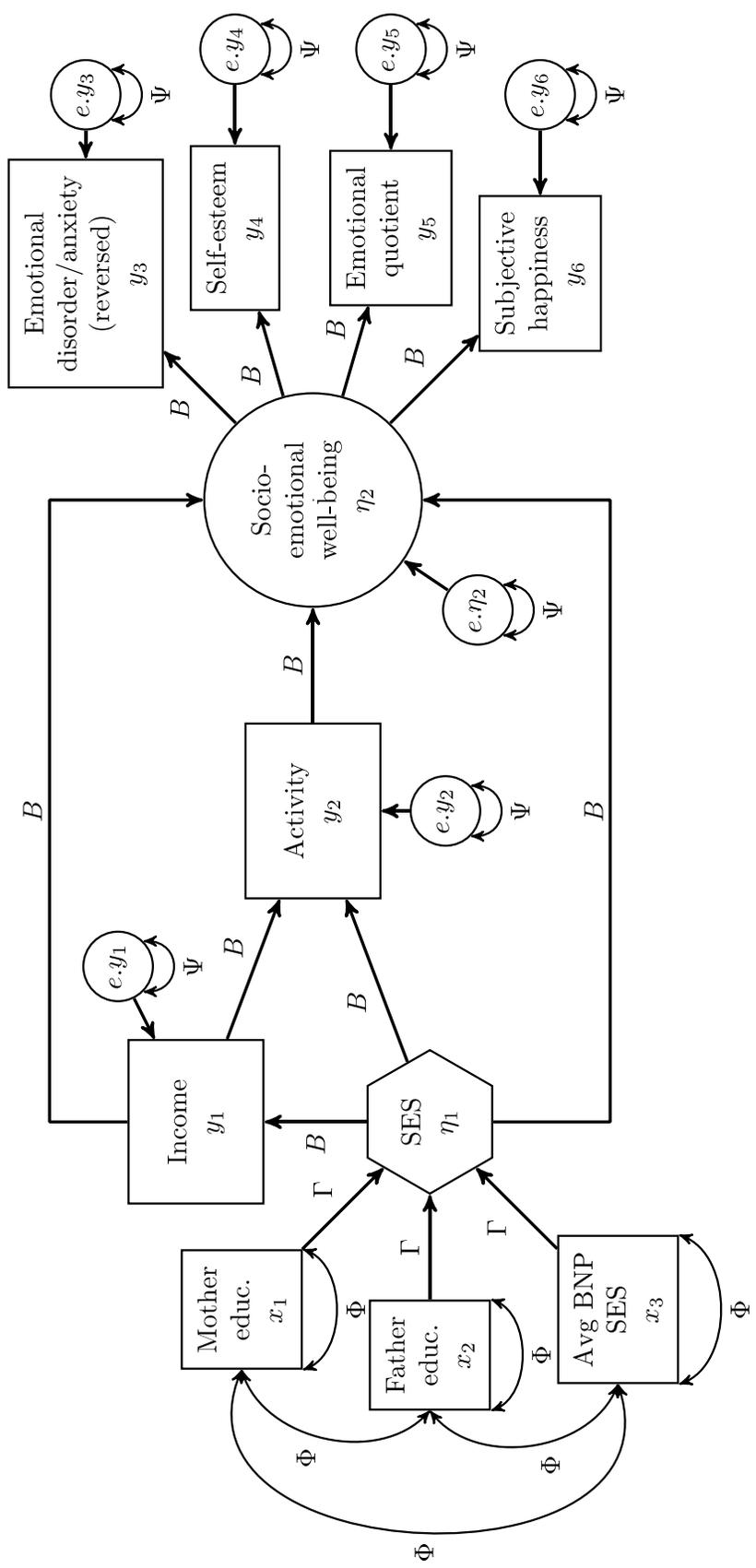


Figure A.3: SEM path diagram of simplified middle-childhood Socio-emotional well-being model (one mediation pathway, no controls)

The variables are all labeled using the notation defined in Table 1. The three variables defining SES have no coefficient connections (arrows) leading to them, as their distribution is not explained in this model, making them exogenous. Their individual variances and the covariances amongst themselves are not specified, leading to six unique parameters to be estimated in Φ . As indicator variables for the SES composite, they each have a coefficient, so Γ has three unique parameters. The eight endogenous variables will each have an error with a variance labeled by the eight diagonal elements of Ψ . They are connected to each other with ten arrows, so B has ten unique elements. Additionally there is an intercept for each exogenous variable, and an expectation value (mean) for each endogenous variables, so in total the number of free parameters is:

$$\begin{aligned} n\theta &= n\Phi+n\Gamma+n\Psi+nB+n\alpha+n\kappa \\ &= 6+3+8+10+3+3+8 =38 \end{aligned} \tag{8}$$

All the structural models specified for this analysis are all recursive.

Recursiveness is a sufficient condition for identification of a SEM model (Bollen, 1989). The measurement model underlying the structural model is also identified, given that the specification sets at least three indicator variables for each latent variable, a sufficient condition for identification (Kline, 2011).

A.4 Model fitting: Maximum Likelihood Fitting Function

Fitting SEM models using maximum likelihood (ML) estimation can intuitively be understood as minimizing the difference between the model-implied parameters and the relationships in the observed data. Given the model specification, we estimate the set of parameters (θ) and resulting variance-covariance matrix that maximizes the probability

of the covariance matrix observed in our sample. For ease of explanation, we will set aside the use of survey weights in the SEM estimation, and return to a discussion of their implementation in a later section.

SEM is often contrasted with regression. While the perspective here is not to define the SEM estimation in terms of linear regression, a few key differences should be noted. A linear regression with only one dependent variable, estimated with maximum likelihood, can be thought of as a special case of SEM. A SEM specification with only one endogenous variable, and only observed variables would result in the same solution as using a regression method. A path/mediation analysis with a structured system of regression equations among observed variables would also result in essentially the same solution as a SEM estimation approach. However, in fitting most SEM models, where there are multiple endogenous variables (a necessity of latent measurement), estimation is somewhat different. Both exogenous and endogenous variables are treated in the same manner in SEM estimation: there is no distinction made between independent and dependent variables (standard x and y) as there would be in linear regression. In a multivariate regression the mean and variance of an independent variable x are parameters fixed to equal the sample mean and variance of x , they are not estimated in the model. In a full SEM model the mean and variance of *all* variables are free parameters to be estimated unless specifically fixed (they are not in the models estimated here). Additionally, SEM ML estimation uses the summary data of the means and covariance structure of the sample, rather than individual observations. These distinctions can be noted in the estimation equations that follow.

Recalling that Y is a $n \times 1$ matrix of endogenous variables, and X is a $m \times 1$ matrix of endogenous variables The t^{th} individual's observed data is labeled

$$\mathbf{z}_t = \begin{pmatrix} \mathbf{y}_t \\ \mathbf{x}_t \end{pmatrix}, \quad (9)$$

Thus the mean values of Y and X for the sample are calculated as

$$\bar{\mathbf{z}} = \frac{1}{N} \sum_{t=1}^N \mathbf{z}_t, \quad (10)$$

where N is the number of individuals in the sample. The sample variance matrix is:

$$\mathbf{S} = \frac{1}{N-1} \sum_{t=1}^N (\mathbf{z}_t - \bar{\mathbf{z}})(\mathbf{z}_t - \bar{\mathbf{z}})'. \quad (11)$$

We assume the true distribution of individuals' observational data in the sample is a multivariate normal distribution; thus, the probability of observing a particular individual \mathbf{z}_t given model parameters θ is

$$P(\mathbf{z}_t | \theta) = \frac{1}{\sqrt{(2\pi)^k |\Sigma_0|}} e^{-(\mathbf{z}_t - \mu_0)' \Sigma_0^{-1} (\mathbf{z}_t - \mu_0) / 2} \quad (12)$$

where k is the number of observable variables, and μ_0 and Σ_0 are the means and covariances of the observable variables. The probability of observing the sample of N individuals given parameters θ is:

$$P(\mathbf{z}_1, \mathbf{z}_2, \dots, \mathbf{z}_N | \boldsymbol{\theta}) = \prod_{t=1}^N P(\mathbf{z}_t | \boldsymbol{\theta}) \quad (13)$$

$$= \frac{1}{((2\pi)^k |\boldsymbol{\Sigma}_0|)^{N/2}} e^{\sum_{t=1}^N -(\mathbf{z}_t - \boldsymbol{\mu}_0)' \boldsymbol{\Sigma}_0^{-1} (\mathbf{z}_t - \boldsymbol{\mu}_0) / 2} \quad (14)$$

$$= \frac{1}{((2\pi)^k |\boldsymbol{\Sigma}_0|)^{N/2}} e^{-N \text{tr}[(\sum_{t=1}^N (\mathbf{z}_t - \bar{\mathbf{z}})(\mathbf{z}_t - \bar{\mathbf{z}})' / N + (\bar{\mathbf{z}} - \boldsymbol{\mu}_0)(\bar{\mathbf{z}} - \boldsymbol{\mu}_0)') \boldsymbol{\Sigma}_0^{-1}] / 2} \quad (15)$$

$$= \frac{1}{((2\pi)^k |\boldsymbol{\Sigma}_0|)^{N/2}} e^{-N \text{tr}[(N-1)\mathbf{S} / N + (\bar{\mathbf{z}} - \boldsymbol{\mu}_0)(\bar{\mathbf{z}} - \boldsymbol{\mu}_0)'] \boldsymbol{\Sigma}_0^{-1}] / 2}. \quad (16)$$

Note that in this final form, the probability depends on observations via the covariance matrix, defined as \mathbf{S} above (equation 11) (Kaplan, 2009; StataCorp, 2013). The use of the sample covariance matrix in equation 13 is mathematically equivalent to the use of individual observations in equation 16. While the probability to be maximized only depends on the summary data, not the individual data points, it is an efficient use of all observations in the sample.

$P(\mathbf{z}_1, \mathbf{z}_2, \dots, \mathbf{z}_N | \boldsymbol{\theta})$ is the likelihood function, labeled $L(\boldsymbol{\theta})$. To fit our model we want to find the set of $\boldsymbol{\theta}$ that will maximize this probability. As log is a monotonic function, Stata 13 “sem” ML estimation minimizes the following function (StataCorp, 2013):

$$\log L(\boldsymbol{\theta}) = -\frac{N}{2} [k \log(2\pi) + \log\{\det(\boldsymbol{\Sigma}_0)\} + \text{tr}(\mathbf{D}\boldsymbol{\Sigma}_0^{-1})], \quad (17)$$

where

$$\mathbf{D} = \frac{N-1}{N} \mathbf{S} + (\bar{\mathbf{z}} - \boldsymbol{\mu}_0)(\bar{\mathbf{z}} - \boldsymbol{\mu}_0)'. \quad (18)$$

The variance matrix of the estimated parameters is calculated by Stata using the delta method (StataCorp, 2013). Given that we use sampling weights (explained in following sections), assumptions that each observation is independent and identically distributed are violated, thus we use the robust estimation technique (the Huber-White sandwich estimator) for obtaining standard errors of parameter estimates that are robust to heteroskedascity of errors.

A.5 Weights

In order to account for the complex survey design of the NLSCY and attrition, this analysis uses the probability longitudinal funnel weights derived by Statistics Canada. All the above equations apply with the use of weights, but now

$$\bar{\mathbf{z}} = \frac{1}{w.} \sum_{t=1}^N w_t \mathbf{z}_t, \quad (19)$$

where w_t are the weights and $w.$ is the sum of the weights, and N is replaced by $w.$ in all equations.

A.6 Model Fit

Model fit statistics are crucial to evaluating SEM models that aim to explain most or all of the variation within their endogenous variables and have a heavy focus on measurement as is the case in the common application of SEM models to psychological research. However, in our analysis, we expect our model specifications to explain only modest proportion of the variation in the mediation constructs or child outcomes. The complex causality of child outcomes is determined by more factors than are captured within the models specified. Therefore we are more interested in the implications of the

specified models for the estimation and significance of path coefficients than finding an overall model. However, path coefficients are meaningless if the specified model does not provide us with significantly more information than the observed correlation matrix.

The use of survey weights and robust standard errors estimation limits the model-fit statistics available. The model fit statistics available when using weights and robust standard errors are the Coefficient of Determination (CD) and Standardized Root Mean Residual (SRMR). It should be noted that the relatively large sample sizes and number of variables used in this analysis render many other SEM model fit statistics (based on degrees of freedom) less useful indicators of the model fit (Kline, 2011).

The SRMR is based on the square root of the discrepancy between the sample covariance matrix and the covariance matrix estimated by the model, defined by the equation. A SRMR ranges between zero and one, with a value below .08 being a conventional threshold of acceptable fit. All nine models in our analysis are well below this threshold, with a SRMR of 0.02 or 0.03. The Coefficient of Determination measures the fraction of variance in all variables explained by the model, or one minus the proportion of variance explained by the error and disturbance terms. For the models, the coefficient of determination ranges from 0.59 to 0.64, which is in line with our expectations of explaining only a portion of the variance in child outcomes.

A.7 Structural parameters: direct, indirect, and total effects

In interpreting the fitted mediation model, our main interest is in structural coefficients that together give the direct, indirect, and total effects among variables, as well as the standard errors and statistical significance of these estimates. Path coefficients

are estimated simultaneously using the maximum likelihood function, however to interpret a mediation model, the indirect and total effects are calculated post-estimation. To make the combined effects meaningfully interpretable and comparable across variables, we use the standardized coefficient estimates in the reporting of effects (statistical significance tests are on the unstandardized solution). For instance, to give the indirect effect of income via child activities on socio-emotional well-being during early childhood (figure 6.3 in the main text, and table C.3 in appendix C), one must multiply the coefficient of income's effect on activities by the coefficient of activities effect on socio-emotional well-being. Standardization puts these coefficients in the same metric (standard deviations), for a meaningful product. In this case income via activities has an effect of a standard deviation increase in income, resulting in a .013 standard deviation increase in socio-emotional well-being in middle childhood.

Direct effects are the path coefficients estimated as model parameters: the one-to-one paths depicted with arrows in the path diagram, either from an exogenous or endogenous variable, labeled B and Γ in the above equations (the simple $X \rightarrow Y$ effect). There is no mediation involved in these effects. In our example in Figure 3, the direct line from Income to Socio-emotional well-being is a direct effect. These effects are interpreted exactly the same as a regression coefficient: the effect of X on Y conditional on all other variables in the model. In our example: the expected unit change in Socio-emotional well-being for a one unit change in Income, holding all other variables constant. The standardized solution is interpreted in terms of standard deviations.

Indirect effects are the effects of one variable on another, through any number of mediating variables. These effects are the $X \rightarrow M \rightarrow Y$ form of mediation (Iacobucci,

2008). In our simplified model, the effect of Income on Socio-emotional well-being via its effect on Activity is an example of an indirect effect. The coefficient for this effect is simply the product of the path coefficient of Income to Activity ($X \rightarrow M \rightarrow Y$) and the path coefficient of Activity to Socio-emotional well-being ($M \rightarrow Y$). The intuition behind this is straightforward: we are finding the proportion of Activity's effect on Socio-emotional well-being determined by income, given the degree of Income's effect on Activity. The indirect effect of a variable on the outcome is the sum of all indirect pathways between two variables. For the full mediation models examined in the main text, income's indirect effect is the sum of indirect effect via Parenting, Family functioning, and Activity: all the indirect paths between income and the model outcome. A parsimonious way of calculating indirect effects is total effects minus direct effects (Kaplan, 2009).

Total effects represent all the pathways of effect between two variables of interest, both direct pathways and effects through mediating variables, *accounting for the simultaneity of the system represented in the model*. The total effects for Income on Socio-emotional well-being can be interpreted as the expected unit change in Socio-emotional well-being for a one unit change in Income. In this interpretation there is no need to 'hold all other variables constant'. The total effects are the sum of direct effects and indirect effects, and can be represented with the matrix $(I - B)^{-1}\Gamma$ (Kaplan, 2009).

In assessing the statistical significance of effects, we follow the mediation best practice established by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) to first evaluate the statistical significance of individual effects, and only consider indirect effects significant if both $X \rightarrow M$ and $M \rightarrow Y$ effects are statistically significant within the same model.

A.8 Assumptions and limitations of SEM

Using SEM with maximum-likelihood estimation depends on a number of statistical assumptions, including multivariate normality, sufficient sample size, missing data being missing completely at random (MCAR), and correct model specification (Kaplan, 2009). The assumption of multivariate normality is in part relaxed by the use of robust estimation of standard errors (due to survey weights), however all variables are continuous, all are approximately normally distributed in univariate case (with the exception of income). Missing data assumptions are discussed in the paper and inform our interpretation and inference with the models.

Correct model specification within SEM is of more crucial importance than in many other statistical approaches because there are strong theoretically-based assertions specified within the model, for instance fixing certain covariances to zero by specifying no pathway of effect. Our model is based on well-developed mediation theories, and builds on previous research in this field, thus the model specification is not a controversial structure of relations. Omitted-variables however are one of the more significant causes for concern within the models investigated, as the model does not explain a large proportion of the variation in outcomes and one can hypothesize regarding a few variables which could be added to the model (e.g. employment/labour provision or child care). These limitations of these exceptions are noted in the discussion and interpretation, particularly when considering the disturbance terms giving unexplained variance. The longitudinal specification of our model, using three cycles of data, gives a timing of the mediation pathway that should reduce concerns regarding reverse causality, as discussed in the main text section on model specification. Interpretation and inference

from fitted model is subject to acceptance of the model specification, with parameter estimates giving us the quantitative probabilistic implications if the model specification is correct.

Appendix B: Measures, descriptive statistics and measurement model

This appendix gives details on the measures used for the constructs in the SEM model specification, as well as the descriptive statistics of these variables and the measurement models for the latent variables. Following the text are tables reporting descriptive statistics and measurement.

B1. Household Income

Total household income is measured only one way in the NLSCY, with an answer to the question: “What is your best estimate of your total household income from all sources in the past 12 months, that is the total income from all household members, before taxes and deductions?” In the minority of cases, an estimate is imputed (by Statistics Canada) from response to prior questions regarding spouse’s, PMK’s and other members’ individual total income when the sum of these exceed the total household estimation. All income measures have been adjusted for inflation (Canadian Price Index) to 2008 constant dollars. Because the estimate is before tax, the distribution is different than after-tax income. Pre-tax income has increased lowest market incomes with transfers (social assistance, child benefits, EI, etc.) and yet top market incomes have not yet been reduced by taxation. Prior analysis (see thesis Paper Two) has also shown that the NLSCY reported total incomes are on average lower than total incomes in the Survey of Labour and Income Dynamics, for which income information is higher quality, having been drawn from tax records in the majority of cases. This difference would suggest that in the NLSCY income is under-reported, or an alternative is that respondents are more readily able to estimate after-tax income (due to payroll deductions); NLSCY income

levels are much closer to SLID estimates of after-tax and transfer income for the same population.

Income is equivalized for household size using the square root of household size. Unfortunately the NLSCY does not contain information on the exact ages of other children (under age 18) in the household, so equivalency scales that weight children based on age, such as those used by the OECD and Eurostat, are not possible. The analysis uses 'permanent income', that is the average equivalized income across the three cycles of observation spanning six years. Permanent income better measures the resources available to the family, given the single-year fluctuations (e.g. job-loss or parental leave) can be 'smoothed' out with savings and lending. As discussed with respect to model specification, this measure also fits with the research motivation to look at the effect of income that can be adjusted by policy: an increase in child benefits (cash transfers) would effect income in all cycles, not a bump at a point-in-time. Prior research (Blau, 1999; Dooley & Stewart, 2007; Mayer, 1997; Phipps & Lethbridge, 2006) has shown that permanent income tends to have a larger effect on child outcomes. Income has also been transformed by taking the natural log in order to improve normalcy of the distribution and allow interpretation by percentage change.

For the early childhood sample, median permanent income, equivalized for household size is \$34,926. The three model samples (after listwise deletion) have slightly higher median income, with cognitive outcome model mean just over \$2000 higher. For the middle childhood sample, median permanent income, equivalized for household size is \$36,375. The median incomes for the middle child model samples are also less than \$2000 higher. For the adolescent the median permanent income, equivalized for

household size is \$40,317. Again, model samples are slightly higher, but less than \$2000 higher. As is expected, household income tends to be higher as children age. Statistics Canada estimates that in 2002 the median total income for all Canadian families was \$51,134 and in 2008 \$55,739 (both 2008 dollars constant) (Statistics Canada, 2014).

B.2 Household Socio-Economic Status

The household socio-economic status (SES) construct aims to capture the relatively stable, non-income element of SES measured at the household level, which is the unit at which a child's SES can be measured. Income is an incoming flow of resources determined by a variety of elements: human capital, occupation, province of residence (e.g. minimum wage), age, labour force participation, government policies/benefits, and simple luck. The measure of SES used within this analysis approaches SES as a hierarchical status within the society denoted by occupation and educational level, closely related to but not dependent on, the annual flow of income that comes from this status. SES and income are directly related but measured as independent concepts with a uni-directional relationship: educational level and occupation will affect income. The uni-directionality is in part due to assumed temporal ordering over the life-course (education tends to come before income). From a policy perspective, in contrast to income, this measure of SES is not easily mutable by policy intervention. Most parents have already completed their educational attainment before having children. Improving occupational position of parents is a complex policy problem, while raising their income can be achieved simply through transfers. The SES composite is indicated by three measures explained below: socio-economic score of the highest occupational class reported in household (either mother's or father's) and mother's and father's educational

level. Because the attempt is to measure a (relatively) permanent characteristic of the family, the highest level of occupation or education reported across the three cycles is used. While during any given cycle a PMK or spouse may be out of work, in a lower class of employment, or studying, the highest level over three cycles (spanning six years) should capture their “maximum” status during the period of observation. This better measures their standing within society than the single cycle snapshot in time, by this measure a temporarily unemployed doctor and a long term unemployed fast-food worker are not given the same SES coding. The SES construct is measured as a formative or composite rather than latent variable: manifest variables of education and occupation determine SES, not the reverse, and we might not expect a great deal of covariance among factors (Bollen & Bauldry, 2011).

B.3 Occupational class (using all cycles of data)

The NLSCY includes PMK and Spouse occupational class coding using the National Occupation Classification-Statistics (NOC-S) 2001 (NLSCY cycles 6,7,8) and Standard Occupational Codes 1991 (SOC-91) (NLSCY cycles 4 and 5, and converted to NOC-S scores). To convert this categorical variable to a meaningful ordinal scale that places occupations within a SES hierarchy, I assign Boyd-Nam-Powers (BNP) SES scores to these categories. The BNP scores for each NOC-S code were determined by Boyd (2008) using 2001 census data to find the average (median) education level and income for each NOC-S classification code and then ordering the classifications based on an even weighting of these two characteristics as well as the percent of the population working in the given class. The interpretation of the BNP score is intuitive, with the score (ranging from 0-100) serving as the percentile of one’s occupational class: a score of 50

denotes a median or 50th percentile ranking of that occupational classification, meaning that half of all working individuals are in occupations with lower median educational level and income than that classification (note: for ease of SEM estimation, this code has been divided by a factor of 10 in analysis). This ordinal scale also gives some sense of the magnitude of difference between occupational classes instead of purely ranked categories. In the NLSCY PMKs and spouses that have not worked within the 12 months prior to interview are not asked to give an occupation. In these instances, the individual has been coded with a BNP SES score of zero, giving unemployment lower status than any occupation. Of young children's parents 16.7% of mothers and 1.4% of fathers had a SES score of zero (were unemployed) in all cycles. For middle age children 8.2% mothers and 2.2% of fathers had zero SES codes in all cycles. For adolescent children 6.6% of mothers and 2.4% of fathers had zero SES codes in all cycles. Only 2.2% of young children, 1.8% of middle age children, and 2.1% of adolescents had no employment by either parent throughout the three cycles of observation.

For the composite measure of household SES I use the highest BNP SES score associated with either the mother or father's highest occupational class in each cycle and then average across all three cycles. The decision to use only one highest score, rather than using both mother and father's score (as with education), is the desire to capture the household/child's social position independent of income or other considerations. Take four hypothetical households: a doctor and long-term stay-at-home parent, a doctor and a daycare worker, two doctors, and a lone-parent doctor. The premise of using only the doctor BNP SES score for these households, rather than a composite of father and mother, is that children in all of these families have essentially the same social status as

“doctors’ children”, despite differing second parents. The income differences of these households will be picked up separately in the income variable, and the individual difference in the parental education levels associated with occupation is more precisely measured directly rather than through the occupational class (for example the stay-at-home parent could have a PhD or elementary education). The average BNP code was 59 (Std. deviation 25) for the youngest children, and 60 (Std. deviation 24) for the middle and oldest age groups.

B.4 Education level

Education for the mother and father is measured as the highest level reported on a 9-level scale over the three cycles. Unlike the occupational class, taking only one parent’s education level might mask important differences in the child’s SES. The two-parent combination of a doctorate and no higher education is qualitatively different for a child than a two-doctorate household, regardless of parental occupations. For lone-parents, the spousal income is imputed to be the same as the lone-parent. The rationale for this course of action (rather than, for instance, imputing average spouse education level) is that for the lone parent families the household educational level is no lower or higher by lacking a spouse, as the child is only experiencing the effect of the one parental educational level. For all samples, with minor variation, both mean 'mother' and 'father' education level are at the level of some post-secondary education, and average is much closer to 'completed a bachelor's degree' than 'completed high school'.

B.5 Parenting Practices

Parenting is a latent variable measured in the second cycle of observation as a mediator operationalizing family stress pathway of effect. For the youngest children, aged 2 and 3 during the cycle preceding outcomes, parenting is measured using three PMK-reported NLSCY scales: positive parenting (5 questions), ineffective parenting (7 questions reverse coded to be ‘effective parenting’), and rational parenting (4 questions, reverse coded). Scores were recoded so that all indicators load positively and the latent factor is interpreted as higher score indicating better parenting practices. All items use five-point scales for frequency of parenting practice referred to in the question. Positive parenting score measures positive interactions between child and parent with questions including: “how often do you praise this child?” and “how often do you and this child laugh together?” The ineffective parenting scale (which is reversed to effective parenting) and rational parenting scales capture discipline techniques of parents. The scale questions are an adaptation of the Parent Practices Scale of Strayhorn and Weidman.

For the middle age group, aged 10/11 for the cycle preceding outcomes, parenting is measured using the same three PMK-reported parenting scales as those for the youngest age group. For the oldest age group, aged 14/15 for the cycle preceding outcomes, parenting is measured using three child-reporting scales: parental nurturance (7 questions), parental rejection (7 questions, reverse coded to be ‘parental acceptance’), and parental monitoring (5 questions). There are no PMK-reported parenting scales for this age group. All items use five-point scales for frequency of parenting practice referred to in the question. The nurturance scale corresponds to the PMK-reported positive parenting scale, and the rejection scale corresponds with the PMK-reported ineffective

scale. The parental monitoring scale captures how well parents know what the child is doing and set boundaries with questions asking for agreement with items such as “my parents find out about my misbehaviour”. These scales from the “my parents and me” section were developed by Lempers, Clark-Lempers, and Simons (1989) and are also used in the Western Australia Child Health Survey.

B.6 Family functioning

Family functioning is a latent variable measured at the second cycle of data collection as a mediating construct. It aims to operationalize one of the family stress pathways through which income and SES affect child outcomes. In the NLSCY family functioning is measured using 12 questions, all of which are on a four-point scale of agreement. The scale questions were developed by researchers at the Chedoke-McMaster Hospital, McMaster University. The questions measure the relationships among family members, including trust, communication, mutual support and openness. Rather than using the one multidimensional score, the questions have been parcelled into three scores clustering questions based on their domain: family decision making, communication/openness, and mutual support. To ease interpretation, all the scales were reverse-coded so that a higher score signifies higher functioning, whereas in the original scale higher scores indicated family dysfunction.

B.7 Child activities

The child activities mediating construct aims to capture the family investment pathway of income and SES’s effect on child outcomes. Activity measures are taken from the cycle preceding outcome measures. Unfortunately the NLSCY does not contain any expenditure data that allows for direct measurement of spending on children or any

measures of time allocated to children. As imperfect proxies, the indicators used to measure child investment thus are children's activities outside of the home (sports, arts, etc.), and, for young children, parental literacy activities with the child. Some of these activities are free, but most have either financial costs (fees or equipment) and/or time costs for the family (commuting, coordinating, parent volunteering). These are the best indicators available in the dataset for how money might be spent on children. From a policy perspective, these activities can either be promoted through tax-breaks (e.g. Child Fitness Tax Credit), or directly supported through programmatic funding. Activity level is treated as a manifest rather than latent variable: children either participate or not, there is no underlying "activity participation" level.

Child activities for the youngest group (age 2/3 at the second cycle) are indicated by two observed variables: home activities and outside home activities. The four question scale on home activities capture frequency of educational play including "how often do you look at books, or try to help him read?". The five questions on hours of outside-of home activities include participation in pre-school, play groups or parent-child programs (other than primarily child-care activities which are queried separately in the survey). For the middle age group and the oldest age group child activities are self-reported in four questions regarding frequency of taking part in organized activities (four categories) outside of class time. For the older age group eight questions differentiate between school-based extra-curricular activities and outside school activities. A single measure is derived by taking the average of responses to all these questions to merge the categories.

B.8 Socio-emotional well-being

The measures of socio-emotional outcomes for children attempt to capture the well-being of children, both as an immediate measure and with potential future effects. Research shows so-called ‘soft-skills’ such as emotional intelligence or social skills can be essential for later achievement (Heckman, 2000; Tough, 2012), but these outcomes also speak to how children are doing in the here and now. For all age groups multiple measures are used to create latent variables. For the youngest age group, age 4/5 at the third cycle, socio-emotional well-being is measured on three dimensions: unhappiness, anxiety and peer relations. The happiness and anxiety dimensions are parcelled from seven questions asked of the PMK regarding the child’s temperament created for the Ontario Child Health Survey. Peer relations are indicated using the average of two ordinal questions asked regarding how well the child got along with peers and siblings. Both are reverse coded so that on the latent construct higher scores are interpretable as higher well-being.

For the middle age group, age 12/13 at the third cycle, socio-emotional well-being is measured along four dimensions using child-respondent questions: emotional-anxiety disorder (reverse coded), self-esteem, emotional quotient, and subjective happiness. The emotional-anxiety scale’s seven questions are the same as those responded to by the PMK for the youngest age group but unified in a single score for parsimony. The self-esteem scale is drawn from four questions taken from the General Self-image Scale of the Marsh Self-description Questionnaire. The emotional quotient scale is the BarOn-Parker Emotional Quotient Inventory Youth Version (EQ-i:YV) which measures of emotional intelligence. These 15 questions measure five major dimensions: intrapersonal,

interpersonal, adaptability, stress management, and general mood. Subjective happiness is based on child Likert-scale responses to how much they agree with the following two statements: “In general, I am happy with how things are for me in my life now” and “The next five years look good to me”.

For the oldest age group, age 15/16 at the third cycle socio-emotional well-being is measured along four dimensions, using child-respondent questions: self-esteem, emotional quotient, subjective happiness, and depression (reverse coded to aid interpretation). The first three scales are measured the same as those for the middle age group. The youth depression scale is based on 12 questions a shorter version of the Depression scale (CES-D), comprising 20 questions, developed by L. S. Radloff of the Epidemiology Study Center of the National Institute of Mental Health in the United States.

B.9 Cognitive development

The cognitive development outcome for the youngest age group is a latent variable defined by three direct-measures of early cognitive development. The Pearson Picture Vocabulary Test- Revised (PPVT-R) is designed to measure receptive/hearing vocabulary and is a standard measure of school readiness. The test was administered to children in English or French. The “Who am I?” Assessment measures developmental level using symbols, drawing, and copying. The assessment was developed by Dr. Molly de Lemos at the Australian Council for Educational Research. The purpose of the 30-point Number Knowledge Assessment is to assess the development of children’s understanding of numbers as a precursor to math skill development. For all three direct

assessments age-standardized scores (standardized by Statistics Canada) are used to allow for fair comparison between four- and five-year-olds taking the same test.

For the middle age group, age 12/13 at the third cycle, cognitive outcomes are measured using a single direct assessment of math skills, without latent measurement due to lack of appropriate measures within the NLSCY. The Mathematics Computation Exercise administered to the child is a shortened version of the Mathematics Computation Test of the standardized Canadian Achievement Tests Second Edition, which measures the student's ability to do addition, subtraction, multiplication and division operations on whole numbers, decimals, fractions, negatives and exponents.

For the adolescent age group, age 16/17 at the third cycle, cognitive outcomes are measured using a direct assessment of general cognitive development, without latent measurement. The Problem Solving Exercise is an 18-item self-complete assessment of reading comprehension, basic math skills, and decision making. Nine of the 18 items were hand-scored by Statistics Canada analysts.

B.10 Behavioural problems

Behavioural problems for all ages are measured as latent variables with multiple manifest indicators. For the youngest age group behavioural problems are measured using PMK-response on two psychometric scales. The physical aggression/conduct disorder is comprised of six items and the indirect aggression is comprised of five items.

Behavioural outcomes for the middle age group are measured using child-response on four psychometric scales. The physical aggression/conduct disorder is comprised of six items, the indirect aggression scale of five items, the pro-social (reversed to anti-social) score of ten items, and the property offence scale of six items. Behavioural outcomes for

the oldest age group are risk behaviours measured using child-response on three dimensions of a formative indicator of risk behaviour: criminal behaviour, violence and drug use. There are three questions on criminal behaviour, three on violence and five questions on drug use.

B.11 Controls (covariates)

The controls used in the analysis cover basic demographics, factors that are theorized to independently affect child outcomes, and sampling features. In a SEM model, these controls are on all dependent variables (mediators and outcomes). Descriptive statistics of these controls vary across nine samples used for analysis. Basic demographics include: child age in months, child gender, and first-taught language. Child age was not included in the early childhood cognitive outcome model as the outcomes were already adjusted for age. Variables with potential independent effects on child outcomes or mediating factors include: mother's age at birth, lone parent in any cycle, number of siblings. Other controls are: father as PMK (at second cycle when parenting is measured), province of residence, urban vs. rural, and first or second cohort.

The weighted samples reflect the expected national Canadian picture. Approximately 72 per cent of children have English as their first language. Average mother's age at birth is 29. Approximately 13 per cent (youngest group) to 22 per cent (oldest group) of children were in a lone-parent family at outcome measurement. The number of siblings averages between one and two. Only eight to ten percent of PMKs are fathers (male) and approximately 14 percent of respondents are rural. As discussed above, the listwise deletion samples differ somewhat, and in a manner that suggests a relatively more advantaged samples. All variables were inspected for distribution and

kurtosis, given the normality assumptions of maximum-likelihood estimations. No major deviations were found. The use of robust standard errors also reduces the implication of normality assumptions.

B.12 Latent Variables Measurement

Using latent variables in the analysis necessitates specifying a measurement model which sets out how the indicator variables come together to measure the latent constructs. Ensuring the measurement model fits is a prerequisite of effective structural models (Kline, 2011). As discussed above, the measurement model is essentially a factor analysis, with the latent variable representing the shared variation among the specified indicator variables. Tables B.4, B.5, and B.6 give the measurement models for each of the nine-models. These tables also provide which indicator variable has a fixed loading of one in the unstandardized solution, which provides the latent variable with a metric (following standard practice, the indicator with the highest loading in factor analysis was chosen). Loading factors can be read as regression coefficients.

The measurement/factor loading of the same variable across age categories varies slightly from model to model due to sample variation. The goal of this analysis is not construct building or measurement specification (i.e. testing the value of the indicators for measurement of the theorized construct), rather the focus is on the structural relations among these constructs, ensuring that measurement accurately captures the construct of interest. Therefore some indicators are included in a measure because of their theorized relevance to the construct, despite their relatively low loading.

Table B.1 Early childhood models descriptive statistics

	Weighted full age sample <i>n=max 5200</i>			Socio-emotional model sample <i>n=4809</i>		Cognitive model sample <i>n=4132</i>		Behavioural model sample <i>n=4688</i>	
	N	Mean/ %	SD	Mean/ %	SD	Mean/ %	SD	Mean/ %	SD
Income and SES									
Average total household income, square root equalized	5200	40180	28555	40522	28130	41369	28398	40672	28443
<i>Median of above</i>		34926		35602		36252		35602	
Log of income measure	5200	10.42	0.59	10.44	0.58	10.47	0.57	10.44	0.59
Mother education (adjusted)	5185	5.85	1.41	5.88	1.39	5.93	1.38	5.87	1.40
Father education (adjusted)	5185	6.07	1.39	6.10	1.36	6.15	1.35	6.10	1.37
Highest BNP SES score	5199	5.91	2.54	6.01	2.49	6.12	2.46	6.01	2.49
Mediators									
Family functioning, Communication	5109	3.29	0.49	3.29	0.49	3.30	0.49	3.29	0.49
Family functioning, Support	5112	3.42	0.46	3.42	0.46	3.43	0.46	3.42	0.47
Family functioning, Decisions	5114	3.28	0.49	3.29	0.49	3.29	0.49	3.29	0.49
Positive interaction	5154	16.51	2.36	16.53	2.35	16.53	2.35	16.55	2.35
Effective parenting	5045	14.31	3.47	14.30	3.45	14.25	3.37	14.33	3.46
Rational parenting	5132	9.79	2.16	9.77	2.15	9.76	2.09	9.78	2.15
Home activities	5191	4.49	0.50	4.50	0.49	4.50	0.48	4.50	0.49
Non-home activities (hrs/wk)	5175	3.32	5.57	3.36	5.60	3.42	5.66	3.38	5.61
Outcomes									
Unhappy score	5177	2.67	0.33	2.67	0.33				
Anxiety score	5173	2.73	0.32	2.73	0.32				
Peer relations	5157	4.30	0.66	4.30	0.66				
PPVT score	4485	10.06	1.55			10.12	1.52		
Number Knowledge	4509	9.91	1.49			9.95	1.48		
Who Am I? Assessment	4473	9.91	1.64			9.94	1.61		
Physical aggression, parcel 1	5177	1.38	0.43					1.38	0.43
Physical aggression, parcel 2	5169	1.17	0.29					1.17	0.29
Indirect aggression	5016	0.47	1.07					0.48	1.07

Table B.1 Early childhood models descriptive statistics, continued

	Weighted full age sample <i>n</i> =max 5200			Socio-emotional model sample <i>n</i> =4809		Cognitive model sample <i>n</i> =4132		Behavioural model sample <i>n</i> =4688	
	N	Mean/ %	SD	Mean/ %	SD	Mean/ %	SD	Mean/ %	SD
Controls									
Child gender (boy)	5200	0.51		0.52		0.52		0.52	
Child Language	5136								
English		0.70		0.71		0.70		0.71	
French		0.21		0.21		0.22		0.21	
Other		0.09		0.08		0.08		0.08	
Child age at interview (month/10)	5200	4.82	0.58	4.83	0.58	4.83	0.58	4.82	0.58
Mother's age at birth	5123	29.52	5.35	29.56	5.28	29.73	5.22	29.53	5.29
PMK Father (middle cycle)	5200	0.11		0.10		0.10		0.10	
Lone Parent	5200	0.13		0.12		0.11		0.12	
Number of siblings	5200	1.31	0.96	1.31	0.95	1.30	0.93	1.32	0.95
Province	5200								
Newfoundland		0.02		0.02		0.02		0.02	
Prince Edward Island		0.00		0.00		0.00		0.00	
Nova Scotia		0.03		0.03		0.03		0.03	
New Brunswick		0.02		0.02		0.02		0.02	
Quebec		0.23		0.22		0.23		0.22	
Ontario		0.40		0.40		0.40		0.40	
Manitoba		0.04		0.04		0.04		0.04	
Saskatchewan		0.03		0.03		0.03		0.03	
Alberta		0.12		0.12		0.12		0.12	
British Columba		0.12		0.12		0.11		0.12	
Rural	5200	0.13		0.13		0.13		0.13	
Cohort 2	5200	0.50		0.50		0.49		0.50	

Table B.2 Middle childhood models descriptive statistics

	Weighted full age sample <i>n</i> =max 4042			Socio-emotional model sample <i>n</i> =2732		Cognitive model sample <i>n</i> =2943		Behavioural model sample <i>n</i> =2805	
	N	Mean/ %	SD	Mean/%	SD	Mean/ %	SD	Mean/ %	SD
Income and SES									
Average total household income, square root equivalized	4042	41638	26599	42711	27698	43060	27755	43131	27957
Log of income measure	4042	10.48	0.56	10.51	0.55	10.52	0.55	10.52	0.55
Median of above		36375		37500		37500		37493	
Mother education (adjusted)	4042	5.60	1.41	5.65	1.42	5.65	1.41	5.65	1.42
Father education (adjusted)	4042	5.71	1.49	5.76	1.48	5.76	1.49	5.75	1.49
Highest BNP SES score	4041	6.01	2.42	6.10	2.37	6.13	2.36	6.15	2.35
Mediators									
Family functioning, Communication	3977	3.28	0.47	3.28	0.47	3.28	0.47	3.28	0.47
Family functioning, Support	3978	3.42	0.43	3.42	0.43	3.41	0.43	3.42	0.43
Family functioning, Decisions	3979	3.27	0.46	3.27	0.46	3.27	0.45	3.27	0.45
Positive interaction	4005	12.02	2.62	11.98	2.61	11.93	2.58	11.96	2.60
Effective parenting	3967	14.50	3.71	14.52	3.69	14.54	3.63	14.49	3.65
Rational parenting	3998	9.97	1.88	9.97	1.89	9.96	1.86	9.94	1.87
Child reported activities	3496	2.10	0.63	2.10	0.64	2.10	0.64	2.11	0.64
Outcomes									
Emotional anxiety (reversed)	3496	10.56	2.73	10.55	2.78				
Self esteem	3590	12.81	2.65	12.86	2.72				
Emotional Quotient	3450	28.23	6.75	28.35	6.72				
Subjective happiness	3620	3.27	0.55	3.27	0.56				
Math score	3601	8.46	4.33			8.48	4.36		
Indirect Aggression	3533	1.40	1.68					1.39	1.69
Physical aggression	3548	1.01	1.65					0.99	1.65
Pro-social (reversed)	3488	7.60	3.82					7.56	3.83
Property Offenses	3537	0.98	1.36					0.98	1.38
Controls									
Child gender (boy)	4042		0.01	0.50		0.50		0.50	
Child Language	4027								
English		0.73		0.74		0.74		0.74	
French		0.24		0.22		0.22		0.22	
Other		0.03		0.04		0.04		0.04	
Child age at interview (month/10)	4042	13.13	0.58	13.13	0.57	13.13	0.58	13.15	0.57
Mother's age at birth	3868	28.63	4.94	28.63	4.82	28.70	4.84	28.70	4.88

Table B.2 Middle childhood models descriptive statistics, continued

	Weighted full age sample <i>n</i> =max 4042			Socio-emotional model sample <i>n</i> =2732		Cognitive model sample <i>n</i> =2943		Behavioural model sample <i>n</i> =2805	
	N	Mean/ %	SD	Mean/%	SD	Mean/ %	SD	Mean/ %	SD
Controls (continued)									
PMK Father	4042	0.08		0.06		0.06		0.07	
Lone Parent	4042	0.19		0.16		0.16		0.15	
Number of siblings	4042	1.44	1.03	1.44	0.98	1.45	1.00	1.45	0.97
Province	4042								
Newfoundland		0.02		0.02		0.02		0.02	
Prince Edward Island		0.00		0.01		0.01		0.01	
Nova Scotia		0.03		0.03		0.03		0.03	
New Brunswick		0.02		0.02		0.02		0.02	
Quebec		0.24		0.22		0.22		0.22	
Ontario		0.38		0.39		0.40		0.39	
Manitoba		0.04		0.04		0.04		0.04	
Saskatchewan		0.04		0.04		0.04		0.04	
Alberta		0.11		0.12		0.11		0.11	
British Columba		0.12		0.12		0.11		0.12	
Rural	4042	0.14		0.14		0.13		0.14	
Cohort 2	4042	0.48		0.51		0.50		0.51	

Table B.3 Adolescent models descriptive statistics

Variables	Weighted full age sample <i>n</i> =max 2846			Socio-emotional model sample <i>n</i> =1782		Cognitive model sample <i>n</i> =1834		Behavioural model sample <i>n</i> =1848	
	N	Mean/ %	SD	Mean/ %	SD	Mean/ %	SD	Mean/ %	SD
Income and SES									
Average total household income, equivalized	2846	45117	27868	46512	27676	46801	27534	46422	27548
Median of above	2846	40317		41457		41813		41457	
Log of income measure	2846	10.56	0.56	10.60	0.55	10.61	0.54	10.60	0.55
Mother education (adjusted)	2846	5.43	1.46	5.53	1.49	5.59	1.45	5.53	1.48
Father education (adjusted)	2846	5.70	1.49	5.83	1.50	5.89	1.45	5.83	1.49
Highest BNP SES score	2846	6.01	2.36	6.18	2.36	6.23	2.32	6.16	2.36
Mediators									
Family functioning, Communication	2829	3.26	0.45	3.27	0.43	3.28	0.43	3.27	0.44
Family functioning, Support	2829	3.41	0.44	3.42	0.43	3.43	0.43	3.42	0.43
Family functioning, Decisions	2829	3.26	0.47	3.26	0.46	3.26	0.47	3.26	0.46
Parent Nurturance	2471	20.50	5.35	20.60	5.25	20.67	5.17	20.63	5.26
Parent acceptance	2474	17.06	4.75	17.12	4.69	17.12	4.67	17.09	4.69
Parent monitoring	2490	14.09	2.92	14.14	2.87	14.25	2.83	14.16	2.89
Child reported activities	2565	1.77	0.59	1.79	0.59	1.81	0.59	1.79	0.59
Youth depression (reversed)	2280	26.06	5.65	26.25	5.51				
Self esteem	2316	12.84	2.60	12.94	2.54				
Emotional Quotient	2277	29.21	5.94	29.43	5.89				
Subjective happiness	2325	3.30	0.55	3.31	0.55				
Problem solving score	2683	12.36	5.78			12.79	5.70		
Criminal Activity	2846	1.22	0.48					1.20	0.45
Violence	2321	1.10	0.31					1.10	0.30
Drugs	2322	1.37	0.59					1.34	0.56
Controls									
Child gender (boy)	2846	0.51		0.47		0.48		0.48	
Child Language	2770								
English		0.74		0.73		0.75		0.73	
French		0.23		0.24		0.23		0.24	
Other		0.03		0.03		0.03		0.03	
Child age (month/10)	2846	17.16	0.57	17.14	0.57	17.13	0.57	17.13	0.57
Mother's age at birth	2597	28.63	5.04	28.75	5.09	28.77	4.97	28.73	5.05
PMK Father (middle cycle)		0.10		0.07		0.06		0.07	
Lone Parent	2846	0.23		0.18		0.17		0.18	
Number of siblings	2846	1.25	1.08	1.31	1.02	1.29	0.98	1.30	1.02

Table B.3 Adolescent models descriptive statistics, continued

	Weighted full age sample <i>n=max 2846</i>		Socio-emotional model sample <i>n=1782</i>		Cognitive model sample <i>n=1834</i>		Behavioural model sample <i>n=1848</i>	
Variables	N	Mean/SD %	Mean/SD %	Mean/SD %	Mean/SD %	Mean/SD %	Mean/SD %	
Controls (continued)								
Province	2845							
Newfoundland		0.02	0.02	0.02	0.02	0.02	0.02	
Prince Edward Island		0.00	0.01	0.01	0.01	0.01	0.01	
Nova Scotia		0.03	0.03	0.03	0.03	0.03	0.03	
New Brunswick		0.02	0.03	0.02	0.02	0.03	0.03	
Quebec		0.24	0.24	0.22	0.22	0.24	0.24	
Ontario		0.39	0.41	0.42	0.42	0.42	0.42	
Manitoba		0.04	0.04	0.04	0.04	0.04	0.04	
Saskatchewan		0.04	0.03	0.04	0.04	0.04	0.04	
Alberta		0.11	0.10	0.09	0.09	0.10	0.10	
British Columbia		0.12	0.10	0.11	0.11	0.11	0.11	
Rural		0.17	0.16	0.16	0.16	0.16	0.16	
Cohort 2		0.50	0.47	0.48	0.48	0.47	0.47	

Table B.4 Early childhood latent measurement

	Socio-emotional model			Cognitive model			Behavioural model		
	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>
Non-Income Socio-Economic Status									
← Mother education	0.24***	0.07	0.12	0.25***	0.08	0.12	0.23***	0.07	0.11
← Father education level	0.16**	0.08	0.08	0.17*	0.09	0.08	0.17**	0.08	0.08
← Highest BNP SES	1.00 ^a		0.88	1.00 ^a		0.87	1.00 ^a		0.88
Family functioning									
→ Communication Score	1.00 ^a		0.88	1.00		0.88	1.00		0.88
→ Support Score	0.93***	0.02	0.87	0.93***	0.02	0.87	0.93***	0.02	0.87
→ Decisions	0.94***	0.02	0.84	0.94***	0.02	0.84	0.94***	0.02	0.84
Positive Parenting									
→ Positive interaction	1.00 ^a		0.31	1.00 ^a		0.30	1.00 ^a		0.31
→ Effective parenting	3.24***	0.38	0.68	2.94***	0.35	0.61	3.25***	0.38	0.69
→ Rational parenting	2.04***	0.22	0.69	2.26***	0.29	0.76	2.00***	0.21	0.68
Socio-Emotional Well-being									
→ Unhappy score	1.00 ^a		0.79						
→ Anxiety score	0.63***	0.07	0.51						
→ Peer relations	0.79***	0.10	0.31						
Cognitive Development									
→ PPVT score				1.15***	0.15	0.59			
→ Number Knowledge				1.32***	0.10	0.69			
→ Who Am I? Assessment				1.00 ^a		0.48			
Behavioural problems									
→ Physical Aggression 1							1.00 ^a		0.76
→ Physical Aggression 2							0.74***	0.06	0.83
→ Indirect aggression							1.23***	0.21	0.38

* $p < .10$; ** $p < .05$; *** $p < .01$; ^aFixed to 1.00 to give latent scale

Table B.5 Middle childhood latent measurement

	Socio-emotional			Cognitive			Behavioural		
	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>
Non-Income Socio-Economic Status									
← Mother education	0.23**	0.08	0.12	0.22**	0.09	0.11	0.26***	0.08	0.14
← Father education level	0.10***	0.08	0.06	0.19*	0.12	0.10	0.04	0.08	0.02
← Highest BNP SES	1.00 ^a		0.90	1.00 ^a		0.87	1.00 ^a		0.91
Family functioning									
→ Communication Score	1.00 ^a		0.83	1.00 ^a		0.84	1.00 ^a		0.84
→ Support Score	0.94***	0.05	0.84	0.93***	0.04	0.85	0.93***	0.04	0.84
→ Decisions	0.99***	0.03	0.84	0.97***	0.03	0.84	0.97***	0.03	0.84
Positive Parenting									
→ Positive interaction	1.00 ^a		0.40	1.00 ^a		0.37	1.00 ^a		0.39
→ Effective parenting	2.49***	0.28	0.70	2.47***	0.26	0.65	2.57***	0.31	0.72
→ Rational parenting	1.34***	0.15	0.74	1.5***	0.21	0.78	1.3***	0.15	0.71
Socio-Emotional Well-being									
→ Emotional Disorder/Anxiety (reversed)	1.00 ^a		0.55						
→ Self Esteem	1.48***	0.11	0.83						
→ Emotional Quotient	3.30***	0.27	0.75						
→ Subjective happiness	0.27***	0.02	0.72						
Behavioural problems									
→ Indirect Aggression							1.00 ^a		0.54
→ Physical Aggression							1.53***	0.15	0.83
→ Pro-social Score (reversed)							1.10***	0.31	0.26
→ Property Offence score							1.19***	0.12	0.78

* $p < .10$; ** $p < .05$; *** $p < .01$; ^aFixed to 1.00 to give latent scale

Table B.6 Adolescence latent measurement

	Socio-emotional			Cognitive			Behavioural		
	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>	<i>Unstd. Coeff.</i>	<i>SE</i>	<i>Std. Coeff.</i>
Non-Income Socio-Economic Status									
← Mother education	-0.02	0.17	-0.01	-0.07	0.16	-0.03	-0.02	0.17	-0.01
← Father education level	0.45**	0.20	0.24	0.51**	0.19	0.27	0.46**	0.19	0.24
← Highest BNP SES	1.00 ^a		0.85	1.00 ^a		0.85	1.00 ^a		0.85
Family functioning									
→ Communication Score	1.00 ^a		0.83	1.00 ^a		0.82	1.00 ^a		0.83
→ Support Score	1.01***	0.05	0.84	1.03***	0.04	0.85	1.01***	0.04	0.84
→ Decisions	1.06***	0.05	0.83	1.09***	0.05	0.84	1.07***	0.05	0.83
Positive Parenting									
→ Positive interaction	1.00 ^a		0.92	1.00 ^a		0.97	1.00 ^a		0.87
→ Effective parenting	0.45***	0.07	0.47	0.42***	0.11	0.45	0.49***	0.08	0.48
→ Rational parenting	0.24***	0.04	0.41	0.22***	0.06	0.39	0.28***	0.05	0.45
Socio-Emotional Well-being									
→ Youth depression (reversed)	1.00 ^a		0.66						
→ Self Esteem	0.54***	0.04	0.77						
→ Emotional Quotient	1.03***	0.10	0.63						
→ Subjective happiness	0.1***	0.01	0.68						
Behavioural problems									
→ Criminal activity							1.00 ^a		0.92
→ Violence							0.43***	0.06	0.59
→ Drugs							0.88***	0.13	0.64

* $p < .10$; ** $p < .05$; *** $p < .01$; ^aFixed to 1.00 to give latent scale

Appendix C: Tables of structural model results

Table C.1 Early childhood model results (main)

Results correspond to figure 13 in main text

	Socio-emotional			Cognitive			Behavioural		
	Coeff.	SE	Std. Coeff	Coeff.	SE	Std. Coeff	Coeff.	SE	Std. Coeff
Effects on Mediators									
SES → Income	0.15***	0.00	0.72	0.14***	0.00	0.71	0.15***	0.00	0.72
SES → Family functioning	0.02***	0.00	0.14	0.02***	0.01	0.16	0.02***	0.00	0.15
SES → Parenting	0.01	0.01	0.03	0.01	0.01	0.04	0.01	0.01	0.03
SES → Child Home Activities	0.01*	0.00	0.05	0.01*	0.00	0.05	0.01**	0.00	0.06
SES → Child Other Activities	0.14**	0.06	0.07	0.13**	0.06	0.07	0.13**	0.06	0.07
Income → Family Functioning	0.03	0.03	0.04	0.02	0.03	0.02	0.03	0.03	0.03
Income → Parenting	0.06	0.05	0.05	0.09*	0.05	0.08	0.03	0.05	0.03
Income → Child Home Activities	-0.01	0.02	-0.01	-0.01	0.03	-0.02	-0.02	0.03	-0.02
Income → Child Outside Activities	1.08***	0.32	0.11	1.11***	0.37	0.11	1.08**	0.33	0.11
Family functioning → Parenting	0.60***	0.08	0.36	0.56***	0.09	0.35	0.61**	0.08	0.36
Effects on Outcome									
Income → Outcome (direct)	0.03	0.02	0.06	0.13**	0.06	0.10	-0.01	0.02	-0.01
Income → Outcome (indirect)	0.01	0.01	0.02	0.01**	0.01	0.01	-0.01	0.01	-0.01
Income → Outcome Total	0.04*	0.02	0.08	0.15**	0.06	0.11	-0.02	0.02	-0.03
SES → Outcome (direct)	-0.01**	0.00	-0.08	0.08***	0.01	0.29	0.00	0.00	-0.04
SES → Outcome (indirect)	0.01***	0.00	0.08	0.02***	0.00	0.09	-0.01***	0.00	-0.05
SES → Outcome Total	0.00	0.00	0.00	0.10***	0.01	0.38	-0.01**	0.00	-0.09
Positive Parenting → Outcome	0.13***	0.02	0.37	0.07	0.04	0.06	-0.17***	0.02	-0.38
Family Functioning → Outcome (direct)	-0.01	0.02	-0.02	0.03	0.06	0.02	0.02	0.02	0.03
Family Functioning → Outcome (indirect)	0.08***	0.01	0.13	0.04***	0.01	0.02	-0.10***	0.01	-0.14
Family Functioning → Outcome Total	0.07***	0.02	0.11	0.07	0.06	0.04	-0.08***	0.02	-0.11
Child Home Activities → Outcome	0.00	0.01	0.00	0.09**	0.04	0.05	-0.01	0.02	-0.01
Child Other Activities → Outcome	0.00	0.00	-0.04	0.00	0.00	0.04	0.00	0.00	0.01
Coefficient of determination		0.64			0.66			0.66	
SRMR		0.03			0.03			0.03	
N		4809			4132			4688	

Table C.2 Early childhood model results (controls)

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Outcome									
Child gender (boy)	0.03**	0.01	0.05	-0.21***	0.05	-0.13	0.06***	0.01	0.09
French	-0.05*	0.03	-0.08	-0.19*	0.10	-0.10	0.06	0.04	0.08
Other language	0.06**	0.03	0.06	-0.28**	0.10	-0.10	-0.07**	0.03	-0.05
Child age at interview (month)	0.02**	0.01	0.06				-0.08***	0.01	-0.15
Mother's age at birth	0.00	0.00	0.02	0.00	0.00	-0.02	0.00	0.00	0.01
PMK Father (middle cycle)	-0.02	0.02	-0.02	-0.03	0.07	-0.01	0.03	0.02	0.03
Lone Parent	-0.04	0.02	-0.05	0.11	0.07	0.04	0.09***	0.03	0.09
Number of siblings	0.00	0.01	0.01	-0.09***	0.02	-0.10	0.06***	0.01	0.16
Newfoundland	0.07***	0.02	0.03	-0.12	0.08	-0.02	-0.03	0.03	-0.01
Prince Edward Island	0.07***	0.03	0.02	0.00	0.09	0.00	-0.05	0.03	-0.01
Nova Scotia	0.02	0.02	0.01	-0.15*	0.08	-0.03	0.02	0.02	0.01
New Brunswick	0.01	0.03	0.01	-0.13	0.08	-0.03	0.01	0.03	0.01
Quebec	-0.02	0.03	-0.03	-0.17	0.11	-0.09	0.03	0.05	0.03
Manitoba	-0.01	0.02	-0.01	-0.11	0.07	-0.03	0.01	0.02	0.01
Saskatchewan	-0.01	0.02	-0.01	-0.25***	0.08	-0.06	-0.01	0.03	-0.01
Alberta	-0.02	0.02	-0.02	-0.10	0.08	-0.04	0.03	0.02	0.03
British Columba	0.00	0.02	0.00	0.07	0.08	0.03	0.07**	0.02	0.07
Rural	0.01	0.01	0.01	-0.01	0.05	-0.01	0.03	0.02	0.03
cohort2	-0.02*	0.01	-0.05	0.03	0.04	0.02	0.01	0.01	0.02
Controls → Parenting									
Child gender (boy)	-0.14***	0.04	-0.09	-0.12***	0.04	-0.09	-0.14***	0.04	-0.09
French	0.36***	0.10	0.20	0.34***	0.11	0.20	0.35***	0.10	0.19
Other language	0.06	0.09	0.02	0.06	0.09	0.02	0.05	0.09	0.02
Child age at interview (month)	-0.09**	0.04	-0.07	0.00	0.00	0.02	-0.10**	0.04	-0.08
Mother's age at birth	0.00	0.00	0.03	-0.06	0.08	-0.03	0.00	0.00	0.03
PMK Father (middle cycle)	-0.05	0.08	-0.02	0.07	0.08	0.03	-0.05	0.08	-0.02
Lone Parent	0.05	0.08	0.02	0.02	0.02	0.02	0.03	0.08	0.01
Number of siblings	0.01	0.02	0.01	0.24***	0.08	0.04	0.00	0.02	0.00
Newfoundland	0.29***	0.08	0.05	0.23**	0.09	0.02	0.28***	0.08	0.05
Prince Edward Island	0.26***	0.09	0.02	0.10	0.07	0.02	0.26***	0.09	0.02
Nova Scotia	0.13	0.07	0.03	0.10	0.08	0.02	0.15**	0.07	0.03
New Brunswick	0.12	0.08	0.03	-0.25**	0.12	-0.15	0.12	0.08	0.02
Quebec	-0.29**	0.10	-0.16	-0.03	0.06	-0.01	-0.26**	0.10	-0.14
Manitoba	0.01	0.06	0.00	-0.11*	0.07	-0.03	0.02	0.06	0.01
Saskatchewan	-0.05	0.06	-0.01	-0.13	0.06	-0.06	-0.04	0.06	-0.01
Alberta	-0.11*	0.06	-0.05	0.01	0.06	0.01	-0.10*	0.06	-0.04
British Columba	0.01	0.06	0.01	-0.03	0.04	-0.01	0.00	0.06	0.00
Rural	-0.04	0.04	-0.02	0.11**	0.04	0.08	-0.06	0.04	-0.03
cohort2	0.1**	0.04	0.07	-0.03	0.04	-0.03	0.10**	0.04	0.07

Table C.2 Early childhood model results (controls), continued

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Functioning									
Child gender (boy)	0.02	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.02
French	0.02	0.05	0.02	0.01	0.06	0.01	0.03	0.05	0.02
Other language	-0.12***	0.04	-0.08	-0.16***	0.05	-0.10	-0.12***	0.04	-0.08
Child age at interview (month)	-0.02	0.02	-0.02	-0.01***	0.00	-0.07	-0.01	0.02	-0.01
Mother's age at birth	-0.01***	0.00	-0.07	0.01	0.04	0.01	-0.01**	0.00	-0.06
PMK Father (middle cycle)	0.00	0.03	0.00	-0.14***	0.04	-0.10	-0.01	0.04	-0.01
Lone Parent	-0.12***	0.04	-0.09	0.02*	0.01	0.04	-0.13***	0.04	-0.10
Number of siblings	0.02*	0.01	0.04	-0.09**	0.04	-0.03	0.02*	0.01	0.04
Newfoundland	-0.09**	0.04	-0.03	-0.14**	0.06	-0.02	-0.09**	0.04	-0.03
Prince Edward Island	-0.15**	0.06	-0.02	-0.06	0.04	-0.02	-0.15**	0.06	-0.02
Nova Scotia	-0.05	0.04	-0.02	-0.05	0.04	-0.02	-0.06	0.04	-0.02
New Brunswick	-0.05	0.04	-0.02	-0.03	0.06	-0.03	-0.05	0.04	-0.02
Quebec	-0.04	0.05	-0.04	0.00	0.03	0.00	-0.05	0.05	-0.05
Manitoba	0.00	0.03	0.00	-0.10***	0.03	-0.04	-0.01	0.03	-0.01
Saskatchewan	-0.09**	0.03	-0.04	-0.01	0.03	-0.01	-0.09**	0.03	-0.04
Alberta	-0.03	0.03	-0.02	-0.14***	0.03	-0.10	-0.03	0.03	-0.02
British Columba	-0.12***	0.03	-0.09	0.05**	0.02	0.04	-0.12***	0.03	-0.09
Rural	0.07*	0.02	0.05	-0.03	0.02	-0.03	0.07***	0.02	0.05
cohort2	-0.03*	0.02	-0.04	-0.01	0.02	-0.02	-0.03	0.02	-0.03
Controls → Child Home Activities									
Child gender (boy)	-0.17***	0.02	-0.17	-0.16***	0.02	-0.17	-0.17***	0.02	-0.17
French	-0.08	0.05	-0.06	-0.1*	0.05	-0.08	-0.06	0.05	-0.05
Other language	-0.13**	0.06	-0.07	-0.13*	0.07	-0.07	-0.12**	0.06	-0.07
Child age at interview (month)	-0.04**	0.02	-0.04	0.00	0.00	0.00	-0.03*	0.02	-0.04
Mother's age at birth	0.00	0.00	0.02	-0.07*	0.04	-0.05	0.00	0.00	0.01
PMK Father (middle cycle)	-0.07**	0.04	-0.05	-0.08*	0.05	-0.05	-0.09**	0.04	-0.05
Lone Parent	-0.1**	0.04	-0.06	0.00	0.01	-0.01	-0.10**	0.04	-0.07
Number of siblings	0.00	0.01	0.00	0.04	0.04	0.01	0.00	0.01	-0.01
Newfoundland	0.06*	0.04	0.02	0.01	0.04	0.00	0.06	0.04	0.02
Prince Edward Island	-0.02	0.05	0.00	0.02	0.04	0.01	-0.02	0.06	0.00
Nova Scotia	0.03	0.03	0.01	-0.01	0.04	0.00	0.03	0.03	0.01
New Brunswick	-0.04	0.04	-0.01	-0.2***	0.06	-0.17	-0.04	0.04	-0.01
Quebec	-0.23***	0.05	-0.19	-0.05	0.03	-0.02	-0.24***	0.05	-0.20
Manitoba	-0.05	0.03	-0.02	-0.11***	0.03	-0.04	-0.05	0.03	-0.02
Saskatchewan	-0.08**	0.03	-0.03	-0.04	0.03	-0.03	-0.07**	0.03	-0.03
Alberta	-0.05*	0.03	-0.03	-0.06	0.03	-0.04	-0.04	0.03	-0.03
British Columba	-0.03	0.03	-0.02	0.04*	0.03	0.03	-0.02	0.03	-0.01
Rural	0.05**	0.02	0.03	-0.02	0.02	-0.02	0.05**	0.02	0.03
cohort2	0.00	0.02	0.00	-0.05**	0.02	-0.06	0.00	0.02	0.00
constant	4.87***	0.26	9.90	4.98***	0.27	10.26	4.90***	0.26	9.99

Table C.2 Early childhood model results (controls), continued

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Child Other Activities									
Child gender (boy)	-0.43**	0.21	-0.04	-0.33	0.23	-0.03	-0.42*	0.22	-0.04
French	-1.36**	0.62	-0.10	-1.45**	0.73	-0.11	-1.38**	0.64	-0.10
Other language	-0.11	0.50	-0.01	0.01	0.58	0.00	-0.06	0.53	0.00
Child age at interview (month)	1.7***	0.19	0.18	-0.02	0.02	-0.02	1.65***	0.19	0.17
Mother's age at birth	-0.01	0.02	-0.01	-0.19	0.45	-0.01	-0.02	0.02	-0.02
PMK Father (middle cycle)	-0.01	0.41	0.00	0.42	0.43	0.02	0.00	0.42	0.00
Lone Parent	0.34	0.37	0.02	-0.16	0.13	-0.03	0.31	0.38	0.02
Number of siblings	-0.17	0.11	-0.03	-1.03**	0.44	-0.02	-0.18	0.11	-0.03
Newfoundland	-0.96**	0.42	-0.02	-0.69	0.69	-0.01	-0.93**	0.42	-0.02
Prince Edward Island	-0.78	0.64	-0.01	0.20	0.51	0.01	-0.78	0.65	-0.01
Nova Scotia	-0.10	0.44	0.00	-1.00**	0.46	-0.03	-0.20	0.43	-0.01
New Brunswick	-1.15**	0.41	-0.03	0.05	0.78	0.00	-1.13**	0.42	-0.03
Quebec	-0.12	0.66	-0.01	-0.83**	0.36	-0.03	-0.01	0.68	0.00
Manitoba	-0.72**	0.34	-0.02	-1.43***	0.31	-0.05	-0.63*	0.35	-0.02
Saskatchewan	-1.28***	0.31	-0.04	-1.27***	0.32	-0.07	-1.3***	0.32	-0.04
Alberta	-1.26***	0.30	-0.07	-0.06	0.36	0.00	-1.27***	0.31	-0.07
British Columba	-0.08	0.31	0.00	-0.42	0.26	-0.03	-0.09	0.32	0.00
Rural	-0.37	0.24	-0.02	0.16	0.24	0.01	-0.39	0.24	-0.02
cohort2	0.21	0.21	0.02	1.58***	0.20	0.16	0.20	0.22	0.02
constant	-15.87***	3.09	-2.84	-15.56 ***	3.41	-2.75	-15.54***	3.15	-2.77

Table C.3 Middle childhood model results (main)

Results correspond to figure 14 in main text

	Socio-emotional			Cognitive			Behavioural		
	Coeff.	SE	Std. Coeff	Coeff.	SE	Std. Coeff	Coeff.	SE	Std. Coeff
Effects on mediators									
SES → Income	0.15***	0.01	0.71	0.14***	0.01	0.70	0.15***	0.01	0.70
SES → Family functioning	0.02***	0.01	0.12	0.02***	0.01	0.12	0.02**	0.01	0.11
SES → Parenting	0.00	0.02	0.00	0.02	0.02	0.04	0.00	0.02	-0.01
SES → Child Activities	0.02**	0.01	0.10	0.03**	0.01	0.13	0.02**	0.01	0.10
Income → Family Functioning	0.03	0.03	0.04	0.03	0.04	0.11	0.06	0.04	0.08
Income → Parenting	0.03	0.10	0.02	-0.06	0.09	-0.04	0.04	0.10	0.02
Income → Child Activities	0.12**	0.05	0.10	0.13**	0.06	0.04	0.09	0.06	0.08
Family functioning → Parenting	0.84***	0.15	0.31	0.74***	0.15	0.30	0.83***	0.14	0.32
Effects on Outcome									
Income → Outcome (direct)	0.27*	0.14	0.10	0.81**	0.38	0.10	-0.17**	0.08	-0.10
Income → Outcome (indirect)	0.06*	0.03	0.02	-0.03	0.06	0.00	-0.01	0.02	-0.01
Income → Outcome Total	0.32**	0.14	0.12	0.78**	0.38	0.10	-0.19**	0.08	-0.11
SES → Outcome (direct)	0.04**	0.02	0.08	0.37***	0.07	0.23	-0.03**	0.01	-0.08
SES → Outcome (indirect)	0.06***	0.01	0.11	0.12***	0.01	0.07	-0.03***	0.01	-0.08
SES → Outcome Total	0.11***	0.02	0.19	0.49***	0.07	0.30	-0.06***	0.01	-0.16
Positive Parenting → Outcome	0.26***	0.08	0.17	0.61***	0.18	0.13	-0.23***	0.05	-0.26
Family Functioning → Outcome (direct)	0.28*	0.16	0.05	-0.78**	0.37	-0.07	0.06	0.08	0.03
Family Functioning → Outcome (indirect)	0.22***	0.04		0.45***	0.09	0.04	-0.19***	0.03	-0.08
Family Functioning → Outcome Total	0.5***	0.16	0.13	-0.33	0.38	-0.03	-0.13	0.08	-0.06
Child Activities → Outcome	0.32***	0.08	0.13	0.16	0.20	0.02	0.03	0.05	0.02
Coefficient of determination		0.61			0.62			0.59	
SRMR		0.03			0.03			0.03	
N		2732			2943			2805	

Table C.4 Middle childhood model results (controls)

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Outcome									
Child gender (boy)	0.31**	0.11	0.10	1.03***	0.26	0.12	0.25***	0.06	0.14
French	0.39	0.26	0.11	0.32	0.60	0.03	-0.33	0.26	-0.15
Other language	1.04**	0.47	0.13	2.98**	1.28	0.13	-0.26	0.35	-0.05
Child age at interview (month)	0.00	0.09	0.00				0.04	0.05	0.03
Mother's age at birth	0.00	0.01	0.01	0.03	0.03	0.03	-0.01**	0.01	-0.07
PMK Father (middle cycle)	0.13	0.28	0.02	-0.04	0.58	0.00	-0.11	0.10	-0.03
Lone Parent	0.03	0.15	0.01	0.26	0.39	0.02	0.03	0.10	0.01
Number of siblings	0.02	0.06	0.02	0.34**	0.15	0.08	0.01	0.04	0.01
Newfoundland	0.01	0.21	0.00	0.87*	0.50	0.03	-0.10	0.11	-0.01
Prince Edward Island	0.58**	0.23	0.03	-0.02	0.49	0.00	0.02	0.16	0.00
Nova Scotia	-0.12	0.20	-0.01	0.12	0.41	0.00	0.13	0.12	0.03
New Brunswick	0.35*	0.19	0.04	-0.33	0.42	-0.01	0.03	0.15	0.01
Quebec	-0.57**	0.28	-0.15	2.39***	0.64	0.23	0.20	0.29	0.09
Manitoba	-0.01	0.17	0.00	1.16**	0.44	0.05	-0.06	0.09	-0.01
Saskatchewan	-0.09	0.19	-0.01	0.56	0.42	0.03	-0.05	0.10	-0.01
Alberta	-0.13	0.16	-0.03	1.19**	0.42	0.09	0.11	0.10	0.04
British Columba	-0.09	0.16	-0.02	1.19***	0.41	0.09	-0.06	0.09	-0.02
Rural	0.07	0.11	0.02	-0.18	0.25	-0.01	-0.08	0.06	-0.03
cohort2	-0.01	0.11	0.00	-0.19	0.27	-0.02	0.00	0.06	0.00
Controls → Parenting									
Child gender (boy)	-0.11	0.08	-0.05	-0.10	0.07	-0.05	-0.07	0.07	-0.03
French	0.11	0.14	0.04	0.14	0.14	0.06	0.18	0.14	0.08
Other language	0.40	0.32	0.07	0.30	0.30	0.06	0.41	0.31	0.08
Child age at interview (month)	0.10	0.06	0.05	0.01	0.01	0.05	0.12**	0.06	0.07
Mother's age at birth	0.01	0.01	0.07	0.17	0.22	0.04	0.02*	0.01	0.07
PMK Father (middle cycle)	0.43	0.29	0.10	-0.13	0.10	-0.05	0.43	0.27	0.10
Lone Parent	-0.02	0.13	-0.01	-0.08*	0.05	-0.09	0.05	0.12	0.02
Number of siblings	-0.06	0.05	-0.06	0.37**	0.18	0.05	-0.02	0.04	-0.01
Newfoundland	0.54***	0.18	0.07	0.17	0.15	0.01	0.59***	0.16	0.07
Prince Edward Island	0.24	0.16	0.02	0.19	0.13	0.03	0.33**	0.15	0.02
Nova Scotia	0.31**	0.15	0.05	0.33***	0.13	0.05	0.32**	0.14	0.06
New Brunswick	0.43***	0.14	0.06	0.10	0.14	0.04	0.41***	0.13	0.06
Quebec	0.12	0.15	0.05	0.01	0.12	0.00	0.08	0.15	0.03
Manitoba	-0.01	0.14	0.00	-0.08	0.11	-0.02	0.02	0.13	0.00
Saskatchewan	-0.10	0.13	-0.02	-0.07	0.12	-0.02	0.00	0.11	0.00
Alberta	0.00	0.13	0.00	0.09	0.12	0.03	0.03	0.12	0.01
British Columba	0.21	0.16	0.07	0.05	0.07	0.02	0.21	0.16	0.07
Rural	0.05	0.08	0.02	0.01	0.07	0.00	0.06	0.08	0.02
cohort2	-0.02	0.08	-0.01	0.05	0.06	0.03	0.01	0.07	0.00

Table C.4 Middle childhood model results (controls), continued

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Functioning									
Child gender (boy)	-0.05*	0.02	-0.06	-0.05*	0.02	-0.14	-0.04*	0.02	-0.16
French	-0.01	0.06	-0.01	-0.01	0.06	-0.19	-0.02	0.06	-0.20
Other language	-0.13*	0.08	-0.07	-0.13	0.08	-0.07	-0.12	0.08	-0.10
Child age at interview (month)	-0.04*	0.02	-0.05	0.00	0.00	-0.03	-0.03	0.02	-0.02
Mother's age at birth	0.00	0.00	-0.06	0.05	0.07	0.00	0.00	0.00	-0.02
PMK Father (middle cycle)	-0.03	0.06	-0.02	-0.12***	0.04	-0.01	0.02	0.07	0.01
Lone Parent	-0.1**	0.04	-0.09	-0.01	0.01	0.06	-0.1**	0.04	-0.02
Number of siblings	-0.01	0.01	-0.04	-0.01	0.04	0.02	-0.02	0.01	0.06
Newfoundland	0.00	0.05	0.00	-0.08	0.05	0.02	0.00	0.05	0.01
Prince Edward Island	-0.06	0.05	-0.01	0.01	0.05	0.05	-0.07	0.05	0.01
Nova Scotia	0.00	0.05	0.00	-0.04	0.04	0.03	0.01	0.05	0.05
New Brunswick	-0.05	0.04	-0.02	0.06	0.06	0.04	-0.05	0.04	0.02
Quebec	0.06	0.06	0.06	0.03	0.04	0.03	0.07	0.06	0.04
Manitoba	0.03	0.04	0.01	0.03	0.04	0.03	0.03	0.04	0.03
Saskatchewan	0.05	0.04	0.03	0.00	0.04	-0.01	0.05	0.04	0.02
Alberta	0.01	0.04	0.01	0.01	0.04	0.05	0.01	0.04	-0.02
British Columba	0.01	0.04	0.01	0.02	0.03	0.04	0.01	0.04	0.03
Rural	0.02	0.03	0.01	0.05**	0.02	0.01	0.04	0.03	0.04
cohort2	0.07**	0.02	0.09	-0.02	0.02	-0.02	0.07**	0.02	0.02
Controls → Child Activities									
Child gender (boy)	-0.2***	0.03	-0.16	-0.18	0.03	-0.06	-0.2	0.03	-0.06
French	-0.3***	0.08	-0.2	-0.29	0.09	-0.01	-0.3	0.08	-0.02
Other language	-0.32**	0.11	-0.09	-0.26	0.11	-0.06	-0.32	0.12	-0.06
Child age (month)	-0.01	0.03	-0.01	0	0	-0.05	-0.02	0.03	-0.05
Mother's age at birth	0	0	-0.02	0.01	0.08	0.03	0	0	-0.04
PMK Father (middle cycle)	0.02	0.08	0.01	-0.02	0.06	-0.11	0.02	0.07	0.01
Lone Parent	-0.04	0.06	-0.02	0.04	0.02	-0.04	-0.03	0.06	-0.09
Number of siblings	0.04*	0.02	0.06	0.12	0.08	0	0.04	0.02	-0.05
Newfoundland	0.11	0.08	0.02	0.14	0.09	-0.01	0.06	0.08	0
Prince Edward Island	0.13	0.08	0.01	0.18	0.07	0	0.11	0.09	-0.01
Nova Scotia	0.17**	0.07	0.05	0.14	0.07	-0.01	0.19	0.07	0
New Brunswick	0.14*	0.08	0.03	0.07	0.09	0.06	0.09	0.07	-0.02
Quebec	0.07	0.09	0.05	0.1	0.06	0.01	0.06	0.08	0.07
Manitoba	0.1	0.07	0.03	0.09	0.06	0.02	0.1	0.07	0.02
Saskatchewan	0.05	0.06	0.02	-0.03	0.05	0	0.06	0.06	0.02
Alberta	-0.04	0.05	-0.02	0.1	0.07	0.01	-0.03	0.05	0.01
British Columba	0.06	0.06	0.03	0.07	0.04	0.02	0.06	0.06	0.01
Rural	0.07	0.04	0.04	0.02	0.03	0.06	0.07	0.04	0.03
cohort2	0.02	0.04	0.02	-0.02	0.03	-0.03	0.03	0.04	0.09

Table C.5 Adolescent model results (main)

Results correspond to figure 15 in main text

	Socio-emotional			Cognitive			Behavioural		
	Coeff.	SE	Std. Coeff	Coeff.	SE	Std. Coeff	Coeff.	SE	Std. Coeff
Effects on Mediators									
SES → Income	0.14***	0.01	0.70	0.14***	0.01	0.70	0.14***	0.01	0.70
SES → Family functioning	0.02***	0.01	0.19	0.03***	0.01	0.21	0.03***	0.01	0.20
SES → Parenting	0.2**	0.10	0.11	0.19*	0.09	0.10	0.17*	0.10	0.11
SES → Child Activities	0.04***	0.01	0.19	0.04***	0.01	0.17	0.04***	0.01	0.18
Income → Family Functioning	0.00	0.03	-0.01	-0.02	0.03	-0.02	0.00	0.03	0.00
Income → Parenting	-0.15	0.52	-0.02	-0.26	0.49	-0.03	-0.11	0.51	-0.01
Income → Child Activities	0.06	0.06	0.05	0.03	0.06	0.03	0.06	0.06	0.06
Family functioning → Parenting	2.97***	0.54	0.22	3.09***	0.55	0.22	2.91***	0.54	0.23
Effects on Outcome									
Income → Outcome (direct)	0.58	0.38	0.09	0.33	0.49	0.03	-0.01	0.04	-0.02
Income → Outcome (indirect)	-0.01	0.20	0.00	-0.02	0.07	0.00	0.00	0.01	0.00
Income → Outcome Total	0.57	0.40	0.09	0.31	0.49	0.03	-0.01	0.04	-0.02
SES → Outcome (direct)	-0.09	0.08	-0.07	0.53***	0.09	0.25	0.01	0.01	0.05
SES → Outcome (indirect)	0.2***	0.04	0.15	0.11***	0.01	0.05	-0.01***	0.00	-0.07
SES → Outcome Total	0.11	0.09	0.08	0.64***	0.09	0.31	0.00	0.01	-0.02
Positive Parenting → Outcome	0.35***	0.06	0.48	0.06	0.06	0.05	-0.03***	0.01	-0.31
Family Functioning → Outcome (direct)	-0.38	0.41	-0.04	1.25**	0.57	0.08	0.02	0.04	0.02
Family Functioning → Outcome (indirect)	1.05***	0.19	0.10	0.18***	0.03	0.01	-0.08***	0.01	-0.07
Family Functioning → Outcome Total	0.67	0.42	0.07	1.43**	0.58	0.09	-0.06	0.04	-0.05
Child Activities → Outcome	0.82**	0.29	0.13	0.44	0.42	0.05	-0.04	0.03	-0.06
Coefficient of determination		0.59			0.61			0.61	
SRMR		0.03			0.02			0.03	
N		1782			1834			1848	

Table C.6 Adolescent model results (controls)

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Outcome									
Child gender (boy)	0.03	0.31	0.00	0.71*	0.42	0.06	0.15***	0.03	0.18
French	1.09*	0.60	0.13	0.77	0.76	0.06	-0.09	0.06	-0.09
Other language	0.03	0.89	0.00	4.04***	1.25	0.12	-0.21***	0.07	-0.09
Child age at interview (month)	-0.13	0.26	-0.02	0.71**	0.34	0.07	0.04	0.03	0.05
Mother's age at birth	-0.02	0.04	-0.03	0.20***	0.05	0.18	0.00	0.00	-0.04
PMK Father (middle cycle)	0.23	0.78	0.02	0.65	0.73	0.03	0.16*	0.10	0.10
Lone Parent	-0.26	0.40	-0.03	0.21	0.53	0.01	0.07	0.04	0.06
Number of siblings	0.16	0.17	0.05	0.31	0.21	0.05	0.00	0.01	-0.01
Newfoundland	0.69	0.62	0.03	0.15	0.73	0.00	-0.01	0.05	0.00
Prince Edward Island	-0.48	0.73	-0.01	-1.12	0.93	-0.01	-0.01	0.06	0.00
Nova Scotia	0.23	0.53	0.01	-1.89**	0.73	-0.05	0.03	0.08	0.01
New Brunswick	0.48	0.50	0.02	-1.14	0.71	-0.03	-0.01	0.06	0.00
Quebec	-0.57	0.62	-0.07	0.80	0.78	0.06	0.06	0.06	0.06
Manitoba	-0.02	0.53	0.00	0.14	0.82	0.00	-0.03	0.05	-0.01
Saskatchewan	-0.47	0.41	-0.02	-0.79	0.64	-0.03	-0.01	0.04	-0.01
Alberta	0.38	0.44	0.03	0.33	0.66	0.02	0.04	0.06	0.03
British Columba	-0.86*	0.50	-0.07	0.08	0.63	0.00	0.08	0.06	0.06
Rural	0.47	0.29	0.05	0.69*	0.41	0.04	-0.07**	0.03	-0.06
cohort2	0.07	0.30	0.01	-0.42	0.42	-0.04	0.01	0.03	0.01
Controls → Parenting									
Child gender (boy)	-0.35	0.39	-0.04	0.12	0.43	0.01	-0.32	0.41	-0.04
French	0.29	0.85	0.03	-0.44	0.92	-0.04	0.25	0.87	0.02
Other language	1.35	1.55	0.05	-0.24	1.17	-0.01	1.39	1.56	0.05
Child age at interview (month)	-0.89***	0.31	-0.11	-0.67**	0.31	-0.08	-0.92***	0.30	-0.12
Mother's age at birth	0.03	0.04	0.03	-0.01	0.04	-0.01	0.01	0.04	0.01
PMK Father (middle cycle)	-0.97	0.68	-0.05	-0.87	0.67	-0.04	-1.10	0.69	-0.06
Lone Parent	0.36	0.61	0.03	-0.02	0.58	0.00	0.10	0.61	0.01
Number of siblings	0.00	0.25	0.00	-0.34	0.25	-0.07	-0.05	0.26	-0.01
Newfoundland	1.22	0.81	0.04	0.43	0.79	0.01	0.93	0.82	0.03
Prince Edward Island	0.03	0.93	0.00	-0.09	0.94	0.00	-0.38	0.90	-0.01
Nova Scotia	-1.33*	0.77	-0.04	-1.48*	0.74	-0.05	-1.43*	0.75	-0.05
New Brunswick	-0.36	0.77	-0.01	-0.66	0.74	-0.02	-0.69	0.75	-0.02
Quebec	0.88	0.85	0.08	1.39	0.86	0.12	0.82	0.85	0.08
Manitoba	0.08	0.74	0.00	0.30	0.71	0.01	0.10	0.71	0.00
Saskatchewan	-0.06	0.74	0.00	0.11	0.60	0.00	-0.40	0.71	-0.02
Alberta	-0.25	0.61	-0.02	-0.27	0.51	-0.02	-0.35	0.61	-0.02
British Columba	0.52	0.63	0.03	0.21	0.65	0.01	0.31	0.62	0.02
Rural	0.05	0.41	0.00	-0.21	0.42	-0.01	-0.03	0.41	0.00
cohort2	-0.66	0.40	-0.07	-0.41	0.40	-0.04	-0.56	0.41	-0.06

Table C.6 Adolescent model results (controls), continued

	Socio-emotional			Cognitive			Behavioural		
	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>	<i>Coeff.</i>	<i>SE</i>	<i>Std. Coeff</i>
Controls → Functioning									
Child gender (boy)	0.04	0.03	0.05	0.04	0.03	0.05	0.03	0.03	0.05
French	0.10	0.08	0.12	0.10	0.09	0.12	0.11	0.08	0.13
Other language	0.18**	0.08	0.09	0.18**	0.09	0.08	0.18**	0.08	0.09
Child age at interview (month)	-0.03	0.02	-0.05	-0.02	0.02	-0.04	-0.03	0.02	-0.04
Mother's age at birth	-0.01***	0.00	-0.14	-0.01***	0.00	-0.11	-0.01***	0.00	-0.14
PMK Father (middle cycle)	-0.08	0.05	-0.05	-0.07	0.05	-0.05	-0.07	0.05	-0.05
Lone Parent	-0.02	0.05	-0.02	0.00	0.05	0.00	-0.01	0.04	-0.01
Number of siblings	-0.02	0.01	-0.04	-0.02	0.01	-0.05	-0.01	0.01	-0.04
Newfoundland	0.02	0.05	0.01	0.03	0.05	0.01	0.02	0.05	0.01
Prince Edward Island	-0.10*	0.06	-0.02	-0.06	0.05	-0.01	-0.1*	0.05	-0.02
Nova Scotia	0.00	0.05	0.00	0.03	0.05	0.01	0.03	0.05	0.01
New Brunswick	-0.01	0.06	0.00	0.00	0.05	0.00	-0.02	0.05	-0.01
Quebec	-0.06	0.09	-0.08	-0.06	0.09	-0.07	-0.07	0.09	-0.08
Manitoba	0.03	0.06	0.01	0.06	0.06	0.03	0.05	0.06	0.03
Saskatchewan	-0.01	0.04	0.00	0.01	0.04	0.00	0.01	0.04	0.01
Alberta	0.02	0.05	0.02	0.04	0.05	0.03	0.03	0.05	0.02
British Columba	0.04	0.05	0.04	0.07	0.05	0.06	0.04	0.04	0.03
Rural	0.01	0.03	0.01	-0.01	0.03	-0.01	0.01	0.03	0.01
cohort2	0.00	0.03	0.00	0.01	0.03	0.02	0.00	0.03	0.00
Controls → Child Activities									
Child gender (boy)	-0.21***	0.05	-0.18	-0.19***	0.05	-0.16	-0.20***	0.05	-0.17
French	-0.05	0.13	-0.04	-0.1	0.14	-0.07	-0.07	0.13	-0.05
Other language	-0.14	0.19	-0.04	-0.1	0.23	-0.03	-0.15	0.19	-0.05
Child age (month)	-0.05	0.04	-0.05	-0.04	0.04	-0.04	-0.06	0.04	-0.06
Mother's age at birth	0	0.01	0.01	0	0.01	0.01	0	0.01	0
PMK Father (middle cycle)	-0.03	0.07	-0.01	-0.01	0.07	-0.01	-0.03	0.07	-0.01
Lone Parent	-0.09	0.06	-0.06	-0.08	0.07	-0.05	-0.11*	0.06	-0.07
Number of siblings	0.02	0.03	0.03	0.01	0.03	0.02	0.01	0.02	0.02
Newfoundland	0.06	0.08	0.02	0.05	0.08	0.01	0.07	0.08	0.02
Prince Edward Island	0.01	0.09	0	0.05	0.09	0.01	0.01	0.09	0
Nova Scotia	-0.03	0.08	-0.01	-0.04	0.08	-0.01	-0.05	0.08	-0.01
New Brunswick	-0.19**	0.09	-0.05	-0.19**	0.09	-0.05	-0.19**	0.09	-0.05
Quebec	-0.05	0.14	-0.04	-0.03	0.15	-0.02	-0.05	0.14	-0.03
Manitoba	0.07	0.1	0.02	0.07	0.09	0.02	0.08	0.09	0.02
Saskatchewan	0.20**	0.09	0.06	0.20**	0.08	0.07	0.19**	0.08	0.06
Alberta	0.03	0.08	0.01	0.06	0.08	0.03	0.02	0.08	0.01
British Columba	0.07	0.08	0.04	0.12	0.09	0.07	0.09	0.08	0.05
Rural	0.06	0.04	0.04	0.03	0.04	0.02	0.05	0.04	0.03
cohort2	0	0.05	0	0.02	0.05	0.01	0.01	0.05	0.01

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Conclusion: Towards an evidence-based ‘disadvantage’ approach to child policy

1	Introduction.....	260
2	Summary of findings	260
2.1	Paper 1: Shifting perspectives and paradigmatic constraints in Canadian child policy 1995-2015	260
2.2	Paper 2: How are the kids doing?: Canadian child well-being during a period of prosperity and policy attention.....	261
2.3	Paper 3: How do Income and Socio-Economic Status Matter? Disentangling Pathways of Effect on Child Well-Being and Development	262
3	Limitations and forward research directions.....	264
4	Discussion & Policy implications.....	265
	References	272

1 Introduction

How can Canadian policy improve children's well-being and equalize the lives of children born into different family circumstances? This dissertation addresses this question through three papers examining recent child policy in Canada and the relationship between Canadian children's family income and their well-being. Independently, each paper offers a different insight into how policy addresses childhood inequality. Taken together, I find that a policy focus on increasing family income, the dominant policy approach in Canada for the past twenty years (Paper #1), has not resulted in measurable improvements in child outcomes or reduced childhood inequalities. This outcome is seen at a population level (Paper #2), and also supported by examination of individual child outcomes that shows income has little effect on outcomes at the individual level (Paper #3).

I begin this conclusion by briefly summarizing the independent findings of each of the papers, and then address a few limitations of the research project and potential future research directions. I then discuss the combined policy contribution of the research, presenting the case for a shift towards a child policy approach focused on 'childhood disadvantage'.

2 Summary of findings

2.1 Paper 1: Shifting perspectives and paradigmatic constraints in Canadian child policy 1995-2015

The first paper of the dissertation describes the recent history of child policy in Canada and the various policy ideas that have determined these policies. In the last twenty years child policy has been an area of significant prominence in Canadian social

policy. Federal spending on children has more than doubled since 1995, as has the value of federal child benefits for the lowest income families. The paper's analysis of government expenditure finds that the overwhelming majority of the federal expansion in child policy either specifically aims to increase family income (i.e. child benefits), or primarily serves children via increasing family income (e.g. tax credits, parental leave benefits). Looking to ideas that shape child policy, I argue that this income focus is the result of a family income 'policy paradigm' that problematizing family income as the key legitimate child policy concern for governments. This paradigm is grounded in the consensus among four policy perspectives of the child in the Canadian political discourse: child as family responsibility, child as deserving poor, child as investment and child as rights bearer. While there have been shifts in the prominence of these differing perspectives, the strength of their common support for increasing family income has sustained the child policy paradigm and provided the political foundation for the significant expansion of government spending on children.

2.2 Paper 2: How are the kids doing?: Canadian child well-being during a period of prosperity and policy attention

The second paper examines whether policies increasing family income and general economic prosperity in Canada from 1994 to 2008 have trickled down to improvements in the lives of young children. I take a multidimensional approach to measuring child well-being and compare metrics of families' financial well-being (poverty and income inequality) with indicators of young children's well-being (measures of physical, socio-emotional, and developmental outcomes, as well as family relations). Despite seeing policy-driven increases in incomes of poorest income families, I find increased government spending and economic growth has not translated into observed

improvements for young Canadian children in terms of relative poverty, income inequality, or measures of child outcomes.

Relative child poverty has remained stable as incomes of families dependent on government assistance have not kept pace with rising median incomes. With one hand government policy has worked to close the gap between poor and rich with increased targeted child benefits; but with the other, government has widened the gap, with tax breaks and universal benefits that have eroded the relative value of child benefits. While children have been somewhat shielded from the major increases in income inequality seen in the general population, I find taxation has regressively evened out the growth rates at different points in the income distribution: income inequality for children is on the rise.

I find very little evidence of either significant general improvement or equalization in child outcomes over the 16 years of data coverage. In the 32 indicators of well-being examined for children under age six, I find general improvements in only nine measures and a worsening of infant developmental outcomes. On approximately half the well-being indicators I find significant gaps between the outcomes of the lowest and highest income children. With the exception of one indicator (hyperactivity), there is no evidence of narrowing in these gaps. Responding to the titular question of this paper, I find that, at a population level, young Canadians have not greatly benefited from an era of expanded child policy focused on income transfers.

2.3 Paper 3: How do Income and Socio-Economic Status Matter? Disentangling Pathways of Effect on Child Well-Being and Development

The final paper of the dissertation examines the determinants of child outcomes at an individual level, disentangling the different pathways of effect of income and non-income elements of socio-economic status (SES) on child outcomes during three stages of childhood: preschool (age 0-5), middle (age 8-13), and high school (age 12-16). Taking a multi-dimensional approach to measuring child well-being, I look at socio-emotional well-being, cognitive development, and behavioral outcomes. The analysis finds that the effects of income and non-income SES vary between different child age groups and outcome measures. In nearly all models, household SES has a stronger influence than income on outcomes, either directly or through mediating pathways. In line with prior research, I find income has a very minor, though positive, effect on a limited range of child outcomes. Parenting behavior, a mediating variable in the model, is found to have the largest effect of any influence on socio-emotional and behavioural outcomes. Children's participation in extra-curricular activities in middle childhood and high school is found to be a mediating factor in SES's affect on children's socio-emotional well-being.

The results of this paper suggest policy interventions to increase income are, on average, unlikely to have a significant effect on child outcomes. The disadvantage of growing up in a lower-income household is found to be a result of some of the key causes of lower income—less education and lower occupational class—rather than the income level itself. The identification of parenting practices and child participation as mediating factors that affect child outcomes and vary with socio-economic status, suggests improving these experiences may be a means of moderating the disadvantage of growing

up in a household with low SES. A more general policy lesson of the paper is its demonstration of the importance of using multiple measures of child well-being and development when considering policy instruments, design and evaluations: different child outcomes are influenced differently by the same factors at different ages.

3 Limitations and forward research directions

This dissertation was motivated by an overarching policy question that is much broader than what can be adequately addressed in three research papers. This dissertation thus offers an important, but inherently limited contribution to our understanding of the potential for public policy to improve and equalize children's lives. While each paper contains a discussion of caveats and constraints, an appreciation of the overall limitations is important in bounding the application of this research, and setting direction for future research.

The analysis in this dissertation provides both policy evaluation (paper two) and policy-applicable research (paper three). However, neither statistical analysis explicitly identifies policy as a variable, or attempts to identify a causal effect of child policy. The discussion and conclusions drawn have been carefully bounded by this limitation. Efforts have been made to complement the interpretation of results with findings from other research where policy is explicitly accounted for in model or technique. The descriptive and observational research does provide the foundation from which to conduct future analysis to identify policy effects, however, that has been beyond the reach of this dissertation. Moving forward, exploiting interprovincial variations offer an opportunity to put policy within an analysis of child outcomes.

The national focus on Canadian child policy has allowed for an in-depth appreciation of and detailed account of the country's policy history, and the resulting research fills a gap in nationally-specific child policy research. However, as discussed in the introduction to the dissertation, Canada is also a unique case in international comparison. This in some way restricts findings to the Canadian context, particularly as concerns the politics of child policy. Without international comparison, the evaluation of Canadian policy also lacks a counterfactual case (e.g., how would have children fared in the absence of policy changes, or under a different policy regime?). Exploiting cross-national differences would be a fruitful direction for future research evaluating the effectiveness of national child policy frameworks.

Lastly, while a motivation for this dissertation was to examine how policy serves the most disadvantaged children, the data used (NLSCY and SLID) were population samples (and, as longitudinal survey data, likely more advantaged than the full population). The findings on the role of socio-economic status or income's effect must be interpreted as average effects, not necessarily representative of effects at all positions in the distribution. Similarly, the stability in population level outcomes seen in the second paper could mask important changes for small sub-populations, including very low income or minority communities.

4 Discussion & Policy implications

Each of the three papers stands independently; however, taken together they offer an evaluation of the last twenty years of Canadian child policy and some guidance for future child policy. My evaluation finds Canadian child policy over the past 20 years has been set by the family income paradigm. While this paradigm has provided the strong

political support necessary for major spending increases, it has also constrained child policies to those that increase family income. This approach has not proven effective in improving child outcomes, and does not correspond with the evidence (developed within this dissertation and found in the broader research literature) on what matters to child well-being and development. Reflecting on this conclusion and returning to the initial question motivating this dissertation, one must ask: what is the way forward for evidence-based policy to improve Canadian children's lives?

The failure of a family income approach to improve child outcomes is rooted in a faulty problem definition: income is not the primary determinant of child well-being. Therefore an evidence-based child policy approach begins with identifying a problem definition that better reflects what is known about the determinants of child well-being. Drawing on the findings of this dissertation, and the broader body of literature on child well-being, I believe shifting policy efforts to focus on reducing *disadvantage*, rather than increasing income, would be an effective path forward for an evidence-based child policy that improves Canadian children's lives.

The Oxford English Dictionary (2014) defines disadvantage as “absence or deprivation of advantage; an unfavourable condition or circumstance.” Disadvantaging factors are conditional on having the potential for a deleterious effect, *or* constitute an inferior position in and of themselves. A disadvantage connotes a relative condition, defined in terms of one's position relative to others or an ideal. A disadvantage is also probabilistic: a lack of advantage rather than a guarantee of poor outcome (e.g. the tortoise is disadvantaged in his race against the hare).

The term *childhood disadvantage* can therefore be used to refer to multiple factors in childhood that negatively affect a child's current condition and/or decrease their chances for positive outcomes later in life. In defining disadvantage as the policy problem, a childhood disadvantage approach would set up a policy objective of improving children's odds of positive outcomes and improving their current realities. It is a child-centred policy approach, focusing directly on the child's condition, rather than indirectly gauging it via a family measure such as income. This approach would allow a greater role for evidence in informing policy, both through identifying the disadvantaging factors as well as the policy methods to address them. This contrasts with the family income paradigm under which both policy problem and solution are statically defined with only limited reference to what is known about child well-being. The performance measure of a disadvantage approach would be set as improved child *outcomes*, rather than outputs such as family higher income being valued as ends in themselves.

A shift to a disadvantage approach is fundamentally about diversifying child policy to reflect the multidimensional nature of child well-being (Bronfenbrenner & Morris, 1998). S. Jones, Aber, and Raver (2003) present an example of an evidence-based framework for child policy reflecting a multidimensional understanding of child well-being. Their policy framework includes: community-directed interventions, such as public awareness campaigns and neighbourhood safety; family-directed measures, such as income and in-kind supports (including child care); parent-directed measures, such as human capital enhancement, parenting education, and home visitation; and, child-directed policies, such as early childhood education and afterschool programs. Extending this framework, a disadvantage approach could also serve to bring policy attention to some of

the structural forces of disadvantage in Canada, such as the disadvantage faced by Aboriginal peoples, economic inequality, and the ill-adaption of social and economic policy to new social norms, including single-parent families and precarious work.

It should be made clear that an argument for a childhood disadvantage approach is not a suggestion to abandon all child policy to increase family income. Research (including that within this dissertation) does not suggest income has no bearing on child well-being, particularly at the lowest income levels. For instance, recent Canadian research has shown that lowest income families tend to spend child benefits on basic needs and educational goods (L. Jones, Milligan, & Stabile, 2015). Income transfers therefore remain an important policy tool to ensure children's needs are met and address serious disadvantages such as lack of adequate food, clothing, or shelter. However, a childhood disadvantage approach places income policy within a broader child policy toolkit, with the selection of tools based on the evidence of effectiveness. A disadvantage approach would also guide the settings of income policy. For instance, targeting child benefits to low-income families, rather than spending on universal benefits that cover high income families where income is not likely a disadvantaging factor.

Expanding from a single factor to a multidimensional understanding to more effectively pursue a policy aim is not new in social policy. Policymakers increasingly approach adult poverty as more than a lack of income, for instance by applying the concept of social exclusion (Hills, Le Grand, & Piachaud, 2002). Likewise, public health has moved to respond to evidence of 'social determinants of health', increasing the scope of proactive public health policy (Marmot & Wilkinson, 1999; Raphael, 2009). As in both of these cases, developing a multidimensional approach to child policy offers a more

nuanced understanding of a complex social problem and thus a better chance at effectiveness.

A policy recommendation's utility can depend heavily on its political viability. I return to the analysis of the politics of Canadian child policy (presented in the first paper of the dissertation) to assess the possibility of childhood disadvantage dislodging the family income paradigm.

There is potential for childhood disadvantage policies to find support from all four of the policy perspectives on the child. Reducing disadvantage can easily be framed as 'investing' to reduce the likelihood of poor outcomes and increase human capital accumulation. Addressing inequalities children face through no fault of their own also resonates with the moral obligation of a 'deserving poor' perspective. A rights-based perspective could also support a childhood disadvantage approach, as many of the rights of the child can be interpreted as freedom from key disadvantaging factors.

The family responsibility perspective may be the least aligned with a disadvantage approach. The perspective that the family, rather than the child, is the unit of legitimate government intervention limits the range of policy supported. However, policy could expand beyond income as the only manner to support families in fulfilling their responsibilities to their children. From a family responsibility perspective, a disadvantage approach allows evidence to guide the determination of which factors disadvantage a family in providing the best conditions for their child, and effect policy interventions. Policies to increase access to recreational programs and facilities as well as voluntary community services could be disadvantage policies framed as respecting family responsibility.

The family income policy paradigm has proved enduring in the Canadian context. However, a shift in paradigms is often presaged by accumulating policy failures under the existing paradigm (Hall, 1993). Years of pursuing an income approach to child policy has not measurably improved Canadian children's well-being. If child well-being is indeed a key goal of family income policies (an important caveat), and the failure to see improvements is publically recognized as such (another key caveat), a shift may be in the offing. The 2015 federal election is replaying the 2006 election debate between child care and child benefits. However, this time Canadians seem less enamored with cheques in the mail, as nine years of the Universal Child Care Benefit has not resulted in accessible, affordable, quality child care options (Ferns & Friendly, 2014). The increasing disconnect between a family income approach and a growing evidence that child well-being is determined by more than income, presents another challenge to the family income paradigm.

Childhood disadvantage offers an alternative policy approach that fits with existing policy perspectives on the child, but presents an alternative, albeit weaker, consensus. Unlike cash transfers under a family income paradigm, there is likely no single policy instrument to address childhood disadvantage that will find undisputed political support amongst all perspectives. Moving child policy forward under this approach will require continual negotiation of which factors of disadvantage to prioritize, as well as how best to deliver policy.

Canadian children face very different lives based on the families that they are born into. However, the extent of these differences is not only the result of the chance of birth, but also public policy decisions about how governments support children and

families. This dissertation has offered new insights into how Canadian public policy serves children, and how effective that support is. While child policy has been one of the most dynamic areas of Canadian social policy over the past twenty years, going forward it must move beyond a family income focus if it is to effectively improve child-well being and reduce disadvantages faced by children.

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