Maternal Employment in Early Childhood: The Complex Relationships with the Developmental Outcomes of Young Canadian Children

by

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Abstract

This thesis focused on the associations between maternal employment in early childhood and the developmental outcomes of infant, toddler, and preschool age children in Canada. It is well established that maternal employment in the first year is negatively associated with children's development, particularly cognitive outcomes. However, a number of questions remain about the effects of the number of hours that mothers work, differential outcomes for boys and girls, and the contributing role of the factors in children's family and child care contexts. Thus, I examined the nature of relationships among maternal employment in early childhood, children's gender, family context, child care context, and young children's development.

Guided by Bronfenbrenner's Bioecological Model of Human Development, I conducted a secondary analysis of data from the Canadian National Longitudinal Survey of Children and Youth using Cycles Six (2004/2005), Seven (2006/2007), and Eight (2008/2009). The method of analysis was multiple linear regression. I tested the associations between mothers' employment in the first four years of children's lives and the motor and social development of zero to four year old children and receptive language of four and five year old children (commonly used as an indicator of cognitive development). Further, because previous research has shown that the influence of maternal employment on children's cognitive development varies with the specific timing of mothers' return to work, I examined the associations between maternal employment in the first two years of children's lives and the receptive language of children four and five years. Additionally, I ran a sub-group analysis comparing children of mothers who worked more than 20 hours a week to children of mothers who worked fewer hours. To examine the influence that child's gender and family and child care contexts have on the relationship between maternal employment in early childhood and children's developmental outcomes, I investigated the moderating effects of child gender, family economic well-being, mothers' marital status, maternal education, and child care type and quality. I also analyzed the mediating effects of

family functioning, depressive symptoms, and parent-child interactions on the relationship between maternal employment in early childhood and children's developmental outcomes.

With children's motor and social development, I found that mothers who returned to work when their children were between zero to four years old had enhanced motor and social development in comparison to children of mothers who did not work during this time. However, the magnitude of the effect was relatively weak. Additionally, findings indicated that maternal employment within the first four years had stronger positive effects on the motor and social development (improved motor and social development) for female children than it did for male children. Findings showed that the only Contextual Process that played a mediating role was parent-child interactions. The enhanced motor and social development of children of mothers who worked was explained in part by more positive parent-child interactions displayed by employed mothers.

Regarding receptive language, findings showed that maternal employment between zero and four years was not significantly associated with children's receptive language. However, I found that relative to children of mothers who worked 20 hours or less per week in the first two years of their children's lives, children of mothers who worked more than 20 hours had lower receptive language scores at four and five years of age. An additional analysis suggested that maternal employment initiated between 12 and 17 months was a sensitive period in which working more than 20 hours a week was negatively associated with children's receptive language.

The small positive associations between maternal employment in early childhood and children's motor and social development provide some reassurance to mothers who engage in maternal employment in early childhood. That being said, my research suggests that working more than 20 hours a week in the first two years of children's lives and even more so between 12 and 17 months of age has negative associations with children's later receptive language. These findings could be of interest to policy analysts and government officials who create and monitor Canadian maternity and parental leave

policies/programs in that they bring attention to areas (i.e., hours worked in early childhood) that policy developers may want to consider in future changes to current Canadian maternity and parental leave policies/programs.

Preface

This thesis is an original work by myself, Teresa Katherine Lightbody. No part of this thesis has been previously published. The research was supported by funds to Canadian Research Data Centre Network (CRDCN) from the Social Sciences and Humanities Research Council (SSHRC), the Canadian Institute for Health Research (CIHR), the Canadian Foundation for Innovation (CFI), and Statistics Canada. Although the research and analysis are based on data from Statistics Canada, the opinions expressed do not represent the views of Statistics Canada.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction and Rationale

In describing Michelle Obama's struggles with returning to employment after the birth of their first daughter, President Barack Obama wrote:

> *But I came to see that in her own mind, two visions of herself were at war with each other – the desire to be the woman her mother had been, solid, dependable, making a home and always there for her kids; and the desire to excel in her profession, to make her mark on the world and realize all those plans she'd had on the very first day we met (Obama, 2006).*

Following childbirth, reconciling such a struggle between being at home with a child or pursuing a desire for a personal career is a choice not restricted to Presidents' wives. A basic Google search using phrases like "working mothers with young children" or "should Canadian women with young children work" results in several million hits. These include social commentaries, personal opinions, newspaper articles, and YouTube videos, which either reassure working mothers they are not harming their young children (i.e., Eichler, 2013) or cite cautionary tales that working mothers cannot have it all (i.e., Carlson, 2012; Slaughter, 2012). While a vigorous public debate regarding whether mothers with young children should work continues, the reality is that the majority of Canadian women with young children, three years of age and under, are employed (64.4% in 2009) (Ferrao, 2010).

The purpose of my dissertation is twofold. Primarily, I aim to address the ongoing gaps in the research literature on the associations between maternal employment in the early years of children's lives and children's outcomes. Secondly, based on my findings, I argue that it may well be time to put this debate aside and to focus instead on how best to support women, their children, and their families in the choices they make regarding employment and the care of their children.

Maternal employment in early childhood has important implications for the long term development of children given the critical role that children's experiences in the early years play throughout their life courses (Hertzman, 1998; Hertzman, 2000). The period spanning infancy through to the time children begin kindergarten, typically defined as early childhood (Duncan, Ziol-Guest, & Kalil, 2010; Holzer, Schanzenbach, & Duncan, 2007; Shonkoff & Phillips, 2000), is a formative stage of development. The

supporting features of almost every system of the individual, "…from the tiniest cell to the capacity for intimate relationships…" are developed and constructed during this time period (Shonkoff & Phillips, 2000, p. 89). As stated by Shonkoff and Phillips (2000), "between the first day of life and the first day of kindergarten, development proceeds at a lightning pace like no other" (p. 89).

Experiences in the early childhood years set individuals onto a trajectory that subsequently affects health, well-being, and competencies overtime (Hertzman, 2000). That being said, a child's life course is not set in stone by the time of school entry. "People are not rockets whose trajectory is established at the moment they are launched" (Shonkoff & Phillips, 2000, p. 90). It is the lifelong ability for change and reorganization that enables humans the capacity for dramatic recovery from early harm. This ongoing plasticity renders humans both adaptive and vulnerable at the same time. Even so, early childhood is a crucial period in children's lives in which development occurs at an accelerated pace, and though not set in stone, experiences as infants, toddlers, and preschoolers do set individuals onto paths affecting lifelong well-being.

For the purposes of my research, I define maternal employment in early childhood as employment initiated by the mother in the first four years of their child's life. Though many researchers, in particular those in the U.S. (i.e., Brooks-Gunn, Han, & Waldfogel, 2002; Han, Waldfogel, & Brooks-Gunn, 2001; Waldfogel, Han, & Brooks-Gunn, 2002), have defined maternal employment early in children's lives as that which begins in the first year, I have chosen a broader definition. This is because of research evidence indicating that experiences within the infant, toddler, *and* preschool years have important consequences (positive and/or negative) for the well-being of children (Hertzman, 1998; Hertzman, 2000). The primary research question I investigated was: w*hat are the associations between maternal employment in early childhood and the developmental outcomes of infant, toddler, and preschool age children in Canada?* Additional sub-questions, introduced in Chapter Two, were also explored. To answer these research questions, I conducted a secondary analysis of data from the National Longitudinal

Survey of Children and Youth (NLSCY). This data set was chosen not only because it includes data about a nationally representative sample of Canadian children, but also because of the large number of measures that were available for my key constructs of interest including maternal employment in early childhood, family environment, and children's outcomes.

Although researchers have advanced knowledge about the associations between maternal employment in early childhood and young children's developmental outcomes, in particular children's cognitive outcomes, questions remain about the contributing role of the factors in children's family and child care contexts, the effects of the number of hours that mothers work, and the differential outcomes for boys and girls. In general, researchers have found that maternal employment within the first year is associated with lower cognitive scores for preschoolers and school-aged children (Brooks-Gunn et al.; 2002; Han et al., 2001; Hill, Waldfogel, Brooks-Gunn, & Han, 2005; Waldfogel et al., 2002). The associations between maternal employment in early childhood and children's behavioral outcomes and motor and social development have been less widely studied and the studies that have been completed have had inconsistent results (Cooksey, Joshi, & Verropoulou, 2009; Han et al., 2001; Harvey, 1999; Parcel & Menaghan, 1994; Sherlock, Synnes, & Koehoorn, 2008).

It is also not clear how maternal employment in the early years of children's lives may influence children's outcomes. Some factors, including child care arrangements (Coley & Lombardi, 2012; Ruhm, 2004; Waldfogel et al., 2002) and the quality of the home environment (Brooks-Gunn et al., 2002), have been examined. However, these factors only partially explain the associations between maternal employment in early childhood and children's outcomes. One of the key aims of my research was to further understand how maternal employment in early childhood is related to children's outcomes. I investigated alternative reasons that might explain the relationship including the quality of interactions children have with parents and family and parental well-being.

Moreover, very few researchers (i.e., Brooks-Gunn et al.; 2002; Brooks-Gunn, Han, & Waldfogel, 2010) have included measures of child care quality in their explorations into the influences of maternal employment in the early years of children's lives on children's outcomes. Though the NLSCY measures of child care quality are not perfect, I included them in my investigation to contribute to the limited research into how the quality of interactions between children and their non-parental caregivers influence the nature of the relationship between maternal employment in early childhood and children's developmental outcomes.

An additional goal of my research was to clarify the many contradictions within this field such as whether the association between maternal employment in early childhood and children's outcomes vary with the gender of the child (Brooks-Gunn et al., 2002; 2010; Desai, Chase-Lansdale, & Michael, 1989; Han et al., 2001; Waldfogel et al., 2002) and by the number of hours worked by mothers (Han et al., 2001; Waldfogel et al. 2002). For instance, there have been inconsistent findings regarding whether working more than 20 hours per week matters for children's development. I built upon previous work by investigating whether gender moderates the relationship between maternal employment in early childhood and children's outcomes and by testing the associations between working more than 20 hours or more in early childhood and children's outcomes.

The majority of current understandings about the relationship between maternal employment in early childhood and children's developmental outcomes derive from U.S. studies. However, in the U.S., the majority of mothers (72.9%) are found to return to work within six months after the birth of a child (Laughlin, 2011), while in Canada only a small *minority* of mothers (less than 20%) are found to return to work within six months after the birth of a child (Baker & Milligan, 2008). A better appreciation of the relationship between maternal employment in early childhood and children's developmental outcomes within a Canadian context is critical given the differences in the timing of maternal employment between Canadian and U.S. mothers. It is possible that there are more extensive effects of maternal

employment in early childhood on U.S. children's development than on Canadian children's development because U.S. mothers tend to engage in employment earlier in their children's early years. Consequently, research findings drawing on Canadian samples may not show the same associations between maternal employment in early childhood and children's developmental outcomes as findings from research studies that employ U.S. samples.

My findings should also be of interest to policy analysts and government officials who develop and monitor Canadian maternity leave policies/programs. Currently, within Canada, paid maternity benefits can be received by eligible parents for a maximum of 15 weeks. Parental benefits can be received for a maximum of 35 weeks (and can be shared with the other parent). Thus, eligible mothers can receive up to 50 weeks of paid leave after the birth of a child (Phipps, 2006). The replacement rate is 55 percent of earnings up to a maximum insurable earnings of $48,600 per year or a maximum amount of $514 per week (Service Canada, 2014). Starting in January 2011, maternity and parental benefits through EI were extended to those who were self-employed on an opt-in basis (Service Canada, 2012). If mothers work while receiving maternity benefits (first 15 weeks), the Canadian government deducts the entire amount mothers earn "dollar for dollar" from their benefits. If mothers work while receiving parental benefits (35 weeks after maternity benefits), they can earn 25 percent of their weekly benefit or up to $50 per week (whichever is higher). Anything over that amount is deducted "dollar for dollar" from their benefits (Service Canada, 2014). Research findings about the influence that timing of maternal employment and the number of hours worked have on young children's development could help policy makers modify maternity and parental benefits to facilitate the capacity of parents to make decisions that allow them to simultaneously meet their financial needs, mothers' personal career goals, and children's developmental needs. For instance, finding that mothers' part-time employment in the first year of life does not negatively influence children's development may suggest a reconsideration of the "dollar for dollar" deductions in parental benefits. Adjusting the "dollar for dollar" clawback could

enhance mothers' abilities to meet their family's financial needs, in addition to their personal career goals, by allowing mothers to retain a greater proportion of their earned income.

The reality is that the majority of mothers with young children are working. However, like Michelle Obama, Canadian women and their families struggle with making decisions to return to employment. Many women feel compelled to return to employment after the birth of their child citing their attachment to their employment (Boyd, Walker, & Thorpe, 2013) and personal identity, well-being, and ongoing learning that employment provides (Boyd, Thorpe, & Tayler, 2010). Some women also desire to return to work to contribute to their family's financial well-being (Boyd et al., 2010; 2013; Harris, 2008). At the same time, women often report significant emotional distress in making this decision and they struggle with finding affordable, accessible, quality care for their children (Boyd et al., 2010, 2013; Harris, 2008).

As I stated at the outset, perhaps it is time to discard the debate on whether maternal employment in early childhood affects children and to focus instead on how factors in children's environments influence the relationship between maternal employment in the early years of children's lives and children's outcomes. This would enable policy analysts to devise policies that best support the well-being of women, their children, and their families (Organisation for Economic Cooperation and Development (OECD), 2007). As argued by Chatterji, Markowitz, and Brooks-Gunn (2013) "to develop public policies that meet the needs of a society in which most mothers are employed, we need a broader knowledge base regarding how maternal employment affects families" (p. 286). My research aligned with this goal by investigating how several of the factors in children's family, parental work, and child care contexts influence the relationship between maternal employment in early childhood and children's developmental outcomes.

My dissertation has four additional chapters. In the second chapter, I discuss the theoretical approach that guided my research, Bronfenbrenner's Bioecological Model, and I review relevant

literature. The final three chapters consist of the methods I used to answer my research questions, the results from my analyses, and the discussion of my results.

Chapter 2: Theoretical Approach and Literature Review

Introduction

For this literature review, I focus on bodies of literature most related to my research question, w*hat are the associations between maternal employment in early childhood and the developmental outcomes of infant, toddler, and preschool age children in Canada?* I frame my discussion with Bronfenbrenner's Bioecological Model of Human Development, which is also frequently referred to as the Process Person Context Time (PPCT) Model. I begin with an overview of the PPCT Model and my rationale for using the model. The remainder of the chapter includes a review of the bodies of literature related to the above research question. Additional details regarding the PPCT Model are also integrated in this review of the literature.

PPCT Model: An Overview

The form and content of the PPCT Model developed over an extended period of time (Bronfenbrenner & Morris, 2006). As stated by Bronfenbrenner and Morris (2006), the PPCT Model "…is an evolving theoretical system for the scientific study of human development over time" (p. 793). Bronfenbrenner's early writings emphasized how the development of an individual is significantly affected by his/her interrelations with the ecological environment. The ecological environment consists of four systems: the microsystem, mesosytem, exosystem, and macrosystem (Bronfenbrenner, 1979). Though Processes, the key element of the PPCT Model, was discussed by Bronfenbrenner in his early writings, it was not described and defined in its mature form until the 1990s (Bronfenbrenner & Morris, 1998; Tudge, Mokrova, Hatefield, & Karnik, 2009). For the purposes of my research, I use the full PPCT Model in its mature form.

The elements that comprise the PPCT Model are Processes, Person, Context, and Time. Processes are the "…complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment" (Bronfenbrenner &

Morris, 1998, p. 996). Examples provided by Bronfenbrener and Evans (2000) are things/activities that regularly occur in the lives of developing individuals such as parents playing with or reading to a child (Bronfenbrenner & Evans, 2000). Person characteristics include age, gender, intelligence, temperament, or motivation (Bronfenbrenner & Morris, 1998). Contexts include the four classic systems in children's ecological environments discussed in Bronfenbrenner's earlier writings, the microsystem, mesosytem, exosystem, and macrosystem (Bronfenbrenner, 1979; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). Microsystems are face-to-face settings such as family, school, or peer groups. Mesosytems are the linkages between two or more settings that contain the developing individual, such as relations between home and school. Exosystems are environments in which other individuals are involved and that have an indirect influence on the developing child such as parents' work environment and resources in the community such as law enforcement and health care. Macrosystems are social policies, legislation, the economy, and wider characteristics of a culture, such as belief systems and ideologies (Bronfenbrenner, 1979). Time includes what is occurring during the course of an interaction or activity (micro-time), the extent to which activities and interactions occur consistently in the developing individual's world (meso-time), and environment and historical events that co-occur as the developing individual is in one stage or another (macro-time) (Bronfenbrenner & Morris, 1998).

Further, the PPCT Model has two central propositions regarding human development. The first proposition states that:

> Throughout the life course, human development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment. To be effective, the interaction must occur on a fairly regular basis over extended periods of time. Such enduring forms of interaction in the immediate environment are referred to as proximal processes (Bronfenbrenner & Morris, 1998, p. 996).

Consistent with Bronfenbrenner and Morris (2006), I conceptualize children's development as the "…stability and change in the biopsychological characteristics of human beings over the life course and across generations" (p. 796). Development involves progressively complex interactions between the growing child and his/her immediate environments (Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). The result of these complex interactions can be either developmental competence or dysfunction (Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 1998; 2006). Competence is "…the demonstrated acquisition and further development of knowledge, skill, or ability to conduct and direct one's own behavior across situations and developmental domains" (Bronfenbrenner & Morris, 1998, p. 1002). Dysfunction is "…the recurrent manifestation of difficulties in maintaining control and integration of behavior across situations and different domains of development" (Bronfenbrenner & Morris, 1998, p. 1002).

The second proposition of the PPCT Model discusses the relationships among the other key elements, in addition to Proximal Processes, that comprise the model including Person, Context, and Time. According to this proposition, the form, power, content, and direction of the Proximal Processes (*Processes*) vary by the characteristics of the developing individual (*Person*), the environmental context (C*ontext*), changes occurring over time, through the life course, and the historical period in which the individual lives (*Time*), and by the developmental outcomes under study (Bronfenbrenner & Evans, 2000).

I drew on Bronfenbrenner's PPCT Model to frame my research study because of the model's focus on how interrelations among Proximal Processes and characteristics of Person, Contexts, and Time influence the developmental outcomes of children. Researchers investigating the association between maternal employment in early childhood and children's outcomes have argued that it is an absolute necessity to explore this relationship with attention to child, parental, familial, and larger environmental contexts especially given the extent to which these contexts moderate the relationships between

maternal employment in early childhood and children's outcomes (Goldberg, Prause, Lucas-Thompson, & Himsel, 2008). The PPCT Model provides a framework which permits me to investigate how the various individual, parental, and contextual factors influence young children's developmental outcomes.

The PPCT Model does not, however, identify the specific factors that work in combination to influence children's development. Therefore, it was necessary to work through the vast literature on the effects of maternal employment in early childhood on children's outcomes to identify specific Process, Person, Context, and Time factors that have been demonstrated to influence the relationship between maternal employment in early childhood and children's outcomes. Most of the factors I chose to examine are those that have been the most widely studied within the maternal employment in early childhood literature. Exceptions to this will be discussed further in the literature review. In addition, I also decided to include factors that have known effects on children's outcomes but have been generally overlooked in research studies investigating the associations between maternal employment in early childhood and children's developmental outcomes. In combination with these bodies of literature, the PPCT Model guided me to explore the influence of the following Processes, Person characteristics, Contextual factors, and Time factors on children's development: children's interactions with parents and non-parental care providers (Proximal Processes); children's gender (a Person characteristic); familial, child care, and maternal work environments (Contextual factors); and changes/transitions (mothers' return to work) occurring early in children's life courses (Time factor).

Relevant Literature

Introduction

In the remainder of this chapter, I discuss the factors identified in the research literature as important for understanding how maternal employment in early childhood influences children's developmental outcomes. This discussion is framed by the PPCT Model, about which I provide greater details than I did in the introductory overview of the Model. Before I discuss the details of the research

findings, I provide a brief overview of the common characteristics of the relevant research literature, including the samples and data sets used as well as the overall complexity of literature on maternal employment in early childhood.

A common characteristic of research studies investigating the influence of maternal employment in early childhood on children's outcomes is that they have, for the most part, drawn on U.S samples (Baum, 2003; Baydar & Brooks-Gunn, 1991; Belsky & Eggebeen; 1991; Blau & Grossberg, 1992; Brooks-Gunn et al., 2002; 2010; Coley & Lombardi, 2012; Desai et al., 1989; Han et al., 2001; Harvey, 1991; Hill et al., 2005; Parcel & Menaghan, 1994; Ruhm, 2004; Smith, Brooks-Gunn, Klebanov, & Lee, 2000; Vandell & Ramanan, 1992; Waldfogel et al., 2002). This is a problem because, as discussed in the introduction, U.S. mothers are found to return to employment earlier after the birth of a child than Canadian mothers, and as such, the results of U.S. studies may not generalize to Canadian women, children, and their families. The exceptions are studies by Cooksey et al. (2009), McMunn, Kelly, Cable, and Bartley (2012), Gregg, Washbrook, Propper, and Burgess (2005), which drew on samples from the U.K. Additionally, Goldberg et al. (2008) conducted a meta-analysis of studies that investigated the effects of maternal employment on children's outcomes in Canada, Belgium, New Zealand, and Israel (n=8). Unfortunately, though Goldberg et al. (2008) identified the studies used in the meta-analysis, they did not specify the number of studies that were Canadian, the authors of the studies which drew on Canadian samples, or the results specific to the Canadian studies. There are, however, a few Canadian studies that have focused on the effects of current maternal employment on young children's outcomes (as opposed to maternal employment in early childhood) (Gagné, 2003) and the influence of factors in children's microsystem and macrosystem environments on young children's outcomes (Baker, et al., 2008; Lefebvre & Merrigan, 2002; Nomaguchi, 2006; Sherlock et al., 2008). These studies will be discussed in more depth later in the literature review.

The U.S. literature generally focuses on maternal employment initiated within the first year after the birth of a baby and subsequent effects on children's outcomes. Thus, in the literature review, when I indicate early maternal employment, I refer to employment beginning within the first year. When the study investigated the effects of maternal employment beyond the first year, I indicate the specific timing of the maternal employment.

An additional common characteristic of the American research literature exploring the effects of maternal employment in early childhood on children's outcomes is that most studies have drawn upon samples from the National Longitudinal Survey of Youth (NLSY) (Baum, 2003; Baydar & Brooks-Gunn, 1991; Belsky & Eggebeen; 1991; Blau & Grossberg, 1992; Cooksey et al., 2009; Desai et al., 1989; Han et al., 2001; Harvey, 1991; Hill et al., 2005; Parcel & Menaghan, 1994; Ruhm, 2004; Smith et al., 2000; Vandell & Ramanan, 1992; Waldfogel et al., 2002). The exceptions are studies by Brooks-Gunn et al. (2002; 2010) and Coley and Lombardi (2012) in which the National Institute of Child Health and Human Development Study of Early Child Care (NICHD) and the Welfare, Children, and Families: A Three-City Study were used. The NLSY is a longitudinal study that followed a nationally representative sample of young men and women who were first interviewed in 1979. In 1986, in-depth child-specific data were collected on all the children born to women in the 1979 sample (Bureau of Labor Statistics, United States Department of Labor, 2003). The NICHD Study of Early Child Care is also a longitudinal study that followed over 1300 children from infancy to 15 years from 10 sites across the U.S. The study focused on how different child care arrangements were related to child health, behavior, school performance, and other indicators of child development (NICHD Early Child Care Research Network, 2000). Welfare, Children, and Families: A Three-City Study began in 1999 and drew on samples from Boston, Chicago, and San Antonio. This longitudinal study investigated the well-being of low-income children and families following welfare reforms in the U.S. (The John Hopkins University, n.d.).

Another common characteristic of the literature on the association between maternal employment in early childhood and children's developmental outcomes is its complexity. Researchers investigating the influences of maternal employment in early childhood on children's developmental outcomes and the various factors that influence this relationship have not always arrived at the same conclusions. Despite using similar methods of analysis and, in several cases, the same data sets, conflicting research findings have been discovered. In the review of the specific research findings, I undertake the challenging process of untangling these contradictory findings and explaining why these contradictory results might exist. However, given the inherent complexity of the relevant research literature, this discussion of research findings is not always simple nor straightforward.

It also seems prudent at this point to mention two additional challenges that arose during the review of the relevant literature. First, a number of the family environment factors (i.e., maternal education, family economic well-being, family structure) included in the research studies exploring the relationship between maternal employment in early childhood and children's developmental outcomes, are interrelated. What I mean by this is that these factors not only act to influence the relationship between maternal employment in early childhood and children's outcomes but they are also associated with one another. Because of these interrelations among the family environmental factors, it became challenging to untangle and describe them separately. It was necessary, in the process of explaining the influences that each family environment factor had on the relationship between maternal employment in early childhood and children's outcomes, to draw on one or more family environmental factors to aid in the explanation.

The second challenge that developed during the course of this literature review was the application of the PPCT Model itself. The key elements of the PPCT Model are typically described as separate and distinct facets of the Model (Bronfenbrenner & Morris, 1998). However, it became apparent to me that many of the Processes and Contexts studied are closely interrelated with one another (i.e., both

Processes and Contextual factors are present within children's family and child care microsystems). Though I attempt to describe the research findings under each distinct element of the PPCT Model, it is because of this interrelation between Processes and Contextual factors that I integrate key research findings about Processes within the discussion of research findings about family and child care microsystem Contextual factors.

With these challenges in mind, I begin the literature review with Time. Specifically, I explore the influence of the timing of mothers' return to work on children's outcomes. Following this discussion, I examine the Contexts and Processes that either influence the nature of the relationship between maternal employment in early childhood and children's outcomes or explain how (i.e., the mechanisms) maternal employment in early childhood is associated with children's developmental outcomes. I start with a discussion of research findings about the family microsystem Contextual factors and Processes. I then focus attention on research findings about the child care microsystem Contextual factors and Process. This is followed by an exploration into research findings regarding the exosystem contextual factor, maternal work intensity. The relevant research literature identifies one Person characteristic, children's gender, as an important influence on the associations between maternal employment in early childhood and children's outcomes. I conclude with an overview of the primary research question and sub-questions I asked.

The Research Findings

Time

The element of Time in the PPCT Model comprises three components: micro-time, meso-time, and macro-time. In terms of my research interest, macro-time plays a significant role. Bronfenbrenner and Morris (2006) described macro-time as *not only* how individuals' development varies according to historical events or societal trends that occur *but also* how individuals' development varies according to transitions occurring during people's lives. The main focus of my study concerns how children's

development varies by a particular event/transition occurring during their lives. More specifically, I am interested in the associations between the timing of mothers' return to employment and children's developmental outcomes.

Timing of Maternal Employment

In this section, I explore literature that specifically investigates the effects of the timing of maternal returns to employment on children's developmental outcomes. I first discuss the effects of maternal employment starting in the first year after birth on children's cognitive and behavioral outcomes. This is followed by an examination of the effects on children of maternal employment beginning after the first year.

The relationship between maternal employment starting in the first year after birth and children's cognitive development has been well studied. And, researchers using multiple regression (Baum, 2003; Baydar & Brooks-Gunn, 1991; Blau & Grossberg, 1992; Waldfogel et al., 2002), a meta-analysis (Lucas-Thompson, Goldberg, & Prause, 2010) and more advanced methods of statistical analysis (Cooksey et al., 2009; Hill et al., 2005; Waldfogel et al., 2002) have generally come to agree that maternal employment in the first year is associated with less advanced cognitive development for children. However, there are slight differences in terms of the magnitude of associations between early maternal employment and children's outcomes among the different methods of analysis used (Hill et al., 2005; Waldfogel et al., 2002). For instance, Hill et al. (2005) found that, using propensity score matching, full-time early maternal employment was negatively and significantly associated with school age children's cognitive outcomes (five to six years) in comparison to the outcomes of children whose mothers did not work and children whose mothers worked part-time (Hill et al., 2005).[1] These effects were slightly smaller in magnitude than those effects estimated by the preliminary regression models run by Hill et al.

[1] Hill et al. (2005) controlled for child ethnicity, child gender, child age, birth order, birth weight, prematurity, marital status, poverty status, maternal age, maternal cognitive attainment and educational attainment, household income, family size, and mother's work history.

(2005). Waldfogel et al. (2002) used family fixed effects models to test the extent to which the estimated negative effects of early maternal employment on children's cognitive development from the ordinary least squares (OLS) models were biased by unobserved heterogeneity between mothers who engaged in early maternal employment and mothers who did not. Like the findings by Hill et al. (2005), Waldfogel et al. (2002) found some differences in the magnitude of the association between early maternal employment and children's outcomes across the different methods of analysis used by Waldfogel et al. However, the family fixed effects models were relatively consistent with the regression models (Waldfogel et al., 2002).[2]

It is interesting to note that Cooksey et al. (2009) found that full-time early maternal employment did not have a significant effect on British children's cognitive development whereas full-time early maternal employment was negatively associated with U.S. children's cognitive development. Cooksey et al. (2009) argued that the differences in findings could be due to U.S mothers, as compared to U.K. mothers, engaging in employment earlier in their children's first year. Researchers have found that maternal employment initiated earlier in the first year is negatively associated with children's later cognitive development in comparison to maternal employment initiated later in the first year (Han et al., 2001). It is thus probable that effects of maternal employment on children's developmental outcomes are more likely to be found for U.S. samples in comparison to U.K. samples due to U.S. mothers initiating employment earlier within this first year (Baum, 2003; Berger et al., 2005).

The relationship between early maternal employment and children's behavioral outcomes has been less widely studied than the relationship between early maternal employment and children's cognitive

[2] Propensity score matching is when the estimated effect of "treatment," in this case maternal employment, is undertaken by developing/creating matched groups based on background characteristics. The method attempts to reduce bias from background characteristics through developing a sample that has received the "treatment" – early maternal employment that is comparable on all observed background characteristic to sample that has not received the "treatment" (Hill et al., 2005). With family fixed effects, the outcomes of a child whose mother engaged in early maternal employment are compared to a sibling whose mother did not engage in early maternal employment. This method allows for a control of a mother's characteristics that are constant over time (do not change) and are related to both a mother's choice to work after birth and a child's developmental outcomes (Waldfogel et al., 2002).

outcomes. The studies that have been undertaken show inconsistent results. For example, some researchers have found no significant effects between early maternal employment and overall behavioral difficulties of preschool and school age children (Harvey, 1999; Parcel & Menaghan, 1994). In contrast, other researchers have found negative effects of early maternal employment on later overall behavioral difficulties (greater likelihood of behavioral problems) (Baydar & Brooks-Gunn, 1991; Han et al., 2001). These conflicting findings could be associated with different samples used. One of the studies, by Han et al. (2001), investigated the effects of early maternal employment separately for different racial groups.[3] Though the researchers found significant negative effects of early maternal employment on the behavioral development (greater likelihood of behavioral problems) of non-Hispanic white children, the researchers did not find significant effects of early maternal employment on the behavioral development of African American children. Han et al. (2001) argued that these results suggest that the effects of early maternal employment on children's outcomes vary by racial or ethnic groups. Other researchers who did not find a significant relationship between early maternal employment and children's overall behavioral difficulties (Harvey, 1999; Parcel & Menaghan, 1994) included both non-Hispanic white children and African American children in their sample. A non-significant relationship between early maternal employment and later children's behavioral outcomes (Harvey, 1999; Parcel & Menaghan, 1994) may have resulted from this pooling of children because the inclusion of African American children suppressed or washed out the relationship between early maternal employment and children's behavioral outcomes.

When researchers examined the effects of early maternal employment on specific types of behavioral difficulties rather than the overall behavioral difficulties discussed above, divergent results are also apparent. Some researchers have found no significant effects between early maternal employment and children's externalizing behavioral problems (i.e., aggression, disobedience,

[3] Baydar and Brooks-Gunn (1991) study included only non-Hispanic white children. Thus, they did not compare the effects of early maternal employment on the outcomes of children in different racial groups.

restlessness, and impulsivity) (Brooks-Gunn et al., 2010; Cooksey et al., 2009). In contrast, Han et al. (2001) found early maternal employment to be associated with greater externalizing problems in children aged seven to nine relative to children of mothers who did not work early in their children's lives. One reason for the difference in findings might be that Brooks-Gunn et al. (2010) only investigated externalizing behavioral difficulties up to the first grade. Han et al. (2001), however, looked at externalizing difficulties at ages four, five to six, and seven to eight finding significant effects only at ages seven to eight.

In terms of internalizing behavior difficulties (including tearfulness, fearfulness, anxiousness, and unhappiness), Han et al. (2001) did not find a significant relationship between early maternal employment and children's internalizing problems at ages four, five to six, and seven to eight. In contrast, Cooksey et al. (2009) discovered a significant and positive effect of early maternal employment on internalizing behavioral problems (fewer internalizing behavioral problems) of U.S. children between the ages of four and sixteen. However, these authors caution researchers from drawing the conclusion that early maternal employment has beneficial consequences for children's internalizing behavior (fewer internalizing behavioral problems) because a large amount of variability within the models was left unexplained (Cooksey et al., 2009).

In short, the association between early maternal employment and children's cognitive development has been widely studied and researchers generally have found that early maternal employment has negative consequences for the cognitive outcomes of children. The relationship between early maternal employment and children's behavioral development has been less extensively studied than children's cognitive development and the findings are more inconsistent. The inconsistent findings possibly result from the nature of the data analyses (i.e., pooling of samples) or the ages at which children's behavioral outcomes were measured, suggesting the need for further investigation and clarification into the associations between maternal employment during the first year and young

children's behavioral development. As far as I have found, no study has specifically explored the influence of early maternal employment on other aspects of children's early development such as motor development (Baker et al., 2008).[4] As argued by Baker et al. (2008), the debate on the effects of early non-parental care/maternal employment has been "preoccupied" with children's cognitive outcomes and it is of utmost "…importance for future study to consider wider arrays of developmental indices for more heterogeneous populations of children" (p. 740).

From the studies that have focused on maternal employment initiated after the first year of a child's life, researchers have found that employment either has no significant associations with children's outcomes or small beneficial consequences on certain aspects of children's development (Baydar & Brooks-Gunn, 1991; Blau & Grossberg, 1992; Lucas-Thompson et al., 2010; Ruhm, 2004; Waldfogel et al., 2002). With cognitive outcomes, maternal employment initiated in the second or third years has been found to be positively associated with children's cognitive outcomes in the preschool (Blau & Grossberg, 1992; Ruhm, 2004; Waldfogel et al., 2002) and school age years (Ruhm, 2004; Waldfogel et al., 2002). In terms of behavioral outcomes, researchers have found that maternal employment initiated in the second or third years does not have significant effects on children's general behavioral difficulties (Baydar & Brook-Gunn, 1991).[5] This being said, it is not just the timing of maternal employment that is important to examine in relation to children's developmental outcomes. Children's

[4] Canadian researchers Sherlock et al. (2008) investigated the influence of length of maternity leave on children's motor and social development finding longer paid maternity leaves were associated with fewer motor and social development difficulties. Sherlock et al.'s (2008) study was limited, however, by using length of paid maternity leave as the primary predictor variable. Through only including those women who take paid maternity leaves, the research study excludes the effects on children of women who do not take paid maternity leaves either because they do not qualify or choose not to apply. This is an important limitation because approximately 40% of Canadian women do not apply or qualify for a paid maternity leave (Marshall, 2003). Baker, Gruber, and Milligan (2008) investigated the influence of the introduction of universally accessible child care in Quebec on children's motor and social development. The researchers discovered decreases in motor and social development scores of children in Quebec during the time of the policy change relative to children in the other Canadian provinces. The researchers, however, did not specifically investigate the effects of early maternal employment on children's early development.

[5] To my knowledge, researchers have not investigated the effects of maternal employment initiated after the first year of a child's life on specific types of behavioral difficulties.

development is influenced by a much wider variety of Processes and Contextual factors in children's environments. In the following sections, I discuss these key Process and Contexts.

Family Microsystem Contextual Factors and Processes

In this section, I discuss the key Contextual factors and Processes in children's family environment identified in the research literature as potentially influencing the relationship between maternal employment in early childhood and children's developmental outcomes. Bronfenbrenner and Evans (2000) defined Context within the PPCT Model as the nature of the larger environment in which the individual lives. The Context includes the micro, meso, exo, and macrosystems. Microsystems are the key interest in this section of the literature review and are described by Bronfenbrenner (1979) as face-to-face settings such as family, school, or peer groups. The Contextual factors in children's family microsystem that I focus on include depressive symptoms, maternal education and cognitive abilities, family structure, family functioning, and family economic status.

Processes are the complex reciprocal interactions between the developing individual and persons, objects, and symbols in his or her environment (Bronfenbrenner & Morris, 1998). The specific Process within children's family microsystem I discuss is children's interactions with their parents. Interactions with parents and other care providers for most young children, are key Proximal Processes (Bronfenbrenner & Morris, 2006). It is through engaging in these various activities/interactions that children/individuals begin to make sense of their world and their place within it.

Depressive Symptoms

Depressive symptoms may be an important mediating factor in the relationship between maternal employment in early childhood and children's developmental outcomes (McMunn et al., 2012. However, unlike many of the family microsystem Contextual factors included in my analyses, depressive

symptoms have rarely been included, even as a control variable, in investigations into the associations between maternal employment in early childhood and children's developmental outcomes.[6]

It is important to include depressive symptoms in investigations into the relationship between maternal employment in early childhood and children's developmental outcomes because post-partum depression has been found to be negatively associated with children's outcomes. The authors of two reviews of research articles investigating the effects of post-partum depression on children's outcomes concluded that children of mothers who suffered from post-partum depression have greater cognitive difficulties (Beck, 1998; Grace Evindar, & Stewart, 2003) and behavioral problems (Beck, 1998; Grace et al., 2003) in toddler, preschool, and school aged years than children of mothers who did not suffer from post-partum depression. Further, young children (under the age of three) of mothers who have experienced depressive symptoms are more likely to have motor and social development problems (To Cadarette, & Liu, 2001).

It is also important to include depressive symptoms in studies investigating the association between maternal employment in early childhood and children's developmental outcomes because depressive symptoms may interfere with mothers' ability to secure and sustain employment. In cross-sectional studies exploring the association between employment and depression, findings show that depression is associated with not working and that the frequency of not working is higher for women with depression than for men with depression (el-Guebaly, Currie, Williams, Wang, Beck et al., 2007; Ellinson, Houck, Marcus, & Pincus, 2004; Ettner, Frank, & Kessler, 1997). Longitudinal research suggests further that individuals with more severe depression have greater risk of future unemployment (Dooley, Prause, & Ham-Rowbottom, 2000). This conclusion is supported by a review of the research literature, including both cross-sectional and longitudinal studies on the effects of depression on employment, which found that unemployment rates were higher for individuals with depression relative to individuals without

[6] The exceptions are Brooks-Gunn et al. (2002; 2010) who controlled for mother's depressive symptoms at one month post-partum.

depression. The authors concluded that populations with depression are vulnerable to unemployment (Lerner & Henke, 2008). In short, research findings suggest that depression interferes with employment. In terms of the maternal employment in early childhood research literature, researchers have found a positive association between maternal employment in early childhood and maternal depression scores (greater maternal depression) (Baker et al., 2008; Chatterji et al., 2013). However, Canadian researchers have discovered that the change in maternity leave policy in Canada that increased the length of paid leave from 25 weeks to 50 weeks was not significantly associated with maternal reports of symptoms of depression (Baker & Milligan, 2008). This finding suggests that increases to the length of time mothers stay home with their children in the first year is not associated with decreases in mothers' symptoms of depression (i.e., staying home longer did not reduce symptoms of depression). Thus, due to the conflicting research findings, it remains unclear whether maternal employment early in children's lives is associated with depressive symptoms.

It is essential to investigate the effects that depressive symptoms have on the relationship between maternal employment in early childhood and children's outcomes, given the associations between depressive symptoms and children's development. One study has examined this - the mediating effects of depressive symptoms on maternal employment in early childhood and children's developmental outcomes (McMunn et al., 2012). This study was undertaken in the U.K. using the U.K. Millennium Cohort Study. In this work, McMunn et al. (2012) found that relative to female children of mothers who worked in the first five years of their children lives, female children of mothers who did not work experienced greater overall behavioral problems at five years of age.[7] These effects were reduced but not eliminated when depressive symptoms of mothers was added to the model suggesting that the positive effect of no maternal employment on female children's behavioral problems was partially explained by mothers' symptoms of depression. However, because only one research study investigating

[7] The association between maternal employment and male children's behavioral problems was not significant after adjusting for confounding factors such as maternal education and household income (McMunn et al., 2012).

the relationship between maternal employment in early childhood and children's developmental outcomes has included depressive symptoms as a mediating factor, it is an area of research that requires further development.

Maternal Education and Cognitive Abilities

Maternal education and cognitive abilities are two Contextual factors within children's families microsystems or face-to-face settings identified by researchers as affecting the relationship between maternal employment in early childhood and children's outcomes (Han et al., 2001), especially cognitive development. Specifically, mothers' level of education and cognitive abilities have been shown to be positively related to better cognitive development for children (Brooks-Gunn, Duncan, & Britto 1999; Carneiro, Meghir, & Parey, 2013). Additionally, maternal education is found to be associated with maternal employment in early childhood. Research has found that mothers with higher levels of education return to work sooner after the birth of a child than mothers with lower levels of education (Baxter, 2005).

Although researchers have established associations between maternal education and cognitive abilities and both children's cognitive development and maternal employment in early childhood, the influence of maternal education and cognitive abilities on the relationship between maternal employment in early childhood and children's developmental outcomes has not been frequently investigated. Only one study that I am aware of has specifically investigated the moderating role of maternal cognitive abilities for these relationships. This study was conducted in the U.S. drawing on the NLSY (Han et al., 2001) and focused on the influence of maternal cognitive abilities on the relationship between early maternal employment and children's developmental outcomes. As well, there was one Canadian study that investigated the influence of maternal education on the relationship between current maternal employment and young children's developmental outcomes (Gagné, 2003). This study did not specifically investigate maternal employment within the first year but whether the mother

currently worked part-time or full-time or currently did not work. However, there were comparable findings between the two studies which suggest that maternal education and maternal cognitive abilities moderates the association between maternal employment in early childhood and children's developmental outcomes. The researchers found negative consequences of maternal employment in early childhood on the cognitive outcomes of young children whose mothers had moderate to high cognitive abilities (Armed Forces Qualification Test (AFQT) scores) (Han et al., 2001) and high levels of education (Gagné, 2003). In contrast, no negative effects (Han et al., 2001) or small positive effects (Gagné, 2003) of maternal employment on young children's cognitive outcomes were found for children of mothers who had very low AFQT scores (Han et al., 2001) and low levels of education (Gagné, 2003).

Researchers have hypothesized that one of the reasons why children of mothers with higher education and cognitive abilities fare worse when their mothers engage in employment in early childhood than children of mothers with lower education and cognitive abilities is because of less cognitive stimulation in the home during children's early years (Belsky & Eggebeen, 1991; Han et al., 2001). Comparatively, developmental benefits may occur for children whose mothers have lower levels of education and cognitive abilities because of the enriching experiences children have in non-maternal care settings (Belsky & Eggebeen, 1991).

It may also be the case that children of mothers with higher educational levels fare worse when their mothers engage in maternal employment in early childhood because mothers with higher educational levels tend to return to work earlier in their children's lives than mothers with lower educational levels (Baxter, 2005). Researchers have found that maternal employment initiated earlier within the first year of children's lives compared to maternal employment initiated later within the first year of children's lives is negatively associated with children's cognitive development (Han et al., 2001).

In short, there is preliminary evidence to suggest that maternal education and cognitive abilities moderate the relationship between maternal employment in early childhood and children's cognitive

outcomes. However, there is limited research in this area. And, like depressive symptoms, it is an area of research that requires further development.

Family Structure

Family structure is a Contextual factor within children's families microsystems recognized by researchers as influencing the relationship between maternal employment in early childhood and children's outcomes (Brooks-Gunn et al., 2002; Goldberg et al., 2008; Han et al., 2001; Harvey, 1999; Ruhm, 2004). Researchers who have explored the moderating influence that family structure has on the relationship between maternal employment in early childhood and children's outcomes have had relatively consistent findings. Research findings indicate that children in families whose mothers are married fare better when mothers do not work early in their children's lives and children in single mother families fare better when mothers work early in their children's lives (Brooks-Gunn et al., 2002; Goldberg et al., 2008; Han et al., 2001; Harvey, 1999; Ruhm, 2004).

Children of married mothers who worked in the first year have been found to have lower cognitive scores between the ages of three to eight relative to children of married mothers who did not work (Brooks-Gunn et al., 2002; Han et al., 2001). Additionally, children of married mothers who worked in the first three years have been found to have lower cognitive scores in the preschool and early school years relative to children in single mother families whose mothers worked in the first three years (Ruhm, 2004). Similarly, other studies have shown that children of single mothers, but not children of married mothers, have significantly higher cognitive scores in the preschool and school age years among samples of children whose mothers worked early in their lives (Goldberg et al., 2008; Harvey, 1999). Only one study investigated the influence of family structure on the relationship between maternal employment in early childhood and children's behavioral outcomes: Harvey (1999) found that maternal employment in the first three years was associated with significantly more overall behavior problems for five to six year old children of married mothers but not for children of single mothers.

Why are children of single mothers potentially benefitting from maternal employment in early childhood relative to children of married mothers? One argument made by researchers is that the extra income made by mothers who return to work in early childhood is more valuable or beneficial to children of single mothers than children of married mothers (Brooks-Gunn et al., 2002; Ruhm, 2004). Because single mothers are at risk for low-income and poverty (Campaign 2000, 2012), the additional income from maternal employment in early childhood may allow single mothers to invest in books, educational outings, and other activities that enhance the developmental outcomes of their children. This is commonly known as the Investment Model. The Investment Model has been extensively investigated and researchers have found, using a variety of large data sets, that the effects of low-income/poverty on children's cognitive development are partially mediated by family investments (i.e. books, educational outings, and activities that enhance the developmental outcomes of children) (Gershoff, Aber, Raver, & Lennon, 2007; Linver, Brooks-Gunn, & Kohen, 2002; Raver, Gershoff, & Aber, 2007; Smith, Brooks-Gunn, & Klebanov, 1997; Yeung, Linver, & Brooks-Gunn, 2002).

I question this explanation for two reasons. First, the additional costs related to employment such as transportation, work related clothing, and/or child care is more likely to erode any benefits that employment may have for children in poor families (London, Scott, Edin, & Hunter, 2004; McMullin, Davies, & Cassidy, 2002). Further, the research studies that investigated how family structure influences the associations between maternal employment in early childhood and children's development have controlled for either family income (Brooks-Gunn et al., 2002; Harvey et al., 1991), family poverty status (Brooks-Gunn et al., 2002; Han et al., 2001), or mother's hourly wage (Ruhm, 2004). Yet, the authors continue to find that family structure moderates the relationship between maternal employment in early childhood and children's outcomes. Additionally, all the research studies controlled for maternal IQ or cognitive ability (Brooks-Gunn et al., 2002; Han et al., 2001; Harvey et al., 1991; Ruhm, 2004), a factor associated with greater investments in children's development (Baharudin & Luster, 1998;

Bradley, Whiteside, Caldwell, Casey, Kelleher et al., 1993). And, like with controlling for income, family structure continued to influence the associations between maternal employment in early childhood and children's outcomes. Why do children of single mothers fare better when their mothers work early in their lives relative to children of married mothers? Are there other factors within the family that influence the relationships between maternal employment in early childhood and children's outcomes?

Family Well-being

The emphasis in the research on maternal employment in early childhood has been on children's developmental outcomes (Chatterji et al., 2013). Rarely have researchers investigated the influence of maternal employment in early childhood on the well-being of families themselves (Baker et al., 2008). This is vital to undertake because family well-being has implications for the developmental outcomes of children and thus, may be an important mediating factor that explains how maternal employment in early childhood influences the developmental outcomes of children. In particular, two aspects of family well-being – family functioning (a family microsystem Contextual factor) and parents' interactions with their children (a family microsystem Process) – have been found to have consequences for children's developmental outcomes (Chao & Willms, 2002; Ginsburg, Siqueland, Masia-Warner, & Hedtke, 2004; Gagné, 2003; Gutman & Feinstein, 2010; Landry, Smith, & Swank, 2003; Nomaguchi, 2006; Racine & Boyle, 2002; Rae-Grant, Thomas, Offord, & Boyle, 1989; To et al., 2001; Tramonte, Gauthier, & Willms, 2013; Venetsanou & Kambas, 2010). I first describe how each of these aspects of family well-being are associated with children's development. This is followed by a review of the limited research evidence about the relationship between maternal employment in early childhood and these aspects of family well-being. I then discuss findings from studies which investigated how family functioning and parents' interactions with their children influence the relationship between maternal employment in early childhood and children's developmental outcomes. I begin with family functioning.

Family functioning is found to be associated with children's behavioral and emotional difficulties, with less effective functioning being related to more behavioral and emotional problems (Ginsburg et al, 2004; Racine & Boyle, 2002; Rae-Grant et al., 1989) and cognitive difficulties for children (Gagné, 2003). To my knowledge, researchers have not focused on investigating the influence of family functioning on the relationship between maternal employment in early childhood and children's developmental outcomes. However, two studies investigated the influence of maternal employment in general on family functioning (Baker et al., 2008; Racine & Boyle, 2002), showing that maternal employment was not associated with family functioning (Baker et al., 2008, Racine & Boyle, 2002). But these studies did not specifically explore the associations between maternal employment in *early childhood* and family functioning.[8]

Though it is possible that maternal employment in early childhood is not associated with family functioning, I believe it continues to be important to explore its potential mediating influences on the relationship between maternal employment in early childhood and children's outcomes. This is because of the established relationship between family functioning and children's development and because of the lack of research that has investigated the influence of maternal employment in early childhood on family functioning. One Canadian study by Gagné (2003) investigated the influence family functioning has on the relationship between current maternal employment and young children's cognitive outcomes. Gagné (2003) discovered that more effective family functioning was associated with enhanced cognitive scores for children of mothers who currently did *not* work outside the home. However, more effective family functioning was not associated with the cognitive outcomes of children of mothers who *did* currently work outside the home. This suggests that the functioning of the family may matter more to the development of children who are home on a daily basis with their families than

[8] Baker et al. (2008) investigated the effects of increases in non-parental care and maternal employment as the result of the day care policy change in Quebec on family functioning. Racine and Boyle (2002) investigate the influence of mothers' employment status on the developmental outcomes of school age children.

for children who are spending time in non-parental care arrangements as a result of their mothers' employment (Waldfogel, 2007).

Similar to the findings about the association between family functioning and children's outcomes, parents' interactions with their children is frequently identified in the research literature as influencing children's developmental outcomes. Researchers have found positive parent-child interactions (i.e., praise child frequently, engage in activities that interest the child, cuddle, read, and sing with the child) to be associated with fewer motor developmental difficulties (Gutman & Feinstein, 2010; To et al., 2001), fewer behavioral problems (Chao & Willms, 2002; Nomaguchi, 2006; Tramonte et al., 2013), enhanced social development (Chao & Willms, 2002; Landry et al., 2003; Nomaguchi, 2006), and better cognitive development (Landry et al., 2003) in toddlers, preschoolers, and school age children. In terms of the influence of maternal employment in early childhood on parent-child interactions, researchers have discovered maternal employment in children's early years to be associated with fewer positive parent-child interactions (Brooks-Gunn et al., 2002; Nomaguchi, 2006). This suggests that mothers who work early in their children's lives engage in fewer positive interactions with their children.

To my knowledge, only two studies have explored the mediating influence of parent-child interactions on the relationship between maternal employment in early childhood and children's developmental outcomes (Brooks-Gunn et al., 2002; Nomaguchi, 2006). Both studies focused on the influence of positive parent-child interactions (i.e., sensitivity to child distress, intrusiveness, positive regard, and supportive presence). For children's cognitive development, Brooks-Gunn et al. (2002) found that adding mothers' positive interaction with children to the model reduced the negative association between early maternal employment and preschoolers' cognitive development. For children's behavioral development, Nomaguchi (2006) found positive child-parent interaction did not change the association between maternal employment in the preschool years and children's fewer externalizing behaviors.

The above research findings (Brooks-Gunn et al., 2002; Nomaguchi, 2006) provide some initial evidence about the mediating role played by parent-child interactions in the relationship between maternal employment in early childhood and children's development. Like family functioning, given the influence that parent-child interactions have on children's developmental outcomes, it seems prudent to further explore how/if parent-child interactions explain the relationship between maternal employment in early childhood and children's outcomes.

Family Economic Status

In this section I discuss current knowledge about the moderating effects of family economic status, a Contextual factor of children's families microsystems, on the association between maternal employment in early childhood and children's developmental outcomes. It is well established that family economic status has important influences on children's development (Brooks-Gunn et al., 1999). I introduce this section with a discussion on how family economic status, defined as being poor or not poor, affects children's outcomes. I then explore the effects of maternal employment in early childhood on the outcomes of children who reside in poor families. This is followed by discussion of the research literature which has compared the influence of maternal employment in early childhood on the outcomes of children living in poor families with children living in non-poor families.

There is a large body of literature from Canada, Europe, and the U.S. connecting poverty with less than optimal outcomes for children in almost every area of functioning (Berthoud, 2001; Bradley & Corwyn, 2002; Ross, Roberts, & Scott, 2005). Poverty has been associated with children's emotional and behavioral difficulties (Bradley & Corwyn, 2002; McLeod & Shanahan, 1993; Ross & Roberts, 1999), cognitive delays (Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997), and health-related problems (Bradley & Corwyn, 2002; Bradshaw, 2002; Piachaud, 2001; Ross & Roberts, 1999). Further, and importantly, the earlier in life children experience poverty (Brooks-Gunn & Duncan, 1997; Duncan, Brooks-Gunn, & Klebanov, 1994; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Wagmiller, Lennone,

Kuang, Alberti, & Aber, 2006), the greater children's health and developmental outcomes are negatively affected.

In studies that *compared children living in poor families whose mothers worked to children living in poor families whose mothers did not work*, similar findings across the studies were found (Coley & Lombardi, 2012; Smith et al., 2000; Vandell & Ramanan, 1992). Children living in poor families in which mothers worked early in the children's lives had higher cognitive development scores and fewer behavior problems relative to children living in poor families in which mothers did not work (Coley & Lombardi, 2012; Smith et al., 2000; Vandell & Ramanan, 1992). One reason why maternal employment in early childhood may have positive effects on the outcomes of children in poor families, in particular cognitive outcomes, is that the additional income from employment may enable parents to invest more stimulating materials and experiences that enhance children's development (Gershoff et al., 2007; Linver et al., 2002; Raver et al., 2007; Smith et al., 1997; Yeung et al., 2002).

When samples are extended to *compare children in poor and non-poor families,* the influence of maternal employment in early childhood on children's development by family economic status varies according to the child outcome being investigated. In terms of cognitive outcomes, researchers have discovered that children in poor families are more negatively affected by early maternal employment than children in non-poor families with controls for family structure (Han et al., 2001; Waldfogel et al., 2002).[9] Both Han et al. (2001) and Waldfogel et al. (2002) argued that these findings may be the result of lower quality child care typically attended by poor children, but without a measure of child care quality, this hypothesis was not tested.

[9] It should be noted that this finding is different from the findings in which *children living in poor families whose mothers worked are compared to children living in poor families whose mothers did not work*. Children residing in poor families in which mothers work in early childhood are found to have higher cognitive development scores and fewer behavioral difficulties in comparison to children residing in poor families in which mothers do not work early in their lives (Coley & Lombardi, 2012; Smith et al., 2000; Vandell & Ramanan, 1992).

For behavioral difficulties, a different pattern of results has been found. Researchers have discovered that children in non-poor families whose mothers return to work early in their children's lives demonstrate greater externalizing behavioral difficulties at four years (Han et al., 2001) and more overall behavior problems at age seven to nine years (Harvey, 1999) than children in poor families whose mothers return to work early (controlling for family structure). This relationship between maternal employment in early childhood and behavioral problems by family economic status could be related to the use of centre-based child care by higher income families. Research finds that non-poor families are more likely than families who are poor to choose centre-based care for their children (Kim & Fram, 2009; Lefebvre & Merrigan, 2002; Lipps & Yiptong-Avila, 1999; Sylva, Steing, Leach, Barnes, Malmberg, & the FCCC-team, 2007), and that the more hours spent in centre-based care is associated with greater behavior problems for children (Belsky, 2006; McCartney, Burchinal, Clarke-Stewart, Bub, Owen et al., 2010; NICHD Early Child Care Research Network, 2006).

In summary, it appears that children in poor families are more likely to have cognitive difficulties relative to children in non-poor families and children in non-poor families are more likely to have behavioral difficulties relative to children in poor families when their mothers engage in employment in early childhood. It is important to keep in mind that this body of research is limited by the inability of researchers to test for the influences of child care quality (Coley & Lombardi, 2012; Han et al., 2001; Harvey, 1999 Smith et al., 2000; Vandell & Ramanan, 1992; Waldfogel et al., 2002). The influences of maternal employment in early childhood on poor children's cognitive development and on non-poor children's behavioral development may be partially explained by the quality and type of child care that children attend.

Child Care Microsystem Contextual Factors and Processes

In this section, I explore the Contextual factors and Processes in children's child care microsystem environments, child care type and quality, identified in the literature as influencing the relationship

between maternal employment in early childhood and children's developmental outcomes. Because young children of employed mothers are likely to be cared for by someone in addition to their mothers, the type of care children attend and the quality of care provided by alternative care providers can have important influences on children's developmental outcomes (Waldfogel, 2007).

Child Care Type

Canadian parents with children under the age of five typically use three different types of child care for their children including care inside and outside the home by a non-relative, care by a relative inside or outside of the home, and centre-based care (Statistics Canada, 2006a). In this section, I discuss the relationship between these various child care types, a Contextual factor in children's child care microsystem, and children's developmental outcomes. I then discuss the findings from studies that have included child care type in their investigations into the associations between maternal employment in early childhood and children's developmental outcomes.

On the surface, research findings seem to suggest that centre-based care positively influences children's cognitive and language development and negatively influences children's behavioral outcomes relative to other forms of care. However, a deeper look shows that findings about the associations between child care type and children's outcomes are more mixed than this straightforward summary suggests. Some researchers have found no relationship between child care type and children's cognitive development (Baydar & Brooks-Gunn, 1991; Lefebvre & Merrigan, 2002). In contrast, others have found that children who attend group settings, including centre-based care (Huston, 2001; Lipps & Yiptong-Avila, 1999; NICHD Early Child Care Research Network, 2001; 2002), early childhood programs (such as play groups, nursery schools, mom and tot programs) (Lipps & Yiptong-Avila, 1999), and child care homes (Huston, 2001; NICHD Early Child Care Research Network, 2001) have enhanced cognitive development in the preschool and early school years in comparison to children who do not attend these types of programs. Additionally, there is evidence to suggest that the amount of time spent in centre-

based care is associated with cognitive development between two and four and a half years (NICHD Early Child Care Research Network, 2006). Interestingly, the NICHD Early Child Care Research Network (2004) found that the more time spent in centre-based care in *infancy* was associated with lower cognitive performance at four and half years, whereas the more time spent in centre-based care in the *toddler years* was related to enhanced cognitive performance at four and half years. These findings suggest that it is not as simple as whether child care type influences children's outcomes but rather at what time point in children's early years did they experience, for instance, centre-based care.

In terms of behavioral development, centre-based care or a child care home has been shown to be associated with more negative behavior in terms of aggression and disobedience relative to the behavior of children in full-time parental care (Huston, 2001; NICHD Early Child Care Research Network, 2001). Further, long hours spent in centre-based care is associated with greater externalizing behavioral problems for young children (Belsky, 2006; McCartney et al., 2010; NICHD Early Child Care Research Network, 2006).

In some of the research exploring the influences of maternal employment in early childhood on children's developmental outcomes, researchers have included child care type in their investigations. The findings are consistent in terms of cognitive outcomes: controlling for child care type reduced the negative relationship between maternal employment in the first year and preschool and school age children's cognitive outcomes (Ruhm, 2004; Waldfogel et al., 2002). However, the relationship remained significant. In terms of behavioral outcomes, controlling for child care type did not substantially change the relationship between early maternal employment and anxiety, somatic, conduct, oppositional, and hyperactivity problems (Coley & Lombardi, 2012).

Though informative, these studies that controlled for child care type have not provided insight into how specific types of child care alter the effects of early maternal employment on children's development. However, a number of studies have investigated the moderating effects of child care type

on the relationships between early maternal employment and children's developmental outcomes. These studies enhance our understanding into the influences of *different* types of care on the relationship between early maternal employment and children's outcomes (Coley & Lombardi, 2012; Gregg et al., 2005; Waldfogel et al., 2002). Early full-time maternal employment has been found to have the strongest negative effects on children's cognitive development for children attending informal care, in particular non-relative care (Waldfogel et al., 2002) or care by a relative or friend (Gregg et al., 2005). This could be associated with the finding that family-based care settings tend to be of lower quality in comparison to centre-based care settings (Bigras, Bouchard, Cantin, Brunson, Coutu, et al., 2010). Further, children in the U.K. were found to have higher cognitive development scores at four years of age if they attended centre-based care rather than informal care when their mothers worked early in their lives (Gregg et al., 2005). This result appears to contradict the findings of the NICHD Early Child Care Research Network (2004) study indicating that greater time in centre-base care in *infancy* is negatively related to children's cognitive development at four years of age**.** Gregg et al.'s (2005) finding of a positive association between centre-based care and British children's cognitive development may be different from the NICHD Early Child Care Research Network's (2004) findings because of the differences in maternal employment in early childhood between American and British women. Gregg et al. (2005) argued that fewer women in the U.K. return to employment during early infancy and more women in the U.K. work part-time in early childhood than women in the U.S. Thus, because children in the U.K. do not experience the same extent of child care early in their lives as their U.S. counterparts, they may not experience the same negative effects on their developmental outcomes as do U.S. children. Additionally, the differences in outcomes between U.K. children and U.S. children who attend centre-base care may be also related to the differences in the quality of centre-base care in the two countries with U.K. children possibly experiencing better quality of care (Taguma, Litjens, & Makowiecki, 2012).

In terms of behavioral development, early maternal employment shortly after birth was associated with fewer attention and conduct problems at seven years for children in informal care (relative or non-relative home care) compared to children in mother care (Coley & Lombardi, 2012). In contrast, early maternal employment was not significantly associated with children's behavior when combined with centre-based care (Coley & Lombardi, 2012). The association between informal care and children's behavior (fewer difficulties) when mothers engage in early maternal employment is interesting. As discussed at the beginning of this section, other studies have shown that centre-based care and informal care is associated with more negative behavior in terms of aggression and disobedience in comparison to parental care (Huston, 2001; NICHD Early Child Care Research Network, 2001). This difference between Coley and Lombardi's (2012) findings and the findings from NICHD Early Child Care Research Network (2001) and Huston (2001) could be related to the sample used by Coley and Lombardi (2012). The authors drew on data from the Welfare, Child, and Families: A Three-City Study, which consisted of a sample that was economically disadvantaged (i.e., average income was below the poverty line). In explaining their findings, Coley and Lombardi (2012) argued that the informal care arrangements for the infants in their sample were primarily provided in the home by a relative. These arrangements may have benefited children because they were a source of extended family support, more developmentally appropriate environments for infants, and provided more consistency for children and mothers relative to centre-based care. There is some research evidence to support this argument. For instance, Loeb, Fuller, Kagan, and Carroll (2004) found that poor children cared for by relatives experienced fewer behavioral difficulties in comparison to poor children attending formal care (i.e., licensed family care homes).

In short, research suggests that child care type plays a role in the relationship between maternal employment in early childhood and children's development outcomes, in particular cognitive outcomes. Research investigating the moderating role of child care type on the relationship between maternal

employment in early childhood and children's outcomes has shown that children whose mothers work have enhanced cognitive development when they attend formal child care relative to informal care. In contrast, children have been found to have fewer behavioral difficulties when they attend informal care relative to mother care (for an economically disadvantaged sample). There are a number of gaps in this body of research that require further investigation including the moderating effects of child care type on the relationship between maternal employment in early childhood and the outcomes of children with various family incomes and the moderating effect of child care type on the association between part-time maternal employment in early childhood and children's developmental outcomes.

Child Care Quality

The quality of care provided in non-maternal care settings has implications for children's developmental outcomes from toddlerhood through to adolescence (Belsky, 2006; Vandell, 2004; (Vandell, Belsky, Burchinal, Steinberg, Vandergrift et al.; 2010). It is therefore important to examine the extent to which child care quality plays a role in the relationship between maternal employment in early childhood and children's outcomes. In this section, I discuss previous research findings about the relationship between quality of child care and children's outcomes, and I review the only two published studies that have investigated the role played by quality of child care for the relationship between maternal employment in early childhood and children's developmental outcomes (Brooks-Gunn et al., 2002; 2010).

Researchers typically conceptualize child care quality as including two components: process and structure (Huston, 2001; NICHD Early Child Care Research Network, 2004; Romano, Kohen, & Findlay, 2010). The process component involves the nature of children's daily experiences in child care especially the daily interactions between children and their non-parental care providers. Generally, the process component includes the appropriateness of the interactions between providers and children (i.e., warm, sensitive, and attentive behavior towards children); the provision of curriculum, materials, and activities

to help facilitate children's development; and a physical environment that is organized and supports children's learning (Bigras et al., 2010; Goelman, Doherty, Lero, LaGrange, & Tougas, 2000; Lefebvre & Merrigan, 2002).

The structure component includes child-staff ratio, group size, and child care providers' education/training in early childhood development and education. Staff education is a particularly important aspect of child care quality because, in addition to being associated with children's development, it is related with process child care quality (Bigras et al., 2010; Fukkink & Lont, 2007; Saracho & Spodek, 2007). In a meta-analysis undertaken by Fukkink and Lont (2007), staff with higher levels of education (at the university or college level) were found to be more sensitive to children's needs, provide better personal care, have a greater frequency of interactions with children, and were more knowledgeable about appropriate educational activities for children than staff with lower levels of education. Ghazvini and Mullis (2002) concluded in their analysis of predictors of process child care quality, that one of the best predictors was specialized caregiver education and training.

I consider the structural component of child care quality to be a Contextual factor within children's child care microsystem and the process component of child care quality as a Process that plays a role in shaping children's development. In the PPCT Model, Processes are defined as interactions between the developing individual and persons or objects in their immediate environment (Bronfenbrenner & Evans, 2000). Because the process component of child care quality emphasizes interactions between providers and children both in terms of teachers' behavior towards children (i.e., warmth or harshness) and the provision of a dynamic/interactive "lived experience" to engage children in the use of these stimulating materials (Goelman et al., 2000), it is a key Process.

What is the relationship between child care quality and children's developmental outcomes? In three review articles, including a review of the findings from the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care, better quality child care processes were found

to be positively associated with cognitive-linguistic development of toddlers and preschoolers (Belsky, 2006) and higher scores on language and cognitive tests (Bradley & Vandell; 2007; Vandell, 2004). Additionally, enhanced structure and process child care quality were found to be associated with happier, more securely attached, and more pro-social children with fewer behavior problems (Bradley & Vandell; 2007; Vandell, 2004). Better quality child care processes in early childhood were further associated with better cognitive, language, and/or academic achievement in later childhood (Bradley & Vandell, 2007) and in adolescence (Vandell et al., 2010).

An ongoing limitation of research investigating the association between maternal employment in early childhood and children's outcomes is the inability to include child care quality due to measures not being available within most of the data sets (Han et al., 2001; Miller, Jenkins, & Keating, 2002; Ruhm, 2004; Vandell & Ramanan, 1992; Waldfogel et al., 2002). Only two studies, both by Brooks-Gunn et al. (2002; 2010), included child care quality and they only examined the process component. The findings showed that the quality of child care processes did not substantially change the reported relationships between early maternal employment and children's outcomes (Brooks-Gunn et al., 2002; 2010).

In summary, because young children of employed mothers are likely to be cared for by someone other than their mother, researchers have argued that it is important to investigate how the quality of child care influences children of mothers who engage in maternal employment in early childhood. As stated by Goldberg et al. (2008) in their meta-analysis of maternal employment, "researchers have been unanimous in their call for attention to the type, quality, and stability of child care, although not all studies have included these parameters" (p. 80). Nevertheless, few studies that have explored the associations between maternal employment in early childhood and children's developmental outcomes have included child care quality, and thus it is an area of study that requires more attention.

Maternal Work Intensity: An Exosystem Factor

It is not only Contextual factors in children's microsystems that can influence the association between maternal employment in early childhood and children's developmental outcomes. Factors more external to children, such as exosystem environments, can also affect this relationship. Exosystems are external environments in which other people are involved such as parents' work environments. Events that occur within these external settings indirectly affect the immediate environments in which children reside (Bronfenbrenner, 1979). Bronfenbrenner (1979) cites parents' place of employment as "…the most powerful influences affecting the development of young children in modern industrialized societies…" (pp. 3-4).

The number of hours worked by mothers, work intensity, is a factor in children's exosystem environment that has been frequently examined in relation to the influence that maternal employment in early childhood has on children's developmental outcomes. In this section, I discuss this body of literature. In general, the findings indicate that greater work intensity in the first year is associated with negative effects on preschooler and school age children's developmental outcomes (Belsky & Eggebeen, 1991; Brooks-Gunn et al., 2002; 2010; Harvey, 1999; Waldfogel et al., 2002). This discovery is further supported by both Goldberg et al.'s (2008) and Lucas-Thompson et al.'s (2010) meta-analyses of studies investigating maternal employment in the early years of children's lives. However, there is one exception to these findings, a study by Han et al. (2001), which found no association between work intensity in early childhood and children's developmental outcomes. There are some key differences among the research studies in terms of measurement of work intensity, which I discuss in greater detail below.

Researchers have taken two approaches to measuring mothers' work intensity during their children's early years: 1) a continuous measure of weekly hours worked; and 2) a categorical measure of full-time and part-time hours worked. There are similar findings with the different methods of measurement. When work intensity is measured continuously, research shows a negative association

between the number of hours worked by mothers when they return to work in children's early years and the cognitive development scores of preschoolers and school-age children (Harvey, 1999). Similarly, when work intensity is measured dichotomously with "full-time" maternal employment defined as more than 30 hours a week, research has shown that beginning full-time work early in children's lives has significant negative effects on children's cognitive outcomes between the ages of three and five years (Brooks-Gunn et al., 2002; 2010). However, working part time, less than 30 hours a week, has been found either not to be associated with children's cognitive outcomes at three and five years (Brooks–Gunn et al., 2002; Brooks-Gunn et al., 2010) or to be related to higher achievement scores (Goldberg et al., 2008).

One of the greatest strengths of two of the studies that examined the effect of working more than 30 hours a week on children's developmental outcomes (Brooks–Gunn et al., 2002; Brooks-Gunn et al., 2010) is that the researchers included measures of child care quality. Brooks-Gunn et al. (2002) hypothesized that mothers who work more hours early in their child's life may place their children in child care that is of lower quality because they pick convenient hours and location over other characteristics of child care arrangements and/or they have less time to search and investigate different child care arrangements because of their long working hours (Brooks-Gunn et al., 2002). Consistent with this hypothesis, the researchers found that children of mothers who worked more than 30 hours a week in the first year of their child's life had lower quality child care settings at three years than children of mothers who worked fewer hours in the first year while controlling for factors likely to affect child care quality (i.e., income). Despite this, the addition of child care quality did not fully explain the relationship between working more than 30 hours a work and lower cognitive scores (Brooks-Gunn et al., 2002; 2010).

In terms of behavioral outcomes, when work intensity is measured continuously, research shows a positive association between the number of hours worked by mothers when they return to work in the

first three years and school age children's behavioral problems (greater behavioral problems) (Harvey, 1999). Work intensity is also positively associated with the likelihood of non-compliant behaviors (i.e., protests going to bed, turns of TV when told, eats foods given) in children between the ages of four and six in comparison to no or more limited (30 hours or less a week) maternal employment during the first three years (Belsky & Eggebeen; 1991). This study (Belsky & Eggebeen, 1991), however, has been criticized by other researchers for reporting on and interpreting the regression effects for models in which the overall R square was not significant (Vandell, 1991). Brooks-Gunn et al. (2010), though, had comparable findings discovering that children of mothers who had full-time employment in the first year (i.e., more than 30 hours per week) had significantly more externalizing behavior problems at ages three, four and half, and in the first grade relative to children of mothers who had part-time employment. Additionally, Lucas-Thompson et al. (2010) discovered from their meta-analysis of studies investigating maternal employment in early childhood that children of mothers who had worked full-time in the first year (i.e., more than 30 years per week) had more externalizing behavior problems relative to children of mothers who did not work.

Although most researchers have used more than 30 hours per week as the distinction between full-time and part-time maternal employment in early childhood, others have argued that the distinction between full-time and part-time employment should be more than 20 hours per week because very young children "are more sensitive to the quantity of time a mother spends with them than are school-aged children" (Han et al., 2001, p. 340). When more than 20 hours a week is used as a cut-off indicating full-time employment, the overall effects on children's development are mixed. Some research has shown significant and negative effects. In comparison to children of mothers who worked 20 hours or less a week, children of mothers who worked more than 20 hours a week demonstrated lower cognitive scores during the preschool and early school age years (Waldfogel et al. 2002). In contrast, Han et al. (2001) did not find that the cognitive and behavioral outcomes of children whose mothers worked more

than 20 hours a week differed from the cognitive and behavior outcomes of children of mothers who worked fewer hours. I am uncertain as to why there are discrepancies in the research evidence. But because there have been fewer studies in which 20 hours per week was used, there is clearly a need for additional research.

Though the majority of Canadian mothers with young children work full time defined as working 30 or more hours per week, 80.5% (Ferrao, 2010), it is warranted to further investigate the association between working more than 20 hours a week and children's developmental outcomes. This is because of the potential policy implications findings could have for Canadian maternity leave policy. In Canada, after the birth of a baby eligible mothers can receive 50 weeks of paid leave. After 50 weeks, Canada does not provide any maternity and parental benefits. If mothers work during the first 15 weeks (maternity leave), the amount earned is deducted dollar for dollar from their benefits. If mothers work during the following 35 weeks (parental leave), mothers can earn 25 percent of their weekly benefit or up to $50 per week. Anything that is earned over this amount is deducted dollar for dollar from their benefit (Service Canada, 2014).

Research findings indicating that working 20 hours or less during the first year is not significantly associated with the developmental outcomes of Canadian children suggests that it might be worthwhile to alter maternity and parental leave policy to enable mothers to more effectively combine employment with maternity and parental benefits within the first year. Such policies could allow mothers, for example, to retain up to 20 hours a week of earned income prior to the clawback of their benefits. This could be especially beneficial for mothers who return to employment early simply because they have insufficient financial resources to remain at home with their children (Gaudet, Cooke, & Jacob, 2011).

On the other hand, research findings indicating that working more than 20 hours after the first year is negatively associated with children's developmental outcomes support an argument for extending maternity and parental benefits beyond first year. The current standards for maternity and parental

benefits in Canada mean that women and their families have little choice with respect to employment after the first year of their child's life. An extension of maternity and parental benefits could at least afford mothers the choice of combining employment with maternity and parental benefits into the second year of their child's life. They could essentially work fewer hours but continue to retain a sufficient income for their families.

In sum, maternal employment in early childhood coupled with working more than 30 hours a week appears to negatively influence preschool and school aged children's cognitive and behavioral outcomes. It is less clear whether maternal employment in early childhood coupled with working more than 20 hours a week is also negatively associated with children's cognitive and behavioral outcomes. As with several of the other topics discussed in this literature review such as child care type, the research findings on the influence of maternal work intensity on child developmental outcomes is unclear and contains inconsistencies.

Person

The fourth dimension of the PPCT Model is Person. Bronfenbrenner and Morris (2006) defined Person within the PPCT Model as the cognitive and socio-emotional characteristics of a person that act as precursors and producers of later development. Three types of person characteristics were identified by Bronfenbrenner and Morris (2006) as the most influential in shaping future development:

1. Demand Characteristics are traits that invite or discourage reactions from the social environment that either interfere or encourage processes of psychological growth. Examples include age, gender, skin color, and physical appearance.
2. Resource characteristics are defined as "…biopsychological liabilities and assets that influence the capacity of the organism to engage effectively in proximal processes" (Bronfenbrenner & Morris, 2006, p. 812). They include mental or emotional resources such

as past experiences, skills, or intelligence as well as conditions that disrupt functioning of the individual such as genetic defects, physical handicaps, and severe or persistent illness.

3. Force characteristics are active behavioral dispositions that can either set proximal processes into action (labeled developmentally generative) or interfere with their occurrence (labeled developmentally disruptive). Developmentally generative dispositions include such factors as curiosity, tendency to engage in activity with others or alone, and responsiveness to initiatives by others. Developmentally disruptive dispositions include such characteristics as impulsiveness, distractibility, apathy, or inattentiveness. Bronfenbrenner and Morris (2006) argued that these characteristics make it difficult to engage in proximal processes that require progressively more complex patterns of reciprocal interaction.

One Person characteristic is included in my research – child's gender. This is the primary person characteristic that has been investigated in the research literature on the influences of maternal employment in early childhood on children's outcomes. The primary rationale given by researchers for this emphasis on child's gender is that previous studies have found that gender influences the nature of the relationship between maternal employment in early childhood and children's outcome *differently* and these different influences are sometimes at odds with each other (Brooks-Gunn et al., 2002; Waldfogel et al., 2002).

Child's Gender

Research findings regarding the moderating influence of child's gender, a demand characteristic of children, on the relationship between maternal employment in early childhood and children's developmental outcomes is nothing but complex. Despite using similar data sets and in some cases, similar methods (Baydar & Brooks-Gunn, 1991; Han et al., 2001; Brooks-Gunn et al., 2002), there are inconsistent findings about whether the influence of maternal employment in early childhood on children's outcomes varies by children's gender.

Some researchers have found no significant differences in the effects of early maternal employment on children's cognitive development (Baydar & Brooks-Gunn, 1991; Han et al., 2001) and behavioral problems (Baydar & Brooks-Gunn, 1991; Brooks-Gunn et al., 2010; Han et al., 2001) by child gender. In contrast, Waldfogel et al. (2002) found female children's cognitive development to be negatively affected by early maternal employment but not male children. Still others have found male children to be more negatively affected by early maternal employment (Brooks-Gunn et al., 2002; Brooks-Gunn et al., 2010; Desai et al., 1989). In a sample drawn from the National Institute of Child Health and Human Development Study, Brooks-Gunn et al. (2002) found that the strongest effect of maternal employment in the first year on three year olds' cognitive development was for male children. In terms of explaining their findings, Brooks-Gunn et al. (2002) suggested that boys are potentially more vulnerable to psychosocial stress in general. Thus, there may be a greater impact of early non-maternal care on male children (Belsky & Rovine, 1988; Bornstein, Hahn, Gist, & Haynes, 2006; NICHD Early Child Care Research Network, 1997) because of the stressful circumstances experienced in these non-maternal care settings such as a lot of children in the centre or too few staff (Bornstein et al., 2006).

Baydar and Brooks-Gunn (1991) argued that one of the reasons for inconsistent findings regarding gender effects is the difference in the samples used for the studies. More specifically, Baydar and Brooks-Gunn (1991) indicated that their findings (i.e., no significant differences of early maternal employment by child's gender) differ from Desai et al. (1989) (i.e., male children more negatively affected by early maternal employment) because Desai et al.'s sample included non-Hispanic white children, Hispanic children, and African American children whereas Baydar and Brooks-Gunn's (1991) study included only non-Hispanic white children. I question this explanation because studies that have drawn on the NLSY and have limited their samples to non-Hispanic white children also have had inconsistent findings. For instance, Baydar and Brooks-Gunn (1991) and Han et al. (2001) found no significant differences by child gender whereas Waldfogel et al. (2002), who also used the NLSCY and

included only non-Hispanic white children, found female children to be more negatively affected by early maternal employment.

This being said, a more recent meta-analysis of research by Goldberg et al. (2008) on the influences of early and concurrent maternal employment on children's outcomes included studies that investigated the moderating effect of child gender. The findings showed that boys' achievement scores were lower than girls' achievement scores among children whose mothers were employed (Goldberg et al., 2008). Goldberg et al.'s (2008) findings appear to coincide with Brooks-Gunn et al.'s (2002; 2010) results that male children are more vulnerable when their mothers engage in early maternal employment. However, an even more recent meta-analysis of maternal employment within the first three years on children's cognitive and behavioral development, found that child's gender did not influence the relationship between maternal employment in the first three years and children's cognitive and behavioral development (Lucas-Thompson et al., 2010). Lucas-Thompson et al.'s (2010) findings seem consistent with Baydar and Brooks-Gunn (1991) and Han et al. (2001), who discovered gender did not influence the relationship between early maternal employment and children's cognitive and/or behavioral development. These contrasting findings from the two meta-analyses make it even more difficult to understand the moderating role of child gender in the relationship between maternal employment in early childhood and children's outcomes and I am inclined to agree with the conclusion drawn by Lucas-Thompson et al. (2010) regarding these contrasting findings:

> …however, because of theoretical and empirical indications that … child sex… [is] consequential in individual studies and in a meta-analysis of concurrent maternal employment and achievement (Goldberg et al., 2008), future work should investigate the possibility suggested by previous work (Desai et al., 1989) that the interactions between these factors may influence the association between early maternal employment and children's development (pp. 936-937).

Research Questions

My research was framed by Bronfenbrenner's PPCT Model – Process, Person, Context, and Time. I drew on this model because of its focus on how the development of children is influenced by the interrelations among the characteristics of the Person, Proximal Processes, Contexts, and Time. Because the PPCT Model does not indicate the specific factors and conditions that interrelate to influence the developing child, I used the established research literature on the influences of maternal employment in early childhood on children's outcomes, as well as gaps in this literature to specify the Contextual factors and Processes investigated in my study.

In this section, I first present the primary research question I asked. After discussing the primary research question, I introduce the sub-questions, which are specific to children's family microsystem Contextual factors and Processes, children's child care microsystem Contextual factors and Processes, and children's exosystem Context (or maternal work intensity). This is followed by the sub-question investigating the influence of a characteristic of the Person, the child's gender, on the relationship between maternal employment in early childhood and children's outcomes.

The primary research question I asked was:

1. *What are the associations between maternal employment in early childhood and the developmental outcomes of infant, toddler, and preschool age children in Canada?*

Based on the research literature and the PPCT Model, I hypothesized that the association between maternal employment in early childhood and children's development would vary by the interrelations among Person characteristics, Processes, Contextual factors, and the child outcomes being investigated.

It may seem out of step that I focused on the associations between maternal employment in the first four years and Canadian children's developmental outcomes given findings by U.S. researchers that maternal employment in the first year is negatively associated with children's developmental outcomes. There was a rationale for this decision. As indicated in the literature review, U.S. women tend to return to work earlier after the birth of an infant than Canadian women (Laughlin, 2011). Because Canadian

women tend to return to employment later in their children's early years than their U.S. counterparts, it seemed more appropriate to use a wider definition of early maternal employment for my research study drawing on a Canadian sample.

In addition to the broad research question, I asked a series of sub-questions that investigated the mediating and moderating role of family microsystem Contextual factors and Processes, child care microsystem Contextual factors and Processes, exosystem Contexts, and Person characteristics in the relationship between maternal employment in early childhood and children's outcomes. According to Baron and Kenny (1986), a mediator is a variable that accounts for the relationship between the predictor and dependent variable. Mediation is best done when there is a strong relationship between the predictor and dependent variable. A moderator, on the other hand, "…is a qualitative … or quantitative … variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron & Kenny, 1986, p. 1174). Moderator variables are generally introduced when there is either an unexpectedly weak or inconsistent relationship between the predictor and dependent variable (i.e., the relationship holds for one subpopulation but not another or holds within one setting but not another setting). I first asked:

a. *What are the mediating effects of family microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's developmental outcomes?*

I investigated the mediating effects of depressive symptoms, family functioning, and parent-child interactions because the research evidence suggests that maternal employment in early childhood is associated with the above mediators (Baker et al., 2008; Brooks-Gunn et al., 2002; Chatterji et al., 2013; Nomaguchi, 2006) and the mediators are associated with children's development outcomes (Beck, 1998, Chao & Willms, 2002; Gagné, 2003; Ginsburg et al, 2004; Grace et al., 2003; Gutman & Feinstein, 2010; Landry et al., 2003; Nomaguchi, 2006; Racine & Boyle, 2002; Rae-Grant et al., 1989; To et al.,

2001; Tramonte et al., 2013). Additionally, I investigated the mediating effects of depressive symptoms, family functioning, and parent-child interactions because these family microsystem Contextual factors and Processes may explain part of the association between maternal employment in early childhood and children's outcomes. However, because very few studies on maternal employment in early childhood have included these factors in their investigations (i.e., Baker et al., 2008; McMunn et al., 2012) and some of the findings regarding the nature of these relationships are inconsistent (i.e., Brooks-Gunn et al., 2002; Nomaguchi, 2006), I did not hypothesize the nature of the mediating role played by depressive symptoms, family functioning, and parent-child interactions.

Given the findings of the research literature discussed, I anticipated that in most cases the relationship between maternal employment in early childhood and children's outcomes would be relatively weak and inconsistent depending on the subpopulation being investigated. Thus, as indicated by Baron and Kenny (1986), it was more appropriate to test moderation and draw on mediation when there was a stronger relationship between the predictor and dependent variable. Therefore, I next asked:

b. What are the moderating effects of family microsystem Contextual factors on the relationship between maternal employment in early childhood and children's developmental outcomes?

The family microsystem Contextual factors included in this sub-question were maternal education, family structure, and family economic status. I hypothesized that maternal employment in early childhood would be associated with more negative developmental outcomes for children whose mothers were more highly educated than children of mothers who had have less education (Gagné, 2003; Han et al., 2001). However, this effect would not be significant when child care quality was held constant. For family structure, I hypothesized that maternal employment in early childhood would be associated with more negative outcomes for the development of children in families in which mothers were married (Brooks et al., 2002; Han et al., 2001; Ruhm, 2004). In terms of family economic status, I

hypothesized that maternal employment in early childhood would be associated with more negative effects for the receptive language of children in poor families relative to children in non-poor families (Han et al., 2001; Harvey, 1999; Waldfogel et al., 2002). I expected that these effects would not be significant when child care quality was controlled for. I did not propose a hypothesis about the moderating effects of family economic status on the relationship between maternal employment in early childhood and other children's outcomes, such as motor and social development, because these relationships have not been previously investigated in literature.

c. *What are the moderating effects of child care microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's developmental outcomes?*

Child care microsystem Contextual factors and Processes included child care type and child care structural and process quality. I did not propose a hypothesis about the influence of child care type on the relationship between maternal employment in early childhood and children's developmental outcomes due to the contradictions in the research literature (Coley & Lombardi, 2012; Gregg et al., 2005; NICHD Early Child Care Research Network, 2001; 2004). However, based on previous research findings on the beneficial effects of child care structural and process quality for children's developmental outcomes (Belsky, 2006; Bradley & Vandell, 2007; Vandell, 2004), I could hypothesize that maternal employment in early childhood would be more beneficial for children attending child care with higher structural and process quality than children attending child care with lower structural and process quality.

d. *What are the moderating effects of child gender (Person characteristic) on the relationship between maternal employment in early childhood and children's developmental outcomes?*

Given inconsistent findings on whether and how child's gender is associated with the relationship between maternal employment in early childhood and children's outcomes (Baydar & Brooks-Gunn,

1991; Brooks-Gunn et al., 2002; 2010; Desai et al., 1989; Han et al., 2001; Lucas-Thompson et al., 2010; Waldfogel et al., 2002), I did not hypothesize the nature of these relationships.

e. *Is working more than 20 hours a week more detrimental to children's developmental outcomes than working 20 hours or less a week?*

I did not propose a hypothesis for this question. This was because of the discrepancy in the findings about whether maternal work intensity of more than 20 hours a week is negatively associated with children's developmental outcomes (Han et al., 2001; Waldfogel et al., 2002).

Chapter 3: Methods

To answer the primary research question, *what are the associations between maternal employment in early childhood and the developmental outcomes of infant, toddler, and preschool age children in Canada,* I investigated the association of mothers' employment in the first four years of their children's lives with the motor and social development of children at zero to four years of age and with the receptive language of children at four and five years of age (with an additional emphasis on maternal employment initiated between zero and two years). To investigate how Person characteristics, Proximal Processes, and Contextual factors are associated with children's outcomes, I examined the mediating and moderating effects of several factors identified in the literature as having important influences on the relationship between maternal employment in early childhood and children's outcomes. In addition, I ran two sub-sample analyses. One sub-sample analysis focused on children of mothers who were employed, examining the association of work intensity with children's outcomes. The other sub-sample analysis pertained to children in two-parent families, to control for the effects of mothers' spouses' work status. Specific details on these analyses are provided later in the chapter.

Data Source

I conducted a secondary analysis on a national data set, the National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is conducted jointly by Statistics Canada and Human Resources and Skills Development Canada. The NLSCY is the first Canadian nation-wide household survey to examine child health, well-being, and development. The survey collects information about a variety of factors that affect the cognitive, emotional, and behavioral development of children and monitors the influence of these factors on children's development over time (Statistics Canada, 1996).

This longitudinal study follows children's development from birth to early adulthood. The first cycle of the NLSCY was undertaken in the winter and spring of 1994/1995. The longitudinal cohort from the first cycle has been monitored every two years. New panels of children aged zero to five, referred to by

Statistics Canada as the Early Childhood Development (ECD) children, have been added each year after the first cycle to monitor early childhood development (Statistics Canada, 2010).

The NLSCY used a cluster sample of households with children between the ages of zero and 11 years drawn from three different sources. For details on the NLSCY sampling approach please see Appendix A. For the first wave of the NLSCY, a total of 15,579 households were asked to participate in the survey. The response rate was 86.3 percent, or 13,439 households, with 22,831 children aged zero to 11 years (Statistics Canada, 1996). Sample weights are used to correct for unequal probabilities of selection, non-response at the person and household levels, and the age and gender distributions within the Canadian population.

For children under the age of 16, most of the information in the survey has been provided by the person most knowledgeable about the child (the PMK). In almost all of the households (over 90%), the PMK is the biological mother (Statistics Canada, 1996). The PMK provides information about herself/himself, the household and the family, and the children. Depending on the child's age, some direct measures of the child's abilities are taken. For example, four and five year olds complete the Peabody Picture Vocabulary Test – Revised (Dunn & Dunn, 1981). School teachers also complete a survey if the child is school-age and if the parent provides permission.

Current Sample

The children in my study were drawn from the Early Childhood Development (ECD) sub-sample in Cycle Six (2004/2005) when they were zero to four years of age (n=5996). It should be noted that a maximum of one child per household was sampled (Statistics Canada, n.d.a). I focused on infants, toddlers, and preschoolers because experiences during this period of development have important consequences for the outcomes of children (Hertzman, 1998; Hertzman, 2000; Shonkoff & Phillps,

2000). My sample was limited to children for whom the PMK was the biological mother of the child.[10] This is because of my interest in the influence of maternal employment in early childhood on children's outcomes. I also limited my sample to children of mothers who had a singleton birth because of the association between multiple births and higher rates of postpartum depression, higher rates of divorce, and lower labour force participation rates of mothers of multiples (Bronars & Grogger, 1994; Choi, Bishai, & Minkovitz, 2009; Jean, Goldman, & Joyce, 2011; Rosenzweig & Wolpin, 1980).

Variables

The primary predictor variable was maternal employment in early childhood. Additionally, the primary predictor variable for the sub-sample of children of employed mothers was work intensity. I considered maternal employment in early childhood as a Time factor in the PPCT Model and work intensity as a factor in children's exosystem environment. The dependent variables included children's motor and social development and receptive language. The mediating variables included Processes and Contextual factors in children's family microsystem environment: depressive symptoms (Contextual factor) and family well-being including family functioning (Contextual factor) and parent-child interactions (Process). The moderating variables included one Person characteristic (child gender) and Processes and Contextual factors in both children's family and child care microsystem environments: maternal education (Contextual factor), family structure (Contextual factor), family economic status (Contextual factor), child care type (Contextual factor), structural child care quality (Contextual factor), and process child care quality (Process).

Table 3.1 details the operationalization of the predictor, dependent, mediating, moderating, and control variables used in my study and the timing of each variable's measurement. Appendix B provides additional details about the creation and coding of eight variables including maternal employment in early childhood, maternal education, family structure, family economic status, child care type, and the

[10] From this point forward, I will use the word mother instead of PMK.

control variables of maternity leave, income, and number of siblings. Some constructs were measured using established instruments. Following Table 3.1, I discuss the details about these instruments as well as how I measured child care quality. In the last section, I describe the control variables included in my study and the rationale for including these variables as control variables.

Table 3.1: Operationalization of Variables and the Timing of Variable Measurement

Variables	Description
Predictor Variables	
Maternal Employment in Early Childhood	Measured in Cycle Six when children were zero to four years of age. Mothers responded to the question: "did you work at a job or a business at any point since this child's birth?" Never worked was coded as one for never worked at a job or business since the child's birth and zero for otherwise (reference category). Worked was coded as one for working continuously or discontinuously post-birth and zero for otherwise.
Work Intensity	Measured in Cycle Six. Mothers reported "how many hours a week did you usually work at that time [when they returned to work after their child's birth]? Twenty hours or less a week was coded as one for children of mothers who worked 20 hours or less a week and zero for otherwise (reference category). Greater than 20 hours a week was coded as one for children of mothers who worked more than 20 hours a week and zero for otherwise. This was the predictor variable only for the sub-sample of children of employed mothers.
Dependent Variables	
Motor and Social Development	Measured in Cycle Six. Forty-eight questions measuring children's motor and social development (the Motor and Social Development (MSD) scale) (coded as continuous). Standardized scores could range from one to 159. Higher scores indicate enhanced motor and social development.
Receptive Language	Measured in Cycle Seven and Cycle Eight when children were four and five years old. An estimate of children's receptive language using the Peabody Picture Vocabulary Test – Revised (PPVT-R) (coded as continuous). Standardized scores could range from 40 to 208. Higher scores indicate enhanced receptive language.
Mediating Variables	
Depressive Symptoms	Measured in Cycle Six. The short version of the Center for Epidemiology Studies Depressive Symptoms Scale (CES-D). The scale assesses the mental health of mothers with a strong emphasis on symptoms of depression (coded as continuous). Scores could range from zero to 36. Higher scores indicate greater symptoms of depression.
Family Functioning	Measured in Cycle Six. The general functioning scale of the McMaster Family Assessment Device (FAD). The goal of the general functioning scale is to provide an overall assessment of family functioning (coded as continuous). Scores could range from zero to 36. Higher scores indicate less effective family functioning.
Parent-child Interactions	Measured in Cycle Six. I summed five questions to create the Positive Interaction Scale. Sample questions include "how often do you and this child laugh together?" or "how often do you do something special with this child that he enjoys" (coded as continuous)? Scores could range from five to 25. Higher scores indicate greater positive interaction.
Moderating Variables	
Maternal Education	Measured in Cycle Six. Maternal education was coded as a series of dichotomous variables: less than high school (the reference category); high school; some post-secondary; college; and post-secondary.
Family Structure	Measured in Cycle Six. Family structure was coded as three dichotomous variables: married (the reference category); common-law; or divorced, widowed, separated, single, and never married.
Family Economic Status	Measured in Cycle Six. Coded as one for not poor (income equal to or greater than the LICO ratio of one) and coded as zero for poor (income less than LICO ratio of one) using the low income cut-off (LICO) for 2004 (based on national family expenditure data from 1992) divided by 1000.
Child Care Type	Measured in Cycle Six, Cycle Seven, and Cycle Eight. Primary type of child care was divided into a series of dichotomous variables: nonrelative care; relative care; day care; and no care (the reference category).
Structural Quality of Child Care	Measured in Cycle Seven and Cycle Eight. Mothers responded to the question: "to your knowledge, does your main care provider have any training in early childhood education or child care, at the college or university level?" Coded as one if mothers reported that the main care provider had training in early childhood education, or child care, at the college or university level and coded as zero if mothers reported that the main care provider did not have training. This question was asked of all children who used child care except children in the care of a brother or sister.

Process Quality of Child Care	Measured in Cycle Seven and Cycle Eight (variable was not available in Cycle Six). Mothers indicated: "in the past month, while in child care, how often did your child participate in learning activities like singing songs, storytelling or learning based play?" Coded as one for every day and zero for several times a week, a few times in the past month, or not in the past month. This question was asked of all children who used child care except children in the care of a brother or sister.
	Measured in Cycle Seven and Cycle Eight (variable was not available in Cycle Six). Mothers indicated: "how satisfied are you with the type of child care you are currently using for him, in terms of his development and what he is learning?" Coded as one for very satisfied and zero for satisfied, dissatisfied, or very dissatisfied. This question was asked of all children who used child care.
Child's Gender	Measured in Cycle Six. Coded as one for females and zero for males.
Control Variables	
Child's Age	Measured in Cycle Six. Age of children as of December 31st, 2004 measured in years (coded as continuous).
Low Birth Weight	Measured in Cycle Six. Mothers reported their child's birth weight as: normal (>=2500 grams), moderately low (1500 to 2499 grams), or very low (<=1500 grams). Coded as one for moderately low or very low birth weight and coded as zero for normal birth weight.
Breast Fed	Measured in Cycle Six. Mothers responded to the question: "did you breast feed him (child) even if only for a short time?" Additionally, children currently being breastfed were also included in this variable with the question asked of mothers: "are you currently breastfeeding this child?" Coded as one for children who were breast fed and children who were currently being breast fed and coded as zero for children who were not breast fed.
Premature Birth	Measured in Cycle Six. Mothers reported if their child was born prematurely (gestational age of 258 days or less) or in the normal late/range (gestational age of 259 days or more). Coded as one for premature birth and coded as zero for normal birth range or late.
Maternal Age	Measured in Cycle Six. Mothers' age of as December 31st, 2004 measured in years (coded as continuous).
Maternity Leave	Measured in Cycle Six. Coded as one for mothers who received paid or unpaid maternity leave and coded as zero for mothers who did not receive a paid or unpaid maternity leave and/or did not work pre-birth and thus did not qualify for a maternity leave.
Hours Worked	Measured in Cycle Six. Mothers responded to a question about "how many hours a week did you usually work at that time [when they returned to work after their child's birth]?" Coded as continuous. Hours worked was only controlled for in models in which the primary predictor variable was maternal employment in early childhood.
Household Income	Measured in Cycle Six. Total household income from all sources in the past 12 months divided by 1000 to ease interpretation (used the natural log).
Number of Siblings	Measured in Cycle Six. The number of younger and older siblings of the selected child living in the household (coded as continuous).
Birth Order	Measured in Cycle Six. The number of older siblings of the selected child living in the household at the time of the interview (coded as continuous).
Spouse's Employment Status	Measured in Cycle Six. Mothers reported the "current work status of the spouse." Coded as one for children of mothers whose spouse was currently working and coded as zero for children of mothers whose spouse was not currently working and either held at least one job in the past year or did not work in the past year. This variable was only included for the sub-sample of children in two-parent families.

Instruments used to Measure the Dependent Variables: Motor and Social Development and Receptive Language

Children's development was measured with two instruments: the Motor and Social Development (MSD) Scale and the Peabody Picture Vocabulary Test – Revised (PPVT-R). Each of these instruments are discussed in the section below.

Motor and Social Development

For children aged zero to 47 months, motor and social development was measured using the Motor and Social Development (MSD) scale. The MSD only assesses motor and social development of children up to the age of four. The scale has been frequently used as an indicator of early childhood development or attainment in other research (Baker & Milligan, 2010; Levebvre & Merrigan, 2002; To et al., 2001; To, Guttmann, Dick, Rosenfield, Parkin et al., 2004). The MSD scale was created by the U.S. National Center for Health Statistics and has been used in the National Longitudinal Survey of Youth in the U.S. (Bureau of Labor Statistics, United States Department of Labor, 2011). This scale comprises 48 questions. Mothers answer 15 child age-appropriate questions out of the 48 items on the scale. Each question asks the mother whether the child can perform a specific task with mothers answering "yes" or "no." The items for the MSD scale were derived from standard measures of children's development including the Bayley Mental Scales, the Gesell Scale, and the Denver Development Screening Test, all of which have high validity and reliability (Poe, 1986). Cronbach's Alpha has not been computed on the MSD. Baker and Mott (1989) argued that "because the successive items in this assessment [MSD] represent increasing levels of difficulty, it was not appropriate to compute a Cronbach's Alpha reliability coefficient for this test" (Baker & Mott, 1989, p. 63). The MSD has been found, however, to correlate moderately well with later assessments of behavioral problems and cognitive development including the Behavior Problems Index scores and sub-scores, the Peabody Individual Achievement Test - Mathematics and Reading Recognition, and Wechsler Memory for Digit Span scores (Baker & Mott, 1989; Mott, Baker, Ball, Keck, & Lenhart, 1995). Please see Appendix C for the individual questions asked at each age.

I used the standardized MSD based on Cycle One standards. The standardized score was created using weighted means and standard deviations calculated on the Cycle One data for each of the age groups. This produced a score with a mean of 100 and standard deviation of 15. One standard deviation below the mean, a cut-off score of 85, has been used in the research literature to define low MSD scores (Willms, 2002). Of note, the MSD scale may "top out" for older children and not provide a sensitive ceiling for these children. Because of this, a control for age was included in my multivariate analyses (Bureau of Labor Statistics, United States Department of Labor, 2013a).

Receptive Language

For children aged four and five years, receptive language was assessed using the Peabody Picture Vocabulary Test – Revised (PPVT-R). The measure has been frequently used as an indicator of cognitive development (Bureau of Labor Statistics, United States Department of Labor, 2013b). The PPVT-R was developed by Lloyd and Leota Dunn at the University of Hawaii for an age range of two to 90 years of age (Dunn & Dunn, 1981). With the PPVT-R, the child is shown a card with four pictures on it. The child chooses the picture representing the word pronounced by the tester. The words pronounced by the tester become increasingly difficult as the test progresses. The PPVT-R provides an estimate of children's receptive language. It is not an intelligence test (Dunn & Dunn, 1981). However, the PPVT-R correlates moderately well with assessments of intelligence, including the Wechsler Intelligence Scale for Children and the Stanford-Binet Intelligence Scale (Dunn & Dunn, 1981). The reliability of the PPVT-R appears to be acceptable. Using a standardized sample, internal consistencies from 0.61 to 0.88 and alternate form reliability from .71 to .91 have been demonstrated (Dunn & Dunn, 1981). I used the standardized PPVT-R scores. This produced a mean of 100 and standard deviation of 15. As with the MSD a cut-off score of 85, one standard deviation below the mean, has been used in the research literature to define low PPVT-R scores (Willms, 2002).

Instruments used to Measure the Mediating Variables: Depressive Symptoms, Family Functioning, and Parent-Child Interaction

The mediating variables were measured with three instruments: the short version of the Center for Epidemiology Studies Depressive Symptoms Scale (CES-D), the General Functioning Scale of the McMaster Family Assessment Device (FAD), and a positive interaction scale developed for the NLSCY. Each of these instruments will be discussed in greater detail below. The items that comprise each instrument are detailed in Appendix D.

Depressive Symptoms

Depressive symptoms were measured using a short version of the CES-D developed by L. S. Radloff of the Epidemiology Center of the National Institute of Mental Health in the U.S. (Radloff, 1977). The original CES-D is used to measure the occurrence and severity of symptoms with a score over sixteen indicating the individual is at risk for depression. Radloff (1977) labeled this cutoff as arbitrary. However, it is widely used as an indicator to determine individuals who are at risk for depression (Gupta & Huston, 2009). The scale has high concurrent validity, strong evidence of construct validity, discriminates well between the general population and psychiatric inpatients, and has high reliability (alpha .85 for the general population and .90 for a clinical sample) (Radloff, 1977).

To ease respondent burden, the CES-D scale used in the NLSCY was reduced to 12 questions by Dr. M. Boyle of the Chedoke-McMaster Hospital, McMaster University for the NLSCY (Statistics Canada, 1996). Scores could range from 0 to 36. The alpha of the shorter scale is consistent with the original twenty item CES-D scale (Poulin, Hand, & Boudreau, 2005). The alpha for mothers with zero to one year olds was .81 and for two to three year olds was .84 in Cycle 6 (Statistics Canada, n.d.a.).

Family Functioning

Family functioning was measured using the General Functioning Scale of the McMaster Family Assessment Device (FAD) (Epstein, Baldwin, & Bishop, 1983), which is based on the McMaster Model of Family Functioning (Epstein, Bishop, & Levin, 1978). The McMaster Model does not include all aspects of

family functioning but rather those features that Epstein and his colleagues (1978), in their clinical work with families, found to be the most important for family members' development/well-being. These features include problem solving, communicating clearly and directly, fulfilling roles, being able to experience a range of emotions, interest and investment in other members of the family for the sake of others, and establishing reasonable standards with opportunities for negotiation and change as needed.

The general functioning scale is a brief version of the full McMaster Family Assessment Device (Epstein et al., 1983). The goal of the general functioning scale is to provide an overall assessment of family functioning. It contains 12 questions reflecting the six dimensions of the McMaster Model. Each question contains four response categories with a total score out of 36. Higher scores indicate less effective family functioning. The scale demonstrates high reliability (internal consistency of .86 and split-half coefficient .83) as well as high validity (Byles, Byrne, Boyle, & Offord, 1988). With the NLSCY, the scale was completed by the mother. The alpha ranged from .91 to .92 (Statistics Canada, n.d.a.).

Parent-Child Interactions

Within the NLSCY, four aspects of parent-child interactions were measured including positive interactions, ineffective parenting, consistent parenting, and rational parenting. Only one aspect of parent-child interactions measured in the NLSCY was included in this study. This was positive interaction (parental warmth). I excluded the three other parenting scales used in the NLSCY because of low reliability scores for hostile/ineffective parenting for zero to one year olds (.37 in Cycle Six) (Statistics Canada, n.d.a). As well, the consistent parenting and rational parenting scales do not assess parent interactions with children aged zero to one. The questions used to assess positive interactions were provided by Dr. M. Boyle at Chedoke-McMaster Hospital based upon the work of Dr. K. Dodge (Dodge,

McClaskey, & Feldman, 1985; Dodge, Pettit, McClaskey, Brown, & Gottman, 1986) and an adaptation of the Strayhorn and Weidman's Parenting Practices Scale (Strayhorn & Weidman, 1988).[11]

Five questions were asked of mothers with zero to four year olds to assess positive interaction. I coded each of these questions as continuous and summed them to create a Positive Interaction Scale (ranging from 5 to 25). Higher scores indicate greater positive interaction. The alpha for the derived scale was .66. See Appendix E for a description of the properties of the derived scale.

Measurement of Child Care Quality

In this section, I describe how I measured child care quality and the rationale for my decisions. The specific questions used to measure child care quality are included in Table 3.1.

Child care quality is typically conceptualized by researchers as including two components – structure and process. Structural child care quality, a Contextual factor within children's child care microsystem, includes child-staff ratio; group size; and providers' training in early childhood development and education (Goelman et al., 2000; Lefebvre & Merrigan, 2002). For this aspect of child care quality, I measured child care staff training. As discussed, staff training is one of most important factors influencing process child care quality (Bigras et al., 2010; Ghazvini & Mullis, 2002; Fukkink & Lont, 2007; Saracho & Spodek, 2007).

Process child care quality includes the appropriateness of the curriculum, materials, and activities; the appropriateness of the interactions between providers and children; activities to which children are exposed; and the environment in which the care is provided (Goelman et al., 2000; Lefebvre & Merrigan, 2002). I view process child care quality as Processes rather than a Contextual factor of the PPCT Model. This is because process child care quality emphasizes interactions between providers and children in

[11] The Strayhorn and Weidman's Parenting Practices Scale measures such factors as involvement, positive interaction, consistency of routines, hostility/physical punishment, and praise/warmth (Strayhorn & Weidman, 1998). The scale has demonstrated good internal consistency (alpha .79), test-retest reliability ranging from .70 to .79, and correlates with other measures of parenting practices including measures involving parenting-child observation (Strayhorn & Weidman, 1998).

terms of teachers' behavior towards children (i.e., warmth) and the provision of a dynamic environment that engages children in using stimulating learning materials (Goelman et al., 2000). The NLSCY does not contain measures that assess these dynamic interactions teachers have with children in terms of their behaviors and engagement. The best measures available in the NLSCY to measure process child care quality are two questions that ask mothers about the frequency (i.e., every day, several times a week, etc.) of children's participation in learning activities at their child care setting and maternal satisfaction (i.e., very satisfied, satisfied, etc.) with the child care setting in terms of children's development and learning. It is important to be clear that these measures are not precise measures of process quality child care because they do not measure the dynamic interactions teachers have with children. However, these measures are the best approximation of process child care quality that are available in the NLSCY and they do provide a maternal report of children's participation in learning activities and maternal satisfaction with the child care setting in terms of development and learning. It should be noted that I had concerns drawing on maternal self-report of child care quality. These concerns are addressed in the discussion chapter.

Control Variables

Selection bias is a particular concern in estimating the associations between maternal employment in early childhood and children's outcomes because women who choose to work earlier in their children's lives "…may be positively or negatively selected in terms of characteristics that matter for their children's development" (Brooks-Gunn et al., 2002, p. 1057). Not controlling for these factors or not holding these factors constant could result in estimates of spurious positive or negative influence of maternal employment in early childhood on children's outcomes. Further, there are several child, maternal, maternal employment, and family characteristics associated with the outcomes of interest, motor and social development and receptive language, that researchers should attempt to control for because of the possible influences these factors have on children's outcomes.

Four categories of variables were controlled for: child characteristics, maternal characteristics, maternal employment characteristics, and family characteristics. The child characteristics included the child's age when data were collected, whether the child was low birth-weight or premature, and whether the child was breast fed. I included one maternal characteristic, mother's age. The maternal employment characteristics included whether the mother took maternity leave and the number of hours the mother worked when she returned to employment after the birth of her child. The family characteristics included the family's income level, the number of siblings, the birth order of the child, and whether the spouse worked. All the control variables were drawn from Cycle 6 when children were zero to four years old. The rationale for why these control variables were included will be discussed in the following sections.

Child Characteristics

Low Birth Weight

Controlling for low birth weight is important because research has found that low birth weight is significantly associated with lower scores on the motor and social development scale, particularly among younger children (To et al., 2001; To et al., 2004). Additionally, low birth weight is associated with lower cognitive scores for school-age children (Aarnoudse-Moens, Weisglas-Kuperus, Goudoever, & Oosterlann, 2009; Bhutta, Cleves, Casey, Cradock, & Anand, 2002).

Breast Fed

Breast feeding was controlled for because of the association between breast feeding and young children's cognitive (Bernard, De Agostini, Forhan, Alfaiate, Bonet et al., 2013; Quigley, Hockley, Carson, Kelly, Renfrew et al., 2012) and motor development outcomes (Bernard et al., 2013; Oddy, Robinson, Kendall, Li, Zubrick et al., 2011). After adjusting for many factors associated with children's cognitive development such as alcohol use and smoking during pregnancy, maternal education, and household income, young children who have been breastfed have been found to have enhanced cognitive (Bernard et al., 2013; Quigley et al., 2012) and motor development (Bernard et al., 2013; Oddy et al., 2011) in

comparison to children who have never been breastfed. Further, evidence from a randomized trial in which participants were randomly assigned to a breastfeeding promotion intervention (promotion of breastfeeding exclusively and increased duration for women who already decided to breastfed) found higher cognitive test scores of children of mothers in the experimental condition in comparison to children of mothers in the control condition (Kramer, Aboud, Mironova, Vanilovich, Platt et al., 2008). The researchers concluded that "our results, based on the largest randomized trial ever conducted in the area of human lactation, strongly suggest that prolonged and exclusive breastfeeding improves cognitive development…" (Kramer et al., 2008, p. 581).

Premature Birth

Controlling for premature birth is also important because research has found a significant association between premature birth and lower scores on the MSD (To et al., 2001). Premature birth is also related to lower cognitive development scores (Aarnoudse-Moens et al., 2009; Bhutta et al, 2002).

Maternal Characteristic

Maternal Age

Maternal age has been found to be associated with children's outcomes. A younger age at birth (below 24 years) has been found to be associated with lower cognitive development scores for preschool aged children (Bushnik & Garner, 2008). Further, toddlers and preschoolers of mothers who are older (35 years or more) have been found to score lower on the motor and social development scale relative to children of younger mothers (Bushnik & Garner, 2008). Additionally, maternal age is also associated with maternal employment in early childhood. For instance, mothers who work full-time in the early years of their children's lives are found to be significantly older than mothers who work part-time in the early years of their children's lives (Nomaguchi, 2006).

Maternal Employment Characteristics

Maternity Leave

I included a control for whether mothers received a maternity leave for two reasons. The first reason relates to the association between maternity leaves and children's outcomes. That is, longer paid maternity leaves have been found to be related to fewer motor and social development difficulties for Canadian children between zero to two years (Sherlock et al., 2008). As well, paid maternity leaves may influence when mothers' return to employment. For instance, Canadian research finds that mothers who return to employment shortly after birth (within a month) are less likely to be eligible for paid maternity leave through the employment insurance program (Marshall, 1999). See Appendix B for how this variable was created and coded.[12]

Number of Hours Worked

In the models in which the primary predictor variable was maternal employment in early childhood and not work intensity (the different models tested will be discussed in the following section), the number of hours mothers worked when they returned to employment was controlled for. This is because of the negative association between the number of hours worked by mothers when they return to work and children's development (Harvey, 1999).

Family Characteristics

Income

Typically in early maternal employment research, in addition to controlling for whether the family lived in poverty, researchers also control for the pre-birth family income (generally measured as a continuous variable) (Brooks-Gunn et al., 2002; Waldfogel et al., 2002). The rationale for controlling for pre-birth income is that income prior to the birth of the infant possibly influences mothers' employment choices after the birth. U.S. research has found that women who engage in early maternal employment have higher family incomes prior to birth than women who do not work in the first year (Waldfogel et

[12] There is no measure in the NLSCY of whether the spouse took parental leave.

al., 2002). Unfortunately, I was unable to control for pre-birth income because the NLSCY does not contain a measure of pre-birth income. However, I did control for total household income during the past 12 months. See Appendix B for how this variable was created and coded.

Number of Siblings

The resource dilution hypothesis suggests that the number of children in the household is important for children's outcomes because more children "dilute" finite parental resources such as time and energy. Thus, parental resources have to be spread out over more children (Blake, 1981). Researchers find an inverse relationship between the number of children in the household and the educational attainment of children even when accounting for major cultural, historical period, and socio-economic variables (Blake, 1981, Downey, 1995; 2001). See Appendix B for how this variable was created and coded.

Birth Order

Birth order was also important to include as a control variable even with taking into consideration the number of siblings in the household because research findings suggest that birth order influences the developmental outcomes of children. For instance, children of higher birth orders (children born later) are found to experience poorer outcomes in terms of academic achievement (Black, Devereux, & Salvanes, 2005; Conley & Glauber, 2006).

Spouse's Employment Status

Research has found that paternal employment in early childhood influences children's outcomes (Harvey, 1999; Parcel & Menaghan, 1994).[13] For instance, fathers working less than full-time hours during their children's first three years is associated with adverse effects on children's behavioral outcomes at four to six years of age (Parcel & Menaghan, 1994). Parcel and Menaghan (1994) speculate that low paternal work hours may result in feelings of frustration for both parents and subsequent

[13] Harvey (1999) and Parcel and Menaghan (1994) did not indicate that their sample was limited to heterosexual couples.

difficulties in setting "…appropriate examples of self-control and to help children establish suitable standards for themselves" (p. 1004). For low-income families, fathers working more hours in the early years is associated with higher cognitive development scores. In contrast, for high-income families, fathers working more hours is associated with lower cognitive development scores (Harvey, 1999). Additionally, fathers' employment status may also influence mothers' length of maternity leave. Recently, Findlay and Kohen (2012) found that when fathers are self-employed, mothers take shorter leaves (40 weeks in comparison to 46 weeks). Because of these research findings, the spouse's employment status was controlled for in the sub-sample of children in two-parent families.

Analysis

In this section, I describe the analyses I employed to answer my research questions. I start with describing my bivariate analyses. I then provide an overview of my primary method of analysis – multiple regression estimated using Ordinary Least Squares. Included in this discussion is a description of the mediating and moderating effects tested. I conclude with a review of missing data and a comparison between complete and non-complete respondents.

Bivariate Analyses

For my bivariate analyses, I used simple linear regression to test the bivariate relationships between maternal employment status (i.e., employed or not employed in the first four years) and the continuous variables. I chose to use linear regression rather than a t-test because it enabled me to not only compare the means of two groups but also to apply the replicated weights provided by Statistics Canada in an attempt to remove the design effect of a non-random sample from the estimated variances. The variables included MSD scores, PPVT-R scores, the depressive symptoms scale, the family functioning scale, the positive interaction scale, the child's age, the mother's age, the number of hours the mother worked when she returned to work, the income level of the family, the number of siblings,

and the birth order of the child. All the variables were drawn from Cycle Six except for PPVT-R scores, which were measured in Cycle Seven and Cycle Eight.

I used Pearson Chi-Square test, applying the replicated weights provided by Statistics Canada, to examine the bivariate relationships between maternal employment status (i.e., employed or not employed in the first four years) and each of the categorical variables. The categorical variables included maternal educational levels, family structure, family economic status, type of child care, the child's gender, whether the child had a low birth weight, whether the child was breast fed, whether the child was born preterm, whether the mother took maternity leave, and the spouse's employment status. All categorical variables were drawn from Cycle Six.

In addition, I provide the proportion of mothers who initiated employment when their children were between zero to five months of age, six months to 11 months, 12 months to 17 months, 18 months to 23 months, 24 months to 35 months, and 36 months to 47 months. These proportions were provided to give more detailed information about when mothers are starting employment after having children.

Further, drawing on Pearson Chi-Square tests applying the replicated weights provided by Statistics Canada, I also examined how child care type and quality varied by mothers' work intensity (i.e., working more than 20 hours a week and working 20 hours or less a week). This additional analysis was undertaken because the type and quality of child care attended may be different depending on mothers work intensity (Brooks-Gunn et al., 2002). The child care type and structural and process child care quality variables were drawn from Cycle Seven and Cycle Eight. Though the structural child care quality measure was available in Cycle Six, I only used the measure in Cycle Seven and Cycle Eight when the process child care quality measures were also available.

Multiple Regression

After my bivariate analyses, I used multiple regression estimated using Ordinary Least Squares (Wooldridge, 2006) to answer the research question: *what are the associations between maternal*

employment in early childhood and the developmental outcomes of infant, toddler, and preschool age children in Canada? All analyses were undertaken using the Statistical Analysis Software (SAS, version 9.3 and 9.4). Statistical significance for all the analyses was set at $p \leq .05$.

Multiple regression estimated using Ordinary Least Squares (OLS) was chosen because the method allows researchers to control for many factors that simultaneously affect the dependent variable (Wooldridge, 2006). As I noted earlier, there are several factors such as maternal age, maternity leave, and household income that differentiate women who work early in their children's lives from women who do not and that can also affect children's development. Controlling for these factors is essential for isolating the unique relationship between maternal employment in early childhood and children's outcomes. Thus, the ability of multiple regression models to hold other factors fixed or constant while investigating the effects of the predictor variable on the dependent variable (Wooldridge, 2006) makes the method particularly suited to my research investigation. Additionally, this method of analysis has been used by several other researchers investigating the associations between maternal employment in early childhood and children's outcomes (Belsky & Eggebeen, 1991; Brooks-Gunn et al., 2002; Clark, Hyde, Essex, & Klein**,** 1997; Han et al., 2001; Smith et al., 2000; Vandell & Ramanan, 1992).

Main Effect Models

To answer my primary research question*,* I used multiple regression estimated with OLS. First, demonstrated by the equation below, I tested the difference in MSD scores between children of mothers who worked within the first four years to children of mothers who never worked in early childhood (β_1) holding all other variables fixed. μ is the error term and β_o is the intercept.

$$\text{MSD scores} = \beta_o + \beta_1(\text{maternal employment in early childhood}) + \beta_2(\text{maternal education}) + \beta_3(\text{family structure}) + \beta_4(\text{family economic status}) + \beta_5(\text{child care type}) + \beta_6(\text{child gender}) + \beta_7(\text{child age}) + \beta_8(\text{low birth weight}) + \beta_9(\text{breast fed}) + \beta_{10}(\text{premature birth}) + \beta_{11}(\text{maternal age}) + \beta_{12}(\text{maternity leave}) + \beta_{13}(\text{hours worked}) + \beta_{45}(\text{income}) + \beta_{15}(\text{number of siblings}) + \beta_{16}(\text{birth order}) + \mu$$

Given that U.S. researchers have found that maternal employment in early childhood is particularly harmful to children's cognitive development (Baum, 2003; Baydar & Brooks-Gunn, 1991; Blau &

Grossberg, 1992; Waldfogel et al., 2002), I thought that it was important to undertake a more precise investigation into the effects of the *timing* of maternal employment on children's receptive language. Thus, I ran an additional model. I tested the difference in PPVT-R scores of children of mothers who worked within the first two years to children of mothers who did not work during this time (β_1) holding all other variables fixed.[14] This group is labeled PPVT-R (0/2) and is indicated in the first equation below. I also tested the difference in PPVT-R (0/4) scores of children of mothers who worked within the first four years (similar to the MSD main effects model described above) to children of mothers who did not work during this time (β_1) holding all other variables fixed. This group is labeled PPVT-R (0/4) and is indicated in the second equation below.

$$\text{PPVT-R (0/2)} = \beta_o + \beta_1(\text{maternal employment in early childhood}) + \beta_2(\text{maternal education}) + \beta_3(\text{family structure}) + \beta_4(\text{family economic status}) + \beta_5(\text{child care type}) + \beta_6(\text{child gender}) + \beta_7(\text{child age}) + \beta_8(\text{low birth weight}) + \beta_9(\text{breast fed}) + \beta_{10}(\text{premature birth}) + \beta_{11}(\text{maternal age}) + \beta_{12}(\text{maternity leave}) + \beta_{13}(\text{hours worked}) + \beta_{14}(\text{income}) + \beta_{15}(\text{number of siblings}) + \beta_{16}(\text{birth order}) + \mu$$

$$\text{PPVT-R (0/4)} = \beta_o + \beta_1(\text{maternal employment in early childhood}) + \beta_2(\text{maternal education}) + \beta_3(\text{family structure}) + \beta_4(\text{family economic status}) + \beta_5(\text{child care type}) + \beta_6(\text{child gender}) + \beta_7(\text{child age}) + \beta_8(\text{low birth weight}) + \beta_9(\text{breast fed}) + \beta_{10}(\text{premature birth}) + \beta_{11}(\text{maternal age}) + \beta_{12}(\text{maternity leave}) + \beta_{13}(\text{hours worked}) + \beta_{14}(\text{income}) + \beta_{15}(\text{number of siblings}) + \beta_{16}(\text{birth order}) + \mu$$

Mediation Analysis

I asked one sub-question that explored the mediating effects that depressive symptoms and family well-being, including family functioning and parent-child interactions, have on the relationship between maternal employment in early childhood and children's developmental outcomes. To answer this research question I drew on the classic Baron and Kenny (1986) approach to testing mediation effects. Four conditions must be met for a variable to be considered a mediator (Baron & Kenny, 1986). First, the predictor variable needs to be significantly associated with the dependent variable. Second, the predictor variable needs to be significantly associated with the mediator. Third, the mediator must be

[14] I did not investigate the effects of first year maternal employment on Canadian children's receptive language, as the U.S. researchers do, because fewer Canadian women initiate employment early within the first year (Baker & Milligan, 2008; Laughlin, 2011).

significantly associated with the dependent variable. And fourth, the association between the predictor variable and the dependent variable needs to be reduced/smaller after controlling for the mediator (Baron and Kenny, 1986).

I began with examining my main effects models. If the predictor variable, maternal employment in early childhood, was not significantly associated with the child outcome, no mediation analysis was undertaken. As stated by Holmbeck (1997) "in other words, if A [predictor] and C [dependent variable] are not significantly associated, there is no significant effect to mediate" (p. 602). If the predictor variable was significantly associated with my dependent variables, I then ran a series of separate regressions with my full set of controls, estimating the effect of my predictor variable, maternal employment in early childhood, on each mediating variable (depressive symptoms, family functioning, and parent-child interactions). If the predictor variable was not significantly associated with a mediating variable, the mediating variable was dropped from mediational analysis. Next, I tested the estimated effect of my mediating variables on the dependent variables. Finally, I tested if the mediator significantly reduced the association between the predictor variable and the dependent variable using the Sobel (1982) test for significance (Preacher & Leonardelli, n.d.). The last two steps were run in the same regression model as recommended by Baron and Kenny (1986).

Moderation Analysis

The key emphasis in my research study is how the relationship between maternal employment in early childhood and children's development varies by factors within children's family and child care microsystem environments (face to face environments) and by a Person characteristic – child's gender. I asked: *what are the moderating effects of family microsystem Contextual factors (maternal education, family structure, and family economic status), child care microsystem Contextual factors and processes (child care type and child care structural and process quality), and child's gender (Person characteristic) on the relationship between maternal employment in early childhood and children's developmental*

outcomes? To examine the influence of these moderating variables, seven different two-way interaction effects were run on the main effects model for the MSD scores, PPVT-R scores (0/4), and PPVT-R (0/2) (maternal employment in early childhood x maternal education; maternal employment in early childhood x family structure; maternal employment in early childhood x family economic status; maternal employment in early childhood x child care type; maternal employment in early childhood x child care structural quality; maternal employment in early childhood x child care process quality; and maternal employment in early childhood x child's gender).

For moderating effects, it is not required that the independent variable be significantly associated with the dependent variable (Baron & Kenny, 1986; Holmbeck, 1997). Thus, interaction effects were tested on all models even when the predictor variable, maternal employment in early childhood, was not significantly associated with the dependent variable, child outcomes.

To reduce the possibility of multicollinearity effects between the moderators and their interaction terms, all continuous variables were centered by subtracting the sample mean from all the individual scores (Holmbeck, 1997). Centering reduces multicollinearity when the variables that are centered are used in the interaction term. If the variables used in the interaction term are not centered, they can be highly correlated with their product (the interaction term). Centering reduces the variable's correlation with the product because if both the centered variables have a mean of zero then the subsequent correlation with the product (interaction term) is zero (Afshartous & Preston, 2011). However, because the variables that were centered were not included in any of the interaction terms, this was not a significant concern for my analyses. However, I still centered the continuous variables because it aided with the interpretation of my parameter estimates.

Sub-sample Analysis

One sub-question I asked concerned the influence of a factor in children's exosystem environment, mothers' work intensity, on children's developmental outcomes. Specifically, I asked: *is working more*

than 20 hours a week more detrimental to children's developmental outcomes than working 20 hours or less a week?

To answer this question, the multiple regression analyses as described above (the main effects, mediation, and moderation analyses) were re-run on a sub-sample of children whose mothers worked post-birth. That is, I compared children of mothers who worked 20 hours or less to children of mothers who worked more than 20 hours a week. Additionally, for this sub-sample analysis with the PPVT-R as the dependent variable, the sample was limited to those children who were attending some form of child care allowing me to investigate the influences of structural and process quality of child care.[15] The reason child care quality was included is that it may explain, at least in part, the negative influence of working full-time on children's receptive language (Brooks-Gunn et al., 2002; 2010).

Further, for this sub-sample of children of mothers who were working, additional regression analyses were undertaken. I compared children of mothers who worked more than 20 hours a week to 20 hours or less per week limiting my sample to children of mothers who initiated employment when their children were zero to five months of age, six months to 11 months, 12 months to 17 months, 18 months to 23 months, 24 months to 35 months, or 36 months to 47 months.[16] These additional analyses on this sub-sample were undertaken to identify if there was a sensitive age for children in which maternal employment at more than 20 hours a week was significantly associated with children's MSD and PPVT-R scores.

One additional sub-sample analysis was completed. The multiple regression analysis as described above (the main effects, mediation, and moderation analyses) was re-run on a sub-sample of children who resided in two-parent families. This sub-sample analysis enabled me to include a control for the

[15] The sub-sample comparing children of mothers who worked more than 20 hours a week to children of mothers who worked 20 hours or less a week with the MSD as the dependent variable was not limited to those children attending child care. This was because the child care process quality measures were not available in Cycle Six and I did not want to reduce the sample size when not required to do so.

[16] These categories of children were created by drawing on a variable that indicates the age of children in months when their mothers return to employment.

spouse's employment status. This is important because paternal employment in early childhood has been found to have influences on children's developmental outcomes (Harvey, 1999; Parcel & Menaghan, 1994) and on the length of leave mothers take after the birth of an infant (Findlay & Kohen, 2012).

In some of the different models run, the moderator and control variables varied. This was because it was either inappropriate to include the variable (i.e., controlling for the number of hours worked when the primary predictor variable was work intensity) or the cell sizes were too small (i.e., below 30) to be able to include the variable. Table 3.2. indicates the moderator and control variables included in each of the models.

Table 3.2: Moderator and Control Variables Included in Each Model

Variable	Main Effects			Sub-sample Work Intensity			Sub-sample Two-Parent Families	
	MSD	PPVT-R (0/2)	PPVT-R (0/4)	MSD	PPVT-R (0/2)	PPVT-R (0/4)	MSD	PPVT-R (0/2)
Moderating Variables								
Maternal Education	X	X	X	X	X	X	X	X
Family Structure	X	X	X	X	X	X	X	X
Family Economic Status	X	X	X	X		X	X	X
Child Care Type	X	X	X	X	X	X	X	X
Structural Child Care Quality					X	X		
Process Child Care Quality					X	X		
Child's Gender	X	X	X	X	X	X	X	X
Control Variables								
Child's Age	X	X	X	X	X	X	X	X
Low Birth Weight	X	X		X			X	
Breast Fed	X	X	X	X			X	X
Premature Birth	X	X		X			X	X
Maternal Age	X	X	X	X	X	X	X	X
Maternity Leave	X	X	X	X	X	X	X	X
Hours Worked	X	X	X				X	X
Household Income	X	X	X	X	X	X	X	X
Number of Siblings	X	X	X	X	X	X	X	X
Birth Order	X	X	X	X	X	X	X	X
Spouse's Employment Status							X	X

Missing Data

All of the above analyses were run on cases in which a complete set of data was available. This resulted in a 25.17 percent reduction in the full sample model with the MSD as the dependent variable; a 26.06 percent reduction in the sample comparing children whose mothers worked more than 20 hours a week to children whose mothers who worked 20 hours or less a week with the MSD as the dependent variable; and a 25.13 percent reduction in the sample of children in two-parent families comparing those who worked post birth to those who did not work post birth with the MSD as the dependent variable. In the PPVT-R (0/2) models, the complete case analysis resulted in 28.91 percent reduction for the full sample; a 29.45 percent reduction in the sample comparing children whose mothers worked more than 20 hours a week to children whose mothers who worked 20 hours or less a week; and a 28.74 percent reduction in the sample of children in two-parent families comparing those who worked post birth to those who did not work post birth. In the PPVT-R (0/4) models, the complete case analysis resulted in 35.99 percent reduction for the full sample; a 40.08 percent reduction in the sample comparing children whose mothers worked more than 20 hours a week to children whose mothers who worked 20 hours or less a week (46.74% of this loss comes from the missing responses to the maternity leave variable); and a 34.55 percent reduction in the sample of children in two-parent families comparing those who worked post birth to those who did not work post birth.

I compared mothers who did not respond to all the questions to mothers who responded to all the questions using t-test for the continuous variables and Pearson chi-square tests for the categorical variables. Few of the variables I tested had consistent direction of effects and consistent significant differences between complete respondents and non-complete respondents across all of the models. The exceptions were maternity leave, family structure, household income, and family economic status. My sample of children whose mothers were complete respondents were more likely to have a mother who received a maternity leave (six out of nine models), were less likely to have a mother who was divorced, separated, widowed, or single (four out six models), and were more likely to live in families with higher

incomes (eight of the nine models) and lower rates of poverty (eight of the nine models) than children whose mothers were not complete respondents. Arguably, these differences between my complete respondents and non-complete respondents could lead to a positive bias in the estimate effects for receptive language and negative bias (fewer difficulties) for motor and social development because children in families who are more advantaged would be expected to have enhanced outcomes (Hill et al., 2005). Please see Appendix F for the findings comparing complete respondents to non-complete respondents.

Weighting

Population weights, normalized weights, and bootstrap weights are all created by Statistics Canada for use with the NLSCY. Due to the NLSCY's complex sampling design (i.e., stratified, multistage design), I used bootstrapping. Bootstrapping is an approach or a method used to approximate a statistic's sampling distribution. Bootstrap samples are drawn repeatedly with replacement from the original data set. Then, drawn from each new sample, the statistic is re-calculated and saved within a dataset. The standard error of the statistic is calculated as the standard deviation of the bootstrap statistics (Lethbridge, 2010). With Statistics Canada survey data, Statistics Canada does the re-sampling. Statistics Canada also provides the bootstrap weights that are used to calculate the standard error (Lethbridge, 2010). I applied bootstrap weights to all analyses as indicated as appropriate by Statistics Canada.

Ethical Considerations

For my research, I accessed the NLSCY microdata. This involved an application process, which included a letter from my academic supervisor confirming that my supervisory committee had reviewed and approved my proposed project and a project proposal indicating rationale, analysis, data requirements, and expected products. The application was reviewed by a Statistics Canada reviewer and approved. I was granted access to the microdata for the purpose of completing my project. The microdata files contain exact responses from the person most knowledgeable (PMK). Thus, the

microdata files include sensitive and possibly identifying characteristics of participants. The microdata files are protected under the Statistics Canada Act and access is restricted to Statistics Canada Employees or those deemed employees of Statistics Canada (Statistics Canada, 2013).

The microdata files are housed in Research Data Centres (RDC). The RDCs provide researchers with access within a secure university setting to microdata files. These centres are staffed by Statistics Canada Employees and operate under the provisions of the Statistics Canada Act (with all the confidentiality rules). The RDCs are only accessible to researchers who have their projects approved and who have been sworn in as a deemed employee under the Statistics Canada Act. This involves a security evaluation, orientation session regarding the policies and procedures at the RDC, signing a contract with Statistics Canada, and taking an Oath to Statistics Canada (Statistics Canada, 2013).

I undertook all my research at the RDC at the University of Alberta in Edmonton. The RDC provided a secure and closed network to undertake my data analysis with sensitive microdata files of the NLSCY. All results I took out of the RDC to complete my dissertation were approved by an Employee of Statistic Canada.

Chapter 4: Results

Results

In this chapter, I discuss the results from my analysis. I begin with the results from my bivariate analysis. Following this, I describe the results from the OLS regression analysis beginning with my main effects models for the overall sample and the two sub-samples: 1) children of mothers who worked post-birth and 2) children in two-parent families. Following this discussion, I present the results from the mediating and moderating analyses.

Bivariate Analysis

The findings from a series of simple regression and chi-square analyses examining the bivariate relationships between maternal employment status in early childhood (i.e., employed or not employed within the first four years) and each of the dependent, independent, mediating, moderating, and control variables are outlined in Tables 4.1 and 4.2. It is important to note that, for confidentiality reasons Statistics Canada does not allow researchers to report the minimum and maximum scores of continuous variables. However, Statistics Canada does allow researchers to report the range of the scores calculated by subtracting the maximum score from the minimum score excluding any zero values.[17] Thus, the ranges indicated in Table 4.1 are the maximum scores on the continuous variables minus the minimum scores excluding any zero values. Figure 4.1 provides the proportion of mothers who initiated employment when their children are between zero to five months of age, six months to 11 months, 12 months to 17 months, 18 months to 23 months, 24 months to 35 months, and 36 months 47 months.

As discussed, because the type and quality of child care received may differ depending on mothers' work intensity (Brooks-Gunn et al., 2002), I also tested whether there were significant differences between working more than 20 hours a week and working 20 hours or less a week and the variables of child care type and child care quality using chi-square analyses. The findings are presented in Table 4.3.

[17] For instance, if the minimum score on the continuous variable was zero, the range reported would be the maximum value minus the next minimum value that was not zero.

This analysis was limited to the two sub-samples of mothers who worked post-birth with the PPVT-R as the dependent variable. This was because the child care quality measures were only available for the cycles in which the PPVT-R was administered. Additionally, child care quality was only tested in models in which the children of mothers were working. This was because these children were assumed to be attending some form of non-maternal care while their mothers were employed and, as such, the quality of this child care attended could be evaluated.

Table 4.1

Regression Results for Continuous Variables Comparing Children and Families whose Mothers Did Not Work within the First Four Years to Children and Families whose Mothers Worked within the First Four Years

Variable	Never Worked	*SE B*	Worked	*SE B*	t value	Range	R^2
	N=2109		N=3849				
Dependent Variables							
MSD Scores	99.71	.47	100.99	.59	2.17*	120	.01
PPVT-R (0/2) Scores	101.24	.89	102.50	1.14	1.10	147	.01
PPVT-R (0/4) Scores	99.21	1.06	102.49	1.16	2.83**	117	.01
Mediating Variables							
Average Depressive Symptoms Scores	4.65	.17	4.02	.21	-2.93**	35	.01
Average Family Functioning Scores	8.60	.15	7.84	.20	-3.78**	35	.01
Average Parent-child Interaction Scores	22.50	.08	22.01	.09	-5.50***	15	.01
Child Characteristics							
Average Age of the Child	1.00	.03	1.78	.04	19.11***	3	.12
Maternal Characteristics							
Average Maternal Age	30.60	.17	31.87	.21	176.18***	34	.01
Maternal Employment Characteristics							
Average Number of Hours Worked by the Mother	---	---	29.33	----	----	89	.68
Family Characteristics							
Average Family Income	52.67	.85	63.96	1.04	10.87***	94	.04
Average Number of Siblings	1.09	.03	0.89	.04	-5.15***	9	.01
Average Birth Order of the Child	1.98	.03	1.73	.04	-6.51***	10	.02

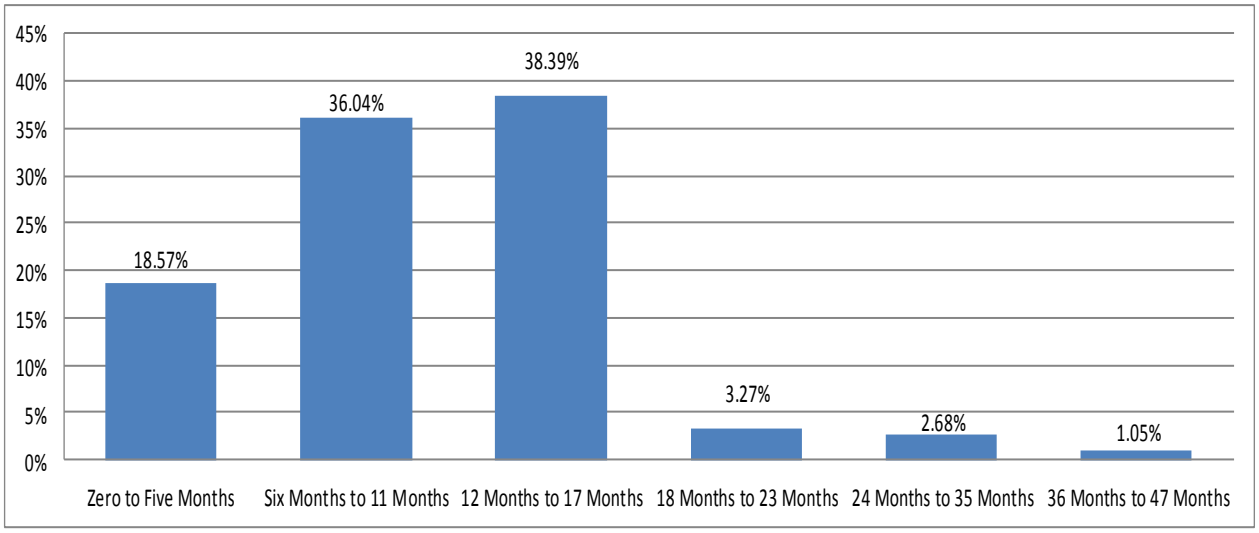
Note. - MSD Scores: Motor and Social Development. PPVT-R: Peabody Picture Vocabulary Test- Revised. Family income is divided by 1000. The dependent and mediating variables had missing data less than 10% due to non-response. Ranges were reported as the maximum scores minus the minimum score excluding zero. All bivariates were bootstrap weighted. Statistics reported as means. *p $\leq$ .05 **p $\leq$ .01 ***p $\leq$ .001.

Table 4.2

Chi-Square Results for Categorical Variables Comparing Children and Families whose Mothers Did Not Work within the First Four Years to Children and Families whose Mothers Worked within the First Four Years

Variable	Never Worked	Worked	Df	X^2
	N=2109	N=3849		
Moderating Variables				
Percentage of Mothers with Less Than High School Education	14.67	7.95	1	65.94***
Percentage of Mothers with High School Education	18.92	14.95	1	15.79**
Percentage of Mothers with Some Post-secondary Education	15.09	13.93	1	1.51
Percentage of Mothers with College Education	25.23	30.61	1	19.56**
Percentage of Mothers with Post-secondary Education	26.10	32.57	1	27.49**
Percentage of Mothers who are Married	67.72	66.67	1	0.71
Percentage of Mothers in Common-law Relationships	18.41	22.97	1	17.78**
Percentage of Mothers who are Divorced, Widowed, Separated, or Single	13.88	10.36	1	16.99**
Percentage of Families who are in Poverty	31.35	14.65	1	237.30***
Percentage of Children Attending No Care	86.85	28.30	1	1876.11***
Percentage of Children Attending Non-relative Care	4.12	27.69	1	512.19***
Percentage of Children Attending Relative Care	3.81	20.05	1	309.67***
Percentage of Children Attending Day Care	5.22	23.95	1	350.70***
Percentage Male (Child)	49.43	52.76	1	6.36
Child Characteristics				
Percentage Born Low Birth Weight	5.05	4.69	1	0.41
Percentage Breast Fed	86.81	87.25	1	0.24
Percentage Born Premature	7.87	10.59	1	12.14*
Maternal Employment Characteristics				
Percent Mothers who Received Maternity Leave	45.96	75.30	1	466.35***
Family Characteristics				
Percentage of Mothers without a Working Spouse	5.61	4.46	1	3.32

Note. - All variables had missing data, except for child gender and marital status, less than 15% due to non-response. All bivariates were bootstrap weighted. Statistics are reported as proportions. *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$.



Note. - Missing data was less than 5% due to non-response. All bivariates were bootstrap weighted. Statistics are reported as proportions.

Figure 4.1. Children's Age in Months (0-47) When Mothers Initiated Employment.

Table 4.3

Chi-Square Results Comparing the Child Care Type and Child Care Quality Experienced by Children of Mothers who Worked 20 Hours or Less a Week and Children of Mothers who Worked More than 20 Hours a Week for Children of Mothers who Worked Within the First Two Years - PPVT-R (0/2) and for Children of Mothers who Worked Within the First Four Years - PPVT-R (0/4)

Variable	20 Hours or Less a Week	Greater than 20 Hours a Week	Df	X^2
PPVT-R (0/2)	N=152	N=454		
Percentage of Child Care Workers with Training	46.11	57.60	1	6.20
Percentage Engaged in Early Learning Activities	71.18	70.28	1	.04
Percentage of Mothers Satisfied with Developmental/Learning Activities	67.17	72.45	1	1.55
Percentage of Children Attending Non-relative Care	33.36	30.80	1	.34
Percentage of Children Attending Relative Care	21.83	20.37	1	.14
Percentage of Children Attending Day Care	44.81	48.83	1	.74
PPVT-R (0/4)	N=215	N=643		
Percentage of Child Care Workers with Training	41.68	55.62	1	11.96**
Percentage Engaged in Early Learning Activities	65.10	70.78	1	2.34
Percentage of Mothers Satisfied with Developmental/Learning Activities	76.35	74.11	1	.41
Percentage of Children Attending Non-relative Care	33.90	27.53	1	3.03
Percentage of Children Attending Relative Care	31.80	22.19	1	7.71*
Percentage of Children Attending Day Care	34.30	50.29	1	15.79**

Note. - PPVT-R: Peabody Picture Vocabulary Test- Revised. Sample is limited to children attending some form of child care in order to compare structural and process quality of child care between the two groups. All bivariates were bootstrap weighted. Statistics are reported as proportions. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

As Tables 4.1 and 4.2 show, the majority of bivariate relationships were statistically significant. The exceptions were the relationships between maternal employment status in the early years and PPVT-R (0/2) scores, child gender, percentage of children born with low birth weight, percentage of children breast fed, the percentage of mothers with some post-secondary education, percentage of mothers who are married, percentage of mothers with a working spouse, percentage of children participating in learning activities every day at their child care setting (for the sub-sample of mothers who worked post-birth), and percentage of mothers very satisfied with the child care setting in terms of children's development and learning (for the sub-sample of mothers who worked post-birth). In short, the results of the bivariate analyses indicate several statistically significant differences between children and families in which mothers were employed and children and families in which mothers were not employed. The nature of these statistically significant differences will be discussed in the paragraphs below.

The findings from the bivariate analyses (Tables 4.1 and 4.2) suggest that children and families of mothers who did not work were at more risk than children and families of mothers who worked within the first four years of their children's lives. In most cases the differences between the two groups of children were not large in terms of practical significance.

Most mothers initiated employment after their children were born (60.21%). Of the mothers who initiated employment in early childhood (Figure 4.1), the majority of mothers started employment when their children were between 12 months of age and 17 months of age (38.39%) followed by six months to 11 months of age (36.04%) and zero and 5 months of age (18.57%). Few mothers initiated employment after 18 months of age, only 7 percent.

Children of mothers who did not work had lower scores on the measures of their developmental outcomes. That being said, the mean MSD and PPVT-R scores were very close to the norm of 100 for both groups of children. Interestingly, a greater proportion of children of mothers who worked were

born prematurely than children of mothers who did not work. However, the difference between the two groups of children was not large, less than 3 percent.

Mothers who did not work were more likely to be younger, divorced, widowed, separated, or single, and have lower levels of education. They were also more likely to have higher depressive symptoms scores and be less likely to receive a maternity leave. The difference in the proportion of mothers receiving a maternity leave between the two groups was quite large. As indicated in Table 4.2, 75.30 percent of women who worked post birth received a maternity leave. Only 45.96 percent of mothers who did not work post birth received a maternity leave.

The mean number of hours worked by mothers when they returned to work after the birth of an infant was 29.33 hours per week. The mean number of hours worked by mothers when they returned to employment had a large range (89). As would be expected, children of mothers who worked were more likely to be in non-parental care arrangements than children of mothers who did not work. The most common form of child care arrangements for children of working mothers was non-relative care (27.69%) followed by day care (23.95%) and relative care (20.05%).

The families of mothers who did not work early in their children's lives had more children in the household, children of higher birth order (the focal child had more older siblings), and somewhat less effective family functioning (higher scores indicate less effective family functioning). It is interesting to note that even though families of mothers who did not work had less effective family functioning, these mothers reported more positive parent-child interaction than did mothers who worked.

A greater percentage of families of mothers who did not work lived in poverty. As well, these families also had lower household incomes relative to the families of mothers who worked earlier in their children's lives. These economic differences were quite large. Almost 17 percent more families of mothers who did not work lived in poverty in comparison to families of mothers who worked.

Additionally, the mean income of families of mothers who did not work was more than $11,000 lower than the mean income of families of mothers who worked.

For the sub-sample of children of mothers who worked within the first two years, there were no significant differences in the type and quality of child care attended by children of mothers who worked more than 20 hours a week and the type and quality of child care attended by children of mothers who worked fewer hours (Table 4.3). However, for the sub-sample of children of mothers who worked within the first four years post-birth, children of mothers who worked more than 20 hours a week were more likely to report having care providers for their children with training in early childhood education.

The bivariate findings indicate that selection bias was a concern for my analyses. The children (and their mothers and families) of mothers who did not work early in their children's lives appear to be more disadvantaged than children (and their mothers and families) of mothers who did work early in their children's lives. These differences could lead to inaccurate estimates of the associations between maternal employment in early childhood and children's developmental outcomes because children who are more advantaged would be anticipated to have better outcomes. In the following sections, I describe the results of multiple regression estimated using OLS for my main effects models controlling/holding constant these important characteristics that differentiate children (and their mothers and families) of mothers who did not work to children (and their mothers and families) of mothers who did work early in their children's lives.

Main Effects Models

Main Effect Models for the Full Samples

To assess the MSD scores of children between the ages of zero to four years as a function of whether mothers worked or did not work within the first four years of their lives, I conducted OLS multiple regression, including the full set of control variables (maternal education, family structure, family economic status, child care type, child's gender, child's age, low birth weight, breastfed, premature birth, maternal age, maternity leave, hours worked, household income, number of siblings, and birth order). Findings are presented in Table 4.4. Maternal employment within the first four years was significantly and positively associated with children's MSD scores (B=2.76, $p \leq .01$) with 3.92 percent of the variance in MSD scores explained by variables in the model. In short, MSD scores were 2.76 points higher for children of mothers who worked in comparison to children of mothers who did not work within the first four years of their children's lives.

Because American researchers have found that maternal employment in early childhood is particularly harmful to children's cognitive development (Baum, 2003; Baydar & Brooks-Gunn, 1991; Blau & Grossberg, 1992; Waldfogel et al., 2002), a more precise investigation into the associations between the *timing* of maternal employment in early childhood and children's receptive language was undertaken. To do this, the PPVT-R scores of four and five year old children of mothers who began working within the first two years of their children's lives were compared to the PPVT-R scores of children of mothers who did not work during this time, including the full set of control variables (maternal education, family structure, family economic status, child care type, child's gender, child's age, low birth weight, breastfed, premature birth, maternal age, maternity leave, hours worked, household income, number of siblings, and birth order). Additionally, the difference between the PPVT-R scores of four and five year old children of mothers who worked within the first four years (similar to the MSD main effects model described above) to the PPVT-R scores of children of mothers who did not work during this time was also tested, including the full set of control variables (maternal education,

family structure, family economic status, child care type, child's gender, child's age, breastfed, maternal age, maternity leave, hours worked, household income, number of siblings, and birth order).

The findings in Table 4.5 show that maternal employment within the first two years was not significantly associated with children's PPVT-R scores at ages four and five. Further, maternal employment within the first four years was also not significantly associated with children's PPVT-R scores at ages four and five. The findings from this model are presented in Table 4.6.

As indicated in the literature review, research findings suggest that there are limited associations between maternal employment initiated within the first or second year and other developmental outcomes such as behavioral difficulties (i.e., Baydar & Brook-Gunn, 1991; Brooks-Gunn et al., 2010; Cooksey et al., 2009). Therefore, there was little research evidence to support testing the associations between maternal employment initiated within the first two years and children's motor and social development. That being said, an additional model was undertaken in which I tested the relationship between maternal employment within the first two years and children's MSD scores. Though the coefficient was positive, the effect of maternal employment on children's MSD scores was not significant and, as such, no additional analyses were run on this model.

Table 4.4

Regression Estimates for the Associations between Maternal Employment within the First Four Years and Children's MSD (Motor and Social Development) Scores for the Full Sample

	MSD Full Sample			
	B	*Beta*	*t value*	*SE B*
Intercept	84.79	0	22.22***	3.82
Maternal Employment in Early Childhood [a]	2.76	.09	2.48**	1.11
High School [b]	-.61	-.02	-.46	1.34
Some Post-secondary [b]	.25	.006	.19	1.28
College [b]	-.40	-.01	-.34	1.18
Post-secondary [b]	-2.23	-.07	-1.70	1.31
Common-law [c]	-1.55	-.04	-2.09*	.74
Divorced, Widowed, Separated, or Single [c]	-.87	-.02	-.55	1.58
Poverty Status	-.69	-.02	-.53	1.30
Non-relative Care [d]	-.39	-.01	-.37	1.03
Relative Care [d]	-.01	-.001	-.01	1.12
Day Care [d]	.45	.01	.38	1.18
Child Gender [e]	4.06	.14	6.35***	.64
Child Age	.17	.01	.48	.34
Birth Weight	3.74	.05	2.35*	1.59
Breastfed	3.14	.07	3.22***	.98
Premature Birth	-.92	-.02	-.83	1.12
Maternal Age	-.13	-.05	-1.91	.07
Maternity Leave	.06	.002	.09	.73
Hours Worked	-.06	-.07	-1.83	.03
Log Income	1.88	.08	1.98*	.95
Number of Siblings	1.18	.08	1.29	.92
Birth Order	-1.86	-.12	-1.99*	.94
Adjusted R^2	.04			
F	4.24***			
N	4490			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$.

Table 4.5

Regression Estimates for the Associations between Maternal Employment within the First Two Years and Children's PPVT-R (Peabody Picture Vocabulary Test-Revised) Scores for the Full Sample

	PPVT-R (0/2) Full Sample			
	B	*Beta*	*t value*	SE *B*
Intercept	77.29	0	12.27***	6.30
Maternal Employment in Early Childhood [a]	2.28	.07	1.48	1.54
High School [b]	-1.71	-.04	-.75	2.27
Some Post-secondary [b]	.74	.02	.32	2.34
College [b]	2.33	.07	1.03	2.26
Post-secondary [b]	4.34	.13	1.99*	2.18
Common-law [c]	-.48	-.01	-0.39	1.22
Divorced, Widowed, Separated, or Single [c]	-4.07	-.08	-1.34	3.03
Poverty Status	-1.48	-.04	-.55	2.69
Non-relative Care [d]	1.31	.03	.80	1.63
Relative Care [d]	1.84	.04	1.33	1.63
Day Care [d]	-.76	-.02	-.59	1.30
Child Gender [e]	1.55	.05	1.44	1.08
Child Age	-.49	-.02	-.46	1.08
Birth Weight	1.58	.02	.39	4.04
Breastfed	2.00	.04	1.37	1.46
Premature Birth	-.85	-.02	-.46	1.86
Maternal Age	-.08	-.03	-.66	.12
Maternity Leave	.48	.01	.36	1.33
Hours Worked	-.09	-.10	-2.17*	.04
Log Income	4.40	.17	2.65**	1.66
Number of Siblings	-1.46	-.09	-.76	1.93
Birth Order	-1.44	-.09	-.74	1.93
Adjust R^2	.11			
F	6.74***			
N	1790			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Table 4.6

Regression Estimates for the Associations between Maternal Employment within the First Four Years and Children's PPVT-R (Peabody Picture Vocabulary Test-Revised) Scores for the Full Sample

	PPVT-R (0/4) Full Sample			
	B	*Beta*	*t value*	SE *B*
Intercept	79.57	0	15.76***	5.05
Maternal Employment in Early Childhood [a]	1.61	.05	1.00	1.61
High School [b]	2.72	.08	1.59	1.71
Some Post-secondary [b]	6.67	.15	3.02**	2.21
College [b]	4.35	.14	2.53*	1.72
Post-secondary [b]	5.19	.17	2.74**	1.89
Common-law [c]	.29	.008	.26	1.13
Divorced, Widowed, Separated, or Single [c]	3.16	.07	1.75	1.80
Poverty Status	-.09	-.002	-.05	1.92
Non-relative and Relative Care [d]	-.47	-.02	-.43	1.08
Day Care [d]	.46	.01	.37	1.25
Child Gender [e]	2.31	.08	2.66**	.87
Child Age	0.01	.001	.01	.88
Breastfed	2.50	.06	2.36*	1.06
Maternal Age	0.21	.08	2.36*	.09
Maternity Leave	1.23	.04	1.07	1.14
Hours Worked	-.07	-.08	-1.83	.04
Log Income	3.13	.13	1.42*	2.21
Number of Siblings	-.16	-.01	-.16	1.00
Birth Order	-2.15	-.15	-2.14*	.96
Adjusted R^2	.09			
F	5.79***			
N	1700			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. to the reduction in sample size, the variables measuring non-relative child care and child care had to be collapsed into one category. Thus, the child care had three categories no child care, day care, and relative/non-relative care. Additionally, the variables measuring child's birth weight and premature birth were not included in the model due too small of cell sizes (below 30). Also, due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Main Effect Models for the Sub-Sample – Work Intensity

To answer the research question: *is working more than 20 hours a week more detrimental to children's developmental outcomes than working 20 hours or less a week,* the outcomes of children of mothers who worked 20 hours or less were compared to children of mothers who worked more than 20 hours. I did not propose a hypothesis for this research question. This was because of the discrepancies in the research findings regarding whether maternal work intensity of more than 20 hours a week is negatively related to children's developmental outcomes (Han et al., 2001; Waldfogel et al., 2002).

To assess the MSD scores of children between the ages of zero to four years as a function of whether mothers worked greater than 20 hours a week or 20 hours or less per week within the first four years of their lives, I conducted OLS multiple regression, including the full set of control variables (maternal education, family structure, family economic status, child care type, child's gender, child's age, low birth weight, breastfed, premature birth, maternal age, maternity leave, household income, number of siblings, and birth order). Findings in Table 4.7 indicate that working greater than 20 hours a week within the first four years was not significantly associated with children's MSD scores.

Next, the PPVT-R scores of four and five year old children of mothers who worked more than 20 hours within the first two years of their children's lives were compared to the PPVT-R scores of children of mothers who worked 20 hours or less during this time, including the full set of control variables (maternal education, family structure, child care type, structural and process child care quality, child's gender, child's age, maternal age, maternity leave, household income, number of siblings, and birth order). Findings in Tables 4.8 show that working greater than 20 hours a week within the first two years of children's lives was significantly associated with children's PPVT-R scores at four and five years (B=-4.92, $p \leq .01$). Relative to children of mothers who worked 20 hours or less a week when they returned to work within the first two years of their children's lives, children of mothers who worked greater than 20 hours a week scored 4.92 points lower on the PPVT-R at ages four and five with 10.48 percent of the

variance in PPVT-R (0/2) scores explained by variables in the model. Additionally, the difference in PPVT-R scores of four and five year old children of mothers who worked more than 20 hours within the first four years of their children's lives was compared to the PPVT-R scores of children of mothers who worked 20 hours or less during this time, including the full set of control variables (maternal education, family structure, family economic status, child care type, structural and process child care quality, child's gender, child's age, maternal age, maternity leave, household income, number of siblings, and birth order). Findings in Table 4.9 indicate that maternal work intensity within the first four years of their children's lives was not significantly associated with children's PPVT-R scores at ages four and five.

Table 4.7

Regression Estimates for the Associations between Maternal Work Intensity within the First Four Years and Children's MSD (Motor and Social Development) Scores

	MSD Work Intensity			
	B	*Beta*	*t value*	SE *B*
Intercept	83.83	0	17.15***	4.89
Work Intensity [a]	-1.46	-.05	-1.89	.78
High School [b]	.85	.02	.44	1.90
Some Post-secondary [b]	.45	.01	.25	1.76
College [b]	.89	.03	.55	1.61
Post-secondary [b]	-.57	-.02	-.32	1.77
Common-law [c]	-.51	-.01	-.59	.86
Divorced, widowed, Separated, or Single [c]	1.67	.03	.92	1.80
Poverty Status	-1.49	-.04	-.87	1.72
Non-relative Care [d]	1.20	.04	1.10	1.09
Relative Care [d]	1.02	.03	.82	1.25
Day Care [d]	2.03	.06	1.67	1.22
Child Gender [e]	5.33	.19	6.90***	.77
Child Age	-.05	-.003	-.12	.43
Birth Weight	-.52	-.008	-.31	1.67
Breastfed	2.85	.07	2.30*	1.24
Premature Birth	-1.62	-.03	-1.22	1.32
Maternal Age	-.20	-.07	-2.19*	.09
Maternity Leave	-.96	-.03	-1.01	.95
Log Income	3.55	.14	2.71**	1.31
Number of Siblings	3.26	.20	3.13**	1.04
Birth Order	-3.19	-.19	-3.01**	1.06
Adjusted R^2	.05			
F	4.00***			
N	2880			

Note. – The reference categories were a) 20 hours or less per week, b) less than high school, c) married, d) no care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$.

Table 4.8

Regression Estimates for the Associations between Maternal Work Intensity within the First Two Years and Children's PPVT-R (Peabody Picture Vocabulary Test-Revised) Scores

	PPVT-R (0/2) Work Intensity			
	B	*Beta*	*t value*	SE *B*
Intercept	85.76	0	11.93***	7.19
Work Intensity [a]	-4.92	-.15	-3.15**	1.56
College [b]	-2.02	-.07	-.97	2.08
Post-secondary [b]	.70	.02	.33	2.16
Divorced, Widowed, Separated, Single, and Common-law [c]	-.54	-.02	-.28	1.92
Non-relative Care [d]	-.98	-.03	-.48	2.02
Day Care [d]	-1.57	-.05	-.72	2.18
Proportion of Child Care Workers with Training	.67	.02	.41	1.63
Proportion of Engaged in Early Learning Activities	-1.80	-.06	-1.13	1.59
Proportion of Mothers Satisfied with Developmental/Learning Activities	2.05	.06	1.25	1.64
Child Gender [e]	-.16	-.01	-.11	1.42
Child Age	-3.12	-.10	-2.07*	1.51
Maternal Age	.23	.08	1.23	.19
Maternity Leave	.62	.02	.32	1.95
Log Income	4.78	.17	2.68**	1.79
Number of Siblings	3.29	.18	.96	3.44
Birth Order	-6.60	-.36	-1.88	3.52
Adjusted R^2	.10			
F	3.62***			
N	610			

Note. – The references categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) relative care, and e) male. Due to the reduction in sample size, the variables measuring less than high school, high school, and some post-secondary education were collapsed into one category. As well, the variables measuring divorced, widowed, separated, or single and common-law were collapsed into one category. Additionally, child's birth weight, premature birth, being breast fed, and poverty status could not be included in the analysis due to small cell sizes. Also, due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Table 4.9

Regression Estimates for the Associations between Maternal Work Intensity within the First Four Years and Children's PPVT-R (Peabody Picture Vocabulary Test-Revised) Scores

	PPVT-R (0/4) Work Intensity			
	B	*Beta*	*t value*	SE *B*
Intercept	97.30	0	15.76***	6.17
Work Intensity [a]	-.77	-.02	-.58	1.32
College [b]	3.13	.11	2.12*	1.48
Post-secondary [b]	4.30	.15	2.49*	1.73
Divorced, Widowed, Separated, Single, and Common-law [c]	1.17	.04	.83	1.40
Poverty Status	.59	.01	.21	2.82
Day Care [d]	-.14	-.005	-.09	1.63
Proportion of Child Care Workers with Training	1.31	.05	.82	1.59
Proportion of Engaged in Early Learning Activities	-3.18	-.11	-2.43*	1.31
Proportion of Mothers Satisfied with Developmental/Learning Activities	-.79	-.03	-.54	1.45
Child Gender [e]	1.11	.04	.95	1.17
Child Age	-.27	-.01	-.22	1.19
Maternal Age	.31	.12	2.61**	.12
Maternity Leave	.005	.001	.00	1.41
Log Income	.89	.03	.46	1.93
Number of Siblings	-.69	-.04	-.50	1.37
Birth Order	-1.75	-.10	-1.34	1.30
Adjusted R^2	.06			
F	2.73***			
N	860			

Note. – The references categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) non-relative or relative care, and e) male. Due to the reduction in sample size, the variables measuring less than high school, high school, and some post-secondary education were collapsed into one category. The variables measuring divorced, widowed, separated, or single and common-law were collapsed into one category. As well, the variables measuring non-relative and relative child care were collapsed into one category. Additionally, child's birth weight, premature birth, and being breast fed could not be included in the analysis due to small cell sizes. Also, due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$.

I ran an additional set of regression analyses for this sub-sample of mothers who were working. I ran several different models for each age group. More specifically, I compared the MSD and PPVT-R scores of children of mothers who worked more than 20 hours a week to children of mothers who worked 20 hours or less per week limiting my sample to children of mothers who initiated employment when their children were zero to five months of age, six months to 11 months, 12 months to 17 months, and 18 months to 23 months. I was unable to run models limited to 24 months to less than 36 months and 36 months to less than 48 months because the sample size was too small. None of these models were significant except for maternal employment initiated when children were between 12 and 17 months with the PPVT-R as the dependent variable, including the full set of control variables (controlling for maternal education, family structure, child care type, structural and process child care quality, child's gender, child's age, maternal age, maternity leave, household income, number of siblings). Findings in Tables 4.10 show that working greater than 20 hours a week, when maternal employment was initiated between 12 and 17 months of age, was significantly associated with children's PPVT-R scores at four and five years (B=-7.86, $p \leq .01$). Relative to children of mothers who worked 20 hours or less a week when they returned to work between 12 and l7 months, children of mothers who worked greater than 20 hours a week scored 7.86 points lower on the PPVT-R at ages four and five with 18.97 percent of the variance in PPVT-R (0/2) scores explained by variables in the model.

Table 4.10

Regression Estimates for the Associations between Maternal Work Intensity and Children's PPVT-R (Peabody Picture Vocabulary Test-Revised) Scores Limited to Mothers who Initiated Employment when their Children were 12 to 17 Months Old

	PPVT-R (12 to 17 Months) Work Intensity			
	B	*Beta*	*t value*	SE *B*
Intercept	118.51	0	10.29***	11.51
Work Intensity [a]	-7.86	-.21	-2.89**	2.72
College [b]	4.31	.15	1.28	3.37
Post-secondary [b]	6.59	.24	1.89	3.48
Divorced, Widowed, Separated, Single, and Common-law [c]	-4.48	-.15	-1.64	2.74
Non-relative Care [d]	-2.06	-.07	-.61	3.39
Day Care [d]	-1.80	-.07	-.45	4.05
Proportion of Child Care Workers with Training	.62	.03	.22	2.77
Proportion of Engaged in Early Learning Activities	-2.59	-.09	-.95	2.74
Proportion of Mothers Satisfied with Developmental/Learning Activities	1.86	.06	.64	2.93
Child Gender [e]	-3.11	-.11	-1.24	2.50
Child Age	1.71	.04	.53	3.23
Maternal Age	.59	.19	2.03*	.29
Maternity Leave	3.29	.07	.89	3.67
Log Income	-2.89	-.10	-1.10	2.62
Number of Siblings	-2.93	-.15	-1.84	1.59
Adjusted R^2	.19			
F	2.52***			
N	220			

Note. – The references categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) relative care, and e) male. Due to the reduction in sample size, the variables measuring less than high school, high school, and some post-secondary education were collapsed into one category. As well, the variables measuring divorced, widowed, separated, or single and common-law were collapsed into one category. Additionally, child's birth weight, premature birth, being breast fed, and poverty status could not be included in the analysis due to small cell sizes. Also, because birth order and the number of siblings were highly correlated birth order was removed from the analysis. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Main Effect Models for the Sub-sample - Two-Parent Families

To address the possible influences of the spouses' work status on the relationship between mothers' employment in early childhood and children's developmental outcomes, a sub-sample analysis was undertaken on children in two-parent families controlling for the work status of the spouse. Two of the three main effects models were run on this sub-sample. The main effect model investigating the relationship between maternal employment within the first four years and children's PPVT-R scores was not tested because spousal work status could not be included due to small cell sizes (below 30). Findings from the other two models are shown in Tables 4.11 and 4.12.

For the sub-sample of children in two-parent families, maternal employment within the first four years was not significantly associated with children's MSD scores including my full set of controls (maternal education, family structure, family economic status, child care type, child's gender, child's age, low birth weight, breastfed, premature birth, maternal age, maternity leave, hours worked, household income, number of siblings, birth order, and spousal work status). This finding is different from my main effects model described in Table 4.5 in which children of mothers who worked within the first four years were compared to children of mothers who did not work during this time including one-parent families and not controlling for the work status of the spouse. In the model that included one-parent families and did not control for the work status of the spouse, maternal employment within the first four years was found to be significantly and positively associated with children's MSD scores (B=2.76, $p \leq .01$). The difference in findings shows that reducing my sample by removing one-parent families and/or controlling for the work status of the spouse eliminated the significant and positive effect maternal employment within the first four years had for children's MSD scores. This may indicate that the association between maternal employment in early childhood and children's MSD scores differs by family structure. Specific results about the variation by family structure are presented later in the

chapter where I present the findings about the moderating effect of family structure on the relationship between maternal employment in early childhood and children's developmental outcomes.

For the sub-sample of children in two-parent families, maternal employment within the first two years was not significantly associated with children's PPVT-R scores including my full set of controls (maternal education, family structure, family economic status, child care type, child's gender, child's age, breastfed, premature birth, maternal age, maternity leave, hours worked, household income, number of siblings, birth order, and spousal work status). This finding is similar to my main effects model described in Table 4.6 in which I also discovered that maternal employment in the first two years was not significantly associated with children's PPVT-R scores including children in one-parent families and not controlling for the work status of the spouse. Of note, spousal work status was not significantly associated with children's outcomes in either of the models I ran.

Table 4.11

Regression Estimates for the Associations between Maternal Employment within the First Four Years and Children's MSD (Motor and Social Development) Scores for the Sub-sample of Children in Two-Parent Families

	MSD Two-Parent Families			
	B	*Beta*	*t value*	SE *B*
Intercept	84.63	0	20.94***	4.04
Maternal Employment in Early Childhood [a]	1.52	.05	1.34	1.13
Spouse Work	1.77	.03	1.11	1.59
High School [b]	1.08	.03	.78	1.38
Some Post-secondary [b]	.65	.02	.47	1.39
College [b]	.30	.009	.23	1.30
Post-secondary [b]	-1.25	-.04	-.89	1.40
Common-law [c]	-1.18	-.04	-1.57	.76
Poverty Status	-1.90	-.04	-1.30	1.46
Non-relative Care [d]	.30	.008	.31	.97
Relative Care [d]	.93	.02	.82	1.14
Day Care [d]	.66	.02	.57	1.17
Child Gender [e]	3.94	.14	6.30***	.62
Child Age	.57	.04	1.66	.34
Birth Weight	2.51	.03	1.51	1.66
Breastfed	1.97	.04	2.09*	.94
Premature Birth	-1.60	-.03	-1.45	1.10
Maternal Age	-.11	-.04	-1.56	.07
Maternity Leave	.008	.001	.01	.73
Hours Worked	-.04	-.05	-1.34	.03
Log Income	2.21	.07	2.13*	1.04
Number of Siblings	1.36	.09	1.45	.93
Birth Order	-1.83	-.12	-1.93	.95
Adjusted R^2	.03			
F	3.93***			
N	3970			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Table 4.12

Regression Estimates for the Associations between Maternal Employment within the First Two Years and Children's PPVT-R (Peabody Picture Vocabulary Test-Revised) Scores for the Sub-sample of Children in Two-Parent Families

	PPVT-R (0/2) Two-Parent Families			
	B	*Beta*	*t value*	SE *B*
Intercept	77.16	0	12.55***	6.15
Maternal Employment in Early Childhood [a]	2.88	.10	1.81	1.58
Spouse Work	-3.52	-.05	-1.05	3.36
High School [b]	-2.17	-.05	-.93	2.32
Some Post-secondary [b]	.79	.02	.36	2.22
College [b]	1.52	.05	.68	2.22
Post-secondary [b]	3.33	.11	1.54	2.17
Common-law [c]	-.33	-.01	-.27	1.20
Poverty Status	-1.67	-.03	-.63	2.64
Non-relative Care [d]	2.41	.06	1.50	1.61
Relative Care [d]	1.62	.03	1.00	1.63
Day Care [d]	-.19	-.005	-.15	1.24
Child Gender [e]	2.54	.08	2.44*	1.04
Child Age	-1.17	-.04	-1.13	1.04
Breastfed	3.30	.07	2.28*	1.45
Premature Birth	-1.67	-.03	-1.17	1.43
Maternal Age	-.10	-.03	-.82	.12
Maternity Leave	1.10	.03	.82	1.34
Hours Worked	-.10	-.11	-2.23*	.04
Log Income	5.00	.15	3.08**	1.63
Number of Siblings	-1.35	-.08	-.69	1.94
Birth Order	-1.49	-.09	-.77	1.94
Adjusted R^2	.10			
F	5.32***			
N	1630			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, e) male. Due to the reduction in sample size for the main effects model PPVT-R (0/2), the variable measuring child's birth weight was not included due small of cell sizes (below 30). Also, due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p $\leq$ .05 **p $\leq$ .01 ***p $\leq$ .001.

Mediation Effects

I used the classic Baron and Kenny (1986) mediation approach to answer the research question: w*hat are the mediating effects of family microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's developmental outcomes?* The family microsystem Context factors and Processes included in this sub-question were depressive symptoms (Context) and family-well-being which included family functioning (Context) and parent-child interactions (Processes). I tested the mediating effects of these variables because the research literature suggests they met the conditions of mediation as indicated by Baron and Kenny (1986) (i.e., maternal employment in early childhood was associated with the mediators and the mediators were associated with children's developmental outcomes). I also tested the mediating effects of these variables because they may explain how maternal employment in early childhood influences children's developmental outcomes. However, I did not propose a hypothesis for this question because only a limited number of studies in the maternal employment in early childhood literature have included these factors in their investigations (i.e., Baker et al., 2008; McMunn et al., 2012) and the findings about the nature of these relationships are not consistent (i.e., Brooks-Gunn et al., 2002; Nomaguchi, 2006).

First, I only included models in which the predictor variables of maternal employment in early childhood and work intensity were significantly associated with children's developmental outcomes. Only two models met this condition: the full sample with the MSD as the dependent variable and the sub-sample of children of mothers who worked within the first two years of children's lives with the PPVT-R (0/2) as the dependent variable.

Next, I regressed the mediator variables (depressive symptoms, family functioning, and parent-child interactions) on the predictor variables in separate regression equations with the full set of controls (maternal education, family structure, family economic status, child care type, child's gender, child's age, low birth weight, breastfed, premature birth, maternal age, maternity leave, hours worked,

household income, number of siblings, and birth order for the full sample with MSD as the dependent variable and maternal education, family structure, child care type, structural and process child care quality, child's gender, child's age, maternal age, maternity leave, household income, number of siblings, and birth order for the sub-sample of children of mothers who worked within the first two years of children's lives with the PPVT-R (0/2) as the dependent variable). The predictor variables were found not to be significantly associated with depressive symptoms and family functioning. Thus, depressive symptoms and family functioning were dropped from the mediation analysis. For the sub-sample of children of mothers who worked within the first two years of children's lives, work intensity was also not significantly associated with parent-child interactions. Therefore, this model was dropped from mediation analysis.

However, maternal employment within the first four years was significantly associated with parent-child interactions (B =.61, $p \leq .01$). Parent-child interaction scores were .61 points higher for mothers' of children who worked in comparison to mothers who did not work. It should be noted that this finding differs from the bivariate analyses (Table 4.1) in which mothers who never worked reported more positive parent-child interactions than did mothers who worked within the first four years of their children's lives. The difference in findings could be related to controlling for factors such as family economic status (Smith, Brooks-Gunn, Kohen, & McCarton, 2001), which may influence parent-child interactions within the regression analysis. Please see Appendix G for all of the models in which the mediator variables including depressive symptoms, family functioning, and parent-child interactions were regressed onto the predictor variables.

Next, I ran the mediation model. In this step, I added parent-child interactions to the main effects model (the full sample with the MSD as the dependent variable) to establish if the mediator was significantly associated with the dependent variable and to determine if the mediator reduced the

association between maternal employment in early childhood and children's MSD scores. The results from these analyses are shown in Table 4.13.

As shown in Table 4.13, the mediator, parent-child interactions was significantly associated with MSD scores (*B*=1.05, p≤.0001). Further, adding parent-child interactions to the main effects model reduced the significant association between maternal employment in early childhood and children's MSD scores with 6.18 percent of the variance in MSD scores explained by variables in the model. A Sobel (1982) test for significance, as recommended by Baron and Kenny (1986), was calculated using the publicly available calculator (Preacher & Leonardelli, n.d.). This test indicates whether the reduction in the association between the predictor variable and the dependent variable after the inclusion of a mediator variable is a statistically significant reduction. The results of the Sobel test suggested that the positive association between maternal employment in early childhood and children's MSD scores was in part explained by parent-child interactions (*z=3.27,* p≤.001).

Table 4.13

Main Effects Model for the Associations between Maternal Employment within the First Four Years and Children's (Motor and Social Development) MSD Scores for the Full Sample and the Mediation Effect of Parent-child Interactions on the Relationship between Maternal Employment within the First Four Years and Children's (Motor and Social Development) MSD Scores for the Full Sample

	Main Effects Model				Mediation Model Positive Interaction			
	B	*Beta*	*t value*	SE *B*	*B*	*Beta*	*t value*	SE *B*
Intercept	84.79	0	22.22***	3.82	85.73	0	22.74***	3.77
Maternal Employment in Early Childhood [a]	2.76	.09	2.48**	1.11	2.13	.07	1.95*	1.09
Parent-child Interactions	---	---	---	---	1.05	.16	6.11***	.17
High School [b]	-.61	-.02	-.46	1.34	-.64	-.02	-.50	1.29
Some Post-secondary [b]	.25	.006	.19	1.28	.27	.006	.22	1.24
College [b]	-.40	-.01	-.34	1.18	-.59	-.02	-.51	1.15
Post-secondary [b]	-2.23	-.07	-1.70	1.31	-2.44	-.08	-1.90	1.28
Common-law [c]	-1.55	-.04	-2.09*	.74	-1.62	-.04	-2.22*	.73
Divorced, widowed, Separated, or Single [c]	-.87	-.02	-.55	1.58	-.86	-.02	-.55	1.56
Poverty Status	-.69	-.02	-.53	1.30	-.88	-.02	-.70	1.27
Non-relative Care [d]	-.39	-.01	-.37	1.03	.35	.009	.35	1.02
Relative Care [d]	-.01	-.001	-.01	1.12	.30	.006	.27	1.12
Day Care [d]	.45	.01	.38	1.18	1.35	.03	1.21	1.12
Child Gender [e]	4.06	.14	6.35***	.64	4.24	.14	6.72***	.63
Child Age	.17	.01	.48	.34	.82	.06	2.26*	.36
Birth Weight	3.74	.05	2.35*	1.59	3.43	.05	2.16*	1.59
Breastfed	3.14	.07	3.22***	.98	3.24	.07	3.33***	.97
Premature Birth	-.92	-.02	-.83	1.12	-1.24	-.02	-1.10	1.13
Maternal Age	-.13	-.05	-1.91	.07	-.13	-.05	-1.91	.07
Maternity Leave	.06	.002	.09	.73	-.02	.001	-.03	.72
Hours Worked	-.06	-.07	-1.83	.03	-.04	-.05	-1.29	.03
Log Income	1.88	.08	1.98*	.95	1.77	.07	1.89	.93
Number of Siblings	1.18	.08	1.29	.92	1.13	.08	1.27	.89
Birth Order	-1.86	-.12	-1.99*	.94	-1.56	-.10	-1.70	.92
Adjusted R^2	.04				.06			
F	4.24***				6.19***			
N	4490				4490			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Moderation Effects

In this section, I discuss the results of the moderation effects that I tested. More specifically, I investigated whether the association between maternal employment in early childhood and children's outcomes varied by children's family and child care microsystem Contextual factors and Processes and child's gender (a person characteristic).

Children's Family and Child Care Microsystem Contextual Factors and Processes Moderation Effects

I asked two sub-questions that explored the moderating role of children's family and child care microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's outcomes. More specifically, I asked:

1. *What are the moderating effects of family microsystem Contextual factors on the relationship between maternal employment in early childhood and children's developmental outcomes?*
2. *What are the moderating effects of child care microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's developmental outcomes?*

The family microsystem Contextual factors included maternal education, family structure, and family economic status. I hypothesized that maternal employment in early childhood would be associated with more negative outcomes for children whose mothers are more highly educated and children of mothers who were married than children of mothers who have less education and children in single mother families (Brooks et al., 2002; Gagné, 2003; Han et al., 2001; Ruhm, 2004). For family economic status, I hypothesized that maternal employment in early childhood would have more negative effects for the receptive language of children in poor families relative to children in non-poor families (Han et al., 2001; Harvey, 1999; Waldfogel et al., 2002). I did not propose a hypothesis about the moderating effects of family economic status on the relationship between maternal employment in early childhood and

children's motor and social development because this relationship has not been previously investigated in the maternal employment in early childhood research literature.

The child care microsystem Contextual factors included child care type and child care structural quality. The child care microsystem Process factor included child care process quality. Due to the inconsistencies in the research literature, I did not propose a hypothesis about the influence of child care type on the relationship between maternal employment in early childhood and children's developmental outcomes (Coley & Lombardi, 2012; Gregg et al., 2005; NICHD Early Child Care Research Network, 2001; 2004). I did however hypothesize that maternal employment in early childhood would be more beneficial for children attending child care with higher structural and process quality than children attending child care with lower structural and process quality. This hypothesis is based on research findings indicating the beneficial effects of child care structural and process quality for children's developmental outcomes (Belsky, 2006; Bradley & Vandell; 2007; Vandell, 2004).

To answer these research questions, I tested the interaction effects between the maternal employment in early childhood and the moderator variables on children's MSD and PPVT-R scores for all main effect models including the sub-samples – work intensity and two-parent families. I included the same set of control variables for child, maternal, and family characteristics as I did in the main effects models. Contrary to my expected hypotheses, the results of these separate analyses indicated that the relationship that maternal employment in early childhood had with the child's outcomes did not vary by maternal education, family structure, family economic status, child care type, and structural and process child care quality. That is, the interaction terms were not significant in the models that I ran. Please see Appendices H - L for the models examining the interaction of maternal employment in early childhood and the moderator variables of maternal education, family structure, family economic status, child care type, and structural and process child care quality on children's MSD and PPVT-R scores.

I was curious if the manner in which I created my maternal education variable explained the lack of significant moderating effects. For all models, maternal education was divided into five dichotomous variables: less than high school, high school degree, some post-secondary, college degree, and post-secondary degree.[18] The cell sizes within these models may have not been large enough to provide adequate power for testing interaction effects (Vandell, 1991). I reran the interaction effect on the model in which the interaction effect approached significance (maternal employment within the first two years with the PPVT-R as the dependent variable) dividing education by some-post secondary education or less (including less than high school, high school, and some-post secondary education) and diploma or post-secondary degree (including college degree and post-secondary degree). This interaction effect was also not significant. Appendix M contains the results of this analysis.

Of note, I also argued that the more negative effects of maternal employment in early childhood for the development of children whose mothers were more highly educated relative to children of mothers who have less education would not be significant with the addition of controls for child care quality (Gagné, 2003; Han et al., 2001). Similarly, with family economic status, I argued that the more negative effects of maternal employment in early childhood on poor children's receptive language relative to non-poor children would no longer be significant when child care quality was held constant (Han et al., 2001; Harvey, 1999; Waldfogel et al., 2002). In the models in which child care quality was controlled for, the sub-sample analyses of work intensity with the PPVT-R as the dependent variable, the maternal education and family economic status interaction models were re-run without controls for structural and process child care quality.[19] Very few differences were found between these models. This

[18] Two models had three dichotomous education categories. In the models in which I compared children of mothers who worked greater than 20 hours a week to children of mothers who worked 20 hours or less a week with the PPVT-R as the dependent variable the three education categories were some post-secondary, college degree, and post-secondary degree. No significant interaction effects were found.

[19] For the sub-sample comparing children of mothers who worked greater than 20 hours a week to children of mothers who worked 20 hours or less a week in the first two years of their children's lives, the family economic status/work intensity interaction effect was not run due to cell sizes being to small (below 30).

suggests that structural and process child care quality did not explain why the effects of employment greater than 20 hours a week in early childhood on children's outcomes did not vary by maternal education levels or family economic status. This being said, the lack of a difference between the two models could also be related to the self-report measures used to assess structural and process child care quality. My concerns regarding the measures used to assess child care quality will be addressed in the following chapter. Appendices H and J provide the findings for the models investigating the influence of work intensity and maternal education and work intensity and family economic status on children's PPVT-R scores with and without controls for child care quality.

Gender (Person Characteristic) Moderation Effects

I also asked one additional research question exploring the influence of a Person characteristic, child's gender, on the relationship between maternal employment in early childhood and children's outcomes. Specifically, I asked: *what are the moderating effects of child's gender on the relationship between maternal employment in early childhood and children's developmental outcomes?* Because of inconsistent findings on whether and how child gender influences the relationship between maternal employment early in children's lives and children's development (Baydar & Brooks-Gunn, 1991; Brooks-Gunn et al., 2002; 2010; Desai et al., 1989; Han et al., 2001; Lucas-Thompson et al., 2010; Waldfogel et al., 2002), I did not propose a hypothesis for this question.

To answer the question, I tested the interaction effect between maternal employment in early childhood and child gender on children's MSD and PPVT-R scores for all main effect models including the sub-samples – work intensity and two-parent families. As shown in Table 4.14, there was a significant gender by maternal employment in early childhood interaction term in two models. The first of these models, which included the full sample of children with the MSD as the dependent variable, revealed a significant gender by maternal employment in early childhood interaction (B=3.39, $p \leq .01$) with 4.21 percent of the variance in MSD scores explained by variables in the model. Figure 4.2 shows the nature

of the effect. Maternal employment within the first four years had a stronger positive effect on the MSD scores for female children than it did for male children.

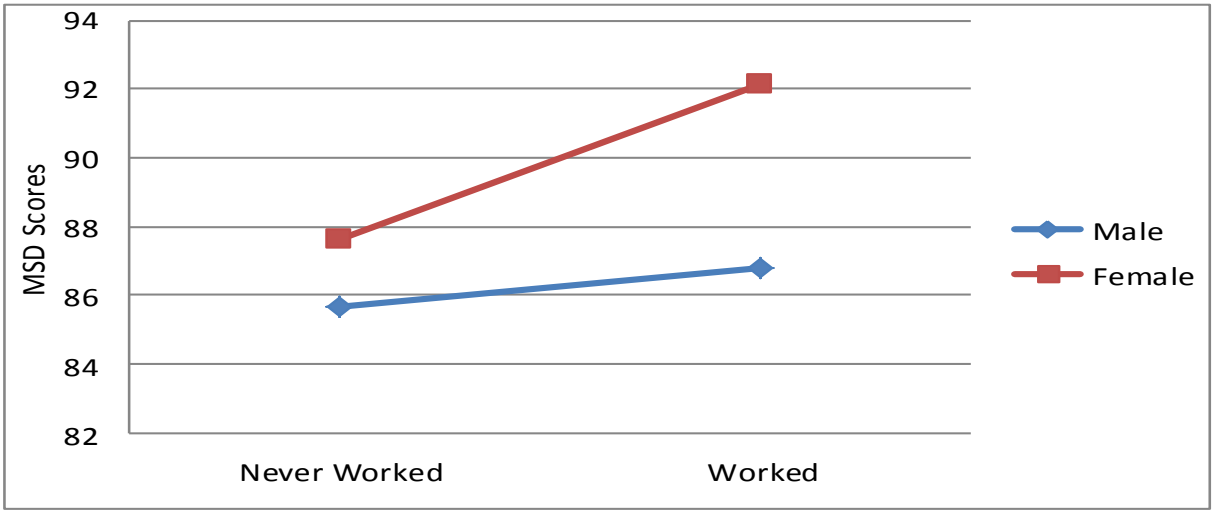


Figure 4.2. Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Children's Gender for the Full Sample.

For the sub-sample of children in two-parent families with the MSD as the dependent variable, there was also a significant gender by maternal employment in early childhood interaction (*B*=3.35, p≤.01) with 3.73 percent of the variance in MSD scores explained by variables in the model. As Figure 4.3 demonstrates, maternal employment within the first four years had a stronger positive effect on the MSD scores for female children than it did for male children. Appendix N provides the results for the other models testing the interaction effect between maternal employment in early childhood and child gender on children's MSD and PPVT-R scores.

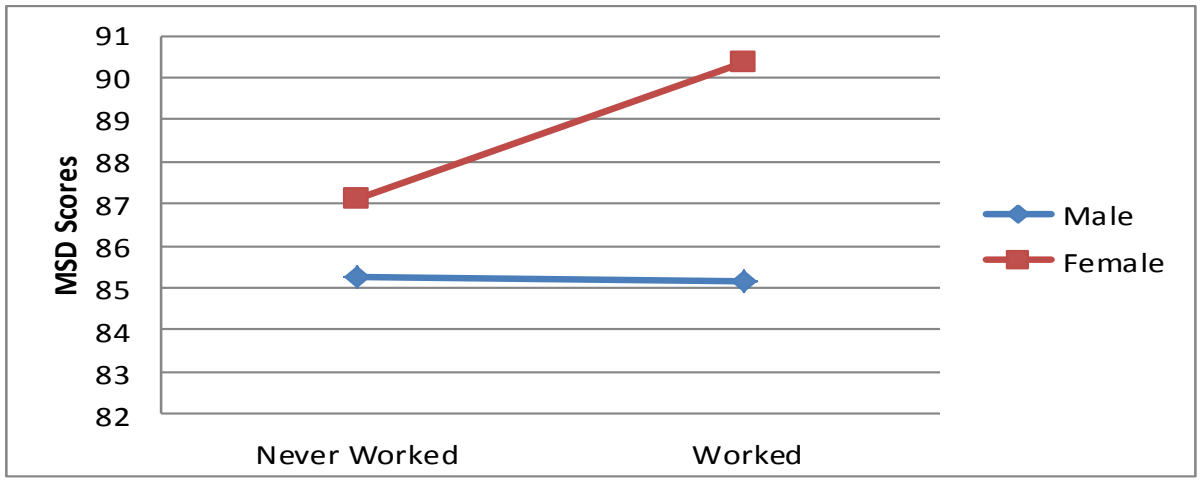


Figure 4.3. Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Children's Gender for the Sub-sample of Children in Two-Parent Families.

Table 4.14

Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Children's Gender for the Full Sample and Sub-sample - Two-Parent Families

	MSD Full Sample				MSD Two-Parent Families			
	B	*Beta*	*t value*	*SE B*	*B*	*Beta*	*t value*	*SE B*
Intercept	85.65	0	22.42***	3.82	85.27	0	21.05***	4.05
Maternal Employment in Early Childhood [a]	1.13	.04	.86	1.31	-.11	.004	-.09	1.27
High School [b]	-.58	-.01	-.43	1.33	1.16	.03	.84	1.37
Some Post-secondary [b]	.39	.01	.31	1.27	.84	.02	.61	1.38
College [b]	-.36	-.01	-.30	1.18	.40	.01	.31	1.29
Post-secondary [b]	-2.10	-.07	-1.62	1.30	-1.09	-.04	-.80	1.39
Common-law [c]	-1.56	-.04	-2.10*	.74	-1.17	-.03	-1.56	.76
Divorced, Widowed, Separated, or Single [c]	-.81	-.02	-.51	1.58	---	---	---	---
Poverty Status	-.67	-.02	-.52	1.30	-1.98	-.05	-1.37	1.44
Non-relative Care [d]	-.43	-.01	-.42	1.04	.28	.008	.29	.97
Relative Care [d]	.04	.001	.04	1.12	.98	.02	.86	1.14
Day Care [d]	.52	.01	.44	1.17	.74	.02	.64	1.16
Child Gender [e]	1.99	.07	1.90	1.05	1.85	.06	1.82	1.02
Mat Employ x Child's Gender	3.39	.10	2.63**	1.28	3.35	.11	2.63**	1.28
Child Age	.17	.01	.50	.35	.57	.04	1.66	.34
Birth Weight	3.85	.06	2.44*	1.58	2.68	.04	1.62	1.65
Breastfed	3.11	.07	3.20**	.97	1.99	.05	2.10*	.94
Premature Birth	-.86	-.02	-.79	1.10	-1.54	-.03	-1.42	1.09
Maternal Age	-.13	-.05	-1.93	.07	-.11	-.04	-1.60	.07
Maternity Leave	.005	.001	.01	.73	-.09	-.003	-.13	.73
Hours Worked	-.06	-.07	-1.88	.03	-.04	-.05	-1.38	.03
Log Income	1.89	.08	1.99	.95*	2.27	.08	2.20*	1.03
Number of Siblings	1.19	.08	1.30	.92	1.36	.09	1.46	.93
Birth Order	-1.86	-.12	-1.99	.94*	-1.82	-.12	-1.93	.94
Spouse Works	---		---	---	1.75	.03	1.12	1.56
Adjusted R^2	.04				.04			
F	4.43***				4.08***			
N	4490				3970			

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients and beta coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Chapter 5: Discussion

Over twenty years ago, as part of an argument that I believe is still relevant today, Greenstein concluded that "asking whether maternal employment is a "good" or "bad" idea is no longer a meaningful exercise; for most mothers today, staying out of the paid labor force is not a viable option" (1993, p. 351). However, he also was convinced that research into the influences of maternal employment in early childhood and substitute child care on children's outcomes should not be abandoned. The research I have undertaken for this thesis leads me to subscribe to the Greenstein proposition that researchers today still need to continue to explore the "… ecology within which maternal employment and substitute child care affect child outcomes" (Greenstein, 1993, p. 351). Drawing on the National Longitudinal Survey of Children and Youth (NLSCY), my aim has been to advance our understanding of how maternal employment in early childhood influences children's outcomes by focusing on the nuances or the "ecology" of this relationship.

In short, similar to some others (i.e., Han et al., 2001; Waldfoegel, 2002), I found that mothers with young children have been able to engage in paid work in a manner that does not seriously impact the developmental outcomes of their children. Given the ongoing debate in the popular media of the consequences of maternal employment in the early years of children's lives on children's development (i.e., Carlson, 2012; Parson, 2011; Slaughter, 2012), these results provide some reassurance to mothers who engage in employment early in their children's lives. This being said, I did find some differences by sub-samples indicating that some children could possibly be more vulnerable to maternal employment in early childhood than other children. In particular, my research suggests that working more than 20 hours a week in the first two years of children's lives and even more so between 12 and 17 months is negatively associated with children's later receptive language.

In the following sections, I discuss the major findings of my study including limitations, how my results differ from other studies in the maternal employment in early childhood literature, and

directions for future research. I conclude with a discussion about enhancements to maternity and parental leave policies that policy developers may want to consider in the future.

Findings

Overview

I draw on Bronfenbrenner's PPCT Model to frame the discussion of my results. More specifically, I first discuss my findings about the influence of the timing of mothers' return to work on children's motor and social development and receptive language. Following this, I examine my findings about the effects of family and child care microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's outcomes. This is followed by a discussion of my research findings about the influences of the exosystem Contextual factor, maternal work intensity. I conclude with a discussion of my findings on the effects of child gender, a Person characteristic, on the relationship between maternal employment in early childhood and children's outcomes.

Time

Within the PPCT Model, time is divided into three components including micro-time, meso-time and macro-time (Bronfenbrenner & Morris, 1998). Macro-time played a significant role in my research and concerns how individuals' development varies according to events/transitions occurring during particular time periods in their lives. More specifically, I investigated how the timing of mothers' return to employment in children's lives affects their developmental outcomes.

For receptive language, I found that maternal employment in the first four years was not significantly associated with children's receptive language at ages four and five as measured by the PPVT-R relative to children of mothers who did not work during this time. This finding is similar to Harvey (1999) who also found no significant relationship between mothers' employment up to three years and children's PPVT-R scores.

However, for children's motor and social development, my findings revealed a small positive relationship between maternal employment in early childhood and infant, toddler, and preschoolers' motor and social development after controlling for child, maternal, and family characteristics. It is important to note that because my research was cross-sectional, inferences about causality, or that maternal employment in early childhood caused positive effects on children's motor and social development, cannot be made. It is possible that children's development influenced mothers' employment (Kuhlthau, Kahn, Hill, Ghanasekaran, & Ettner, 2010; Leiter, Krauss, Anderson, & Wells, 2004). For instance, mothers of children with developmental difficulties may reduce or limit their employment because of their children's greater caregiving needs (Kuhlthau et al., 2010). However, results from a recent longitudinal study (Cooksey et al., 2009) suggest that early maternal employment affects children's outcomes rather than the reverse direction. It is also important to note that because only a small minority of mothers in my sample returned to work in their children's preschool years (7%), the association between maternal employment in early childhood and children's motor and social development seems to be primarily driven by employment initiated within children's first two years.

The early maternal employment literature has emphasized the influence of maternal employment in early childhood on children's cognitive outcomes (with a lesser focus on behavioral outcomes) (Baker et al. 2008). To my knowledge, no study has specifically explored the influence of maternal employment in early childhood on children's motor and social development. The possible exception is Sherlock et al. (2008) who investigated the effect of the length of paid maternity leave on children's motor and social development. These researchers discovered that longer maternity leaves were associated with fewer motor and social developmental difficulties for children between the ages of zero and two years. One of the reasons why Sherlock et al. (2008) may have found a positive effect of longer leaves on children's motor and social developmental outcomes whereas I found that working early in children's lives was positively associated with children's motor and social development is Sherlock et al.'s (2008) use of paid

maternity leave as their primary predictor variable, excluding from their sample children of mothers who did not receive a paid maternity leave. Mothers who do not take paid maternity leaves are more likely to be single parents and have lower levels of education (Findlay & Kohen, 2012; Khanam, Nghiem, & Connelly, 2009) and lower incomes (Findlay & Kohen, 2012) relative to mothers who receive paid maternity leaves. Therefore, Sherlock et al.'s (2008) findings showing the benefits of longer leaves on children's early developmental outcomes could have been positively biased because children whose mothers took maternity leaves are more likely to be living in advantaged circumstances than children whose mothers did not take maternity leaves.

Also, it is important to be aware that combining motor and social development into one dependent variable, as with the motor and social development scale, may have been problematic. Research has found that motor and social development are two distinct domains of development with each domain having their own predictors (Mistry, Biesanz, Taylor, Burchinal, & Cox, 2004). Though my choices of variables was limited by those that were available in the NLSCY, future research may consider exploring the associations that maternal employment in early childhood has with children's motor development and with social development to uncover if these domains of development are differentially associated with maternal employment in early childhood.

While my finding of a positive relationship between maternal employment in early childhood and children's motor and social development is interesting and unexpected, the practical significance of the effect of maternal employment in early childhood was quite weak - equivalent to approximately one quarter of a standard deviation of change in motor and social development scores. This finding provides some support for my argument that maternal employment in early childhood only has minor consequences for children's developmental outcomes. And, as such, it makes more sense for researchers to focus their attention on the factors and conditions that influence the relationship between maternal employment in early childhood and children's outcomes in order for governments to

develop policies that better support children, mothers, and families during this crucial period of development.

Family Microsystem Contextual Factors and Processes

In an effort to advance knowledge about the why/how (the nuances) maternal employment in early childhood influences children's development, I asked: *what are the mediating and moderating effects of family microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's developmental outcomes?* I begin with discussing the findings about the mediating effects of family microsystem Contextual factors and Processes. These included depressive symptoms (Contextual factor), family functioning (Contextual factor), and parent-child interactions (Processes).

Mediation Effects of Family Microsystem Contextual Factors and Processes

For depressive symptoms, I intended to explore the mediating effects of depressive symptoms on the relationship between maternal employment in early childhood and children's developmental outcomes. I found, with the first step of mediational analysis of regressing the mediator on the predictor variable, that maternal employment in early childhood was not associated with depressive symptoms. Therefore, no further mediational analyses were undertaken with depressive symptoms. Within the maternal employment in early childhood literature, few researchers have explored the association between maternal employment in early childhood and the outcomes for mothers themselves. Most research has emphasized the effects of maternal employment in early childhood on the well-being of children (Chatterji et al., 2013). This being said, researchers who have investigated the effects of maternal employment in early childhood on the well-being of mothers have found that maternal employment in early childhood is associated with higher maternal depression scores (greater maternal depression) (Baker et al., 2008; Chatterji et al., 2013). My regression analysis, on the other hand, suggests that maternal employment in early childhood is not associated with depressive symptoms.

This lack of association between maternal employment in early childhood and depressive symptoms could be related to my more advantaged sample of complete respondents. For instance, the families of children whose mothers responded to every question were found to have higher household incomes relative to the families of children whose mothers did not respond to every question. Researchers have found lower household incomes to be associated with higher prevalence of depressive symptoms for mothers who have recently had children (Kahan, Wise, Kennedy, & Kawachi, 2000; Segre, O'Hara, Arndt, & Stuart, 2007). Thus, it may be possible that my sample of children had mothers with lower depressive symptoms scores because they were more advantaged in terms of income. Future research should consider drawing on more advanced techniques for managing missing data, such as multiple imputation rather than complete case analysis to address this bias created by using samples of complete respondents.

Additionally, I may have not found a significant association between maternal employment in early childhood and depressive symptoms because I investigated the association between maternal employment up to four years and depressive symptoms. Other research that explored the relationship between early maternal employment within the first year and depressive symptoms, found a positive association between employment and higher maternal depression scores (greater maternal depression) (Chatterji et al., 2013). This finding aligns with the research evidence that maternal depression is more prevalent in the first year after the birth of a child relative to the toddler, preschooler, and school age years (Dave, Peterson, Sherr, & Nazareth, 2010; Pop, Essed, de Geus, van Son, & Komproe, 1993). Exploring the effects of maternal employment up to four years, as I did, may have essentially washed out any associations between maternal employment in early childhood and depressive symptoms.

Since maternal employment in early childhood may influence family functioning and parent-child interactions (Baker et al., 2008; Brooks-Gunn et al., 2002; Nomaguchi, 2006) and family functioning and parent-child interactions are known to influence children's developmental outcomes (Chao & Willms,

2002; Gagné, 2003; Ginsburg et al, 2004; Gutman & Feinstein, 2010; Landry et al., 2003; Nomaguchi, 2006; Racine & Boyle, 2002; Rae-Grant et al., 1989; To et al., 2001; Tramonte et al., 2013), I investigated the mediating effects of these two aspects of family well-being in the relationship between maternal employment in early childhood and children's developmental outcomes. I did not hypothesize about the role of family functioning and parent-child interactions in the association between maternal employment in early childhood and children's outcomes because few studies in the maternal employment in early childhood literature have examined the mediating effects of family well-being (i.e. Brooks-Gunn et al., 2002; Nomaguchi, 2006).

I found, with the first step of mediational analysis, that maternal employment in early childhood was not associated with family functioning. Therefore, no additional mediational analysis was undertaken with family functioning. This result is consistent with the findings of Baker et al. (2008) and Racine and Boyle (2002) who also discovered maternal employment was not associated with family functioning.

Both Baker et al. (2008) and Racine and Boyle (2002) measured family functioning, as I did, with the general functioning scale of the McMaster Family Assessment Device (FAD). The FAD is a brief self-report measure that provides an overall assessment of family functioning. Given the degree to which family functioning affects children's developmental outcomes (Gagné, 2003; Ginsburg et al, 2004; Racine & Boyle, 2002; Rae-Grant et al., 1989), the role family functioning has in the association between maternal employment in early childhood and children's outcomes warrants further investigation possibly drawing upon other measures of the family functioning.

In terms of parent-child interactions, I discovered that the positive association between maternal employment in early childhood and children's motor and social development scores was explained, in part, by the enhanced parent-child interactions displayed by employed mothers. This finding is interesting given it is intuitive to think that employed mothers would have less overall time available to

interact with their children (Beyer, 1995). In actuality, research findings indicate only a small difference in the time mothers spend with their children between mothers who work outside the home and mothers who do not work outside the home (Baydar, 1999; Bianchi, 2000). This lack of difference in the time spent with children between mothers who work outside the home and mothers who do not may be due to mothers reducing the amount of time they spend on activities such as housework, sleep, free-time activities, and volunteer work so that they can spend more time with their children (Bianchi, 2000). In short, mothers who work attempt to compensate for time apart through increased attention on their young children during non-work hours (i.e., weekends) (Baydar, 1999). Further, the quality of parent-child interactions (i.e., affection towards children, responding positively, reading, playing, and talking with children) does not appear to be negatively impacted by maternal employment (Baydar, 1999; Booth, Clarke-Stewart, Vandell, McCartney, & Owen, 2002; Nock & kingston, 1988). In fact, research has discovered that mothers who work outside the home may spend more time engaged in quality interactions with their young children than mothers who do not work outside the home. For instance, Huston and Aronson (2005) discovered that relative to mothers who did not work outside the home, mothers who worked outside the home spent a significantly higher proportion of their time engaged in social interaction with their infant children such as talking, holding, playing, and other forms of interaction (Huston & Aronson, 2005). Thus, one reason I found that maternal employment in early childhood was positively associated with children's motor and social development is that maternal employment in early childhood may actually enhance, rather than hinder mothers' interactions with their children.

Moderation Effects of Family Microsystem Contextual Factors

I investigated the moderating effects of three family microsystem Contextual factors including maternal education, family structure, and family economic status on the relationship between maternal employment in early childhood and children's developmental outcomes. None of these Contextual

factors had an effect. In the paragraphs below, I discuss how these findings align with the maternal employment in early childhood literature and possible explanations for why I did not find any effects. It should be noted that I do not discuss each moderating Contextual factor separately. This is because the results of my analyses were often quite similar and, thus, the explanations for the findings at times cut cross the different moderating Contextual factors.

Researchers have argued that the negative effect of maternal employment in early childhood on children's outcomes may occur because of less cognitive stimulation in the home (Belsky & Eggebeen, 1991). Children may experience developmental difficulties with maternal employment in early childhood in circumstances of advantage because they lose time with their educated mother. On the other hand, children may experience developmental benefits of maternal employment in early childhood in circumstances of disadvantage because they gain time in potentially enriching experiences in non-maternal care (Belsky & Eggebeen, 1991). There has been some evidence to support this hypothesis (Gagné, 2003; Han et al., 2001). Based on these research findings, I hypothesized that maternal employment in early childhood would have more beneficial effects on children whose mothers are less educated than children of mothers with more education (Gagné, 2003; Han et al., 2001), but that this interaction would not be significant when child care quality was held constant. The results of my analysis showed that the effect of maternal employment in early childhood on children's developmental outcomes did not vary by maternal education. Additionally, in the models in which child care quality (sub-samples examining the association between work intensity and receptive language) was held constant, no significant interaction effects were found prior to and after controlling for child care quality.

U.S. researchers have found that children of single mothers have significantly higher cognitive scores, but not children of married mothers, among samples of children of mothers who worked early in their lives (Goldberg et al., 2008; Harvey, 1999). In contrast, children of married mothers who worked

early in their children's lives were found to have lower cognitive scores relative to children of married mothers who did not work (Brooks-Gunn et al., 2002; Han et al., 2001). In contrast to these findings, the result from my analyses of the interaction between maternal employment in early childhood and family structure suggest that the associations between maternal employment in early childhood and children's outcomes do not vary by family structure in Canada.

Similarly, my findings about the interaction between maternal employment in early childhood and family economic status did not align with previous research showing that children's cognitive development in poor families is more negatively affected by early maternal employment than children in non-poor families (Han et al., 2001; Waldfogel et al., 2002). Han et al. (2001) and Waldfogel et al. (2002) argue that this effect may be because of the lower quality child care attended by poor children. I did not find a significant interaction between family economic status and maternal employment in early childhood suggesting that the motor and social development and receptive language of children whose mothers engage in maternal employment early in their children's lives did not vary by family economic status. Further, in the one model in which I was able to control for child care quality, there were no significant interactions prior to or after controlling for child care quality.

One of the reasons why I may have not discovered a significant interaction between maternal employment in early childhood and maternal education, family structure, and family economic status is because the cell sizes within these models were not big enough to provide sufficient power for testing interactions (Vandell, 1991). With maternal education, as discussed in my results chapter, instead of using five maternal education categories I reran the interaction effect with two maternal education categories. None of the interaction effects were significant.

Besides small cell size, what else might explain why I did not find a significant interaction with family economic status and family structure whereas others have, in particular U.S. studies (Han et al., 2001; Harvey, 1999; Waldfogel et al., 2002)? It may be possible that Canadian children of single mothers

and Canadian children in poverty did not experience the same benefits of the additional income from maternal employment in early childhood as the U.S. samples because fewer children in Canada live in deep poverty than the U.S. (Gornick & Jäntti, 2009). It is well established that the greater the depth of poverty the more children's health and developmental outcomes are negatively affected (Brooks-Gunn, 1995; Brooks-Gunn et al., 1999). One of the reasons why fewer Canadian children reside in deep poverty in comparison to children in the U.S is governmental transfers in Canada such as the Canada Child Tax Benefit and National Child Benefit Supplement, which reduce the number of children living in deep poverty in Canada (UNICEF Innocenti Research Centre, 2012; The National Child Benefit, 2010). Research findings demonstrate that prior to income redistribution through governmental taxes and transfers, Canada and the U.S. have similar rates of young children (less than six years of age) residing in deep poverty (20.7% and 20.4% respectfully). After income redistribution, the rate of young children living in deep poverty in Canada is reduced twice as much as the U.S. (11.4% and 4.9% reduction respectfully) (Gornick & Jäntti, 2009). Ultimately, it is possible that family economic status and family structure affect the relationship between maternal employment in early childhood and children's developmental outcomes. However, because fewer Canadian children experience severe poverty and the associated developmental consequence than their U.S. counterparts, I failed to find these relationships.

Child Care Microsystem Contextual Factors and Processes

I also explored the moderating effects of children's child care microsystem Contextual factors and Processes on the relationship between maternal employment in early childhood and children's developmental outcomes. The Contextual factors included child care type and structural child care quality, and the Processes included process child care quality. I did not propose a hypothesis for the moderating effect of child care type due to the contradictions in the research literature (Coley & Lombardi, 2012; Gregg et al., 2005; NICHD Early Child Care Research Network, 2001; 2004). I examined child care type as a moderator instead of a mediator because testing moderating relationships is

generally done when there is a weak or inconsistent relationship between the independent and dependent variables (Baron & Kenny, 1986). Based on previous research findings, I hypothesized that a weak and an inconsistent relationship between my independent and dependent variables would be the nature of my results. The results of my analysis indicate that the relationship between maternal employment in early childhood and children's developmental outcomes did not vary by child care type. This contradicts the findings of Waldfogel et al. (2002), which showed that early full-time maternal employment has the strongest negative effect on U.S. children's cognitive development for children attending informal care, in particular non-relative care (Waldfogel et al., 2002).

This lack of interaction between child care type and maternal employment in early childhood may be the result of the differences in maternal employment in the early years of children's lives by U.S. and Canadian women. The majority of U.S. mothers (72.9%) return to work within six months after the birth of a child (Laughlin, 2011) whereas my findings, along with Baker and Milligan (2008) indicate that a small *minority* of Canadian mothers (less than 20%) return to work within six months after the birth of a child. Thus, it is likely that Canadian children do not experience the same quantity of non-parental child care in infancy as U.S. children (Bushnik, 2006; Laughlin, 2013) because fewer Canadian women work very early in their children's lives than do U.S. women. This difference in quantity of early child care is important because research finds that experiences in early child care settings (i.e., poorer child care quality) have stronger impacts on children's later cognitive development than experiences in child care setting later in early childhood (NICHD Early Child Care Research Network, 2000). It may be the case that young Canadian children in child care settings actually have more negative outcomes when their mothers work in comparison to children in parental care. However, because a very small percentage of Canadian infants are in child care (Bushnik, 2006; Laughlin, 2013), it becomes more difficult to detect a significant negative interaction effect between child care type and maternal employment in early childhood.

An ongoing limitation of research on the relationship between maternal employment in early childhood and children's outcomes is the inability to examine child care quality due to measures not being available in data sets. In an effort to address this limitation, I tested the moderating effect of structural and process child care quality on the relationship between work intensity and children's developmental outcomes. Again, I tested the moderating role of child care quality because of the inconsistent and weak relationship between work intensity and children's outcomes demonstrated in my findings. Based on previous research findings (Belsky, 2006; Bradley & Vandell; 2007; Vandell, 2004), I hypothesized that greater work intensity would be more beneficial for children in higher structural and process quality child care.[20] In short, I found that the association between work intensity and children's receptive language did not vary by structural and process child care quality.

A significant interaction effect between child care quality and work intensity may not have been found because the questions I used to measure child care quality did not accurately measure the quality of care children attended. The three maternal self-report questions I used to measure child care quality, though the best available in the NLSCY, were not standardized measures of child care quality and, as such, they may not have accurately portrayed the quality of child care children attended. For instance, 42 to 58 percent of employed mothers in the two sub-samples in which child care quality was measured (PPVT-R (0/2) and PPVT-R (0/4) sub-sample of work Intensity) indicated that their child care provider had training in early childhood education or child care at the college or university level. However, a recent Canadian study discovered that only a minority of parents are able to accurately report their children's day care teachers' level of education (Howe, Jacobs, Vukelich, & Recchia, 2013). Parents were found, in particular, to overestimate the percentage of day care teachers that had advanced education (i.e., BA degrees) and underestimate the percentage of teachers with basic qualifications (Howe et al., 2013).

[20] As a reminder, child care quality was only included in the models in which I investigated the influence of maternal work intensity on children's receptive language.

Further, 65 to 71 percent of mothers in the two sub-samples in which child care quality was measured indicated that their child participated in learning activities every day and 67 to 76 percent of mothers indicated that they were very satisfied with the type of child care they are using in terms of development and learning. But, researchers have found that parents rate the quality of their child care significantly higher than trained observers (Cryer & Burchinal, 1997; Cryer, Tietze, & Wessels, 2002). As stated by Cryer and Burchinal (1997) "…parents overestimate the quality of their children's programs and are unaware that they are not obtaining high quality with respect to those aspects of quality that they value most highly" (p. 54).

This may be the case for my sample of mothers. Findings from the largest, most systematic, and most multi-jurisdictional Canadian investigation on child care quality showed that the majority of Canadian child care centres are providing care "that is of minimal to mediocre quality" and have limited materials and activities available to promote children's development (Goelman et al., 2000, p. ix). Quality of care was measured in this study using three widely used standardized tools including the Caregiver Interaction Scale (CIS) (measuring the quality of interactions with children), and the Infant/Toddler Environment Rating Scale (ITERS) and the Early Childhood Environment Rating Scale-Revised (ECERS-R) (measuring characteristics such as learning activities and program structure) (Goelman et al., 2000). Findings from the descriptive statistics in the study by Goelman et al. (2000) showed that most centres in Canada demonstrate "…high levels of warm, attentive and engaged teacher behavior with children and, in most cases, low levels of harshness and detachment" (p. 40). However, half the preschool rooms and almost three-quarters of infant/toddler rooms received a score below five on the ECERS-R indicating that "…children's health and safety was protected, and teachers were warm and supportive, but learning opportunities were minimal" (Goelman et al., 2000, p. 46). A more recent study of quality of child care in Canada (drawing on a sample of day care centres and family- based child care groups from Montreal) found that quality has not improved. A number of the day care centres and

family-based child care groups in the sample were "…rated as offering unsatisfactory process quality. Shortfalls were noted on quality dimensions related to observational and activity planning practices; the educational value placed on playtime activities; and the accessibility of equipment and material, especially in family-based care" (Bigras et al., 2010, p. 143).

In short, given this disconnect between mothers' rating of process child care quality in my study and research evidence on quality of child care in Canada (Bigras et al., 2010; Goelman et al., 2000), it is possible that mothers overestimated the process quality of their child care arrangements. Future research should consider drawing on standardized measures of child care quality in exploring the role of child care quality in the relationship between work intensity and children's developmental outcomes because maternal self report may be an inaccurate indicator of the quality of child care their children receive.

Maternal Work Intensity: An Exosystem Factor

In regards to maternal work intensity, I asked: *is working more than 20 hours a week more detrimental to children's developmental outcomes than working 20 hours or less a week?* As discussed in the literature review, researchers have found that working more than 30 hours a week during a child's first year has negative consequences for children's cognitive outcomes in comparison to working less than 30 hours a week during the first year (Brooks-Gunn et al., 2002; 2010). Other researchers have argued that the division point should be 20 hours per week instead of 30 or more per week because very young children "are more sensitive to the quantity of time a mother spends with them than are school-aged children" (Han et al., 2001, p. 340). Because the research evidence was unclear about whether maternal employment in the first year coupled with working more than 20 hours a week was negatively associated with children's cognitive outcomes (Han et al., 2001; Waldfogel et al. 2002), I compared children of mothers who worked more than 20 hours per week to children of mothers who worked 20

hours or less per week. Another reason for undertaking these analyses relates to the potential implications that findings could have for Canadian maternity and parental leave policy.

Maternal employment greater than 20 hours a week between the ages of *zero to four* was not significantly associated with children's motor and social development or receptive language at four and five. However, working more than 20 hours a week in the first two years, in particular when maternal employment was initiated between 12 months and 17 months, was significantly associated with children's receptive language at four and five years. It appears that the negative association between working more than 20 hours a week on children's receptive language in the first two years was primarily driven by maternal employment that was initiated between 12 to 17 months. Whereas maternal employment initiated at less than 12 months or greater than 17 months was found not to be negatively associated with children's receptive language. These findings are suggestive of a sensitive period in which maternal employment at more than 20 hours a week is negatively associated with children's receptive language and is an area that requires additional investigation.

In terms of the practical significance of my results, the magnitude of the effect of working more than 20 hours a week on children's receptive language in the first two years was relatively weak - approximately one quarter of a standard deviation of change in PPVT-R scores. The negative effect of working greater than 20 hours a week on children's receptive language when maternal employment was initiated between 12 to 17 months was stronger - approximately one half of a standard deviation of change. These findings are consistent with Waldfogel et al.'s (2002). Ideally, I would have liked to compare the magnitude of my findings to the results of Waldfogel et al.'s (2002) analyses. Unfortunately, these results are not available (J. Waldfogel, personal communication, December 19th, 2013). The best comparison at hand is Brooks-Gunn et al.'s (2002) discovery of a negative relationship between maternal employment greater than 30 hours a week and children's cognitive development as measured by the Bracken School Readiness Scale ($B=-6.52$ $p<.01$). This is equivalent to approximately

one quarter of a standard deviation of change. While Brooks-Gunn et al.'s (2002) results are based on slightly different metrics and a somewhat different sample than was used in my study, the direction and magnitude of the relationship aligns with my findings.

An additional point I want to address in terms of the number of hours worked, is child care quality. Brooks-Gunn et al. (2002) argue that one reason why children of mothers who work more hours a week fare worse than children of mothers who work fewer hours is the poorer quality of child care attended by children of mothers working more hours. Brooks-Gunn et al. (2002) hypothesized that children of mothers who work a greater number of hours early in their children's lives pick child care that is of lower quality. This is because they have less time to explore different child care options and they tend to choose convenient locations and hours over other characteristics of child care arrangements. In support of this hypothesis, Brook-Gunn et al. (2002) did discover that children of mothers who worked more than 30 hours a week early in their children's lives have lower quality child care arrangements than children of mothers who worked fewer hours (Brooks-Gunn et al., 2002). Despite this, the addition of child care quality did not entirely explain the association between working more than 30 hours a work and children's lower cognitive scores (Brooks-Gunn et al., 2002).

With my study, in addition to testing the moderating effects of child care quality, I controlled for structural quality (staff training) and process quality (participation in learning activities and parental satisfaction with learning and development in the child care setting) in exploring the effects of work intensity on children's receptive language. I found that even with controls for structural and process child care quality, working more than 20 hours a week in the first two years was significantly associated with children's receptive language in the later preschool years. Thus, similar to Brooks-Gunn et al. (2002), child care quality did not appear to explain the negative association between maternal work intensity in early childhood and children's receptive language. It is important to note this may be due in part to the problems with my measures of child care quality. Additionally, I was only able to measure the

quality of care for the current child care circumstances. This was because the process child care quality questions were not asked in earlier cycles. Child care at younger ages may have had a stronger impact on children's later cognitive development than current child care quality that I measured (NICHD Early Child Care Research Network, 2000).

Person

Person characteristics in the PPCT Model are defined as the cognitive and socio-emotional characteristics of people that influence later development (Bronfenbrenner & Morris, 2006). Three types of person characteristics – demand, resource, and force are identified by Bronfenbrenner and Morris (2006) as the most important for future development. My study included one demand characteristic – the gender of the child. Demand characteristics invite or discourage reactions from the social environment that either interfere or encourage processes of psychological growth. I asked: *what are the moderating effects of child gender (Person characteristic) on the relationship between maternal employment in early childhood and children's developmental outcomes?* I did not propose a hypothesis for this research question because of the inconsistencies in research findings on whether and how child gender influences the relationship between maternal employment in children's early years and children's outcomes (Baydar & Brooks-Gunn, 1991; Brooks-Gunn et al., 2002; 2010; Desai et al., 1989; Han et al., 2001; Lucas-Thompson et al., 2010; Waldfogel et al., 2002).

I discovered that with receptive language as the dependent variable, child gender did not influence the relationship between maternal employment in early childhood and children's developmental outcomes. This finding is consistent with the results by Baydar and Brooks-Gunn (1991) and Han et al. (2001). However, in two of the models I ran, the full sample and the sub-sample of children in two-parent families with the motor and social development as the dependent variable, child gender influenced the relationship between maternal employment in early childhood and children's motor and

social development. The effect was similar for both models demonstrating that maternal employment within the first four years had stronger positive effects for female children than it did for male children.

It seems prudent at this point to discuss the relatively low amount of variance explained by my models in which the predictor variable was significantly associated with the developmental outcomes under investigation. In the case of the association between maternal employment in early childhood and children's motor and social development, more than 90 percent of the variance was unexplained. Like other studies within the maternal employment in early childhood literature (i.e., Cooksey et al., 2009; Han et al., 2001; Waldfogel et al., 2002), the variables examined contributed little to the developmental outcomes examined. This suggests that there are other variables that play an important role for children's development outcomes such as genetics as of the child (i.e. personality traits) that are not included in the NLSCY.

Future research may want to explore the role of genetics, a person characteristic in the PPCT Model (Bronfenbrenner & Morris, 2006), on the relationship between maternal employment in early childhood and children's developmental outcomes. One example of how genetics could possibly play a role in the relationship between maternal employment in early childhood and children's developmental outcomes is related to the differential-susceptibility hypothesis. This hypothesis suggests that children who are more "plastic" or "malleable" are more susceptible to *both* adverse development as a result of negative environments as well as positive development as a result of positive/supportive environments (Pluess & Belsky, 2010). In contrast, less susceptible children are much less affected, if at all, by the same environments as plastic or malleable children (Pluess & Belsky, 2010). For example, children with difficult temperaments have been found to have more externalizing behavioral problems in the school years than other children if they experienced low quality parenting (insensitivity) but had fewer difficulties across the whole sample of children if they experienced high quality parenting (Bradley & Corwyn, 2008). In relation to my research, it may be the case that maternal employment in the early

years of children's lives may have greater benefits or negative consequences for children who are more plastic or malleable and fewer effects, both positive and negative, for children who are less susceptible or malleable. Due to limitations with the data set chosen, I was unable to investigate the role of genetics. Future research should consider investigating possible genetic factors such as personality traits or genetic markers (i.e., monoamino oxidase A (MAOA), dopamine receptor D4 (DRD4)), typically overlooked in family social science research (Samek, Koh, & Rueter, 2013), which may moderate the association between maternal employment in early childhood and children's development.

Another reason why I had a small amount of variance explained by my models was that some of the measures I used may have not captured the essence of the constructs that I examined. My study, as well as the vast majority of research studies on the associations between maternal employment in early childhood and children's outcomes, drew on a large data set - the National Longitudinal Survey of Children and Youth (NLSCY). This data set contains mostly self-report and easy to complete measures. These self-report measures of complex phenomena such as family functioning and child care quality might not do as good of a job at measuring these constructs as other approaches such as direct observation (Rubin & Babbie, 2001). Future research may consider drawing upon measures that do not rely exclusively on parental self-report to obtain a more valid measure of complex constructs such as family functioning and child care quality. More valid measure of these constructs may increase the amount of variance explained by the models.

One additional challenge with my research study was the application of Bronfenbrenner's PPCT Model. I drew on the PPCT Model because it provided a framework to explore how the various Process, Person, Context, and Time factors influenced the developmental outcomes of young children. However, Bronfenbrenner did not demonstrate how to apply his Model in research. As stated by Tudge et al. (2009) "…in none of his [Bronfenbrenner] writings did he provide a clear methodological guide to help in the application of the theory" (p. 207). Therefore, I drew on the extensive literature on the effects of

maternal employment in early childhood on children's outcomes to frame my research study. Also, influenced by the methods used by researchers in this field of study, I used multiple regression to test my hypotheses, entering variables simultaneously. Future research might consider drawing on alternative methods of analysis such as hierarchical regression. Hierarchical regression is method in which researchers successively add predictors to the regression model (Teo, 2013). This method may provide a more systematic approach to pinpoint which Process, Person, Context, and Time factors matter most for children's developmental outcomes, beyond the variance that is explained by the control variables.

It is also important to acknowledge, that due to the number of analyses undertaken, a Type 1 error may have occurred. A Type I error occurs when a significant relationship between the variables is detected but in actuality there is no significant association. Or, in my case, reporting a significant relationship between maternal employment in early childhood and children's outcomes when in actuality there is no significant association between these variables.

Summary

My work makes several unique contributions to knowledge about how maternal employment in early childhood influences children`s developmental outcomes. First, my study has expanded upon the limited knowledge about how maternal employment in early childhood is associated with outcomes beyond cognitive development of children within a Canadian context, in particular children's motor and social development. In short, I found that maternal employment within the first four years had a small positive association with infant, toddler, and preschoolers' motor and social development. Further, my research added to the limited knowledge, especially within Canada, about the contributing role of child gender and the factors in children's family and child care contexts including interactions children have with parents, family and maternal well-being, and child care quality. I found that the majority of these factors and Processes did not explain the relationship (i.e., there were no significant interactions or

mediating associations). The exception was child gender and parent-child interactions. Maternal employment within the first four years had stronger positive effects for female children than it did for male children. In terms of parent-child interactions, the association between maternal employment in early childhood and children's motor and social development scores was partially explained by enhanced parent-child interactions of employed mothers.

Third, my study added some clarity to how working more than 20 hours or more in early childhood affects children's outcomes. In terms of maternal work intensity, maternal employment greater than 20 hours a week within the first two years, in particular when maternal employment was initiated when children were between 12 months and 17 months of age, had a negative association with children's receptive language at ages four and five. These findings from my study highlight areas that policy developers may want to consider/focus on in future maternity and parental leave policy development.

Policy Implications

The key result from my study with implications for policy development is the finding that children of mothers who worked more than 20 hours within the first two years, especially when maternal employment began when children were between 12 months and 17 months of age, was associated with lower receptive language scores relative to children of mothers who worked 20 hours or less a week. These findings bring attention to areas (i.e., hours worked in early childhood) that policy developers may want to consider in future changes to current Canadian maternity and parental leave policy.

In Canada, maternity and parental leave is not provided into the second year. Eligible mothers only receive 50 weeks of paid leave after the birth of a child (Phipps, 2006) with a replacement rate of 55 percent of earnings up to a maximum insurable earnings of $48,600 per year or a maximum amount of $514 per week (Service Canada, 2014). The Canadian government deducts the whole amount earned "dollar for dollar" from their benefits, if mothers work during the first 15 weeks of the maternity leave. This is presumably to provide mothers with adequate time to give birth, to recover from child birth, and

to breastfeed their infant (International Labour Organization, n.d.). The Canadian government allows mothers to earn 25 percent of their weekly benefit or up to $50 per week (whichever is higher), if mothers work during the 35 weeks following the 15 weeks of maternity leave (anything over this amount is deducted "dollar for dollar" from their benefits) (Service Canada, 2014). It should be noted that in 2012, the Canadian federal government introduced a new pilot project, Working While on Claim (WWC). This pilot project changes the manner in which earnings are deducted if mothers work while on parental leave (the 35 weeks following the 15 weeks of maternity leave). With the WWC "…if your earnings are equal to or less than 90% of your weekly earnings that were used to calculate your benefit rate, your benefits will be reduced at a rate of 50% of your earnings each week. Any earnings that exceed this 90% threshold, will be deducted dollar for dollar from your benefits" (Service Canada, 2013). The intent of this pilot program is for individuals to stay connected to the labor market and to ensure individuals are always benefiting from employment (Service Canada, 2013).

My findings that maternal employment initiated within the first year at more than 20 hours a week is not negatively associated with children's receptive language, suggest that revamping maternity and parental leave benefits in the first year to be more facilitating of employment by mothers may not have negative implications for children's receptive language. However, such a policy change is premature given the findings from previous studies indicating a negative association between maternal employment in the first year and children's cognitive development (Brooks-Gunn et al.; 2002; Han et al., 2001; Hill et al., 2005; Waldfogel et al., 2002). Additional research regarding the association between maternal work intensity in Canadian children's first year is needed prior to broad sweeping changes to maternity and parental leave policies are considered. That being said, the finding of a negative association between maternal employment of more than 20 hours a week initiated at 12 to 17 months and children's later receptive language, leads me to suggest that it might be worthwhile to explore

whether providing mothers and their families with maternity and parental benefits into the first half of the second year enhances the receptive language of children.

Though Canada does not allow mothers to effectively combine maternity/parental leaves with employment in the first year, let alone the second year, some European countries, such as Norway and Sweden, have adopted this type of policy. Norway's maternity and parental leave policy is considered to be one of the most generous (Rønsen & Kitterød, 2012). In Norway, mothers can choose to receive 49 weeks of benefits at 100 percent coverage or 59 weeks at 80 percent coverage (The Norwegian Labour and Welfare Administration, n.d.a). Mothers can work while receiving benefits. They have two choices called graduated parental benefits. Mothers can postpone receiving their parental benefit because they are working full-time. Or they can extend the period of the benefit (up to three years) through receiving a part of their parental benefit while working less than full-time. The amount of parental benefits mothers receive is reduced by the proportion they work resulting in the benefit being extended over a longer time period (The Norwegian Labour and Welfare Administration, n.d.b).

I was unable to ascertain how many mothers participate in the graduated parental benefits or the effects this program has on mothers' employment after the birth of a child and children's development. However, an interesting qualitative study of Norwegian mothers, most returning to work between 11-14 months postpartum, found that mothers reported connections to the work place gave them a sense of being valued as more than just a mother (Alstveit, Severinsson, & Karlsen, 2010). Further, a recent study found that Norwegian mothers enter into part-time employment much faster after the birth of a child in comparison to full-time employment (Rønsen & Kitterød, 2012). The authors suggest this finding may be related to the availability of part-time employment in Norway as well as the family related policies (Rønsen & Kitterød, 2012).

It is not a completely novel recommendation to offer women the choice of working part-time and retaining their maternity and parental benefits beyond the first year. Research suggests this may be

desired by more than just Norwegian women (O'Connor & Wright, 2013). O'Connor and Wright (2013) found that in Ireland, which provides 26 weeks of paid maternity leave and 16 weeks of unpaid maternity leave, participants desired a phased in reengagement with the workplace. Essentially they wanted an opportunity to return to employment during the period of maternity and parental benefits instead of being absent from the work place for the entire time. The authors recommended that "maternity leave structure should be re-examined to explore transition return to work earlier in the maternity leave timescale to reduce the stress on child, mother and impact on companies…" (O'Connor & Wright, 2013, p. 336). In addition, providing an opportunity for mothers to combine their maternity and parental benefits with employment could possibly address the negative implications that longer maternity and parental leaves can have on mothers' employment and career opportunities. For instance, combining maternity and parental leaves with employment may mitigate mothers' loss of connections/attachments to their employer that can occur with longer leaves (Waldfogel, 2001).

Going hand in hand with a policy of enabling mothers to combine employment and maternity and parental benefits into the second year, is the provision of quality, affordable, and accessible child care for children while their mothers are working. Though my findings suggest that child care quality does not play a meaningful role in the relationship between maternal work intensity and children's receptive language, my measures of child care quality may not have accurately measured the quality actually experienced by my sample. Previous research has found that the quality of child care provided in Canada is far from adequate (Bigras et al., 2010; Goelman et al., 2000). Child care quality is important, especially in early childhood, because of its association with the well-being of children (Belsky, 2006; Bradley & Vandell; 2007; Vandell, 2004). Currently, Canada does not have a public system of high quality child care that is affordable and accessible to all children and families (Campaign 2000, 2013) but rather a "patchwork of disjointed programs" of mediocre quality (Friendly & Prentice, 2008). "Canada is failing to meet the child care needs of the majority of children and families. Canadian parents are desperate for

high quality child care space in all provinces; outside Quebec, they pay sky-high fees" (Campaign 2000, 2013, p. 14). To support women and families in their employment choices after the birth of a child, Canada needs to develop a national child care program that provides a range of high quality child care options that are affordable and accessible (Campaign 2000, 2013; Friendly & Prentice, 2008).

Ultimately, "what is best for one child or one family may not be optimal for another child or family" (Waldfogel, 2001, p. 107). Maternity leave, parental leave, and child care policies that provide mothers and their families with the greatest amount of choice in terms of employment in the first few years of a child's birth would appear to have the greatest potential to benefit the well-being of children and their mothers and families (Waldfogel, 2001).

Conclusion

In conclusion, on one hand it is reassuring that maternal employment initiated in the first four years has small, positive benefits for children's motor and social development. However, it is also concerning that even after controlling for a host of child, maternal, and family characteristics, maternal employment at more than 20 hours a week in the first two years, in particular between 12 and 17 months, is negatively associated with children's receptive language at four and five years. It would be important for researchers to continue with efforts to uncover what contributes to this relationship and for policy developers to focus on providing women with the choice, if desired, to work part-time (20 hours or less per week) into the second year after the birth of an infant. Extended maternity and parental benefits in combination with a national child care program may give mothers and parents "…more and better choices about how to balance their work and family responsibilities…" (Brooks-Gunn et al., 2002, p. 1069). In short, researchers should move away from concerns over the potential negative implications of maternal employment in early childhood, which when found are relatively weak, and focus on research that effectively optimizes the well-being of children, mothers, and families.

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Appendix A: NLSCY Sampling Approach

The NLSCY Sampling Approach

The NLSCY used a cluster sample of households with children between the ages of zero to 11 years drawn from three different sources. These were labeled the Main Component, the Integrated Component, and the Territorial Component (Statistics Canada, 1996).

The Main Component

With Cycle One of the NLSCY, the requirement was to select households with children between the ages of zero to 11 years. The difficulty was that the majority of Canadian households do not have children within this age range (only 26% of households in Canada's 10 provinces had at least one child between zero and 11 years). In order not to spend dollars on screening households to identify these children, the NLSCY drew on Statistics Canada's Labour Force Survey (LFS). The LFS is a monthly survey collecting labour market data from a national sample of Canadian households. The sample covers civilian, non-institutionalized people 15 years or older in Canada's ten provinces. The LFS excludes individuals living on reserves and other Aboriginal settlements, full-time members of the Canadian Armed Forces, inmates of institutions, and individuals living in Canada's three territories (Statistics Canada, 2010). Households that were currently or had recently been in the LFS sample were reviewed to determine households that had children. This was the source of the household sample for the Main Component of the NLSCY (approximately 12,900 households were selected) (Statistics Canada, 1996) as well as for the Early Childhood Development (ECD) Children (Statistics Canada, 2010).

The Integrated Component

At the same time the NLSCY was being initiated, another national longitudinal survey, the National Population Health Survey (NPHS), was also being undertaken by Statistics Canada. Both the NLSCY and the NPHS were required to collect data on the health of Canadian children. Thus, a portion of the sample and content within the two surveys was integrated for the 10 provinces. The children chosen for the

NPHS between the ages of zero and 11 were part of the sample for both of the surveys (approximately 2,700 households were selected) (Statistics Canada, 1996).

The NPHS was intended to assess the health status of the Canadian population over time, the determinants of health, and the economic, social, demographic, occupational, and environmental correlates of health. The sample excluded individuals on reserves, full-time members of the Canadian Armed Forces, residents of health institutions, and some remote areas of Ontario and Québec and the territories. The NPHS used a stratified two-stage sample design (clusters, dwellings) based upon the sampling frame of the Labour Force Survey (LFS) in all provinces except Québec. However, the NPHS drew on a fresh sample chosen specifically for the NPHS – the sample was not already part of the LFS (Statistics Canada, n.d.b; Statistics Canada, 1996).[21]

The Territories Component

The sample of households for both the Main and the Integrated Components excluded Canada's northern territories. Both the NLSCY and the NPHS were required to contain estimates from the north, therefore the Territories Component was added again with an integrated sample for both the NLSCY and NPHS. The sample was drawn from the population of privately occupied dwellings. The sample excluded institutions, unorganized areas, and very remote and small communities. The goal was to obtain data from approximately 2,300 children. In the final release, only the data from the 10 provinces was included. This was because the data from territories had yet to processed and, thus would be part of future releases (Statistics Canada, 1996).

[21] Within Québec, the NPHS sample was drawn from households participating in a health survey arranged by Santé Québec - the 1992/1993 Enquête sociale et de santé (ESS) (Statistics Canada, n.d.b).

Appendix B: Creation and Coding of Variables

Maternal Employment in Early Childhood

I created the variable measuring maternal employment in early childhood using two different variables provided by Statistics Canada. First, in order to categorize mothers as either those who worked post-birth and those who did not work post-birth, I drew on the following question asked of mothers: "did you work at a job or a business at any point since this child's birth?" For mothers who had worked post birth, they were subsequently asked in the NLSCY if they had worked continuously since reentering the labour market. Drawing on this question, I categorized mothers who answered yes to this question as continuously employed. Mothers who answered no, but worked at least half of the time between the birth and no, worked less than half of the time between then and now were considered discontinuously employment. I operationalized early maternal employment as three dichotomous variables:

1. Never Worked – never worked at a job or a business at any point since this child's birth was coded as one and zero for otherwise (the reference category).
2. Continuously Employed - worked at a job or business since the child's birth and worked continuously since then was coded as one and zero for otherwise.
3. Discontinuously Employed - worked at a job or business since the child's birth and either worked at least half of the time between the birth, or worked less than half of the time between then and now was coded as one and zero for otherwise.

When the preliminary regression analyses were run, few differences were found on the dependent variables between the children of mothers who were continuously employed and the children of mothers who were discontinuously employed. Therefore, for all subsequent analyses, I combined children of mothers who were both continuously and discontinuously employed into one group and operationalized maternal employment in early childhood as two dichotomous variables.

Maternal Education

Maternal education was measured with the following question asked of mothers in the NLSCY: "what is the highest grade or level of education you have attended or completed." I operationalized maternal education into five dichotomous variables:

1. Less than high school - no schooling, some elementary, completed elementary, and some secondary were coded as one and zero for otherwise (the reference category);
2. High school - completed secondary school was coded as one and zero for otherwise;
3. Some post-secondary – some university, community, technical or teaching college, CEGEP (Collège d'enseignement général et professionnel), nurses training, and other post-secondary education or training were coded as one and zero for otherwise;
4. College - completed community college, technical college, CEGEP, or nurse's training were coded as one and zero for otherwise;
5. Post-secondary - completed university or teacher's college, master's degree, or doctorate or medical degree were coded as one and zero for otherwise.

Family Structure

Family structure was measured by the mothers indicating if they were married, living common-law, widowed, separated, divorced, or single/never married. I operationalized family structure as three dichotomous variables:

1. Married – coded as one and zero for otherwise (the reference category);
2. Common-law – coded as one and zero for otherwise;
3. Divorced, widowed, separated, single, or never married – coded as one and zero for otherwise.

Family Economic Status

Family economic status was operationalized as the household being poor or not poor drawing on the most widely used and established method of measuring poverty in Canada - the Low Income Cut-off (LICO) (Statistics Canada, 2006b). The LICO is an income threshold below which a household is

considered in “straitened circumstances” if they devote 20 percent or more of their income to basic necessities including food, housing, and clothing than the average proportion spent by Canadian families. The cut-off varies by family and community size (Statistics Canada, 1996). To categorize households as poor or not poor, I drew on the LICO for 2004 (based on national family expenditure data from 1992) provided by the NLSCY. This variable was coded as continuous. I then divided the data from this variable by 1000, as recommended by Statistics Canada (n.d.a), to obtain ratio values. Households with incomes equal to or above the LICO ratio of one were not poor and households with incomes less than the LICO ratio of one were poor.

Child Care Type

Child care type was measured through mothers indicating their children’s primary type of child care while she and her spouse or partner were working or studying. I operationalized child care type into four dichotomous variables.

1. Nonrelative care - care in someone else’s home by a non-relative and care in child’s home by a non-relative were coded as one and zero for otherwise;
2. Relative care - care in someone else’s home by a relative and care in child’s home by a relative other than child’s brother or sister were coded as one and zero for otherwise;
3. Daycare - daycare centre and nursery school or preschool were coded as one and zero for otherwise;
4. No care - including does not use child care, other, child in own care, and care in child’s home by child’s brother or sister was coded as one and zero for otherwise (the reference category).

Maternity Leave

I measured whether mothers received maternity leave benefits through the question: “were you on paid or unpaid maternity or parental leave, including those weeks paid by employment insurance after stopping work (one for yes and zero for no)?” This question contained a number of valid skips (31% of

mothers). A valid skip is defined by Statistics Canada (n.d.b) as a question that is not applicable to a survey respondent. For instance, the question regarding maternity leave benefits may not be applicable because the mother did not work prior to having the child. To determine if these valid skips could be categorized as receiving maternity leave, I drew on an additional question: "did you work at a job or a business at any point before this child's birth?" Sixty-four percent of the respondents with valid skips to the first question (were you on paid or unpaid maternity or parental leave) answered no to this question. Because these individuals did not work prior to their child's birth, they would not qualify for a paid or unpaid maternity or parental leave so they were categorized as not receiving a paid or unpaid maternity leave. Eight percent of the valid skips to the first question did work pre-birth so they were categorized as missing on paid or unpaid maternity or parental leave because it could not be reliably determined or assumed that they did or did not receive a paid or unpaid maternity or parental leave. Twenty-nine percent of the valid skips to the first question were also valid skips to the pre-birth work question. They were also categorized as missing because again it could not be reliably determined or assumed they did or did not receive a paid or unpaid maternity or parental leave. The final maternity leave variable was coded as:

1. Received maternity leave - answered yes to the paid or unpaid maternity or parental leave question (coded as one);
2. Did not receive maternity leave - answered no to the paid or unpaid maternity or parental leave question or answered no to the pre-birth work question and was a valid skip to the paid or unpaid maternity or parental leave question (coded as zero);
3. Missing - included data missing on the paid or unpaid maternity or parental leave question; was a valid skip to the paid or unpaid maternity or parental leave question and worked pre-birth; or was a valid skip to the paid or unpaid maternity or parental leave question and was a valid skip to the pre-birth question.

Income

Total household income was measured through the question: "what is the best estimate of the total household income from all sources in the past 12 months, that is the total household income from all household members, before taxes and deductions?" This variable was coded as continuous, however, I capped it at 100,000 and divided by 1000 to ease interpretation (simpler to manipulate smaller numbers). I used the natural log of family income because the distribution of the variable was positively skewed. Using a log term results in a distribution that is closer to normal (Wooldridge, 2006).

Number of Siblings

I measured the number of siblings using two questions provided in the NLSCY: the number of older siblings of the selected child living in the household at the time of the interview including full, half, step, adopted, and foster siblings; and the number of younger siblings (of the selected child) living in the household including full, half, step, adopted, and foster siblings. I added the data from these two questions together to create a continuous variable which represented the number of siblings.

Appendix C: Individual Questions for the Motor and Social Development Scale

Age in Months	MSD Questions
0 to 3 Months	1. When lying on his stomach, has this child ever turned his head from side to side? 2. Have his eyes ever followed a moving object? 3. When lying on his stomach on a flat surface, has this child ever lifted his head off the surface for a moment? 4. Have his eyes ever followed a moving object all the way from one side to the other? 5. Has this child ever smiled at someone when that person talked to or smiled at (but did not touch) him? 6. When lying on his stomach, has this child ever raised his head and chest from the surface while resting his weight on his lower arms or hands? 7. Has this child ever turned his head around to look at something? 8. When lying on his back and being pulled up to a sitting position, did this child ever hold his head stiffly so that it did not hang back as he was pulled up? 9. Has he ever laughed out loud without being tickled or touched? 10. Has he ever held in his hand a moderate sized object such as a block or a rattle? 11. Has he ever rolled over on his own purpose? 12. Has this child ever seemed to enjoy looking in the mirror at himself? 13. Has this child ever been pulled from a sitting to a standing position and supported his own weight with his legs stretched out? 14. Has he ever looked around with his eyes for a toy which was lost or not nearby? 15. Has he ever sat alone with no help except for leaning forward on his hands or with just a little help from someone else?
4 to 6 Months	1. When lying on his back and being pulled up to a sitting position, did this child ever hold his head stiffly so that it did not hang back as he was pulled up? 2. Has he ever laughed out loud without being tickled or touched? 3. Has he ever held in his hand a moderate sized object such as a block or a rattle? 4. Has he ever rolled over on his own purpose? 5. Has this child ever seemed to enjoy looking in the mirror at himself? 6. Has this child ever been pulled from a sitting to a standing position and supported his own weight with his legs stretched out? 7. Has he ever looked around with his eyes for a toy which was lost or not nearby? 8. Has he ever sat alone with no help except for leaning forward on his hands or with just a little help from someone else? 9. Has he ever sat for 10 minutes without any support at all? 10. Has he ever pulled himself to a standing position without help from another person? 11. Has this child ever crawled when left lying on his stomach? 12. Has he ever said any recognizable words such as ‘mama’ or ‘dada’? 13. Has this child ever picked up small objects such as raisins or cookie crumbs, using only his thumb and first finger? 14. Has he ever walked at least 2 steps with one hand held or holding on to something? 15. Has this child ever waved good-bye without help from another person?
7 to 9 Months	1. Has this child ever seemed to enjoy looking in the mirror at himself? 2. Has this child ever been pulled from a sitting to a standing position and supported his own weight with his legs stretched out? 3. Has he ever looked around with his eyes for a toy which was lost or not nearby? 4. Has he ever sat alone with no help except for leaning forward on his hands or with just a little help from someone else? 5. Has he ever sat for 10 minutes without any support at all? 6. Has he ever pulled himself to a standing position without help from another person? 7. Has this child ever crawled when left lying on his stomach? 8. Has he ever said any recognizable words such as ‘mama’ or ‘dada’? 9. Has this child ever picked up small objects such as raisins or cookie crumbs, using only his thumb and first finger? 10. Has he ever walked at least 2 steps with one hand held or holding on to something? 11. Has this child ever waved good-bye without help from another person? 12. Has he ever shown by his behavior that he knows the names of common objects when somebody else names them out loud? 13. Has he ever shown that he wanted something by pointing, pulling, or making pleasant sounds rather than crying or whining? 14. Has he ever stood alone on his feet for 10 seconds or more without holding on to anything or another person?

15. Has this child ever walked at least 2 steps without holding on to anything or another person? [22]

10 to 12 Months

1. Has this child ever crawled when left lying on his stomach?
2. Has he ever said any recognizable words such as 'mama' or 'dada'?
3. Has this child ever picked up small objects such as raisins or cookie crumbs, using only his thumb and first finger?
4. Has he ever walked at least 2 steps with one hand held or holding on to something?
5. Has this child ever waved good-bye without help from another person?
6. Has he ever shown by his behavior that he knows the names of common objects when somebody else names them out loud?
7. Has he ever shown that he wanted something by pointing, pulling, or making pleasant sounds rather than crying or whining?
8. Has he ever stood alone on his feet for 10 seconds or more without holding on to anything or another person?
9. Has this child ever walked at least 2 steps without holding on to anything or another person?
10. Has he ever crawled up at least 2 stairs or steps?
11. Has this child said 2 recognizable words besides 'mama' or 'dada'?
12. Has this child ever run?
13. Has he ever said the name of a familiar object, such as a ball?
14. Has he ever made a line with a crayon or pencil?
15. Did he ever walk up at least 2 stairs with one hand held or holding the railing?

13 to 15 Months

1. Has this child ever waved good-bye without help from another person?
2. Has he ever shown by his behavior that he knows the names of common objects when somebody else names them out loud?
3. Has he ever shown that he wanted something by pointing, pulling, or making pleasant sounds rather than crying or whining?
4. Has he ever stood alone on his feet for 10 seconds or more without holding on to anything or another person?
5. Has this child ever walked at least 2 steps without holding on to anything or another person?
6. Has he ever crawled up at least 2 stairs or steps?
7. Has this child said 2 recognizable words besides 'mama' or 'dada'?
8. Has this child ever run?
9. Has he ever said the name of a familiar object, such as a ball?
10. Has he ever made a line with a crayon or pencil?
11. Did he ever walk up at least 2 stairs with one hand held or holding the railing?
12. Has he ever fed himself with a spoon or fork without spilling much?
13. Has this child ever let someone know, without crying, that wearing wet (soiled) pants or diapers bothered him?
14. Has he ever spoken a partial sentence of 3 words or more?
15. Has he ever walked up stairs by himself without holding on to a rail?

16 to 18 Months

1. Has this child ever walked at least 2 steps without holding on to anything or another person?
2. Has he ever crawled up at least 2 stairs or steps?
3. Has this child said 2 recognizable words besides 'mama' or 'dada'?
4. Has this child ever run?
5. Has he ever said the name of a familiar object, such as a ball?
6. Has he ever made a line with a crayon or pencil?
7. Did he ever walk up at least 2 stairs with one hand held or holding the railing?
8. Has he ever fed himself with a spoon or fork without spilling much?
9. Has this child ever let someone know, without crying, that wearing wet (soiled) pants or diapers bothered him?
10. Has he ever spoken a partial sentence of 3 words or more?
11. Has he ever walked up stairs by himself without holding on to a rail?
12. Has he ever washed and dried his hands without any help except for turning the water on and off?
13. Has he ever counted 3 objects correctly?
14. Has he ever gone to the toilet alone?
15. Has he ever walked up stairs by himself with no help, stepping on each step with only one foot?

19 to 21 Months

1. Has this child ever run?
2. Has he ever said the name of a familiar object, such as a ball?
3. Has he ever made a line with a crayon or pencil?
4. Did he ever walk up at least 2 stairs with one hand held or holding the railing?
5. Has he ever fed himself with a spoon or fork without spilling much?

[22] This question was not asked of mothers of children 7 to 9 months because of a problem with the application of the question (93% of cases responded no to this question) (Statistics Canada, n.d.a).

	6. Has this child ever let someone know, without crying, that wearing wet (soiled) pants or diapers bothered him? 7. Has he ever spoken a partial sentence of 3 words or more? 8. Has he ever walked up stairs by himself without holding on to a rail? 9. Has he ever washed and dried his hands without any help except for turning the water on and off? 10. Has he ever counted 3 objects correctly? 11. Has he ever gone to the toilet alone? 12. Has he ever walked up stairs by himself with no help, stepping on each step with only one foot? 13. Does he know his own age and sex? 14. Has this child ever said the names of at least 4 colors? 15. Has this child ever pedaled a tricycle at least 10 feet?
22 to 47 Months	1. Has this child ever let someone know, without crying, that wearing wet (soiled) pants or diapers bothered him? 2. Has he ever spoken a partial sentence of 3 words or more? 3. Has he ever walked up stairs by himself without holding on to a rail? 4. Has he ever washed and dried his hands without any help except for turning the water on and off? 5. Has he ever counted 3 objects correctly? 6. Has he ever gone to the toilet alone? 7. Has he ever walked up stairs by himself with no help, stepping on each step with only one foot? 8. Does he know his own age and sex? 9. Has this child ever said the names of at least 4 colors? 10. Has this child ever pedaled a tricycle at least 10 feet? 11. Has this child ever done a somersault without help from anybody? 12. Has this child ever dressed himself without any help except for tying shoes (and buttoning the backs of outfits)? 13. Has this child ever said his first and last name together without someone's help? (Nickname may be used for first name.) 14. Has this child ever counted out loud up to 10? 15. Has this child ever drawn a picture of a man or woman with at least 2 parts of the body other than a head? (Statistics Canada, n.d.a; n.d.c).

Appendix D: Items Comprising the CES-D (short version), the General Functioning Scale, Family Assessment Device, and the Positive Interaction Scale

Instrument	Description
CES-D (short version)	A scale measuring symptoms of depression. "The next set of statements describes feelings or behaviors. For each one, please tell me how often you felt or behaved this way during the past week." Answers ranged from one to four with one being rarely or none of the time and four being most or all of the time. - I did not feel like eating. - My appetite was poor. - I felt that I could not shake off the blues even with help from my family or friends. - I had trouble keeping my mind on what I was doing. - I felt depressed; I felt that everything I did was an effort. - I felt hopeful about the future. - My sleep was restless. - I was happy. - I felt lonely. - I enjoyed life. - I had crying spells. - I felt that people disliked me (Statistics Canada, n.d.c).
General Functioning Scale, Family Assessment Device	A scale measuring overall family functioning. Answers ranged from one to four with one being strongly agree and four being strongly disagree. - Planning family activities is difficult because we misunderstand each other. - In times of crisis we can turn to each other for support. - We cannot talk to each other about sadness we feel. - Individuals, in the family, are accepted for what they are. - We avoid discussing our fears or concerns. - We express feelings to each other. - There are lots of bad feelings in our family. - We feel accepted for what we are. - Making decisions is a problem for our family. - We are able to make decisions about how to solve problems. - We don't get along well together. - We confide in each other (Statistics Canada, n.d.c).
Positive Interaction Scale	A scale measuring positive interaction. Answers ranged from one to five with one being never and five being many times each day. - 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!' - 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? - How often do you and this child laugh together? - How often do you do something special with this child that he enjoys? - How often do you play sports, hobbies or games with this child (Statistics Canada, n.d.c)?

Appendix E: Properties of the Positive Interaction Scale

I conducted an item analysis of the Positive Interaction Scale. The alpha for the derived scale was .66. The table below indicates that the alpha for the overall scale measuring positive interactions if one of the items was removed from the scale. Because excluding any one of the items would result in a lower alpha for the scale, all questions were retained.

Alpha with the Deleted Variable

Deleted Variable	Alpha
Praise (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!')	0.65
Focus (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?)	0.58
Laugh (How often do you and this child laugh together?)	0.63
Enjoy (How often do you do something special with this child that he enjoys?)	0.60
Play (How often do you play sports, hobbies or games with this child?)	0.55

Below are the intercorrelations of the questions used to calculate the score on the Positive Interaction Scale. The Pearson Product correlation matrix for the scale demonstrates that all the questions on the scale were significantly and positively correlated to one another.

Intercorrelations between the Items for Positive Interaction Scale

Subscale	1	2	3	4	5
			n = 5900		
1. Praise	1.00000				
2. Focus	0.32209***	1.00000			
3. Laugh	0.31589***	0.39943***	1.00000		
4. Enjoy	0.18949***	0.31417***	0.22763***	1.00000	
5. Play	0.18231***	0.38069***	0.30580***	0.46247***	1.00000

Appendix F: Comparisons between Complete Respondents and Non- Complete Respondents

Comparison between Complete Respondents and Non-Complete Respondents: MSD

	MSD Full Sample		MSD Two-Parent Families		MSD Work Intensity	
	Complete Respondents	Non-Complete Respondents	Complete Respondents	Non-Complete Respondents	Complete Respondents	Non-Complete Respondents
Maternal Employment in Early Childhood	64.01	66.42	64.67	67.03	---	---
Working More than 20 Hours a Week	---	---	---	---	69.66	73.63*
MSD Scores	100.80 (14.56)	101.70* (14.55)	100.80 (14.38)	101.70 (14.52)	101.40 (13.88)	102.20 (14.29)
Depressive Symptoms Scores	4.12 (4.82)	4.59** (5.31)	3.78 (4.45)	4.18* (4.93)	4.07 (4.87)	4.22 (4.79)
Family Functioning Scores	8.22 (5.16)	8.38 (5.09)	7.99 (5.10)	8.14 (5.06)	8.09 (5.20)	8.14 (5.00)
Parent-child Interaction Scores	22.33 (2.19)	22.13** (2.26)	22.36 (2.16)	22.17* (2.25)	22.13 (2.17)	21.99 (2.26)
Proportion of Mothers with Less Than High School	10.36	10.95	8.50	8.38	7.17	8.69
Proportion of Mothers with High School Diplomas	17.05	16.27	16.58	15.00	15.55	14.38
Proportion of Mothers with Some Post-Secondary Education	14.69	16.12	14.08	15.09	13.81	14.70
Proportion of Mothers with College Diplomas	23.39	29.07	30.96	30.34	32.88	32.62
Proportion of Mothers with a Post-Secondary Degree	27.46	27.59	29.88	31.18	30.58	29.61
Proportion of Mothers Married	68.69	66.53	76.79	78.42	68.86	66.54
Proportion of Mothers in Common-law Relationships	21.11	17.23***	23.21	21.58	21.57	18.95
Proportion of Mothers Divorced, Separated, Widowed, or Single	10.21	16.24***	---	---	9.57	14.51***
Proportion of Families who are Poor	17.29	22.40***	10.72	12.56	12.35	17.37***
Proportion of Children who are Male	52.46	52.35	51.83	52.71	53.13	52.02
Proportion of Children in Non-relative Care	21.04	20.00	21.35	20.39	30.76	29.71
Proportion of Children in Relative Care	14.33	15.35	13.98	15.25	19.49	22.12
Proportion of Children in Daycare	15.47	13.61	14.58	12.07*	21.47	17.41*
Proportion of Children in No Child Care	49.16	51.04	50.09	52.29	28.29	30.76
Age of Child	1.46 (1.09)	1.73*** (1.08)	1.46 (1.46)	1.68*** (1.09)	1.73 (1.02)	1.98*** (0.97)
Proportion Low Birth Weight	4.08	4.82	3.73	5.23*	4.11	5.07
Proportion Not Breast Fed	14.93	10.07***	13.88	8.63***	14.27	9.02***
Proportion Premature	9.38	10.27	8.96	11.03*	9.71	10.92
Age of Mother	30.95 (5.36)	31.07 (5.51)	31.33 (5.10)	31.44 (5.22)	31.37 (5.22)	31.38 (5.23)

Proportion of Mothers Receiving Maternity Leave	65.21	65.86	66.87	66.58	75.89	78.59
Hours Worked per Week	18.58 (17.34)	20.06** (17.64)	18.73 (17.32)	20.10* (17.43)	29.02 (12.89)	30.19* (12.75)
Household Income	59.25 (27.25)	56.21*** (27.25)	63.61 (25.02)	62.30 (25.50)	63.06 (26.34)	59.45*** (27.77)
Total Number of Siblings	.97 (1.01)	.99 (.97)	.99 (1.01)	1.02 (.97)	.90 (.88)	.92 (.92)
Birth Order of the Child	1.83 (1.00)	1.85 (.97)	1.85 (.99)	1.87 (.98)	1.74 (.86)	1.77 (.91)
Proportion of Spouses Working	94.70	94.23	94.70	94.23	95.34	94.58
N	4490	1510	3970	1330	2880	1010

Note. - Statistics are reported as means (SD) and proportions. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. *p < .05. **p < .01. ***p < .001.

Comparison between Complete Respondents and Non-Complete Respondents: PPVT-R (0/2)

	PPVT-R (0/2) Full Sample		PPVT-R (0/2) Two-Parent Families		PPVT-R (0/2) Work Intensity	
	Complete Respondents	Non-Complete Respondents	Complete Respondents	Non-Complete Respondents	Complete Respondents	Non-Complete Respondents
Maternal Employment in Early Childhood	56.09	45.93***	56.53	46.43***	---	---
Working More than 20 Hours a Week	---	---	---	---	76.40	72.58
PPVT-R Scores	102.00 (14.52)	100.50 (15.07)	102.50 (14.33)	100.90 (14.58)	10.3 (14.04)	102.7 (15.00)
Depressive Symptoms Scores	4.13 (4.66)	4.46 (5.10)	3.84 (4.31)	3.99 (4.47)	3.78 (4.45)	3.94 (4.07)
Family Functioning Scores	8.44 (5.12)	8.43 (4.95)	8.20 (5.05)	8.56 (4.91)	8.20 (5.20)	8.45 (5.15)
Parent-child Interaction Scores	22.85 (1.98)	22.89 (2.06)	22.87 (1.98)	22.93 (2.04)	22.72 (1.89)	22.87 (2.41)
Proportion of Mothers with Less Than High School	6.67	13.23***	5.30	10.26***	---	---
Proportion of Mothers with High School Diplomas	12.45	12.91	12.01	13.39	---	---
Proportion of Mothers with Some Post-Secondary Education	15.93	17.95	15.02	17.57	---	---
Proportion of Mothers with Less Than Some Post-Secondary Education	---	---	---	---	24.75	33.33*
Proportion of Mothers with College Diplomas	33.76	30.24	34.05	31.48	36.80	35.11
Proportion of Mothers with a Post-Secondary Degree	31.18	25.67**	33.62	27.30**	38.45	31.56
Proportion of Mothers Married	68.42	67.86	74.57	76.49	65.35	63.64
Proportion of Mothers in Common-law Relationships	23.61	20.14	25.43	23.51	---	---
Proportion of Mothers Divorced, Separated, Widowed, or Single	7.96	12.00**	---	---	---	---
Proportion of Mothers Common-law, Divorced, Separated, Widowed, or Single	---	---	---	---	34.65	36.36
Proportion of Families who are Poor	14.41	22.21***	9.17	13.44**	7.26	15.02***
Proportion of Children who are Male	51.93	53.79	51.60	53.59	53.47	52.96
Proportion of Children in Non-relative Care	17.44	11.98**	17.86	12.01**	33.00	23.01**
Proportion of Children in Relative Care	11.61	12.29	11.15	11.15	22.44	23.45
Proportion of Children in Daycare	27.76	23.50*	27.59	22.67*	53.54	44.50*
Proportion of Children in No Care	43.19	52.23***	43.41	53.81***	---	52.97
Proportion of Child Care Workers with Training	54.32	57.61	54.54	56.95	52.97	58.79
Proportion Engaged in Early Learning Activities	69.40	71.18	69.75	70.49	68.65	73.01
Proportion of Mothers Satisfied with Developmental/Learning Activities	72.00	71.83	72.47	72.76	72.28	70.76
Age of Child	.59 (.49)	.54* (.50)	.58 (.49)	.54 (.50)	.72 (.45)	.67 (.47)

Proportion Low Birth Weight	4.21	4.21	3.94	4.19	4.14	6.37
Proportion Not Breast Fed	9.40	15.60	12.32	14.20	12.07	14.62
Proportion Premature	9.87	10.45	9.24	10.97	11.28	13.15
Age of Mother	30.40 (5.05)	29.90* (5.42)	30.76 (4.78)	30.31 (5.21)	30.32 (4.72)	30.57 (5.26)
Proportion of Mothers Receiving Maternity Leave	70.50	59.72***	72.04	60.24***	85.15	73.22**
Hours Worked per Week	16.70 (17.77)	13.22*** (16.98)	12.48 (15.13)	9.70*** (13.80)	30.73 (12.02)	29.36 (12.45)
Household Income	60.90 (26.86)	55.22*** (28.13)	64.34 (24.75)	60.27*** (25.69)	67.74 (25.66)	60.42*** (27.53)
Total Number of Siblings	.84 (.98)	0.97** (.98)	.86 (.98)	1.00** (1.00)	.68 (.77)	.79 (.88)
Birth Order of the Child	1.80 (.98)	1.94** (.98)	1.82 (.97)	1.96** (1.00)	1.75 (.77)	1.65 (.89)
Proportion of Spouses Working	94.44	93.01	94.46	92.96	95.28	90.82*
N	1790	720	1630	650	610	250

Note. - Statistics are reported as means (SD) and proportions. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. *p < .05. **p < .01. ***p < .001.

Comparison between Complete Respondents and Non-Complete Respondents: PPVT-R (0/4)

	PPVT-R (0/4) Full Sample		PPVT-R (0/4) Two-Parent Families		PPVT-R (0/4) Work Intensity	
	Complete Respondents	Non-Complete Respondents	Complete Respondents	Non-Complete Respondents	Complete Respondents	Non-Complete Respondents
Maternal Employment in Early Childhood	80.73	74.87***	80.88	76.38*	---	--
Working More than 20 Hours a Week	---	---	---	---	74.94	76.19
PPVT-R Scores	102.00 (13.73)	101.50 (14.38)	102.3 (13.61)	102.00 (14.24)	102.9 (12.94)	102.5 (14.06)
Depressive Symptoms Scores	3.97 (4.80)	4.45* (5.18)	3.70 (4.57)	3.99 (4.72)	3.86 (4.82)	4.27 (4.94)
Family Functioning Scores	7.74 (5.28)	8.29** (5.09)	7.54 (5.22)	7.93 (4.95)	7.60 (5.24)	8.09 (5.05)
Parent-child Interaction Scores	21.66 (2.22)	21.70 (2.25)	21.70 (2.20)	21.75 (2.21)	21.54 (2.22)	21.53 (2.28)
Proportion of Mothers with Less Than High School	10.11	10.69	8.97	8.35	---	---
Proportion of Mothers with High School Diplomas	20.45	20.74	19.64	19.70	---	---
Proportion of Mothers with Some Post-Secondary	11.81	13.44	11.77	12.72	---	---
Proportion of Mothers with Less than Some Post-Secondary Education	---	---	---	---	33.10	34.86
Proportion of Mothers with College Diplomas	29.20	30.16	29.13	31.05	33.57	33.80
Proportion of Mothers with a Post-Secondary Degree	28.44	24.97	30.49	28.18	33.33	31.34
Proportion of Mothers Married	72.21	69.38	79.91	81.77	70.75	66.20
Proportion of Mothers in Common-law Relationships	18.16	15.46	20.09	18.23	---	---
Proportion of Mothers Divorced, Separated, Widowed, or Single	9.64	15.15***	---	---	---	---
Proportion of Mothers Common-law, Divorced, Separated, Widowed, or Single	---	---	---	---	29.25	33.80
Proportion of Families who are Poor	14.45	21.63***	9.04	12.19*	8.74	12.94**
Proportion of Children who are Male	52.94	52.98	52.73	52.46	54.66	53.66
Proportion of Children in Non-relative and Relative Care	32.90	32.90	32.90	33.47	57.81	54.81
Proportion of Children in Daycare	26.09	25.06	24.97	24.34	41.29	45.19
Proportion of Children in No Care	41.01	42.04	42.13	42.19	---	---
Proportion of Child Care Workers with Training	50.89	51.81	50.00	50.75	49.65	49.48
Proportion Engaged in Early Learning Activities	67.86	74.29**	67.38	72.48*	68.30	73.86*
Proportion of Mothers Satisfied with Developmental/Learning Activities	72.60	76.78	73.57	77.76	74.83	73.78
Age of Child	2.54 (.50)	2.49** (.50)	2.54 (.50)	2.48** (.50)	2.50 (.50)	2.51 (.50)

Proportion Low Birth Weight	3.90	4.00	3.92	4.46	3.75	2.98
Proportion Not Breast Fed	14.69	9.21***	13.46	8.15***	14.45	8.92*
Proportion Premature	8.51	10.02	8.68	10.06	9.10	8.25
Age of Mother	32.47 (5.15)	31.63*** (5.37)	32.72 (4.97)	32.01** (5.11)	32.76 (4.90)	32.06* (5.13)
Proportion of Mothers Receiving Maternity Leave	67.16	59.80**	68.14	62.25*	82.40	76.49*
Hours Worked Per Week	23.48 (16.06)	22.38 (16.85)	23.49 (16.08)	22.62 (16.57)	29.97 (11.63)	30.83 (11.39)
Household Income	62.40 (26.77)	56.01*** (27.68)	66.31 (24.72)	62.03*** (25.01)	67.57 (25.65)	61.40*** (26.97)
Total Number of Siblings	1.12 (.99)	1.03* (.98)	1.13 (.99)	1.07 (.99)	.90 (.76)	.94 (.86)
Birth Order of the Child	1.85 (.99)	1.81 (.96)	1.85 (.99)	1.83 (.98)	1.71 (.77)	1.70 (.85)
Proportion of Spouses Working	96.65	94.41*	96.65	94.41*	97.89	95.73*
N	1700	960	1540	810	860	570

Note. - Statistics are reported as means (SD) and proportions. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. *p < .05. **p < .01. ***p < .001.

Appendix G: The Association between the Mediators and the Predictor Variables

Regression Estimates for the Associations between Maternal Employment within the First Four Years and Depressive Symptoms

	MSD Full Sample		
	B	SE *B*	*t value*
Intercept	8.87	1.32	6.70***
Maternal Employment in Early Childhood [a]	.06	.36	.16
High School [b]	-.33	.51	-.64
Some Post-secondary [b]	-.95	.52	-1.83
College [b]	-.69	.53	-1.31
Post-secondary [b]	-.95	.59	-1.59
Common-law [c]	.48	.30	1.62
Divorced, widowed, Separated, or Single [c]	1.06	.52	2.04*
Poverty Status	.26	.44	.58
Non-relative Care [d]	.21	.30	.71
Relative Care [d]	.37	.37	1.00
Day Care [d]	.24	.32	.74
Child Gender [e]	-.05	.21	-.25
Child Age	.04	.10	.43
Birth Weight	.45	.53	.85
Breastfed	.33	.31	1.09
Premature Birth	.53	.36	1.46
Maternal Age	-.01	.03	-.52
Maternity Leave	-.08	.26	-.30
Hours Worked	-.01	.01	-.66
Log Income	-1.34	.34	-3.98***
Number of Siblings	-.26	.30	-.86
Birth Order	.45	.31	1.43
Adjusted R^2	.05		
F	6.22***		
N	4490		

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Regression Estimates for the Associations between Maternal Work Intensity within the First Two Years and Depressive Symptoms

	PPVT-R (0/2) Work Intensity		
	B	SE *B*	*t value*
Intercept	10.88	3.16	3.45***
Work Intensity [a]	.03	.62	.05
College [b]	-.82	.75	-1.09
Post-secondary [b]	-.74	.79	-.94
Divorced, Widowed, Separated, Single, or Common-law [c]	-.18	.66	-.28
Non-relative Care [d]	-.68	.70	-.98
Day Care [d]	-.92	.81	-1.14
Proportion of Child Care Workers with Training	.13	.67	.19
Proportion of Engaged in Early Learning Activities	-.97	.57	-1.71
Proportion of Mothers Satisfied with Developmental/Learning Activities	-1.71	.58	-2.96**
Child Gender [e]	-.14	.47	-.30
Child Age	.05	.52	.09
Maternal Age	-.09	.06	-1.44
Maternity Leave	-.43	.80	-.53
Log Income	-.84	.69	-1.23
Number of Siblings	-.75	1.49	-.50
Birth Order	1.65	1.52	1.09
Adjusted R^2	.08		
F	2.12**		
N	610		

Note. – The references categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) relative care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Regression Estimates for the Associations between Maternal Employment within the First Four Years and Family Functioning

	MSD Full Sample		
	B	SE *B*	*t value*
Intercept	14.69	1.16	12.68***
Maternal Employment in Early Childhood [a]	-.72	.38	-1.87
High School [b]	-.44	.37	-1.21
Some Post-secondary [b]	-1.64	.39	-4.20***
College [b]	-.97	.38	-2.57*
Post-secondary [b]	-1.21	.40	-3.02**
Common-law [c]	-.02	.28	-.08
Divorced, Widowed, Separated, or Single [c]	-.04	.42	-.11
Poverty Status	-.54	.43	-1.26
Non-relative Care [d]	.10	.34	.28
Relative Care [d]	.09	.34	.25
Day Care [d]	-.43	.34	-1.25
Child Gender [e]	-.02	.20	-.11
Child Age	-.23	.11	-2.10*
Birth Weight	-.48	.55	-.86
Breastfed	-.09	.29	-.32
Premature Birth	-.03	.41	-.08
Maternal Age	.03	.02	1.27
Maternity Leave	-.42	.25	-1.69
Hours Worked	.03	.01	3.00**
Log Income	-.99	.32	-3.11**
Number of Siblings	-1.19	.31	-3.81***
Birth Order	1.22	.32	3.79***
Adjusted R^2	.06		
F	7.13***		
N	4490		

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Regression Estimates for the Associations between Maternal Work Intensity within the First Two Years and Family Functioning

	PPVT-R (0/2) Work Intensity		
	B	SE *B*	*t value*
Intercept	17.72	2.69	6.59***
Work Intensity [a]	.45	.74	.61
College [b]	.007	.74	.01
Post-secondary [b]	.02	.86	.02
Divorced, Widowed, Separated, Single, or Common-law [c]	-.14	.66	-.18
Non-relative Care [d]	-.04	.79	-.05
Day Care [d]	-1.28	1.20	-1.07
Proportion of Child Care Workers with Training	.57	1.10	.52
Proportion of Engaged in Early Learning Activities	-.92	.63	-1.47
Proportion of Mothers Satisfied with Developmental/Learning Activities	-1.09	.60	-1.81
Child Gender [e]	-.31	.61	-.52
Child Age	.51	.64	.79
Maternal Age	-.06	.07	-.79
Maternity Leave	-.05	.88	-.05
Log Income	-1.89	.62	-3.05**
Number of Siblings	-1.37	1.35	-1.01
Birth Order	2.21	1.40	1.58
Adjusted R^2	.06		
F	1.99*		
N	610		

Note. – The references categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) relative care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Regression Estimates for the Associations between Maternal Employment within the First Four Years and Parent-child Interactions

	MSD Full Sample		
	B	SE *B*	*t value*
Intercept	21.29	.66	32.36***
Maternal Employment in Early Childhood [a]	.61	.16	3.72**
High School [b]	.03	.20	.13
Some Post-secondary [b]	-.02	.19	-.12
College [b]	.18	.19	.94
Post-secondary [b]	.20	.21	.94
Common-law [c]	.07	.12	.56
Divorced, widowed, Separated, or Single [c]	-.01	.23	-.04
Poverty Status	.19	.21	.88
Non-relative Care [d]	-.70	.14	-4.94***
Relative Care [d]	-.30	.15	-1.99*
Day Care [d]	-.86	.16	-5.41***
Child Gender [e]	-.17	.09	-1.89
Child Age	-.63	.05	-12.11***
Birth Weight	.29	.25	1.18
Breastfed	-.09	.14	-.68
Premature Birth	.30	.16	1.84
Maternal Age	-.001	.01	-.17
Maternity Leave	.08	.11	.76
Hours Worked	-.02	.004	-3.37**
Log Income	.11	.16	.67
Number of Siblings	.05	.14	.34
Birth Order	-.29	.14	-2.09*
Adjusted R^2	.15		
F	19.63***		
N	4490		

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Regression Estimates for the Associations between Maternal Work Intensity within the First Two Years and Parent-child Interactions

	PPVT-R (0/2) Work Intensity		
	B	SE *B*	*t value*
Intercept	21.72	1.10	19.70***
Work Intensity [a]	-.07	.25	-.28
College [b]	.21	.25	.87
Post-secondary [b]	.09	.28	.30
Divorced, Widowed, Separated, Single, or Common-law [c]	.04	.23	.17
Non-relative Care [d]	-.02	.26	.09
Day Care [d]	-.11	.33	-.33
Proportion of Child Care Workers with Training	-.40	.28	-1.42
Proportion of Engaged in Early Learning Activities	.02	.21	.12
Proportion of Mothers Satisfied with Developmental/Learning Activities	.76	.22	3.48***
Child Gender [e]	.04	.19	.18
Child Age	-.41	.21	-1.96
Maternal Age	-.03	.02	-1.14
Maternity Leave	-.28	.27	-1.04
Log Income	.13	.26	.48
Number of Siblings	-.02	.42	-.05
Birth Order	-.16	.43	-.38
Adjusted R^2	.07		
F	1.78*		
N	610		

Note. – The references categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) relative care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Appendix H: Moderation Effects - Maternal Education

Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Maternal Educational Levels for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	MSD Full Sample			MSD Two-Parent Families			MSD Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	85.96	3.85	22.34***	85.88	4.07	21.10***	86.29	5.00	17.30***
Maternal Employment in Early Childhood [a]	1.00	1.92	.52	-.57	2.22	-.26	---	---	---
Work Intensity [1]	---	---	---	---	---	---	-5.26	2.46	-2.14*
High School [b/2]	-1.39	1.81	-.77	-.20	1.90	-.10	-1.63	2.14	-.76
Some Post-secondary [b/2]	.85	1.73	.49	.89	1.90	.47	-3.24	2.56	-1.26
College [b/2]	-1.76	1.65	-1.07	-1.00	1.81	-.55	-1.63	2.06	-.79
Post-secondary [b/2]	-3.88	1.76	-2.20*	-2.78	1.92	-1.44	-2.82	2.09	-1.35
Mat Employ x High School	1.73	2.58	.67	2.64	2.71	.98	---	---	---
Wk Intensity x High School	---	---	---	---	---	---	3.97	3.22	1.23
Mat Employ x Some Post-Secondary	-.55	2.39	-.23	.14	2..72	.05	---	---	---
Wk Intensity x Some Post- Secondary	---	---	---	---	---	---	5.70	3.30	1.73
Mat Employ x College	2.62	2.17	1.21	2.61	2.45	1.06	---	---	---
Wk Intensity x College	---	---	---	---	---	---	4.04	2.80	1.44
Mat Employ x Post-Secondary	3.07	2.22	1.39	2.99	2.49	1.20	---	---	---
Wk Intensity x Post-Secondary	---	---	---	---	---	---	3.66	2.73	1.34
Common-law [c/3]	-1.49	.74	-2.02*	-1.11	.76	-1.47	-.51	.85	-.60
Divorced, Widowed, Separated, or Single [c/3]	-.94	1.57	-.60	---	---	---	1.73	1.79	.96
Poverty Status	-.58	1.31	-.45	-1.82	1.46	-1.24	-1.45	1.68	-.86
Non-relative Care [d/4]	-.57	1.05	-.55	.18	.99	.18	1.11	1.10	1.01
Relative Care [d/4]	-.07	1.13	-.06	.89	1.15	.77	1.00	1.25	.80
Day Care [d/4]	.32	1.19	.27	.58	1.19	.49	1.95	1.23	1.58
Child Gender [e/5]	4.05	.64	6.37***	3.94	.62	6.31***	5.31	.77	6.89***
Child Age	.14	.35	.41	.55	.34	1.61	-.07	.42	-.16

Birth Weight	3.69	1.61	2.30*	2.43	1.67	1.46	-.44	1.67	-.26
Breastfed	3.11	.98	3.17**	1.92	.95	2.02*	2.71	1.24	2.18*
Premature Birth	-.97	1.12	-.86	-1.66	1.10	-1.51	-1.62	1.32	-1.23
Maternal Age	-.13	.07	-1.84	-.11	.07	-1.47	-.20	.09	-2.18*
Maternity Leave	.11	.73	.14	-.03	.73	.05	-.96	.95	-1.01
Hours Worked	-.06	.03	-1.81	-.04	.04	1.34	---	---	---
Log Income	1.80	.95	1.89	2.13	1.04	2.05*	3.54	1.30	2.73**
Number of Siblings	1.15	.92	1.25	1.35	.94	1.44	3.29	1.04	3.16**
Birth Order	-1.84	.94	-1.96	-1.83	.95	-1.92	-3.23	1.06	-3.06**
Spouse Works	---	---	---	1.89	1.60	1.18	---	---	---
Adjusted R^2	.04			.04			.06		
F	3.82***			3.64***			3.59***		
N	4490			3970			2880		

Note. – Reference categories for the full sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Reference categories for the sub-sample work intensity were 1) 20 hours or less per week for the sub-sample work intensity, 2) less than high school, 3) married, 4) no child care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Two Years and Maternal Educational Levels for the Full Sample and Sub-sample - Two-Parent Families

	PPVT-R (0/2) Full Sample			PPVT-R (0/2) Two-Parent Families		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	76.67	6.34	12.09***	77.09	6.06	12.72***
Maternal Employment in Early Childhood [a]	4.58	3.56	1.28	2.73	3.86	.71
High School [b]	-2.46	3.05	-.81	-4.01	3.03	-1.32
Some Post-secondary [b]	1.09	3.37	.32	.87	2.95	.29
College [b]	4.52	3.29	1.38	2.76	3.08	.90
Post-secondary [b]	5.33	2.87	1.86	3.29	2.79	1.18
Mat Employ x High School	2.19	4.29	.51	5.40	4.81	1.12
Mat Employ x Some Post-Secondary	-1.26	4.35	-.29	.01	4.51	.00
Mat Employ x College	-4.81	4.01	-1.20	-2.07	4.26	-.49
Mat Employ x Post-Secondary	-2.57	3.65	-.70	.33	3.99	.08
Common-law [c]	-.57	1.23	-.46	-.32	1.22	-.26
Divorced, Widowed, Separated, or Single [c]	-4.23	3.04	-1.39	---	---	---
Poverty Status	-1.69	2.71	-.62	-1.75	2.64	-.66
Non-relative Care [d]	1.22	1.65	.74	2.43	1.62	1.50
Relative Care [d]	1.66	1.63	1.02	1.62	1.63	.99
Day Care [d]	-.82	1.32	-.62	-.25	1.26	-.20
Child Gender [e]	1.65	1.05	1.57	2.58	1.02	2.52**
Child Age	-.33	1.07	-.31	-1.00	1.03	-.97
Birth Weight	1.57	3.99	.39	---	---	---
Breastfed	2.03	1.43	1.43	3.22	1.42	2.26*
Premature Birth	-.78	1.85	-.42	-1.61	1.39	-1.16
Maternal Age	-.10	.13	-.82	-.12	.12	-1.01
Maternity Leave	.45	1.34	.34	1.11	1.34	.83
Hours Worked	-.09	.04	-2.07*	-.10	.04	-2.21*
Log Income	4.45	1.68	2.65**	5.52	1.64	3.12**
Number of Siblings	-1.31	1.95	-.67	-1.22	1.95	-.63
Birth Order	-1.56	1.95	-.80	-1.57	1.94	-.81

Spouse Works	---	---	---	-3.69	3.33	-1.11
Adjusted R^2	.11			.10		
F	5.99***			4.97***		
N	1790			1630		

Note. – Reference categories for the full sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test – Revised) Scores as a Function of Maternal Employment within the First Four Years and Maternal Educational Levels for the Full Sample

	PPVT-R (0/4) Full Sample		
	B	*SE B*	*t value*
Intercept	81.75	5.36	15.26***
Maternal Employment in Early Childhood [a]	.92	2.82	.33
High School [b]	4.90	2.85	1.72
Some Post-secondary [b]	8.88	5.34	1.66
College [b]	4.43	2.83	1.56
Post-secondary [b]	.20	2.93	.07
Mat Employ x High School	-2.79	3.35	-.83
Mat Employ x Some Post-Secondary	-2.45	5.99	-.41
Mat Employ x College	.23	3.31	.07
Mat Employ x Post-Secondary	6.36	3.33	1.91
Common-law [c]	.17	1.12	.15
Divorced, Widowed, Separated, or Single [c]	2.81	1.80	1.56
Poverty Status	.17	1.88	.09
Non-relative and Relative Care [d]	-.57	1.09	-.52
Day Care [d]	.33	1.22	.27
Child Gender [e]	2.25	.85	2.64**
Child Age	-.14	.87	-.16
Breastfed	2.49	1.07	2.33*
Maternal Age	.22	.09	2.43*
Maternity Leave	1.09	1.13	.97
Hours Worked	-.07	.04	-1.73
Log Income	2.71	1.43	1.89
Number of Siblings	-.19	.99	-.19
Birth Order	-2.20	.95	-2.30*
Adjusted R^2	.10		
F	5.13***		
N	1700		

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Two Years and Maternal Educational Levels for the Sub-sample - Work Intensity with and without Controls for Child Care Quality

	PPVT-R (0/2) Work Intensity with Child Care Quality Controls			PPVT-R (0/2) Work Intensity without Child Care Quality Controls		
	B	*SE B*		*B*	*SE B*	*t value*
Intercept	85.22	8.08	10.54***	85.40	8.10	10.54***
Work Intensity [a]	-4.39	3.60	-1.22	-5.29	3.69	-1.43
College [b]	.41	4.20	.10	-.15	4.26	-.03
Post-secondary [b]	-.29	3.85	-.07	-.81	3.94	-.21
Wk Intensity x College	-3.21	4.76	-.67	-2.29	4.88	-.47
Wk Intensity x Post-Secondary	1.21	4.24	.28	2.08	4.31	.48
Divorced, Widowed, Separated, Single, or Common-law [c]	-.30	1.92	-.16	-.28	1.91	-.15
Day Care [d]	-1.80	1.86	-.97	-1.42	2.19	-.65
Non-relative Care [d]	-1.13	1.89	-.60	-1.00	1.99	-.50
Proportion of Child Care Workers with Training	---	---	---	.53	1.69	.31
Participation in Learning Activities	---	---	---	-1.81	1.60	-1.13
Mothers' Satisfaction with Developmental/ Learning Activities	---	---	---	2.08	1.67	1.24
Child Gender [e]	-.20	1.42	-.14	-.18	1.42	-.13
Child Age	-3.27	1.56	-2.09*	-3.24	1.54	-2.11*
Maternal Age	.24	.19	1.29	.25	.19	1.33
Maternity Leave	.56	1.94	.29	.72	1.97	.36
Log Income	4.99	1.83	2.73**	4.89	1.83	2.67**
Number of Siblings	3.55	3.36	1.06	3.70	3.37	1.10
Birth Order	-7.06	3.46	-2.04*	-7.11	3.44	-2.06*
Adjusted R^2	.10			.11		
F	3.62***			3.24***		
N	610			610		

Note. –Reference categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) relative care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented.
*p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Four Years and Maternal Educational Levels for the Sub-sample - Work Intensity with and without Controls for Child Care Quality

	PPVT-R (0/4) Work Intensity with Controls for Child Care Quality			PPVT-R (0/4) Work Intensity without Controls for Child Care		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	94.74	6.40	14.81***	96.56	6.19	15.60***
Work Intensity [a]	.12	2.05	.06	-.10	2.03	-.05
College [b]	5.31	2.54	2.09*	4.84	2.46	1.97*
Post-secondary [b]	4.48	2.77	1.62	4.34	2.72	1.59
Wk Intensity x College	-2.79	3.05	-.92	-2.20	2.94	-.75
Wk Intensity x Post-Secondary	-.17	3.36	-.05	-.04	3.27	-.01
Divorced, Widowed, Separated, Single, or Common-law [c]	1.07	1.41	.76	1.24	1.41	.88
Poverty Status	.19	2.92	.07	.52	2.83	.18
Day Care [d]	.19	1.21	.15	-.16	1.63	-.10
Proportion of Child Care Workers with Training	---	---	---	1.32	1.60	.83
Participation in Learning Activities	---	---	---	-3.12	1.30	-2.40*
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	-.75	1.45	-.52
Child Gender [e]	1.47	1.17	1.26	1.12	1.17	.96
Child Age	.19	1.19	.16	-.23	1.20	-.20
Maternal Age	.31	.12	2.56*	.31	.12	2.59**
Maternity Leave	.05	1.42	.03	.09	1.41	.06
Log Income	.73	1.98	.37	.91	1.94	.47
Number of Siblings	-.73	1.38	-.53	-.66	1.37	-.48
Birth Order	-1.77	1.33	-1.33	-1.77	1.30	-1.36
Adjusted R^2	.05			.06		
F	2.54**			2.45***		
N	860			860		

Note. – Reference categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) non-relative and relative care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Appendix I: Moderation Effects - Family Structure

Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Family Structure for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	MSD Full Sample			MSD Two-Parent Families			MSD Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	85.14	3.88	21.93***	84.76	4.04	20.96***	83.21	4.90	16.99***
Maternal Employment in Early Childhood [a]	2.05	1.17	1.76	1.07	1.17	.92	---	---	---
Work Intensity [1]	---	---	---	---	---	---	-.75	.90	-.84
High School [b/2]	-.61	1.34	-.45	1.13	1.38	.82	.87	1.91	.46
Some Post-secondary [b/2]	.20	1.28	.15	.64	1.39	.46	.48	1.77	.27
College [b/2]	-.47	1.19	-.39	.29	1.30	.22	.96	1.62	.59
Post-secondary [b/2]	-2.29	1.32	-1.74	-1.25	1.40	-.89	-.54	1.78	-.30
Common-law [c/3]	-3.12	1.32	-2.38*	-2.66	1.35	-1.97*	1.35	1.46	.92
Divorced, Widowed, Separated, or Single [c/3]	-2.23	2.34	-.95	---	---	---	3.56	2.41	1.48
Mat Employ x Common-law	2.48	1.53	1.62	2.32	1.56	1.48	---	---	---
Wk Intensity x Common-law	---	---	---	---	---	---	-2.45	1.76	-1.39
Mat Employ x Divorced, Widowed, Separated, or Single	2.40	2.64	.91	---	---	---	---	---	---
Wk Intensity x Divorced, Widowed, Separated, or Single	---	---	---	---	---	---	-2.61	2.88	-.91
Poverty Status	-.80	1.31	-.61	-1.95	1.46	-1.33	-1.44	1.73	-.83
Non-relative Care [d/4]	-.28	1.01	-.27	.34	.97	.35	1.13	1.09	1.03
Relative Care [d/4]	-.07	1.12	-.06	.96	1.14	.84	1.10	1.24	.89
Day Care [d/4]	.41	1.18	.35	.58	1.17	.50	2.02	1.22	1.66
Child Gender [e/5]	4.06	.64	6.33***	3.94	.62	6.29***	5.35	.77	6.92***
Child Age	.15	.34	.43	.56	.34	1.62	-.02	.43	-.06
Breastfed	3.15	.98	3.20**	2.00	.94	2.13*	2.90	1.24	2.33*
Birth Weight	3.75	1.59	2.29*	2.59	1.66	1.56	-.64	1.67	-.38
Premature Birth	-.94	1.12	-.84	-1.57	1.10	-1.42	-1.62	1.31	-1.24
Maternal Age	-.13	.07	-1.86	-.11	.07	-1.53	-.20	.09	-2.20*

Maternity Leave	.26	.73	.18	.08	.72	.10	-.97	.96	-1.02
Hours Worked	-.06	.03	-1.96	-.04	.03	-1.46	---	---	---
Log Income	1.91	.95	2.02*	2.24	1.04	2.16*	3.58	1.30	2.75**
Number of Siblings	1.25	.92	1.37	1.38	.93	1.48	3.28	1.04	3.15**
Birth Order	-1.96	.93	-2.10*	-1.87	.95	-1.98*	-3.17	1.06	-3.00**
Spouse Works	---	---	---	1.69	1.59	1.06	---	---	---
Adjusted R^2	.04			.04			.06		
F	4.14***			3.97***			3.69***		
N	4490			3970			2880		

Note. – Reference categories for the full-sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Reference categories for the sub-sample work intensity were 1) 20 hours or less per week for the sub-sample work intensity, 2) less than high school, 3) married, 4) no child care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$.

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Two Years and Family Structure for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	PPVT-R (0/2) Full Sample			PPVT-R (0/2) Two-Parent Families			PPVT-R (0/2) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	77.45	6.40	12.10***	77.40	6.16	12.56***	85.75	7.30	11.27***
Maternal Employment in Early Childhood [a]	1.69	1.68	1.01	2.30	1.69	1.37	---	---	---
Work Intensity [1]	---	---	---	---	---	---	-4.91	1.88	-2.62**
High School [b]	-1.61	2.29	-.70	-2.03	2.32	-.87	---	---	---
Some Post-secondary [b]	.73	2.35	.31	.79	2.21	.36	---	---	---
College [b/2]	2.39	2.28	1.05	1.61	2.22	.73	-2.02	2.09	-.97
Post-secondary [b/2]	4.44	2.19	2.02*	3.45	2.17	1.59	.07	2.18	.32
Common-law [c]	-1.90	1.78	-1.07	-1.61	1.80	-.90	---	---	---
Divorced, Widowed, Separated, or Single [c]	-4.15	4.92	-.84	---	---	---	---	---	---
Divorced, Widowed, Separated, Single, or Common-law [3]	---	---	---	---	---	---	-.53	3.24	-.16
Mat Employ x Common-law	2.85	2.32	1.23	2.58	2.37	1.09	---	---	---
Mat Employ x Divorced, Widowed, Separated, or Single	.17	4.94	.04	---	---	---	---	---	---
Wk Intensity x Divorced, Widowed, Separated, Single, or Common-law	---	---	---	---	---	---	-.02	3.52	-.00
Poverty Status	-1.59	2.67	-.59	-1.81	2.66	-.68	---	---	---
Non-relative Care [d/4]	1.36	1.63	.83	2.47	1.60	1.54	-.98	2.03	-.48
Relative Care [d]	1.85	1.63	1.13	1.64	1.63	1.00	---	---	---
Day Care [d/4]	-.82	1.28	-.64	-.24	1.24	-.19	-1.57	2.22	-.71
Proportion of Child Care Workers with Training	---	---	---	---	---	---	.67	1.69	.40
Participation in Learning Activities	---	---	---	---	---	---	-1.80	1.60	-1.12
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	---	---	---	2.05	1.65	1.24
Child Gender	1.49	1.08	1.37	2.48	1.03	2.40*	-.16	1.44	-.11
Child Age [e/5]	-.48	1.07	-.45	-1.14	1.03	-1.11	-3.12	1.52	-2.05*

Birth Weight	1.61	4.03	.40	---	---	---	---	---	---
Breastfed	2.04	1.49	1.36	3.29	1.45	2.28*	---	---	---
Premature Birth	-.88	1.87	-.47	-1.70	1.44	-1.18	---	---	---
Maternal Age	-.08	.12	-.62	-.09	.12	-.78	.23	.19	1.23
Maternity Leave	.56	1.34	.42	1.19	1.34	.88	.63	1.95	.32
Hours Worked	-.10	.04	-2.32*	-.10	.04	-2.36*	---	---	---
Log Income	4.41	1.65	2.68**	5.02	1.62	3.10**	4.79	1.81	2.65**
Number of Siblings	-1.46	1.93	-.76	-1.35	1.94	-.70	3.29	3.45	.95
Birth Order	-1.43	1.93	-.74	-1.49	1.94	-.77	-6.60	3.53	-1.87
Spouse Works	---	---	---	-3.57	3.36	-1.06	---	---	---
Adjusted R^2	.11			.10			.10		
F	6.40***			5.15***			3.37***		
N	1790			1630			610		

Note. – Reference categories for the full sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Reference categories for the sup-sample work intensity were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p $\leq$ .05 **p $\leq$ .01 ***p $\leq$ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Four Years and Family Structure for the Full Sample and Sub-sample - Work Intensity

	PPVT-R (0/4) Full Sample			PPVT-R (0/4) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	79.40	5.07	15.66***	98.16	6.42	15.29***
Maternal Employment in Early Childhood [a]	2.23	1.79	1.24	---	---	---
Work Intensity [1]	---	---	---	-1.36	1.73	-.79
High School [b]	2.70	1.72	1.55	---	---	---
Some Post-secondary [b]	6.68	2.22	3.01**	---	---	---
College [b/2]	4.33	1.74	2.49*	3.06	1.48	2.06*
Post-secondary [b/2]	5.25	1.90	2.76**	4.26	1.73	2.46*
Common-law [c]	3.76	3.16	1.19	---	---	---
Divorced, Widowed, Separated, or Single [c]	3.50	3.04	1.15	---	---	---
Divorced, Widowed, Separated, Single, or Common-law [3]	---	---	---	-.47	2.31	-.20
Mat Employ x Common-law	-4.11	3.33	-1.23	---	---	---
Mat Employ x Divorced, Widowed, Separated, or Single	-.48	3.27	-.15	---	---	---
Wk Intensity x Divorced, Widowed, Separated, Single, or Common-law	---	---		2.02	2.56	.79
Poverty Status	.08	1.91	-.04	.50	2.82	.18
Non-relative and relative care [d]	-.53	1.09	-.49	---	---	---
Day Care [d/4]	.45	1.25	.36	-.14	1.63	-.09
Proportion of Child Care Workers with Training	---	---	---	1.26	1.60	.79
Participation in Learning Activities	---	---	---	-3.14	1.32	-2.37*
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	.72	1.45	-.50
Child Gender [e/5]	2.35	.87	2.71**	1.07	1.17	.91
Child Age	-.04	.88	-.04	-.27	1.19	-.23
Breastfed	2.46	1.06	2.32*	---	---	---

Maternal Age	.21	.09	2.38*	.32	.12	2.65**
Maternity Leave	1.16	1.14	1.02	-.01	1.41	-.01
Hours Worked	-.07	.04	-1.73	---	---	---
Log Income	3.08	1.41	2.18*	.81	1.94	.42
Number of Siblings	-.17	1.00	-.17	-.75	1.38	-.54
Birth Order	-2.09	.96	-2.18*	-1.76	1.30	-1.35
Adjusted R^2	.09			.06		
F	5.27***			2.68***		
N	1700			860		

Note. – Reference categories for the full sample were a) never worked, b) less than high school, c) married, d) no child care, and e) male. The reference categories for the sub-sample work intensity were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) non-relative and relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p $\leq$ .05 **p $\leq$ .01 ***p $\leq$ .001.

Appendix J: Moderation Effects - Family Economic Status

Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Family Economic Status for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	MSD Full Sample			MSD Two-Parent Families			MSD Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	84.85	3.746	22.54***	84.85	4.05	20.94***	85.59	4.81	17.79***
Maternal Employment in Early Childhood [a]	2.60	1.85	1.41	1.00	2.13	.47	---	---	---
Work Intensity [1]	---	---	---	---	---	---	-4.13	2.30	-1.79
High School [b/2]	-.61	1.34	-.46	1.07	1.39	.77	.813	1.88	.44
Some Post-secondary [b/2]	.25	1.27	.19	.63	1.39	.46	.45	1.75	.26
College [b/2]	-.40	1.18	-.34	.29	1.30	.22	.89	1.60	.56
Post-secondary [b/2]	-2.23	1.31	-1.71	-1.27	1.40	-.90	-.58	1.75	-.33
Common-law [c/3]	-1.55	.74	-2.09*	-1.18	.75	-1.57	-.54	.85	-.63
Divorced, Widowed, Separated, or Single [c/3]	-.87	1.58	-.55	---		---	1.723	1.80	.96
Poverty Status	-.79	1.60	-.49	-2.16	1.79	-1.20	-3.37	1.96	-1.72
Mat Employ x Poverty Status	.23	1.86	.12	.64	2.16	.29	--	---	---
Wk Intensity x Poverty Status	---	---	---	---	---	---	3.16	2.41	1.31
Non-relative Care [d/4]	-.40	1.01	-.40	.27	.97	.28	1.12	1.08	1.03
Relative Care [d/4]	-.02	1.11	-.01	.91	1.14	.80	1.08	1.23	.87
Day Care [d/4]	.44	1.17	.38	.64	1.16	.55	1.97	1.22	1.62
Child Gender [e/5]	4.06	.64	6.36***	3.95	.63	6.30***	5.34	.77	6.92***
Child Age	.16	.34	.48	.56	.34	1.64	-.04	.43	-.09
Birth Weight	3.74	1.59	2.35*	2.51	1.66	1.51	-.46	1.68	-.27
Breastfed	3.14	.98	3.20**	1.98	.94	2.10*	2.86	1.24	2.31*
Premature Birth	-.92	1.12	-.82	-1.58	1.09	-1.45	-1.63	1.32	-1.24
Maternal Age	-.13	.07	-1.90	-.11	.07	-1.55	-.20	.09	-2.18*
Maternity Leave	.07	.73	.09	.01	.73	.02	-.84	.93	-.90
Hours Worked	-.06	.03	-1.81	-.04	.03	-1.34	---	---	---
Log Income	1.88	.95	1.98*	2.20	1.03	2.13*	3.47	1.30	2.67**
Number of Siblings	1.18	.92	1.28	1.35	.93	1.45	3.22	1.04	3.11**
Birth Order	-1.86	.93	-2.00*	-1.82	.95	-1.93	-3.13	1.05	-2.97**
Spouse Works	---	---	---	1.79	1.60	1.12	---	---	---

Adjusted R^2	.04	.03	.06
F	4.11***	3.78***	3.90***
N	4490	3970	2880

Note. – Reference categories for the full sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. The reference categories for the sub-sample work intensity were 1) 20 hours or less per week, 2) less than high school, 3) married, 4) no child care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Two Years and Family Economic Status for the Full Sample and Sub-sample - Two-Parent Families

	PPVT-R (0/2) Full Sample			PPVT-R (0/2) Two-Parent Families		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	77.74	6.30	12.35***	77.54	6.40	12.12***
Maternal Employment in Early Childhood [a]	.66	3.48	.19	1.12	3.59	.31
High School [b]	-1.71	2.30	-.75	-2.15	2.34	-.92
Some Post-secondary [b]	.70	2.35	.30	.80	2.23	.36
College [b]	2.35	2.29	1.03	1.52	2.23	.68
Post-secondary [b]	4.36	2.2	1.98*	3.35	2.18	1.53
Common-law [c]	-.49	1.22	-.40	-.34	1.21	-.28
Divorced, Widowed, Separated, or Single [c]	-3.93	3.08	-1.28	---	---	---
Poverty Status	-2.04	3.29	-.62	-2.21	3.22	-.69
Mat Employ x Poverty Status	1.96	3.42	.57	1.94	3.57	.54
Non-relative Care [d]	1.23	1.64	.75	2.38	1.61	1.48
Relative Care [d]	1.84	1.63	1.13	1.61	1.63	.98
Day Care [d]	-.84	1.30	-.65	-.21	1.25	-.17
Child Gender [e]	1.54	1.08	1.42	2.52	1.04	2.41*
Child Age	-.53	1.08	-.50	-1.16	1.03	-1.12
Birth Weight	1.56	4.09	.39	---	---	---
Breastfed	2.07	1.48	1.40	3.33	1.46	2.29*
Premature Birth	-.84	1.87	-.45	-1.65	1.43	-1.16
Maternal Age	-.08	.12	-.65	-.10	.12	-.82
Maternity Leave	.53	1.36	.39	1.15	1.37	.84
Hours Worked	-.09	.04	-2.19*	-.10	.04	-2.26*
Log Income	4.37	1.65	2.64**	4.98	1.63	3.06**
Number of Siblings	-1.43	1.93	-.74	-1.33	1.94	-.68
Birth Order	-1.44	1.94	-.74	-1.49	1.94	-.77
Spouse Works	---	---	---	-3.44	3.30	-1.04
Adjusted R^2	.11			.10		
F	6.71***			5.23***		

N	1790	1630

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. For the sub-sample work intensity, the interaction between family economic status and work intensity was not run because the cell sizes were too small. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Four Years and Family Economic Status for the Full Sample

	PPVT-R (0/4) Full Sample		
	B	*SE B*	*t value*
Intercept	78.26	5.26	14.89***
Maternal Employment in Early Childhood [a]	3.54	2.57	1.38
High School [b]	2.56	1.73	1.48
Some Post-secondary [b]	6.52	2.20	2.96**
College [b]	4.18	1.73	2.42*
Post-secondary [b]	5.08	1.89	2.68**
Common-law [c]	.29	1.13	.25
Divorced, Widowed, Separated, or Single [c]	3.09	1.78	1.73
Poverty Status	1.41	2.70	.52
Mat Employ x Poverty Status	-2.70	2.74	-.99
Non-relative and Relative Care [d]	-.37	1.09	-.34
Day Care [d]	.52	1.25	.42
Child Gender [e]	2.33	.87	2.67**
Child Age	.06	.88	.07
Breastfed	2.45	1.07	2.29*
Maternal Age	.21	.09	2.40*
Maternity Leave	1.24	1.15	1.08
Hours Worked	-.07	.04	-1.83
Log Income	3.25	1.41	2.30*
Number of Siblings	-.17	1.00	-.18
Birth Order	-2.17	.95	-2.28*
Adjusted R^2	.09		
F	5.49***		
N	1700		

Note. – Reference categories were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Four Years and Family Economic Status for the Sub-sample - Work Intensity with and without Controls for Child Care Quality

	PPVT-R (0/4) Work Intensity without Controls for Child Care Quality			PPVT-R (0/4) Work Intensity with Controls for Child Care Quality		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	95.67	6.69	14.30***	97.99	6.55	14.96***
Work Intensity [a]	-.83	4.11	-.20	-1.62	4.07	-.40
College [b]	3.15	1.49	2.11*	3.13	1.47	2.12*
Post-secondary [b]	4.32	1.78	2.43*	4.29	1.73	2.48*
Divorced, Widowed, Separated, Single, Common-law [c]	.92	1.40	.66	1.16	1.40	.83
Poverty Status	.28	3.97	.07	-.08	3.95	-.02
Wk Intensity x Poverty Status	.03	4.42	.01	.96	4.39	.22
Day Care [d]	.20	1.20	.17	-.14	1.63	-.09
Proportion of Child Care Workers with Training	---	---	---	1.30	1.60	.82
Participation in Learning Activities	---	---	---	-3.21	1.32	-2.43*
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	-.79	1.46	-.54
Child Gender [e]	1.47	1.17	1.25	1.11	1.17	.94
Child Age	.17	1.17	.15	-.27	1.19	-.23
Maternal Age	.30	.12	2.54*	0.31	.12	2.61**
Maternity Leave	-.06	1.43	-.04	.01	1.41	.00
Log Income	.70	1.98	.35	.87	1.93	.45
Number of Siblings	-.79	1.38	-.57	-.68	1.37	-.50
Birth Order	-1.72	1.34	-1.29	-1.74	1.30	-1.33
Adjusted R^2	.05			.05		
F	2.36**			2.57***		
N	860			860		

Note. – Reference categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) non-relative or relative care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p $\leq$ .05 **p $\leq$ .01 ***p $\leq$ .001.

Appendix K: Moderation Effects - Child Care Type

Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Child Care Type for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	MSD Full Sample			MSD Two-Parent Families			MSD Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	86.07	3.79	22.73***	85.31	4.06	21.04***	84.23	4.89	17.22***
Maternal Employment in Early Childhood [a]	1.58	1.18	1.33	.96	1.18	.81	---	---	---
Work Intensity [b]	---	---	---	---	---	---	-1.62	1.47	-1.10
High School [b/2]	-.51	1.34	-.38	1.04	1.39	.75	1.04	1.90	.55
Some Post-secondary [b/2]	.27	1.26	.21	.56	1.39	.40	.55	1.75	.32
College [b/2]	-.43	1.18	-.37	.23	1.30	.18	1.05	1.61	.65
Post-secondary [b/2]	-2.20	1.30	-1.69	-1.30	1.40	-.92	-.35	1.76	-.20
Common-law [c/3]	-1.53	.74	-2.08*	-1.20	.75	-1.60	-.41	.86	-.48
Divorced, Widowed, Separated, or Single [c/3]	-.71	1.53	-.46	---	---	---	1.602	1.80	.90
Poverty Status	-.55	1.29	-.43	-1.81	1.44	-1.25	-1.38	1.70	-.81
Non-relative Child Care [d/4]	-5.64	3.48	-1.62	-1.44	2.97	-.49	-1.30	1.45	-.90
Relative Child Care [d/4]	1.14	2.30	0.50	2.60	2.70	.96	1.82	1.48	1.23
Day Care [d/4]	-4.95	3.51	-1.41	-5.11	4.13	-1.24	3.70	1.60	2.32*
Mat Employ x Non-relative Care	6.72	3.70	1.81	2.34	3.20	.73	---	---	---
Wk Intensity x Non-relative Care	---	---	---	---	---	---	3.33	1.99	1.68
Mat Employ x Relative Care	-.43	2.59	-.17	-1.42	2.98	-.48	---	---	---
Wk Intensity x Relative Care	---	---	---	---	---	---	-.98	2.24	-.44
Mat Employ x Day Care	6.97	3.66	1.90	6.82	4.22	1.61	---	---	---
Wk Intensity x Day Care	---	---	---	---	---	---	-2.06	2.13	-.97
Child Gender [e/5]	4.05	.62	6.49***	3.99	.62	6.48***	5.39	.77	6.98***
Child Age	.19	.34	.56	.57	.34	1.68	-.04	.43	-.09
Birth Weight	3.72	1.59	2.34*	2.61	1.67	1.57	-.64	1.68	-.38

Breastfed	3.19	.97	3.29**	2.03	.95	2.14*	2.83	1.24	2.28*
Premature Birth	-1.01	1.10	-.92	-1.61	1.09	-1.47	-1.76	1.34	-1.33
Maternal Age	-.13	.07	-1.95	-.11	.07	-1.60	-.20	.09	-2.24*
Maternity Leave	-.01	.73	-.02	-.09	.72	-.12	-.97	.95	-1.02
Hours Worked	-.06	.03	-2.01*	-.04	.03	-1.36	---	---	---
Log Income	1.61	.95	1.70	2.03	1.04	1.94	3.43	1.30	2.64**
Number of Siblings	1.38	.90	1.54	1.47	.89	1.65	3.34	1.04	3.20**
Birth Order	-2.07	.91	-2.27*	-1.96	.91	-2.14*	-3.22	1.07	-3.02**
Spouse Works	---	---	---	1.87	1.59	1.18	---	---	---
Adjusted R^2	.04			.04			.06		
F	4.04***			4.09***			3.99***		
N	4490			3970			2880		

Note. – Reference categories for the full-sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Reference categories for the sub-sample work intensity were 1) 20 hours or less per week for the sub sample work intensity, 2) less than high school, 3) married, 4) no child care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p $\leq$ .05 **p $\leq$ .01 ***p $\leq$ .001.

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Two Years and Child Care Type for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	PPVT-R (0/2) Full Sample			PPVT-R (0/2) Two-Parent Families			PPVT-R (0/2) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	77.77	6.29	12.36***	77.41	6.16	12.55***	90.60	7.37	12.30***
Maternal Employment in Early Childhood [a]	1.35	1.91	.71	2.21	1.92	1.15	---	---	---
Work Intensity [1]	---	---	---	---	---	---	-10.86	3.21	-3.37**
High School [b]	-1.65	2.28	-.73	-2.06	2.35	-.88	---	---	---
Some Post-secondary [b]	.71	2.35	.30	.92	2.23	.41	---	---	---
College [b/2]	2.42	2.28	1.06	1.67	2.25	.74	-1.68	2.05	-.82
Post-secondary [b/2]	4.32	2.19	1.98*	3.46	2.18	1.59	1.18	2.12	.55
Common-law [c]	-.51	1.22	-.42	-.35	1.21	-.29	---	---	---
Divorced, Widowed, Separated, or Single [c]	-3.97	2.99	-1.33	---	---	---	---	---	---
Divorced, Widowed, Separated, Single, or Common-law [3]	---	---	---	---	---	---	-.41	1.91	-.22
Poverty Status	-1.47	2.69	-.55	-1.67	2.64	-.63	---	---	---
Non-relative Child Care [d/4]	.83	2.98	.28	2.87	2.90	.99	-7.45	4.31	-1.73
Relative Child Care [d]	1.67	2.59	.64	.02	2.54	.01	---	---	---
Day Care [d/4]	-2.23	2.15	-1.04	-1.01	1.99	-.51	-6.47	3.39	-1.91
Mat Employ x Non-relative Care	1.08	3.38	.32	-.58	3.38	-.17	---	---	---
Wk Intensity x Non-relative Care	---	---	---	---	---	---	8.77	4.79	1.83
Mat Employ x Relative Care	.52	3.17	.17	3.05	3.24	.94	---	---	---
Mat Employ x Day Care	2.88	2.71	1.06	1.60	2.64	.61	---	---	---
Wk Intensity x Day Care	---	---	---	---	---	---	6.57	3.92	1.68
Proportion of Child Care Workers with Training	---	---	---	---	---	---	.67	1.64	.41
Participation in Learning Activities	---	---	---	---	---	---	-1.81	1.58	-1.15
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	---	---	---	2.41	1.63	1.48

Child Gender [e/5]	1.54	1.08	1.42	2.49	1.04	2.40*	-.22	1.44	-.16
Child Age	.63	1.09	-.58	-1.22	1.05	-1.16	-3.01	1.51	-1.99
Birth Weight	1.46	4.04	.36	---	---	---	---	---	---
Breastfed	2.026	1.44	1.43	3.22	1.44	2.23*	---	---	---
Premature	-1.05	1.86	-.57	-1.71	1.46	-1.17	---	---	---
Maternal Age	-.07	.12	-.58	-.09	.12	-.73	.24	.19	1.26
Maternity Leave	.62	1.35	.46	1.20	1.38	.87	.82	1.97	.42
Hours Worked	-.09	.04	-2.24*	-.10	.04	-2.24*	---	---	---
Log Income	4.34	1.65	2.63**	4.97	1.62	3.06**	4.55	1.77	2.58*
Number of Siblings	-1.46	1.95	-.75	-1.36	1.96	-.69	4.00	3.40	1.18
Birth Order	-1.49	1.95	-.77	-1.49	1.96	-.76	-7.13	3.48	-2.05*
Spouse Works	---	---	---	-3.51	3.36	-1.04	---	---	---
Adjusted R^2	.11			.10			.11		
F	6.53***			5.39***			3.79***		
N	1790			1630			610		

Note. – Reference categories for the full sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Reference categories for the sup-sample work intensity were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Four Years and Child Care Type for the Full Sample and Sub-sample - Work Intensity

	PPVT-R (0/4) Full Sample			PPVT-R (0/4) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	79.79	5.22	15.30***	97.26	6.25	15.57***
Maternal Employment in Early Childhood [a]	1.25	1.79	.70	---	---	---
Work Intensity [1]	---	---	---	-.69	1.69	-.40
High School [b]	2.86	1.71	1.67	---	---	---
Some Post-secondary [b]	6.79	2.23	3.05**	---	---	---
College [b/2]	4.47	1.71	2.62**	3.13	1.48	2.11*
Post-secondary [b/2]	5.30	1.88	2.83**	4.30	1.73	2.49*
Common-law [c]	.33	1.12	.29	---	---	---
Divorced, Widowed, Separated, or Single [c]	3.17	1.81	1.75	---	---	---
Divorced, Widowed, Separated, Single, or Common-law [3]	---	---	---	1.17	1.40	.83
Poverty Status	-.09	1.92	-.05	.61	2.84	.21
Non-relative and Relative Child Care [d]	-2.78	2.59	-1.07	---	---	---
Day Care [d/4]	.83	3.79	.22	.02	2.50	.01
Mat Employ x Non-relative and Relative Child Care	2.64	2.84	.93	---	---	---
Mat Employ x Day Care	-.31	3.98	-.08	---	---	---
Wk Intensity x Day Care	---	---	---	-.21	2.76	-.08
Proportion of Child Care Workers with Training	---	---	---	1.31	1.60	.82
Participation in Learning Activities	---	---	---	-3.18	1.31	-2.43*
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	-.79	1.45	-.54
Child Gender [e/5]	2.32	.87	2.66**	1.10	1.18	.94
Child Age	.01	.88	.01	-.27	1.19	-.23
Breastfed	2.51	1.06	2.37*	---	---	---

Maternal Age	.21	.09	2.35*	.31	.12	2.61**
Maternity Leave	1.22	1.14	1.07	-.01	1.43	-.00
Hours Worked	-.07	.04	-1.85	---	---	---
Log Income	3.10	1.43	2.17*	.89	1.93	.46
Number of Siblings	-.17	1.00	-.17	-.69	1.37	-.50
Birth Order	-2.15	.96	-2.24*	-1.73	1.30	-1.33
Adjusted R^2	.09			.06		
F	5.32***			2.58***		
N	1700			860		

Note. – Reference categories for the full sample were a) never worked, b) less than high school, c) married, d) no child care, and e) male. The reference categories for the sub-sample work intensity were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) non-relative and relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$.

Appendix L: Moderation Effects - Child Care Quality

Children's PPVT-R (0/2) and (0/4) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Two and Four Years and Structural (Staff Training) Child Care Quality for the Sub-sample - Work Intensity

	PPVT-R (0/2) Work Intensity			PPVT-R (0/4) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	87.39	7.19	12.15***	96.87	6.18	15.67***
Work Intensity [a/1]	-7.18	2.46	-2.92**	.07	1.70	.04
College [b/2]	-1.99	2.07	-.96	3.16	1.48	2.13*
Post-secondary [b/2]	.77	2.13	.36	4.31	1.74	2.48*
Divorced, Widowed, Separated, Single, or Common-law [c/3]	-.65	1.91	-.34	1.19	1.40	.85
Poverty Status	---	---	---	.76	2.85	.27
Non-Relative Child Care [d]	-.93	2.01	-.46	---	---	---
Day Care [d/4]	-1.56	2.16	-.72	-.07	1.63	-.04
Proportion of Child Care Workers with Training	-2.71	2.97	-.91	2.69	2.59	1.04
Participation in Learning Activities	-2.06	1.58	-1.30	-3.23	1.32	-2.44*
Mothers' Satisfaction with Developmental/Learning Activities	2.03	1.63	1.25	-.78	1.45	-.54
Wk Intensity x Training	4.58	3.28	1.40	-1.84	2.74	-.67
Child Gender [e/5]	-.20	1.41	-.14	1.06	1.17	.90
Child Age	-3.02	1.50	-2.01*	-.29	1.19	-.25
Maternal Age	.23	.19	1.21	.31	.12	2.62**
Maternity Leave	.93	1.97	.47	-.09	1.44	-.06
Log Income	4.79	1.78	2.69**	.84	1.95	.43
Number of Siblings	3.63	3.41	1.06	-.71	1.38	-.51
Birth Order	-6.87	3.48	-1.98*	-1.69	1.31	-1.29
Adjusted R^2	.11			.06		
F	3.71***			2.64***		
N	610			860		

Note. – For PPVT-R (0/2) sub-sample work intensity the reference categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) day care, and e) male. For PPVT-R (0/4) sub-sample the reference categories were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) non-relative or relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/2) and (0/4) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Two and Four Years and Process (Participation in Learning Activities) Child Care Quality for the Sub-sample - Work Intensity

	PPVT-R (0/2) Work Intensity			PPVT-R (0/4) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	87.05	7.48	11.63***	97.33	6.28	15.49***
Work Intensity [a/1]	-6.74	2.77	-2.44*	-.81	2.05	-.40
College [b/2]	-2.01	2.09	-.96	3.12	1.46	2.13*
Post-secondary [b/2]	.75	2.17	.35	4.30	1.73	2.49*
Divorced, Widowed, Separated, Single, or Common-law [c/3]	-.48	1.93	-.25	1.17	1.41	.83
Poverty Status	---	---	---	.59	2.84	.21
Non-Relative Child Care [d]	-.93	1.99	-.47	---	---	---
Day Care [d/4]	-1.33	2.17	-.61	-.14	1.62	-.09
Proportion of Child Care Workers with Training	.40	1.64	.24	1.31	1.59	.82
Participation in Learning Activities	-3.78	3.07	-1.23	-3.23	2.09	-1.55
Mothers' Satisfaction with Developmental/Learning Activities	2.06	1.64	1.25	-.78	1.45	-.54
Wk Intensity x Learning	2.63	3.47	.76	.06	2.67	.02
Child Gender [e/5]	-.26	1.41	-.18	1.11	1.17	.95
Child Age	-3.24	1.51	-2.14*	-.27	1.19	-.22
Maternal Age	.23	.19	1.23	.31	.12	2.60**
Maternity Leave	.63	1.95	.32	.01	1.41	.01
Log Income	4.78	1.80	2.66**	.89	1.94	.46
Number of Siblings	3.10	3.53	.88	-.69	1.37	-.50
Birth Order	-6.40	3.60	-1.77	-1.74	1.30	-1.34
Adjusted R^2	.10			.06		
F	3.51***			2.59***		
N	610			860		

Note. – For PPVT-R (0/2) sub-sample work intensity the reference categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) day care, and e) male. For PPVT-R (0/4) sub-sample the reference categories were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) non-relative or relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/2) and (0/4) (Peabody Picture Vocabulary Test - Revised) Scores as a Function of Maternal Employment within the First Two and Four Years and Process (Satisfaction with Developmental/Learning Activities) Child Care Quality for the Sub-sample - Work Intensity

	PPVT-R (0/2) Work Intensity			PPVT-R (0/4) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	87.05	7.84	11.10***	98.23	6.37	15.41***
Work Intensity [a/1]	-6.14	2.79	-2.20*	-2.06	2.40	-.86
College [b/2]	-1.85	2.10	-.88	3.08	1.48	2.08*
Post-secondary [b/2]	.89	2.20	.41	4.26	1.72	2.48*
Divorced, Widowed, Separated, Single, or Common-law [c/3]	-.52	1.92	-.27	1.22	1.41	.87
Poverty Status	---	---	---	.59	2.84	.21
Non-Relative Child Care [d]	-.87	1.97	-.44	---	---	---
Day Care [d/4]	-1.40	2.18	-.64	-.16	1.62	-.10
Proportion of Child Care Workers with Training	.55	1.63	.34	1.29	1.59	.81
Participation in Learning Activities	1.81	1.60	-1.13	-3.16	1.32	-2.40*
Mothers' Satisfaction with Developmental/Learning Activities	.73	2.92	.25	-2.10	2.31	-.91
Wk Intensity x Development	1.82	3.54	.51	1.70	2.88	.59
Child Gender [e/5]	-.21	1.41	-.15	1.16	1.17	.99
Child Age	-3.14	1.51	-2.09*	-.29	1.18	-.25
Maternal Age	.24	.19	1.26	.31	.12	2.65**
Maternity Leave	.59	1.93	.30	-.03	1.41	-.02
Log Income	4.64	1.86	2.50*	.92	1.93	.47
Number of Siblings	3.18	3.49	.91	-.71	1.37	-.52
Birth Order	-6.49	3.56	-1.82	-1.74	1.29	-1.35
Adjusted R^2	.10			.06		
F	3.38***			2.56***		
N	610			860		

Note. – For PPVT-R (0/2) sub-sample work intensity the reference categories were a) 20 hours or less per week, b) less than some-post secondary education, c) married, d) day care, and e) male. For PPVT-R (0/4) sub-sample the reference categories were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) non-relative or relative care, and 5) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Appendix M: Moderation Effects - Maternal Education (Collapsed)

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Two Years and Maternal Educational Levels for the Full Sample

	PPVT-R (0/2) Full Sample		
	B	*SE B*	*t value*
Intercept	74.76	6.20	12.05***
Maternal Employment in Early Childhood [a]	5.26	1.97	2.67**
College/Post-secondary [b]	5.25	1.84	2.86**
Mat Employ x College/Post-secondary	-4.06	2.05	-1.98
Common-law [c]	-.82	1.24	-.67
Divorced, Widowed, Separated, or Single [c]	-4.22	3.00	-1.40
Poverty Status	-2.06	2.71	-.76
Non-relative Care [d]	1.35	1.64	.82
Relative Care [d]	1.85	1.62	1.14
Day Care [d]	-.62	1.32	-.47
Child Gender [e]	1.65	1.07	1.54
Child Age	-.40	1.10	-.37
Birth Weight	1.47	4.04	.36
Breastfed	2.29	1.42	1.61
Premature Birth	-.63	1.85	-.34
Maternal Age	-.07	.13	-.52
Maternity Leave	.28	1.36	.21
Hours Worked	-.10	.04	-2.30*
Log Income	4.83	1.68	2.87**
Number of Siblings	-1.35	1.95	-.69
Birth Order	-1.69	1.95	-.87
Adjusted R^2	.11		
F	7.03***		
N	1790		

Note. – Reference categories were a) never worked, b) less than some post-secondary education, c) married, d) no child care, and e) male. Due to Statistics Canada data confidentiality all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Appendix N: Moderation Effects – Child Gender

Children's MSD (Motor and Social Development) Scores as a Function of Maternal Employment within the First Four Years and Children's Gender for the Sub-sample - Work Intensity

	MSD Work Intensity		
	B	*SE B*	*t value*
Intercept	83.48	4.90	17.02***
Work Intensity [a]	-1.05	1.06	-1.00
High School [b]	.86	1.90	.45
Some Post-secondary [b]	.48	1.76	.28
College [b]	.93	1.62	.57
Post-secondary [b]	-.53	1.77	-.30
Common-law [c]	-.49	.86	-.57
Divorced, Widowed, Separated, or Single [c]	1.67	1.81	.92
Poverty Status	-1.51	1.72	-.88
Non-relative Care [d]	1.19	1.09	1.08
Relative Care [d]	1.15	1.25	.92
Day Care [d]	2.03	1.22	1.66
Child Gender [e]	5.95	1.08	5.54***
Wk Intensity x Child's Gender	-.89	1.45	-.61
Child Age	.05	.43	.12
Birth Weight	-.52	1.67	-.31
Breastfed	2.85	1.24	2.29*
Premature Birth	-1.60	1.32	-1.21
Maternal Age	-.20	.09	-2.20*
Maternity Leave	-.97	.95	-1.02
Log Income	3.56	1.31	2.71**
Number of Siblings	3.27	1.04	3.15**
Birth Order	-3.19	1.06	-3.01**
Adjusted R^2	.05		
F	4.19***		
N	2880		

Note. – Reference categories were a) 20 hours or less per week, b) less than high school, c) married, d) no child care, and e) male. Due to vetting requirements at Statistics Canada all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/2) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Two Years and Children's Gender for the Full Sample and Sub-samples - Two-Parent Families and Work Intensity

	PPVT-R (0/2) Full Sample			PPVT-R (0/2) Two-Parent Families			PPVT-R (0/2) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	77.22	6.30	12.25***	77.11	6.19	12.46***	84.55	7.22	11.70***
Maternal Employment in Early Childhood [a]	2.58	1.82	1.41	3.18	1.88	1.70	---	---	---
Work Intensity [1]	---	---	---	---	---	---	-3.52	2.23	-1.58
High School [b]	-1.71	2.27	-.75	-2.17	2.32	-.94	---	---	---
Some Post-secondary [b]	.73	2.34	.31	.79	2.21	.36	---	---	---
College [b/2]	2.34	2.26	1.04	1.53	2.22	.69	-2.00	2.07	-.97
Post-secondary [b/2]	4.34	2.18	1.99*	3.34	2.17	1.54	.75	2.16	.35
Common-law [c]	-.46	1.22	-.38	-.32	1.21	-.27	---	---	---
Divorced, Widowed, Separated, or Single [c]	-4.08	3.04	-1.34	---	---	---	---	---	---
Divorced, Widowed, Separated, Single, Common-law [3]	---	---	---	---	---	---	-.54	1.92	-.28
Poverty Status	-1.45	2.69	-.54	-1.61	2.63	-.61	---	---	---
Non-relative Care [d/4]	1.29	1.63	.79	2.39	1.60	1.50	-.91	1.99	-.46
Relative Care [d]	1.85	1.63	1.13	1.63	1.63	1.00	---	---	---
Day Care [d/4]	-.76	1.30	-.59	-.18	1.24	-.15	-1.23	2.17	-.56
Proportion of Child Care Workers with Training	---	---	---	---	---	---	.47	1.65	.26
Participation in Learning Activities	---	---	---	---	---	---	-1.72	1.58	-1.09
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	---	---	---	-2.17	1.63	1.33
Child Gender [e/5]	1.85	1.68	1.10	2.86	1.57	1.82	2.14	2.64	.81
Mat Employ x Child's Gender	-.60	1.99	-.30	-.64	1.93	-.33	---	---	---
Wk Intensity x Child's Gender	---	---	---	---	---	---	-3.04	3.10	-.98
Child Age	-.48	1.09	-.44	-1.15	1.04	-1.11	-3.11	1.51	-2.06*
Birth Weight	1.58	4.04	.39	---	---	---	---	---	---

Breastfed	2.00	1.46	1.37	3.29	1.45	2.27*	---	---	---
Premature Birth	-.85	1.86	-.46	-1.66	1.43	-1.16	---	---	---
Maternal Age	-.08	.12	.65	-.10	.12	-.82	.23	.19	1.22
Maternity Leave	.49	1.33	.37	1.12	1.34	.83	.73	1.95	.38
Hours Worked	-.09	.04	-2.17*	-.10	.04	-2.23*	---	---	---
Log Income	4.38	1.65	2.64**	4.96	1.61	3.09**	4.75	1.78	2.67**
Number of Siblings	-1.46	1.94	-.75	-1.35	1.95	-.69	3.15	3.49	.90
Birth Order	-1.44	1.94	-.74	-1.49	1.95	-.76	-6.44	3.57	-1.80
Spouse Works	---	---	---	-3.53	3.37	-1.05	---	---	---
Adjusted R^2	.11			.10			.10		
F	6.47***			5.07***			3.52***		
N	1790			1630			610		

Note. – Reference categories for the full sample and sub-sample two-parent families were a) never worked, b) less than high school, c) married, d) no child care, and e) male. Reference categories for the sub-sample work intensity were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) relative care, and 5) male. Due to vetting requirements at Statistics Canada all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.

Children's PPVT-R (0/4) (Peabody Picture Vocabulary Test-Revised) Scores as a Function of Maternal Employment within the First Four Years and Children's Gender for the Full-sample and Sub-sample - Work Intensity

	PPVT-R (0/4) Full Sample			PPVT-R (0/4) Work Intensity		
	B	*SE B*	*t value*	*B*	*SE B*	*t value*
Intercept	81.03	5.06	16.00***	96.64	6.27	15.41***
Maternal Employment in Early Childhood [a]	-.18	1.88	-.10	---	---	---
Work Intensity [1]	---	---	---	-.04	1.87	-.02
High School [b]	2.75	1.72	1.60	---	---	---
Some Post-secondary [b]	6.89	2.18	3.16**	---	---	---
College [b/2]	4.42	1.72	2.57*	3.15	1.48	2.12*
Post-secondary [b/2]	5.28	1.89	2.80**	4.33	1.72	2.52*
Common-law [c]	.25	1.12	.22	---	---	---
Divorced, Widowed, Separated, or Single [c]	3.32	1.79	1.85	---	---	---
Divorced, Widowed, Separated, Single, Common-law [c/2]	---	---	---	1.22	1.41	.86
Poverty Status	-.10	1.91	-.05	.58	2.82	.20
Non-relative and Relative Care [d]	-.41	1.08	-.38	---	---	---
Day Care [d/4]	.50	1.25	.40	-.16	1.63	-.10
Proportion of Child Care Workers with Training	---	---	---	1.26	1.58	.80
Participation in Learning Activities	---	---	---	-3.15	1.30	-2.42*
Mothers' Satisfaction with Developmental/Learning Activities	---	---	---	-.86	1.45	-.59
Child Gender [e/5]	-.56	2.15	-.27	2.37	2.20	1.07
Mat Employ x Child's Gender	3.68	2.35	1.56	---	---	---
Wk Intensity x Child's Gender	---	---	---	-1.64	2.53	-.65
Child Age	.08	.89	.09	-.26	1.19	-.22
Breastfed	2.51	1.05	2.40*	---	---	---
Maternal Age	.21	.09	2.38*	.31	.12	2.58**
Maternity Leave	1.14	1.15	.99	-.01	1.41	-.00
Hours Worked	-.07	.04	-1.86	---	---	---
Log Income	3.09	1.40	2.20*	.93	1.93	.48
Number of Siblings	-.18	1.00	-.18	-.73	1.38	-.53

Birth Order	-2.15	.95	-2.26*	-1.70	1.30	-1.31
Adjusted R^2	.09			.06		
F	5.93***			2.63***		
N	1700			860		

Note. – Reference categories for the full sample were a) never worked, b) less than high school, c) married, d) no child care, and e) male. The reference categories for the sub-sample work intensity were 1) 20 hours or less per week, 2) less than some-post secondary education, 3) married, 4) non-relative and relative care, and 5) male. Due to vetting requirements at Statistics Canada all Ns were rounded to the nearest tenth. Unstandardized *B* coefficients are presented. *p ≤ .05 **p ≤ .01 ***p ≤ .001.