

Investments in children's health and well-being:  
Canadian evidence for two-parent families

by

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## ABSTRACT

Using the first cycle (1994-1995) of the National Longitudinal Survey of Children and Youth (NLSCY), I estimate the investment levels of the two-parents families into the health and well-being of their children. Controlling for the household income, size, and family characteristics, I find that investments of stepfamilies, adoptive families and foster parents families are not necessarily significantly different from the investments made by families with both biological parents with respect to children's visits to the doctor and dentist. However, families with stepfathers and adoptive-fathers are less likely - about 5% for the stepfathers and 12% for the adoptive-fathers - to invest in children's visits to a dentist.

Investments of families with adoptive-fathers and foster parents are not necessarily significantly different from investments by families with both biological parents with respect to children's well-being. Families with stepmothers are 9% more likely to invest in children's participation in summer day camp activities. However, families with stepparents are 12% less likely to invest in children's participation in organized sports and 8% less likely to invest in children's participation in dance, music or art classes.

## INTRODUCTION

According to Statistics Canada (2001 Census), the once dominant family type, i.e. the one consisting of married couples with children, has become less common in Canada. From a 55% share in 1981 and a 49 % share in 1991, respectively, the proportion of married or common-law couples with children of age 24 and under living at home, relative to the number of all families in Canada, dropped to a 44% share in 2001. A graphical representation of this situation is given in Fig.1.

### Proportion of couples with children under 25 at home continues to decline, Canada

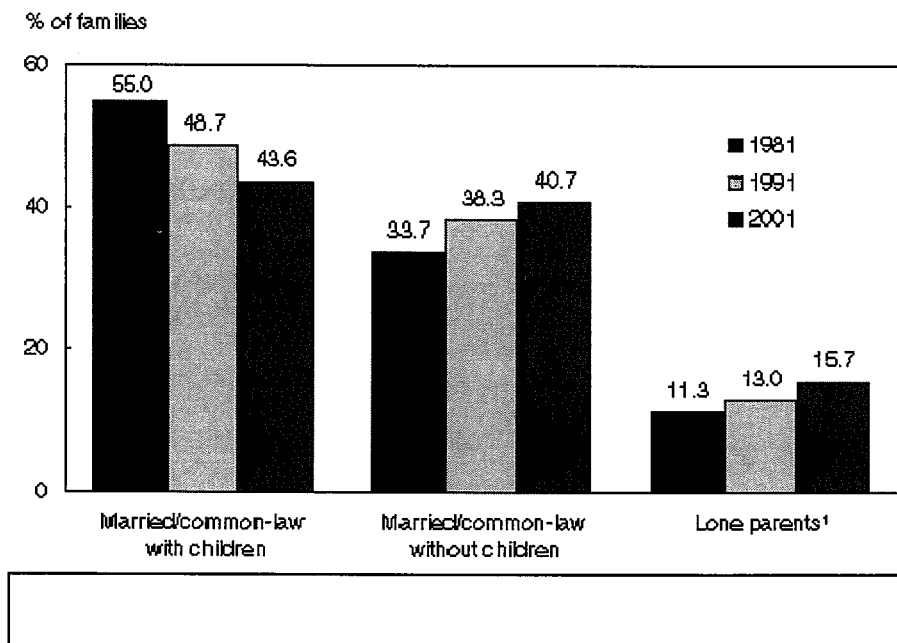


Fig.1. Source: Statistics Canada. 2001 Census Analysis Series - A Profile of Canadian families and households: Diversification continues. Statistics Canada.

<http://www12.statcan.ca/english/census01/Products/Analytic/companion/fam/canada.cfm>

As a result of changing family structure, Canada has experienced an increased number of diverse stepfamilies with a mix of biological and step-relationships between

parents and children, as well as an increased number of single-parent families. In 2001, stepfamilies represented almost 12% of all Canadian couples with children, compared to 10% in 1995 (Statistics Canada, 2001 Census). In 1994, approximately 9% of Canadian children under the age of 12 lived in a stepfamily, the majority of which were blended families, with both parents bringing children from a previous relationship into their current union (Statistics Canada, 1997b).

If I consider the commonly-held assumption that two biological parents provide the optimal family environment for a healthy child development, than all these changes in the traditional family structure have the potential of inducing significant stress and adaptive challenges for children who are part of disrupted families (Hetherington *et al.*, 1998). Divorce, life in single-parent families, cohabitation, and remarriage are difficult and stressful experiences that could impact both the children and the well-being of adults. Given this factual reality of changing family structure in Canada, it is important to understand if children living in different types of families have different outcomes and what mechanism leads to these different outcomes.

Current literature extensively addresses aspects related to the outcomes of children living with at least one biological parent absent relative to children living in traditional families with both biological parents. The results indicate small to moderate impacts of a wide range of family structure effects on the investigated outcomes. An interesting finding is that children residing with stepparents have outcomes more similar to the children residing with a single parent than children residing with both biological parents (McLanahan and Sandefur, 1994; Duncan and Brooks-Gunn, 1997). Stepchildren and children living in single-parent families are more likely to experience adverse and

socially undesirable outcomes, such as poor academic achievements, lower rates of employment, lower-status occupational positions, criminal behavior, drug abuse, early sexual activity and marital instability (McLanahan and Sandefur, 1994; Evenhouse and Reilly, 1999; Kerr, 2004). They are also more likely to experience health, emotional and behavioral problems (Dawson, 1999; Case and Paxson, 2001; Kerr 2004).

In addition to contrasting outcomes of children living in different types of families, a number of studies analyze the mechanisms that account for the association between the family structure and the outcomes. An early unhappy life and the stress of living with multiple parent figures (Cherlin and Fustenburg, 1994; Wu, 1996), as well as the economic insecurity as a result of family disruption (Duncan and Brooks-Gunn, 1997), are both mechanisms considered to have a significant impact on the different outcomes for children living in various families types. Furthermore, one paper suggests that outcomes for children living in stepfamilies are different than the outcomes for children living with both biological parents. Daly and Wilson (1999) suggest that this is due to lower investment that stepparents make in their stepchildren. Parents may choose to invest more in their biological children and less in their stepchildren, in order to protect their own genetic material and to increase the number of their genes presents in future generations.

A number of papers analyze the direct measures of parental investment in children, such as risk behavior, emotional health, children's social network, spending on education and allowance. The majority of results indicate that parents tend to invest more in biological children and less in stepchildren (Evenhouse and Reilly, 1999; Anderson *et al.*, 2001). Stepparents save less and invest less in stepchildren's postsecondary education

as well as in the stepchildren's health and well-being (Zvoch, 1999; Case and Paxson, 2001).

In this paper I continue the research on the line of two-parent families' investments, and in particular, the investments made by stepparents in the health and well-being of the children. I follow the methodology used in a recent paper by Case and Paxson (2001), who investigate the impact of family structure on investments made in children's health, for the case of the United States, using data from the 1988 National Health Interview Survey Child Health Supplement. Case and Paxson (2001) use old data from the 1988 Child Health Supplement and the National Health Interview Survey in US. Here, I use new data, from Canada, in order to analyze whether stepfamilies, invest less in their stepchildren's health and well-being relative to biological children. Besides a group of variables used as well by Case and Paxson (2001), I choose an extra set of key dependent variables in order to analyze the investment made by stepparents in children's well being. These particular investments refer to the participation of children in organized sports or physical activities in the past 12 months, the participation of children in music, dance or art classes in the past 12 months, as well as the children's participation in summer day camps and/or recreational and skill-building activities in the past 12 months.

In order to reach the objective of my paper, I consider the particular case of children and adults living in ten Canadian provinces, over the time period of 1994 -1995. Using data from the first cycle of the National Longitudinal Survey of Children and Youth (NLSCY), I investigate whether children living with stepparents in Canada are less likely to have routine visits to a family doctor, a dentist or a pediatrician. I also analyze whether they are less likely to participate in sports, music, dance, arts and summer day-

camp activities outside of school as a result of their parental affiliation. The key explanatory variables describe the different two-parents family structures as well as the socioeconomic characteristics of families, such as household income and size, parents' education, and their working status, as well as children's age, gender and immigration status.

The results in my paper are partially consistent with those of Case and Paxson (2001). Controlling for household income, size, and family characteristics, I find that investments of stepfamilies, adoptive families and foster parents families are not necessarily significantly different from the investments made by families with both biological parents with respect to children's visits to the doctor and dentist. However, families with stepfathers and adoptive-fathers are less likely - about 5 % for the stepfathers and 12% for the adoptive-fathers - to invest in children's visits to a dentist. I cannot control for the age of a child's mother. However, Case and Paxson (2001) found that even controlling for parents' age, simultaneously with controlling for parents' education and household income, results do not change.

Investments of families with adoptive-fathers and foster parents are not necessarily significantly different from investments by families with both biological parents with respect to children's well-being. Families with stepmothers are 9% more likely to invest in children's participation in summer day camp activities. However, families with stepparents are 12% less likely to invest in children's participation in organized sports and 8% less likely to invest in children's participation in dance, music or art classes.

The paper proceeds as follows. The first section, reviews the literature related to the major aspects pertaining to the present work. The second section describes the data source and the sample selection together with the variables and the methodology used in my current research. The third section presents the results of the statistical analysis. The final section summarizes the conclusions and the recommendations emerging from this research. The attached appendices include a list of variables, a categorization of two-parents families, as well as the program code.

## **1. LITERATURE REVIEW**

This literature review is divided into the two main streams found in the literature. I first address the work that deals with the analysis of the different *outcomes* for children living in families with at least one biological parent absent relative to children living in traditional families with both biological parents. Secondly, I address the stream that deals with several *mechanisms* that account for the different outcomes for children living in different types of families, with a particular interest in papers that directly analyze whether stepparents invest in children's well-being and, more specifically, in the children's health.

### **1.1. Outcomes for children living with at least one biological parent absent.**

Several studies have examined different outcomes for children living in alternative families with at least one biological parent absent relative to children living in traditional families with both biological parents. Within the social science research, the main work comes from sociology. The range of analyzed outcomes covers educational attainment, behavioral problems, psychological problems, jobs as well as income and

physical health. While most papers discussed the outcomes of children in one- and two-parent families, a small group of papers have distinguished between outcomes of stepchildren and biological children. An even smaller number of papers have considered the particular case of the outcomes of stepchildren and biological children living in Canada. Overall, researchers agree that children who grow up with at least one biological parent absent have less favorable outcomes than children who grow up in traditional families with both biological parents. However, the magnitude of the family structure effect on the different outcomes ranges from small to moderate, depending on the outcome being researched.

One of the most influential works that assesses the effects of family structure on children's outcomes is McLanahan and Sandefur (1994). They examine a broad range of outcomes using four sources of data - the National Longitudinal Survey of Youth, the Panel Study of Income Dynamics, the High School and Beyond Study, and the National Survey of Families and Households – and a methodology based on probit models. They suggest that children who grow up in traditional families with both biological parents are more likely to have good academic achievements. By testing five different measures of high school performance for students in USA, they find that children living with both biological parents perform better on test scores and on grades, have higher expectations regarding college, and have better attendance records. Later on, in college, even though the negative effect of family structure is reduced compared to the effect in high school, children growing up in traditional families still have the highest rate of enrolment and graduation. Besides better educational outcomes, McLanahan and Sandefur (1994) find

that children living with both biological parents are less likely to become sexually active early in life or become teenage parents.

Dawson (1999) finds similar negative outcomes for children living with a biological mother and a stepfather or with a single mother, formerly or never married, relative to children living with both biological parents. After controlling for demographic and socioeconomic differences among four groups of children, 5 to 17 years of age, the author finds that children living in stepfamilies or single-mother families, relative to children living with both biological parents, have a 75% and a 40% increased risk of having to be expelled and/or suspended or having to repeat a grade in school. These children also have an overall health vulnerability score that is 20% to 40% higher<sup>1</sup>. The effects of the family structure were most evident in the area of behavioral and emotional problems. Children between 3 to 17 years of age living in stepfamilies or single-mother families receive professional help for emotional and behavioral problems with a probability two to three times greater than children living with both biological parents.

Using the National Longitudinal Study of Adolescent Health in USA, Evenhouse and Reilly (1999) examine a large group of child outcomes, covering aspects related to education, risk behavior, child's social network, relationship quality and emotional health. They estimate a reduced-form model of child well-being and control for parents and children's characteristics, environmental characteristics as well as for siblings and birth order. They find that stepchildren perform worse than biological children in practically every measure of the child well-being which they analyze.

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<sup>1</sup> The overall health vulnerability score is "the best general indicator of child health problems" based on a list of items such as, accident/injuries/poisoning, asthma, frequent headaches, stammer/speech defect, and enuresis (bedwetting). (Dawson, 1999, p.577)

Controlling for mother's education and work status, Biblarz and Raftery (1999) find that "children from single father families, father/stepmother families, and mother/stepfather families had lower attainments than children from both-two biological-parent families" (p.323). Also, they seem to suggest that mother's role in raising a child is more important than that of the father. Controlling for socioeconomic position, Biblarz and Raftery (1999) find that "children from single-mother families consistently do better than those raised in single-father families or stepfamilies" (p.354).

The literature that deals with family structure and children outcomes contains only one paper referring to the Canadian context. Based on the first, the second and the third cycle of the NLSCY, Kerr (2004) examines specific outcomes for Canadian children of 4 to 7 years of age. His findings are consistent with the fact that children living in stepfamilies and single-parent families, as well as children experiencing persistent poverty, are more likely to experience difficult outcomes than children living in traditional families with both biological parents. These children are more likely to have signs of hyperactivity (inattention, impulsive and symptomatic motor activity), emotional distress and anxiety, as well as school-related difficulties in reading, writing, as well as mathematical skills. Even controlling for the parent's low educational attainment, parents' young age and lack of life experience, the results of the analysis are consistent with the anticipated findings that stepchildren and children living with a single parent experience childhood difficulties.

Overall, researchers agree that children living in disrupted families are more likely to have negative outcomes relative to children living in families with both biological parents. However, a study of Ganong and Coleman (1984), review thirty-eight

empirical studies of the effects of remarriage on children and find that stepchildren are not necessarily different from children in other types of families in regards to academic achievements and school grades, personality characteristics, social behavior and family relationships. Some of the results were explained by the authors themselves, through the “use of a deficit-comparison model, limited conceptualizations of family structural variables, a failure to account for the complexity of stepfamilies, small and nonrandom samples, reliance on self-report questionnaires, and the use of data gathered from one family member” (p.402).

While a number of researchers have documented the less favorable outcomes for children living in alternative families with at least one biological parent absent, relative to children living in traditional families, the question that arises is what particularly accounts for this association between the family structure and the low outcomes?

### **1.2. Mechanisms that account for family structure and low outcomes association**

While much has been said about the less favorable outcomes for children living with at least one biological parent absent relative to children living with both biological parents, less has been discussed about what generates such outcomes. In a study about the formation and functioning of stepfamilies, Cherlin and Fustenburg (1994) suggest that an early unhappy life and the stress living with multiple parent figures are causing adverse and socially undesirable outcomes for children living with at least one biological parent absent. Wu (1996) supports the idea that the stress accompanying changes in the family structure, such as divorce and remarriage, is critical for the well being of children. Frequent changes in the number and types of parental figures, as well as the uncertainty generated by fluctuations in family income, are strongly and significantly associated with

the risk of premarital birth for the adolescent women. Economic insecurity as a result of a family disruption is also considered as playing a role in the different outcomes for children living in different family structures (Duncan and Brooks-Gunn, 1997). Income is an important factor, which accounts for the negative effect of parent's disruption and "explains about 50 percent of the difference in the educational achievement of children raised in one- and two-parent families" (p.37). Duncan and Brooks-Gunn (1997) use in their analysis, a variety of data and a series of ordinary least square (OLS) multiple linear regressions. Some of the data used comes from the National Longitudinal Survey of Youth (NLSY), the Infant Health and Development Project (IHDP) and the National Survey of Families and Households (NSFH). They follow the outcomes of children in all development stages and estimate the effects of family structure, size of income and parental education on these outcomes.

One other paper suggests that different outcomes for children living in stepfamilies relative to children living with both biological parents are the result of the lower investment that stepparents make in their stepchildren. Parents may choose to invest less in their stepchildren and more in their biological children in order to protect their own genetic material and increase the numbers of copies of their genes present in future generations. Daly and Wilson (1999) outline that there is "a strong theoretical rationale for expecting that the evolved human psyche contains safeguards against allowing a mere step-child, however appealing, easy access to that special mental category occupied by genetic children, the appropriate objects for the most nearly selfless love we know" (p.66).

A number of studies deal directly with parental investment into children's education, health and well-being. Anderson *et al.* (2001) investigate men's parental investment in children from current and previous unions. They use a parental investment variable consisting of the amount of money spent for children education, clothing, hobbies, allowance, medical expenses and gifts. They find that men invest more in biological children of the current mate, less in stepchildren of current mate, even less in biological children of the former mate and, the least of all in stepchildren of former mate. Using a reduced-form model of children's well-being and controlling for parents and children's characteristic, environmental characteristics as well as for siblings and children's birth order, Evenhouse and Reilly (1999) find that stepparents invest less in their stepchildren and favor their biological children. Consequently, they argue that stepchildren do worse than the biological children in education, risk behavior, children's social network and emotional health.

Using data from the U.S. National Education Longitudinal Survey, Zvoch (1999) looks directly into whether stepparents invest less in stepchildren's postsecondary education than in their biological children. Controlling for income and parents' education, child ability and the number of financial dependents, and, inferring a parental consensus on the amount that finance children's postsecondary education, he finds that stepparents invest less in stepchildren's postsecondary education relative to biological children. Stepparents delay the start of a saving account for postsecondary education, save less to subsidize the cost of higher education, as well as, expect to allocate fewer economic resources to support the stepchild first year of postsecondary education. In a paper focused on comparing educational attainment for children raised by biological,

step, adoptive and foster mothers Case et al. (2000) confirm that stepparents invest less in their stepchildren's education relative to their biological children.

Considering children and adults living in US, Case and Paxson (2001) examine the effect of family structure on the investments made in children health and well-being. Controlling for household income and household and parental characteristics, they find that stepmothers invest less in children's health and well-being relative to children living with a biological mother. Stepchildren are less likely to have routine doctor visits, dentist visits, and a regular place for medical care. They are less likely to wear a seatbelt and more likely to live in family with someone who smokes. Further more, Case and Paxson (2001) lend support to the idea that "health investments are made disproportionately by a child's mother, and that on this dimension a step-mother is not an adequate substitute for a birth-mother" (p.323).

The literature review indicates that there is limited or no research in Canada that looks directly into the investments of stepparents in children health and/or children participation in activities outside of school, such as sports, music, dance, arts and summer day-camp, as a function of their parental affiliation. Additionally, should be noted that the main work discussed within the literature review is based on cross-sectional data rather than longitudinal-data.

## **2. DATA**

### **2.1. Data source description**

This paper makes use of the first cycle of the National Longitudinal Survey of Children and Youth (NLSCY), which is available through Statistics Canada. This national database was developed with the purpose of following the development and well

being of children across ten provinces of Canada, over time, from birth to young adulthood. The information was collected so as to cover a wide range of topics related to the health and physical development of children, their learning abilities and behavior, as well as their social environment (family, friends, schools and communities). Data were collected from two sources, households and schools, using questionnaires completed either face-to-face or by telephone.<sup>2</sup> The current study uses information only from the household collection. Currently, the NLSCY is organized in five cycles from 1994 to 2003, each cycle providing information on the same children and their family environment, over a two-year period<sup>3</sup>. Only the first three cycles are available to the public.

The information comprised in the first cycle of NLSCY was collected by Statistics Canada between 1994 and 1995, based on a database of households with children from 0 to 11 years of age. From a responding sample of 13,439 households in ten Canadian provinces, the first cycle resulted in a sample of 22,831 children 0 to 11 years of age<sup>4</sup>. As indicated by Statistics Canada, only 26% of the Canadian households had at least one child under the age of 12 (NLSCY-cycle 1, User's Guide, p.15). Therefore, as a method to reduce the costs associated with finding households comprising children 0 to 11 years of age, the NLSCY was based on a Labor Force Survey (LFS) sampling framework. It is important to note that the LFS framework excluded certain populations not part of the LFS sample, specifically individuals living in the Yukon and Northwest Territories. However, this initial exclusion was further included into the

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<sup>2</sup> The school collection includes information about the child's academic achievement, behavior at school and test scores. It also includes information on school policies, resources and educational climate.

<sup>3</sup> Further information regarding the NLSCY is available at:  
<http://www.statcan.ca/english/Dli/Data/Ftp/nlscy.htm>

<sup>4</sup> Excludes Yukon and Northwest Territories

NLSCY, under the Territories Component that was released in 1995 (NLSCY-cycle 1 User's Guide).

For each household, Statistics Canada identifies a "Person the Most Knowledgeable" (PMK) that completed the majority of the survey. In 91.3% of the cases, the PMK was the mother. However, for 8.2% of the cases the respondent was the father (NLSCY-Cycle1, User's Guide, p. 63). The spouse was defined in the NLSCY as the married and/or common-law partner of the PMK, residing in the household at the time of interview. If the child had a very young mother living with her own parents, the PMK was not the mother of the child but another adult living in the household, usually the child's grandmother. In 0.5% of the cases, the PMK was not the parent but lived in the household.<sup>5</sup>

Based on the relationship of children living with two parents, Statistics Canada identified several different categories of family structures. One category, the intact family, was defined as the married or common-law couple with all children biological or adopted. Another category, the stepfamily, consisted of "married or common-law couple with at least one stepchild living with them who is the biological or adopted child of one parent but not the other parent" (NLSCY-Cycle1, User's Guide, p. 65). The last category, the blended family, was defined as a subset of stepfamilies consisting "of a married or common-law couple living with at least two children, one of whom does not share the same natural and/or adoptive parents as the other child(ren)" (NLSCY-Cycle1, User's Guide, p.65). Based on these definitions and following the methodology of Case and Paxson (2001), I select six categories of two-parent families for my study. These categories are discussed in Table 5 and justified in section 2.2.

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<sup>5</sup> In 0.1% of the cases the parent did not live in the household with the child and the PMK.

## 2.2. Sample selection

In my paper, I use only the first cycle, 1994-1995. This cycle has data available to the public as well as key variables defining the PMK relationship to the child that are not suppressed from the data file. The subsequent cycles do suppress these key variables and are thus insufficient for the analysis herein.

In my research, I focus on the investments of two-parent families into the health and well-being of their children. The elimination of single parent families reduces the sample from 22,831 children to 19,470 children, 0 to 11 years of age. In this sample, both a “mother” and the “father” are present in the household, and the relationships between the child and each of the parents is known. Parents are identified as biological, step, adoptive or foster. Furthermore, by considering the definitions of two-parent families given by Statistics Canada, I group the different combinations of parents into six household structures: two-biological parents, two-parents with stepmother, two-parents with adoptive father, two-parents with step father, two parents with adoptive father and two-foster parents<sup>6</sup>.

In several cases, the selected sample of 19,470 children 0 to 11 years of age is further restricted. Questions of how often the child has taken part, in any organized sports which involved coaching or instruction in the previous 12 months, or, in lessons or instruction in music, dance, art or other non-sport activities, were asked for children of 4 years of age and more. As a result, the sample of 19,470 children is restricted to 12,033 children 4 to 11 years of age for the analysis pertaining to these investments. Similarly, the question of whether the child has attended a day camp last summer or recreational or

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<sup>6</sup> Appendix B describes the possible combinations of two parents, grouped in six categories

skill-building activity (e.g., music program, reading program, athletic program) is asked for children of 6 years of age and older. The sample of 19,470 children is then restricted to 8,876 children of 6 to 11 years of age for the analysis pertaining to this investment.

### **2.3. Variable description**

This section of the paper describes and justifies the dependent and explanatory variables used in this study. In order to outline the investments parents make in their children's health and well-being, I select two groups of dependent variables. One group of dependent variables refers to investments in child health. More specifically, the two dependent variables are first, whether or not parents have seen or talked over the phone about the child's physical or mental health with either a general practitioner or a pediatrician in the past 12 months, and second, whether they have seen or talked over the phone about the child's health with a dentist<sup>7</sup>. For the first group of health investments measures, the sample comprises 19,470 children of 0 to 11 years of age.

The other group of dependent variables refers to investments made in the children's well-being. More specifically, three dependent variables reflect whether or not parents have considered enrolling their children in others activities outside the school with the purpose of increasing their well-being. These activities refer to the participation of children in organized sports or physical activities in the past 12 months, the participation of children in music, dance or art classes in the past 12 months, as well as the children's participation in summer day camps and/or recreational and skill-building activities in the past 12 months. I consider these particular investments in child well-

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<sup>7</sup> While there are two separate questions for visits of children to a family doctor, or to a pediatrician, I combine them in one variable. In Canada, families use for their children the medical service of either a family doctor or a pediatrician.

being, since investing in participation of children in extracurricular activities has positive effects on child outcomes. For example, as McNeal (1995) finds, participation in extracurricular activities such as sports and fine arts significantly reduces a student's likelihood of dropping out school. For sports, music, dance and art classes participation, the sample is restricted to 12,033 children of 4 to 11 years of age, while for day camp participation the sample is restricted to 8,876 children of 6 to 11 years of age. Appendix A describes the NLSCY variables used to construct the two groups of key dependent variables.

Table 1, Panel A, presents the descriptive statistics for dependent variables. The investments made by parents in children's health and well-being, are summarized based on the six measures of family structure already discussed in section 2.2. In general, biological parents invest more in their children than any other category of parents. Relative to biological parents, families with stepmothers (.75 versus .82) and stepfathers (.74 versus .82) are less likely to have taken their children to visits to either a family doctor or a pediatrician in the past 12 months. The same pattern can be observed for the participation of children in sports, music, dance, and arts activities, outside of school. However, for visits to a dentist and for the participation in summer day camps, families with stepmothers and stepfathers are more likely than biological parents to invest in their children. Families with adoptive mothers are less likely than biological parents to invest in children's visit to either a family doctor or a pediatrician (.79 versus .82). However, they are more likely to invest in children's visits to a dentist (.65 versus .52) as well as in children's participation in sports (.66 versus .58), music (.43 versus .29), and day camps activities (.36 versus .30). Foster parents seem to invest more than biological parents with

regard to visits to either a family doctor or a pediatrician (.88 versus .82). However, they do worse than biological parents in all other types of investments.

From Table 1, Panel A, it is interesting to notice the sample size of the different family types. Most of the sample comes from families with biological parents (about 7,754 to 17,849 observations), while the lowest share comes from families with foster parents (7 to 34 observations). The second smallest share is families with stepmothers (96 to 118 observations), while families with stepfathers account for a larger sample size (around 661 to 859 observation). Families with an adoptive mother or an adoptive father have sample sizes between 55 and 202 observations.

The control variables are presented in Table 1, Panel B. I include measures of household income (nine categories) and household size<sup>8</sup>. For the descriptive statistics, I construct and report the average family income by setting the family income equal to the midpoint of each of the nine possible categories. Families with income of 80,000 CAD and more are assigned an average income of 115,000 CAD<sup>9</sup>. There are no missing values for the family income category. The household size variable is capped at 6 in the NLSCY data file. I also include measures of the child's age, immigration status and gender. I use dummy variables for children immigration status (1=immigrant, 0=not immigrant) and gender (1=male, 0=female), and I also control for parents' highest level of education (parents have high school or more) and working status (1=employed and 0=unemployed). Following Case and Paxson (2001), I include an indicator 1/0, the PMK is the father,

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<sup>8</sup> The 9 categories of family income are: less than \$10,000; \$10,000-14,999; \$15,000-19,999; \$20,000-29,000; \$30,000-39,000; \$40,000-49,999; \$50,000-59,999; \$60,000-79,999; \$80,000 and more.

<sup>9</sup> In NLSCY, income for a few outliers with more than \$150,000 was tapcoded to \$150,000. Statistics Canada, NLSCY-cycle 1, User's Guide, section 8.5, p.70.

since “women are the primary health care givers and investors, and the fathers may not know as much about child’s health or health investments” (p.309).

The results in the descriptive statistics table demonstrate some important differences across family types. These differences may help explain the observed differences in investment activities. For example, families with adoptive-mothers have, on average, higher incomes, smaller family sizes, and higher education levels compared to other families. As Case and Paxson (2001) suggest, adoptive parents are screened as good parents prior to adopting, and therefore they are most likely to invest in their children. For the case of families with stepmothers, average income is slightly higher relative to families with biological parents (\$55,120 versus \$53,050). At the same time their children are, on average, older than children living with biological parents (7.91 versus 4.97 years). If, for example, children living with stepmothers are older, and if older children are on average more likely to go to a dentist, than that could explain why results for dentist visits are higher for stepparents relative to biological parents. Given the influences that socioeconomic characteristics of families might have on the investments that parents make in the children’s health and well-being, I control for all these differences in my regressions. For families with adoptive-fathers and stepfathers, on average, the income and education are lower. Foster parent families have lower income, lower education, and larger family size.

One limitation of the public use files for NLSCY is that I cannot include the age of a child’s mother as a measure of the child vulnerability. As indicated earlier in my paper, in 8.2% of the cases, the PMK is the father (NLSCY-Cycle1, User’s Guide, p. 63). While I have information on the age group of the PMK, I don’t have information on the

age group of the spouse of PMK. This variable is suppressed from the NLSCY public file. However, Case and Paxson (2001) found that even controlling for parents' age simultaneously with controlling for parents' education and household income, results do not change.

#### **2.4. Methodology**

To estimate the impact of the two-parents families on the health and well-being of their children, and, particularly, to answer the question of whether or not, relative to biological parents, stepparents invest less in stepchildren's health and well-being, I consider a series of probit regressions. This selection is justified because the dependent variables that I use in my study - visits to either a family doctor or a pediatrician as well as to a dentist, the participation in sports, music, arts and summer day camp activities - are 0/1 dummy variables. I regress the probability of investments into the children's health and well-being for children of 0 to 11 years of age, on measures of family structure, socio-economic characteristics of families, and characteristics of children. In my regressions, I omit the category of the two-biological parents, so that the coefficients of the dummy variable reflecting the family structure answer the following question. Holding constant the socioeconomic characteristics of families, how does living with a stepparent affect the probability of a child having routine visits to either a family doctor or a pediatrician as well as to a dentist, and his/her participation in sports, music, arts and summer day camp activities relative to a family with both biological parents?

The probit regressions used in my analysis have the following form:

$$\text{prob}(Y = 1 | X, V, W) = \phi(\alpha + \beta X + \gamma V + \varepsilon W + u), \text{ where}$$

$\phi$  = The cumulative normal distribution function and gives the probability of the event occurring for any value of  $z$ .

$z = \alpha + \beta X + \gamma V + \varepsilon W + u$ , the  $z$ -index of the probit model.

$\beta, \gamma, \varepsilon$  = Effects on the  $z$ -index of a unit change in any of the components of  $X, V, W$ ;  $u$  is the error term.

$Y$  = Visits to either a family doctor, a pediatrician, as well as to a dentist in the past 12 months, and participation in organized sports, music, dance or arts and in summer day camps.

$X$  = Family structure variables: stepmother, adoptive mother, stepfather, adoptive father and foster parents. The omitted reference category is biological parents.

$V$  = Socio-economic characteristics of families: income, household size, and mother and father years of education, and status of employment.

$W$  = Characteristics of children: age, immigrant, and gender.

In my research there are a significant number of observations registered as “don’t know”, “refusal” and “not stated”. As Case and Paxson (2001) suggest, a “don’t know” answer might have an informative value for some of the dependent variables. For example, if the PMK does not know whether or not the child has been to the family doctor or a pediatrician in the past 12 months, this may be an indicator of the attention that the child receives. I deal with the missing observations in the following manner. For the dependent variables, I recode the missing observations as negative answers while for

the key control variables, I create a separate category and include the missing observations. Each of the two probit results tables, Tables 2 and 3, have now two columns. Column (a) includes a full sample, where all positive responses for investments in child health and well being are considered as “1”, all negative answers are considered as “0” and all “don’t know”, “refusal” and “not stated” observations are considered “0” as well. Column (b) includes a sub-sample where positive responses are considered as “1” while negative responses are considered as “0”. “Don’t know”, “refusal” and “not stated” are not included in the sub-sample. In this column there are no missing observations for any of the dependent variables. Since for the family structure explanatory variables, the two-biological parents represent the omitted category, the interpretation of the coefficients of the key explanatory variables is relative to that category.

### 3. RESULTS

The probit results for the impact of family structure on investments in children’s health and well-being for two parent families are presented in Tables 2 and 3. As earlier described in the methodology, section 2.4, results are reported in two columns. Column “a”, corresponds to the full sample, while column “b” corresponds to the sub-sample with missing observations ignored. I find small differences in the results for the two columns<sup>10</sup>. For the dependent variables, I include both the probit results and the marginal effects<sup>11</sup>.

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<sup>10</sup> I re-run all regressions using the linear probability models instead of probit; results no not change.

<sup>11</sup> “ Rather than reporting the coefficients, dprobit reports the marginal effect, that is the change in the probability for an infinitesimal change in each independent, continuous variable and, by default, reports the discrete change in the probability for dummy variables”. STATA help: <http://www.stata.com/help.cgi?dprobit>

### 3.1. Investment in children's health (Table 2)

Results for visits to either a family doctor or to a pediatrician are presented in the first two columns of Table 2. Investments of stepfamilies or adoptive families are not significantly different from investments by families with both biological parents with respect to visits to either a family doctor or a pediatrician. This is what I expected, given the fact that for the health care in Canada patients are not charged. Foster parents are more likely – about 10% - to invest in children's visits to either a family doctor or a pediatrician. The estimate is significant at the 10% level. With one exception, results do not change in column "b". Excluding the missing observations in column "b", the effect of foster parents becomes insignificant.

For the health investment, results for income and parents' education are as expected. Families with higher income and better-educated parents invest significantly more in children visits to either a family doctor or a pediatrician. Mother's education also has a greater impact than father's education. This may be because "mothers are generally the health care investors in the household" (Case and Paxson, 2001, p.310). The household size coefficient has a significant negative effect at the 5% level. Whether the child is an immigrant or a boy has an insignificant effect on the visits to either a family doctor or a pediatrician. Results do not change in column "b" when missing observations are ignored.

Results for investments in children's visits to a dentist are presented in the last two columns of Table 2. Investments of families with stepmothers, adoptive-mothers and foster parents are not significantly different from investments by families with both

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biological parents with respect to visits to a dentist. Families with stepfathers are significantly less likely – about 5% - to invest in children’s visit to a dentist. The estimate is significant at the 5% level. For families with adoptive-fathers, the effect is also negative and significant at the 10% level. Results do not change in column “b” when missing observations are ignored.

For dentist visits, results for income and parents’ education are as expected. Families with higher income and better-educated parents invest significantly more in children’s visits to a dentist. Similarly, the mother’s education has a greater impact than father’s education. Household size coefficient has an insignificant effect on investments in children’s visits to a dentist. An interesting finding is that being an immigrant makes the child significantly less likely – about 8% less likely – to have visits to a dentist. Girls are significantly more likely – about 2% more likely - than boys to have visits to a dentist. Both estimates are significant at the 5% level. Results do not change in column “b” when missing observations are ignored.

My results are partially consistent with those of Case and Paxson (2001), who also consider the investments parents make in visiting the doctor and seeing a dentist. Controlling for household income and size, children’s age, gender and immigration status, as well as for parents’ education and work status, I find that investments into the children’s health made by families with stepmothers or adoptive-mothers are not significantly different from investments made by families with both biological parents.<sup>12</sup> Investments of families with stepfathers or adoptive-fathers are also not significantly

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<sup>12</sup> To distinguish between preventive and prophylactic health and dentist care, I run the regressions for investments in childrens’ health and I control for child health. I use the variable PMK assessment of childrens’ health and I create a dummy variable: 0 for excellent and very good health, 1 for good, fair and poor health. Results do not change.

different from investments by biological parents with respect to visits to a family doctor or a pediatrician. Adoptive-father families invest less in children's visits to a dentist. Similar to Case and Paxson (2001), I find that stepfather families invest less in children's visits to a dentist. Foster parents are more likely to invest in children visits to a family doctor or a pediatrician. But is this finding true also for investments in children well-being? I am addressing the question in the next section.

### **3.2. Investment in children's well being (Table 3)**

Results for investments in children participation in organized sports or physical activities in the past 12 months, are presented in the first two columns of Table 3. I find that, relative to biological parents, children living in families with stepmothers or stepfathers are significant less likely – about 8% less likely for stepfathers and 12% less likely for stepmothers - to participate in organized sports. The estimates are significant at the 5% level. Having an adoptive-mother or and adoptive-father, or, foster parents, has no significant effect on children's participation in organized sports. With one exception, results do not change in column "b". By excluding the missing observations in column "b", the effect of foster parents becomes negative and significant for the 5% level.

For children's participation in organized sports, families with higher income and better-educated parents invest significantly more. The mother's education has a greater impact than the father's education. The household size coefficient has a negative and significant effect at the 5% level. An interesting finding is that being an immigrant makes the child significantly less likely – about 8% less likely – to participate in organized sports. Boys are significantly more likely – about 3% more likely - than girls to

participate in organized sports. Both estimates are significant at the 5% level. Results do not change in column “b” when missing observations are ignored.

The third and the fourth column of Table 3, present the results for investments in children’s participation in music, dance or art classes. Investments of families with stepmothers are not significantly different from investments by families with both biological parents with respect to children’s participation in these activities. However, the presence of an adoptive-mother makes the child significantly more likely – about 10% more likely - to participate in music, dance or art classes. Families with a stepfather are significantly less likely – about 8% less likely – to invest in their children. The estimate is significant at the 5% level. Having an adoptive-father or foster parents has an insignificant effect on children’s participation in music, dance or art classes. Results do not change in column “b” when missing observations are ignored.

Families with higher income and better-educated parents invest more in children’s participation in music, dance or art classes. Mother’s education has a greater impact than father’s education. Household size coefficient has a negative and significant effect at the 5% level. Being an immigrant has an insignificant effect. Girls are significantly more likely – about 3% more likely - than boys to participate in these activities. The estimate is significant at the 5% level. Results do not change in column “b” when missing observations are ignored.

Results for investments in children participation in summer day camp activities are presented in the last two columns of Table 3. I find that, relative to biological parents, children living in families with stepmothers are significant more likely – about 9% more likely - to participate in summer day camp activities. The estimate is significant at the 5%

level. Investments of families with stepfathers, adoptive parents or foster parents are not significantly different from investments by families with both biological parents with respect to children's participation in summer day camp activities. Results do not change in column "b" when missing observations are ignored.

Once more, families with higher income and better-educated parents invest significantly more in children's participation in summer day camp activities. The mother's education has a greater impact than father's education. The estimates are significant at the 5% level. Being an immigrant makes the child significantly less likely - about 10% - to participate in summer day camp activities at the 5% level. Boys are not significantly different from girls with respect to their participation in these activities. Results do not change in column "b" when missing observations are ignored.

Results in Table 3 indicate that relative to biological parents, stepmother families invest less in children's participation in organized sports and more in children's participation in summer day camp activities. However, investments of stepparents are not significantly different from investments by biological parents with respect to children's participation in music, dance or art classes. The presence of a stepfather makes the child significant less likely to participate in organized sports, music, and dance or art classes. However, the effect is insignificant for the summer day camp activities. Adoptive-mother families invest more in children's participation in music, dance or art classes. Investments of families with adoptive-fathers and foster parents are not significantly different from investments made by families with both biological parents with respect to children's well-being. When missing observations are ignored in column "b", foster parents are significantly less likely to invest in children's participation in organized sports.

#### 4. DISCUSSIONS AND CONCLUSIONS

Given the changing family structure in Canada, and the impact such changes have on the outcome for both children and adults, it is important to understand the different outcomes and the mechanisms generating them. Past studies focused on outcomes and the mechanism that generated such outcomes, for children living in various types of families. Overall, in the literature reviewed in this research, stepchildren seem to have less favorable outcomes than children living in families with both biological parents. In addition, relative to biological parents, stepfamilies seem to invest less in stepchildren. However, a study of Ganong and Coleman (1984) finds that stepchildren are not necessarily different from children in other types of families in what concerns academic achievements and school grades or personality characteristics.

Using a sample of children 0 to 11 years of age living in Canada and following the methodology of Case and Paxson (2001), this paper examines the investments of two-parents families into the health and well-being of their children. The results presented in my paper are only partially consistent with those of Case and Paxson (2001) who also consider the investments parents make in visiting the doctor and seeing a dentist. Controlling for household income and size, children age, gender and immigration status, as well as for parents' education and work status, I find that stepfamilies do not necessarily invest less in stepchildren. For example, investments of families with stepmothers are not significantly different from investments of families with both biological parents with respect to children's health. Moreover, stepmothers are 9% more likely to invest in children's participation in summer day camps. Investments of families with stepfathers are not significantly different from those of families with both biological

parents with respect to children's visits to either a family doctor or a pediatrician, as well as to the children's participation in summer day camps. However, relative to families with two biological parents, I find that families with stepmothers are 12 % less likely to invest in children's participation in organized sports. Stepfather families are 5 % less likely to invest in children's visits to a dentist and 8% less likely to invest in children's participation in organized sports as well as in music, dance, or arts activities.

Contrary to Case and Paxson (2001), I also find that families with adoptive-fathers are 12% less likely to invest in children's visits to a dentist. Moreover, investments of families with adoptive-mothers are not significantly different from investments of families with both biological parents with respect to children's health. Given the fact that my findings are only partially consistent with those of Case and Paxson (2001), I am attempting to explain these results as follows.

First of all, as already indicated, some of my results are consistent with those of Case and Paxson (2001). My findings that stepfather families invest less in children visits to a dentist could be explained by the fact that stepfathers have a difficult times negotiating with stepchildren. For example "children with step-fathers are significantly more likely to be reported, to argue too much, be disobedient at home and school, misbehave, have trouble getting along with teachers, be sullen, stubborn or irritable, and to have strong temper" (Case and Paxson, 2001, p.320). This can also explain why stepfather families invest less in children participation in organized sports, music, dance, or art classes. My results are also similar with those of Case and Paxson (2001) for families with adoptive-mothers or foster parents. As they also suggest, this may be because both adoptive and foster parents have been screened as responsible parents.

Second of all, some of the results presented in my paper are different from those of Case and Paxson (2001). After controlling for household income and size, children's age, gender and immigration status as well as for parent's education and employment, I find that investments of families with stepmothers or adoptive-mothers are not significantly different from investments by families with both biological parents with respect to children's health. This is perhaps expected since, contrary to US, the health and the dental care is free in Canada<sup>13</sup>. For the case of stepmothers who invest more in children's participation in summer day camps, I would attribute this finding to a small sample size. Possible extensions of the research could address the behavior of children and the way stepfamilies negotiate with their children.

Despite all its limitations, this paper raises an important question: should we or should we not be concerned with the level of the stepfamilies' investment in stepchildren? The answers provided in the present research paper could prove an important and useful tool capable of shading light on the impact that the stepfamilies have on the well being of the children involved. The outcome and conclusions of my research could also prove to be of particular interest for family custody judges as well as lawmakers and government agencies and/or NGOs, which have either legislative powers and/or a special interest in the success and well being of such families.

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<sup>13</sup> Wikipedia, Dentistry in Canada. [http://en.wikipedia.org/wiki/Dentistry#Dentistry\\_in\\_Canada](http://en.wikipedia.org/wiki/Dentistry#Dentistry_in_Canada)

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## TABLES

Table 1. Sample means of investment variables and family characteristics (National Longitudinal Survey of Children and Youth, - NLS-CY - 1994-1995)<sup>a</sup>

Observations	Biological parents		Step Mother		Adoptive Mother		Step Father		Adoptive Father		Foster parents	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
<b>A. Dependent variables</b>												
Visits to the family doctor or pediatrician in the past 12 months.	17849	.819	118	.754	202	.792	859	.743	66	.789	34	.882
Visits to the dentist in the past 12 months.	17847	.519	118	.754	202	.653	858	.698	66	.697	34	.294
Participation in organized sports or physical activities	10677	.582	111	.523	153	.660	783	.502	62	.581	14	.214
Participation in music/dance/art activities outside of school	10678	.287	111	.279	153	.431	783	.247	62	.274	14	.143
Participation in day camp or recreational or skill-building activity.	7754	.289	96	.385	128	.359	661	.211	55	.272	7	.143
<b>B. Independent variables</b>												
Household income	18166	53050	125	55120	203	59876	875	44850	67	46911	34	26764
Age of child	18166	4.97	125	7.91	203	6.37	875	7.59	67	7.99	34	3.56
Number of household members	18166	4.39	125	4.75	203	4.09	875	4.43	67	4.19	34	5.68
Respondent is the father	18166	.085	125	.288	203	.103	875	.04	67	.075	34	.03
Child is immigrant	17839	.015	120	.025	202	.089	862	.009	66	.015	33	0
Mother has high school or more	18030	.852	121	.835	201	.841	860	.730	65	.831	34	.706
Mother currently working	17966	.706	121	.769	201	.791	854	.711	65	.692	34	.235
Father has high school or more	17706	.808	119	.773	197	.822	827	.751	63	.762	34	.676
Father currently working	17632	.954	119	.933	197	.949	817	.903	62	.919	34	1

<sup>a</sup> The average family income is constructed by setting the family income equal to the midpoint of each of the 9 possible categories. Families with income of 80,000 CAD and more are assigned an average income of 115,000 CAD. The number of household members variable is capped at 6. Respondent is the father, child is immigrant, parent's education and employment are 0/1 dummy variables.

Table 2. Probit Results

	Family doctor or pediatrician visits for children 0-11 years of age		Dentist visits for children 0-11 years of age	
	a) 19470	b) 19128	a) 19470	b) 19125
Number of observations				
Two-parents family structure:				
Step mother	0.050 (0.127) [0.013]	0.095 (0.130) [0.022]	-0.117 (0.137) [-0.047]	-0.076 (0.141) [-0.302]
Adoptive mother	-0.028 (0.105) [-0.007]	-0.026 (0.105) [-0.006]	0.053 (0.111) [0.021]	0.052 (0.111) [0.021]
Step dad	-0.034 (0.049) [-0.009]	-0.027 (0.049) [-0.007]	-0.113** (0.052) [-0.045]	-0.102* (0.053) [-0.041]
Adoptive dad	0.115 (0.177) [0.028]	0.116 (0.177) [0.027]	-0.302* (0.172) [-0.120]	-0.306* (0.173) [-0.121]
Foster parents	0.524* (0.294) [0.104]	0.385 (0.287) [0.078]	-0.254 (0.248) [-0.101]	-0.337 (0.254) [-0.134]
Household income (CAD):				
\$10,000 to 14,999	0.033 (0.135)	0.016 (0.137)	0.134 (0.146)	0.115 (0.147)
\$15,000 to 19,999	0.148 (0.131)	0.131 (0.134)	0.090 (0.143)	0.068 (0.143)
\$20,000 to 29,999	0.210* (0.127)	0.180 (0.129)	0.342** (0.138)	0.320** (0.139)
\$30,000 to 39,999	0.223* (0.127)	0.210 (0.129)	0.482** (0.138)	0.467** (0.139)
\$40,000 to 49,999	0.195 (0.127)	0.187 (0.129)	0.525** (0.138)	0.513** (0.139)
\$50,000 to 59,999	0.208 (0.128)	0.196 (0.130)	0.672** (0.139)	0.662** (0.140)
\$60,000 to 79,999	0.289** (0.128)	0.278** (0.130)	0.651** (0.139)	0.636** (0.140)
\$80,000 or more	0.264** (0.129)	0.252* (0.132)	0.765** (0.140)	0.754** (0.141)
Household size (total number of persons in the household including child)				
	-0.169** (0.013)	-0.164** (0.013)	0.016 (0.013)	0.020 (0.013)
Child immigration status:				
Child is an immigrant	-0.030 (0.081)	-0.024 (0.081)	-0.410** (0.083)	-0.409** (0.083)
Child immigrant missing observations	-2.32** (0.111)	-0.107 (0.251)	-2.37** (0.150)	-0.312 (0.269)
Child age (0 to 11 years of age)				
	-0.096** (0.0033)	-0.097** (0.0034)	0.294** (0.0038)	0.296** (0.0038)

Child is male	0.024 (0.022)	0.025 (0.022)	-0.045** (0.022)	-0.045** (0.022)
Mother has high school education or more:				
Secondary school graduation	0.0068 (0.037)	0.0061 (0.037)	0.243** (0.038)	0.243** (0.038)
Post secondary school graduation	0.097** (0.036)	0.093** (0.036)	0.287** (0.037)	0.287** (0.037)
College or university degree (including trade)	0.076** (0.037)	0.072* (0.037)	0.331** (0.038)	0.330** (0.038)
Education missing observations	0.290 (0.213)	0.382 (0.234)	0.268 (0.218)	0.331 (0.228)
Mother currently working:				
Employed	0.041 (0.026)	0.045* (0.026)	-0.0029 (0.026)	-0.0026 (0.026)
Employment missing observations	-0.137 (0.167)	-0.080 (0.174)	0.037 (0.168)	0.069 (0.170)
Father has high school education or more:				
Secondary school graduation	0.028 (0.036)	0.023 (0.036)	0.012 (0.037)	0.012 (0.037)
Post secondary school graduation	0.079** (0.034)	0.076** (0.034)	0.023 (0.035)	0.026 (0.035)
College or university degree (including trade)	0.112** (0.033)	0.115** (0.034)	0.102** (0.034)	0.105** (0.034)
Education missing observations	-0.130 (0.145)	-0.065 (0.148)	-0.297** (0.149)	-0.271* (0.151)
Father currently working:				
Employed	-0.125** (0.055)	-0.124** (0.056)	-0.056 (0.056)	-0.053 (0.057)
Employment missing observations	0.0015 (0.140)	0.019 (0.141)	-0.0052 (0.141)	0.0088 (0.142)
Respondent (PMK) is the father	-0.049 (0.040)	-0.057 (0.040)	-0.049 (0.040)	-0.051 (0.040)

*Note:* Data is from the first cycle of the National Longitudinal Survey of Children and Youth (NLSCY), 1994-1995. Statistics Canada.

a. Standard errors for probit results are reported in the round parentheses ( ). Marginal effects, dprobit results, are reported in the squared parentheses [ ].

\* Denotes significance at the 10% level

\*\* Denotes significance at the 5% level

Table 3. Probit Results

	Participation in organized sports or physical activities for children 4-11 years of age		Participation in music/dance/art activities outside of school for children 4-11 years of age		Participation in day camp or recreational or skill-building activity for children 6-11 years of age	
	a) 12033	b) 11800	a) 12033	b) 11801	a) 8876	b) 8701
Two-parents family structure:						
Step mother	-0.304** (0.125) [-0.121]	-0.289** (0.126) [-0.115]	-0.109 (0.136) [-0.033]	-0.102 (0.137) [-0.031]	0.267** (0.133) [0.094]	0.276** (0.133) [0.099]
Adoptive mother	0.048 (0.111) [0.019]	0.049 (0.111) [0.019]	0.300** (0.108) [0.103]	0.302** (0.108) [0.105]	0.108 (0.116) [0.037]	0.116 (0.117) [0.040]
Step dad	-0.212** (0.050) [-0.08]	-0.208** (0.050) [-0.082]	-0.277** (0.056) [-0.079]	-0.273** (0.056) [-0.080]	-0.083 (0.057) [-0.027]	-0.082 (0.057) [-0.027]
Adoptive dad	-0.040 (0.171) [-0.016]	-0.041 (0.171) [-0.016]	-0.146 (0.179) [-0.043]	-0.145 (0.179) [-0.044]	0.024 (0.183) [0.008]	0.023 (0.183) [0.008]
Foster parents	-0.536 (0.381) [-0.210]	-0.811** (0.410) [-0.310]	0.201 (0.406) [0.067]	-0.071 (0.447) [-0.022]	0.139 (0.511) [0.047]	-0.171 (0.624) [-0.054]
Household income (CAD):						
\$10,000 to 14,999	0.139 (0.181)	0.122 (0.182)	0.063 (0.222)	0.061 (0.222)	0.226 (0.307)	0.218 (0.308)
\$15,000 to 19,999	-0.044 (0.175)	-0.055 (0.176)	-0.061 (0.214)	-0.065 (0.215)	0.613** (0.292)	0.603** (0.294)
\$20,000 to 29,999	0.215 (0.169)	0.206 (0.169)	0.037 (0.207)	0.035 (0.207)	0.612** (0.287)	0.604** (0.288)
\$40,000 to 49,999	0.360** (0.168)	0.350** (0.169)	0.158 (0.206)	0.155 (0.207)	0.694** (0.286)	0.685** (0.287)
\$50,000 to 59,999	0.444** (0.169)	0.436** (0.169)	0.268 (0.206)	0.266 (0.207)	0.650** (0.286)	0.641** (0.288)
\$60,000 to 79,999	0.576** (0.170)	0.568** (0.170)	0.347* (0.207)	0.342* (0.208)	0.701** (0.287)	0.693** (0.288)
\$60,000 to 79,999	0.686** (0.170)	0.678** (0.170)	0.389* (0.207)	0.387* (0.207)	0.778** (0.287)	0.769** (0.288)
\$80,000 or more	0.828** (0.171)	0.827** (0.172)	0.581** (0.208)	0.581** (0.208)	0.986** (0.288)	0.981** (0.289)
Household size (total number of persons in the household including child)	-0.077** (0.015)	-0.073** (0.015)	-0.060** (0.016)	-0.059** (0.016)	-0.077** (0.018)	0.076** (0.018)
Child immigration status:						
Child is an immigrant	-0.213** (0.083)	-0.212** (0.083)	0.026 (0.088)	0.028 (0.088)	-0.295** (0.100)	-0.295** (0.100)
Child immigrant missing observations	-2.47** (0.228)	-0.367 (0.437)	-1.82** (0.290)	0.018 (0.520)	-1.89** (0.374)	-0.191 (0.640)

Child age (0 to 11 years of age)	0.136** (0.0055)	0.137** (0.0055)	0.121** (0.0058)	0.121** (0.0059)	0.040** (0.0086)	0.040** (0.0086)
Child male	0.266** (0.025)	0.268** (0.025)	-0.679** (0.026)	-0.680** (0.026)	0.0087 (0.029)	0.0086 (0.029)
Mother has high school education or more						
Secondary school graduation	0.296** (0.041)	0.299** (0.041)	0.204** (0.048)	0.203** (0.048)	0.121** (0.053)	0.121** (0.053)
Post secondary school graduation	0.405** (0.040)	0.407** (0.040)	0.357** (0.047)	0.356** (0.047)	0.299** (0.051)	0.298** (0.051)
College or university degree (including trade)	0.508** (0.041)	0.510** (0.041)	0.442** (0.047)	0.442** (0.047)	0.427** (0.051)	0.427** (0.051)
Education missing observations	0.335 (0.254)	0.348 (0.259)	0.065 (0.265)	0.060 (0.269)	-0.154 (0.317)	-0.145 (0.319)
Mother currently working:						
Employed	0.162** (0.029)	0.161** (0.029)	0.069** (0.032)	0.069** (0.032)	0.079** (0.037)	0.080** (0.037)
Employment missing observations	0.136 (0.205)	0.151 (0.207)	0.392* (0.209)	0.413** (0.210)	0.214 (0.250)	0.220 (0.251)
Father has high school education or more:						
Secondary school graduation	0.127** (0.041)	0.124** (0.041)	0.120** (0.046)	0.120** (0.046)	0.091* (0.050)	0.091* (0.051)
Post secondary school graduation	0.134** (0.038)	0.132** (0.038)	0.244** (0.043)	0.243** (0.043)	0.142** (0.047)	0.143** (0.047)
College or university degree (including trade)	0.236** (0.037)	0.234** (0.037)	0.263** (0.041)	0.263** (0.041)	0.196** (0.046)	0.195** (0.046)
Education missing observations	0.410** (0.167)	0.430** (0.168)	0.427** (0.188)	0.432** (0.189)	0.192 (0.196)	0.199 (0.196)
Father currently working						
Employed	0.193** (0.064)	0.199** (0.064)	0.106 (0.074)	0.107 (0.074)	0.186** (0.083)	0.186** (0.083)
Employment missing observations	-0.027 (0.159)	-0.017 (0.159)	-0.185 (0.184)	-0.183 (0.185)	0.123 (0.191)	0.126 (0.191)
Respondent(PMK) is the father	-0.069 (0.045)	-0.070 (0.045)	-0.016 (0.048)	-0.016 (0.048)	0.015 (0.053)	0.017 (0.053)

Note: Data is from the first cycle of the National Longitudinal Survey of Children and Youth (NLSCY), 1994-1995. Statistics Canada.

a. Standard errors for probit results are reported in the round parentheses ( ). Marginal effects, dprobit results, are reported in the squared parentheses [ ].

\* Denotes significance at the 10% level

\*\* Denotes significance at the 5% level

## APPENDIX

### A. Variable description

VARIABLES		Primary variables NLSCY- cycle 1 (1994-1995)
Code & Description		Code & Description
<b>A. Dependent variables</b>		
Visits to the family doctor: 0/1 (family_doc)		AHLCQ48A* In the past year how many times have you seen or talked on the telephone about child's physical or mental health with a general practitioner?
Visits to the pediatrician: 0/1 (ped)		AHLCQ48B* In the past year how many times have you seen or talked on the telephone about child's physical or mental health with a pediatrician ?
Visits to the family doctor or pediatrician in the past 12 months. (doc_a)	Full-Sample: 1=visits to either the family doctor or pediatrician 0=no visits. Don't Know and Missing are included as negative answers	
Visits to the family doctor or pediatrician in the past 12 months. (doc_b).	Sub-Sample: 1=either the family doctor or pediatrician 0 = no visits "." = Don't Know and Missing	
Visits to the dentist in the past 12 months. (dent_a).	Full-Sample	
Visits to the dentist in the past 12 months. (dent_b).	Sub-Sample	
Participation in organized sports or physical activities outside of school: 0/1 (sports)		AACCQ3A* Last 12 months, how often did your child participate in organized sports or physical activities
Participation in organized sports outside of school (sports_a)	Full-Sample	
Participation in organized sports outside of school (sports_b)	Sub-Sample	
Participation in music/dance/art activities outside of school: 0/1 (music)		AACCQ3C* Last 12 months, how often did your child participate in instruction in music/dance/art activities outside of school?
Participation in music/dance/art activities outside of school (music_a)	Full-Sample	
Participation in music/dance/art activities outside of school (music_b)	Sub-Sample	
Participation in day camp or recreational or skill-building activity: 0/1 (camp)		AACCQ3A* Last summer how often did your child participate in any day camp or recreational or skill-building activity?
Participation in day camp or recreational or skill-building activity (camp_a)	Full-Sample	

Participation in day camp or recreational or skill-building activity (camp_b)	Sub-Sample	
<b>B. Explanatory variables</b>		
Family structure (Parent_status) 6 categories: 1. Biological parents;2. Step mother;3. Adoptive mother 4. Step father;5. Adoptive father;6. Foster parents	ADMCD06*	Relationship of the PMK to the child
	ADMCD06B*	Relationship of the spouse of the PMK to the child
Household income (income_new) 9 categories: less than 10,000; 10,000-14,999; 15,000-19,999; 20,000-29,000; 30,000-39,000; 40,000-49,999; 50,000-59,999; 60,000-79,999; 80,000 and more.	AINHD01B*	Household income
Age of child (child_age)	AMMCQ01*	Age of child (0 to 11 years of age)
Child is immigrant (child_immig)	ASDCD02B*	Number of years since first immigrating to Canada – grouped– child.
Child is male (child_male)	AMMCQ02	Child: male/female
Number of household members (house_size)	ADMHD02*	Capped at 6 members
Respondent (PMK) is the father (pmk_male)	AMMPQ02*	PMK: male/female.
Less than secondary; secondary; post secondary; college & university (mom_educ)	AEDPD02*	PMK education
Highest level of schooling obtained by mothers (mom_educ_d)	AEDSD02*	Spouse of PMK education
Less than secondary; secondary; post secondary; college & university (dad_educ)		
Highest level of schooling obtained by fathers (dad_educ_d)		
Mother currently working (mom_work)	ALFPD25*	Current working status for PMK.
Father currently working (dad_work)	ALFSD25*	Current working status for spouse of PMK.

\* Available in the micro-file data of the National Longitudinal Survey of Children and Youth - Cycle 1, 1994-1995. Statistics Canada.

**B. Family structure categories**

Two-parents families structure	Categories of family structure used in the study
Both biological parents	Biological parents
Step mother and biological father	Step mother
Step mother and step father	Step mother
Step mother and adoptive father	Step mother
Step mother and foster father	Step mother
Adoptive mother and biological father	Adoptive mother
Adoptive mother and step father	Adoptive mother
Adoptive mother and adoptive father	Adoptive mother
Adoptive mother and foster father	Adoptive mother
Biological mother and step father	Step father
Foster mother and step father	Step father
Biological mother and adoptive father	Adoptive father
Foster mother and adoptive father	Adoptive father
Both foster parents	Foster parents