

EXAMINING THE IMPACT OF CHILD CHARACTERISTICS AND MICROSYSTEM
VARIABLES ON DEVELOPMENTAL TRAJECTORIES OF PROSOCIAL BEHAVIOUR
IN CANADIAN CHILDREN: A LONGITUDINAL STUDY USING THE NLSCY

by

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ABSTRACT

In this study the impact of child characteristics and microsystem variables on developmental trajectories of prosocial behaviour in Canadian children between the ages of 4 and 11 years was examined. In addition, whether the relationship between parenting practices and prosocial behaviour trajectories is moderated by gender, temperament, family SES or use on non-parental care and whether the relationship between non-parental child care and prosocial behaviour trajectories is moderated family SES was also examined. Using data obtained from six cycles of the National Longitudinal Survey of Children and Youth (NLSCY), growth curve analyses were conducted using Hierarchical Linear Modelling (HLM) software. It was found that children's initial levels of prosocial behaviour at the age of 4 years were significantly impacted by their gender, temperament, presence of siblings, and family SES. Females, children with 'easy' temperaments, children without siblings, and children of higher SES were found to display higher initial levels of prosocial behaviours at four years of age. However, the rate at which prosocial behaviour changes between the ages of 4 and 11 years was not influenced by any of the predictor variables included in the study. Positive parenting practices were associated with higher levels of prosocial behaviour and hostile/ineffective parenting practices were associated with lower levels of prosocial behaviour. The study also revealed two important interactive effects. The beneficial effect of positive parenting on prosocial behaviour was found to be stronger for children rated as having 'easy' temperaments compared with the effect for children with 'difficult' temperaments and the impact of non-parental care on prosocial behaviour trajectories was moderated by family SES. Low SES children who received non-parental care at 2 to 3 years of age displayed higher levels of prosocial behaviour than those of low SES who did not experience non-parental care. Of those children who experienced non-parental care at 2 to 3 years of age, hours in non-parental care or whether the care was licensed or not did not significantly impact prosocial behaviour trajectories.

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CHAPTER I

Introduction

It has been demonstrated in the literature that children who demonstrate high levels of prosocial behaviour demonstrate lower rates of aggression (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Fraser et al., 2005), have lower rates of delinquency and later criminality, are less likely to engage in deviant peer groups (Lacourse et al., 2006), are more likely to be successful academically (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Fleming et al., 2005; Squires, 2000; Welsh, Parke, Widaman, & O'Neil, 2001; Zins, Bloodworth, Weissberg, & Wallberg, 2004), and are more likely to contribute positively to society in later years (Aviles, Anderson, & Davila, 2006). By examining how prosocial behaviours develop over time and what variables impact the development of prosocial behaviour, more can be discovered about how to promote the development of prosocial behaviour in the young people in our society. The purpose of the current study was to examine how prosocial behaviours in young Canadian children change over time and, using a bio-ecological framework, to assess the impact of child characteristics and microsystem variables and interactions between these variables on prosocial behaviour trajectories of Canadian children. Using data obtained from the National Longitudinal Survey of Children and Youth (NLSCY), a series of growth curve analysis was conducted using Hierarchical Linear Modelling software (HLM).

It is advantageous for children in our society to develop positive social relationships, understand how to relate to others, and be caring individuals with concern and respect for others (Elias & Arnold, 2006). Social-emotional competence is defined as prosocial behaviour, initiation and maintenance of peer and adult relationships, management of conflict, development of a sense of mastery and self-worth, and emotional regulation (Squires, 2003). Social emotional learning is the process by which a child develops social-emotional competence such as: developing skills needed to recognize and control emotions, developing caring and concern for

others, making conscientious decisions, establishing positive relationships with others, and handling difficult situations successfully (Collaborative for Academic Social and Emotional Learning [CASEL], 2006).

The antithesis of social emotional competence is delinquency and anti-social behaviour (CASEL, 2006). The majority of studies in the research literature have focussed on problematic behaviours such as aggression and other anti-social behaviours, rather than on the positive aspects of social emotional competence (Hastings, Utendale, & Sullivan, 2007; Sanson, Hemphill, & Smart, 2004). However, the interest in social emotional competence has increased significantly during the last thirty years, resulting in more studies directly examining these competences (Eisenberg & Mussen, 1989). Prosocial behaviour, defined as "voluntary actions that are intended to help or benefit another individual or group of individuals" (Eisenberg & Mussen, 1989, p. 3), is a central component of social emotional competence (Squires, 2003).

Proponents of the ecological theory posit that children are viewed in the context of ecological systems in which they reside (Bronfenbrenner, 1986). Child behaviours are theorized to be impacted by child characteristics, microsystem variables, and interactions between these variables (Bronfenbrenner, 1979; Romano, Tremblay, Boulerice, & Swisher, 2005). In current study, the impact of child characteristics (gender, temperament, and cognitive ability) and microsystem variables (the presence of siblings, parenting practices, early non-parental care experiences, and family SES) on the development of prosocial behaviours in children over time; and how the effect of some of these variables (parenting practices and the use of non-parental child care) may be influenced by other variables was examined. For children who experienced non-parental child care, the study also explored possible differences in prosocial behaviour trajectories in relation to whether the non-parental care experienced was licensed or not, and the hours per week spent in non-parental care. These analyses were conducted using growth curve modelling.

Determinants of the Development of Prosocial Behaviours

It has been demonstrated in the empirical literature that prosocial behaviour is significantly impacted by various child characteristics including cognitive ability (Eisenberg & Mussen, 1989; Kohlberg, 1969; Piaget, 1970), gender (Fabes & Eisenberg, 1999; Letourneau et al., 2006; Michalik et al., 2007; Romano et al., 2005), and temperament (Carlo, Roesch, & Melby, 1998; Kochanska, 1994; Sanson et al., 2004). Researchers have proposed an age-related sequence of the development of prosocial behaviours, based on changes in children's cognitive abilities (Eisenberg & Mussen, 1989; Kohlberg, 1969; Piaget, 1970). It has been concluded that as children get older and develop higher levels of cognitive ability, they are more likely to demonstrate prosocial behaviour (Fabes & Eisenberg, 1999). Most research on how prosocial behaviour changes with age has been cross-sectional in design, examining groups of children at various ages, or has been limited to two measures of prosocial behaviour in the same individual child over time (Fabes & Eisenberg, 1999). This has led to a call for research to examine prosocial developmental trajectories in young children and factors that might impact these trajectories (Fabes & Eisenberg, 1999). With the development of more complex data analysis techniques, it is now possible to examine the development of prosocial behaviour in individual children over time (Bryk & Raudenbush, 1992). In the current study, Hierarchical Linear Modelling software was used to run a series of growth curve analyses using longitudinal data to examine how prosocial behaviour changes with age over more than two time points and to assess how changes in prosocial behaviour are impacted by child characteristics and microsystem variables (Bryk & Raudenbush, 1992).

There is evidence that female children have higher rates of prosocial behaviours than male children (Fabes & Eisenberg, 1999; Letourneau et al., 2006; Michalik et al., 2007; Romano et al., 2005). Theoretically, there are a number of reasons to suggest that boys and girls would differ in their prosocial development. For example, it has been suggested that

parenting behaviours differ for boys and girls and that parents emphasize prosocial behaviours more in their daughters than their sons (Hoffman, 1963; Lambert, Hammers, & Frasure-Smith, 1979; Power & Parke, 1986). In addition, it is theorized that gender may moderate the impact of parenting practices on child outcomes, such as prosocial behaviour (Foster et al., 2008; Rothbaum & Weisz, 1994). Thus, it is important to consider both the impact of gender on the development of prosocial behaviours and the moderating impact of gender on the impact of parenting on prosocial behaviour. In the current study both issues were addressed.

Temperament, defined as constitutional differences in behavioural style that are apparent from the earliest years of a child's life, has been demonstrated to be significantly associated with prosocial behaviour in children (Sanson et al., 2004). It has been posited that prosocial behaviours are the developmental products of temperament (Carlo et al., 1998; Kochanska, 1994). Furthermore, it has been demonstrated in the empirical literature that temperament has a significant impact on parenting which, in turn, has been demonstrated to impact prosocial behaviour (Bridgett et al., 2009; Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007). In addition, it has been theorized that a child's temperament may moderate the impact of parenting practices on child outcomes such as prosocial behaviours (Cornell & Frick, 2007; Van Aken, Junger, Verhoeven, Van Aken, & Dekovic, 2007). Thus, it is evident that the direct impact of temperament and the interaction between temperament and parenting on prosocial behaviours in children needs to be examined in more detail. In the current study, both of these issues are addressed.

It has been theorized, and empirically demonstrated, that cognitive abilities are associated with prosocial behaviours in children (Slaughter, Dennis, & Pritchard, 2002; Veenstraa et al., 2008). Children with higher levels of cognitive abilities are theorized to be more able to engage in perspective-taking and moral reasoning, which is posited to be the cognitive basis for overt

prosocial behaviour (Eisenberg & Mussen, 1989). Thus it is important to consider the impact of cognitive abilities when examining prosocial behaviour in children.

In 1998-1999, 75% of young children in Canada had one or more siblings (Government of Canada, 2000). Sibling relationships are a central component of many children's social worlds and thus, are an important socializing influence on one another's social, emotional development (Dunn, 2002; Karos, Howe, & Aquan-Asee, 2007). Children who have positive relationships with their siblings are more likely to have positive relationships with their peers (Stormshak & Bellanti, 1996). The assumption behind the association between having a sibling and social competence is that siblings provide each other with opportunities to practice social behaviour. Therefore, when examining variables that impact the development of prosocial behaviour in children it is important to consider the presence of siblings.

Family socioeconomic status (SES) may also be influential in children's development of prosocial behaviours. Family socioeconomic status is defined as "the relative position of a family or individual on an hierarchical social structure, based on their access to, or control over, wealth, prestige, and power" (Willms, 2003, p. 3). It has been theorized that SES may have a direct impact on prosocial behaviour in children, an indirect effect on prosocial behaviour, and may moderate the effect of parenting practices (Aunola, Nurmi, Onatsu-Arviolommi, & Pulkkinen, 1999; Gordon, 1969; Kahl & Davis, 1955; Melson, Ladd, & Hsu, 1993; Willms, 2003) and early child care experiences on prosocial behaviour in children. In addition, SES may moderate the impact of use of non-parental care on prosocial behaviour and the impact of parenting practices on prosocial behaviour. In the current study these interaction effects were examined.

Parents are proposed to be the primary socialization agent for the majority of children with children learning how to behave based on how their parent behaves with them (Bandura, 2001). Parenting practices have been demonstrated to have a significant impact on a child's

prosocial behaviour (Denham & Grout, 1992; Lee & Bell, 2003; Matas, Arend, & Sroufe, 1978; McDowell, Kim, O'Neil, & Parke, 2002; Rubin et al., 2004; Spera, 2005). Specifically, the use of positive parenting practices, such as reasoning and unconditional positive regard, has been associated with enhanced prosocial behaviours (Janssens & Dekovic, 1997). In contrast, it has been demonstrated that harsh parenting practices can inhibit the development of prosocial behaviour (Romano et al., 2005). Parenting has been theorized to differ based on a child's gender and temperament, family SES, and use of non-parental child care. Thus, it is important to consider these variables when examining the effect of parenting practices on prosocial behaviour in children. Specifically, it has been posited that the impact of parenting practices on child outcomes is moderated by temperament (Belsky, Hsieh, & Crnic, 1998; Van Aken et al., 2007), child gender (Conger et al., 1993; Fergusson, Horwood, & Lynskey, 1995), the use of non-parental child care experiences (Pierrehumbert, Ramstein, Karmaniola, & Halfon, 1996), and family SES (Clarke-Stewart, Allhusen, & Bornstein, 2002). These interaction effects have not yet been examined in the published literature. In the current study how child temperament, child gender, family SES, and non-parental child care experiences moderate the impact of parenting practices on prosocial behaviour in children was explored.

With more dual-earner families, the use of non-parental child care has increased significantly in Canada (Ross, Scott, & Kelly, 1996; NICHD, 2005). Non-parental care is another significant socialization agent for Canadian children. It has been suggested that early child care arrangements are possibly the most critical source of social interaction for young children (Austin, Braeger, Schvaneveldt, & Lindauer, 1991; NICHD, 1998). Non-parental care has been demonstrated to impact physical aggression trajectories in children (Cote et al., 2007). Cote et al. reported that non-parental care reduced the risk of physical aggression in children whose mothers had lower levels of education. However, the research on the relationship between prosocial behaviour and non-maternal care is limited and, thus far, has provided inconsistent

results (Austin et al., 1991; DiLalla, 1998; NICHD Early Child Care Research Network, 2002). This is an area in need of further study. It has also been posited that the use of non-parental care may moderate the impact of parenting practices on prosocial behaviour in children. Furthermore, it is also possible that the relationship between prosocial behaviour and use of non-parental care may be moderated by SES, or differ based on quality of non-parental care and the number of hours per week the child spends in non-parental care. These areas in need of further examination were addressed in the current study.

Purpose of the Study

The purpose of this study was: to describe how prosocial behaviours in young Canadian children change over time; to examine the impact of selected child characteristics and microsystem variables on the development of prosocial behaviours in children over time; and to examine how the effect of some of these variables may be influenced by other variables within the model. Using a sample of young children from the National Longitudinal Survey of Children and Youth (NLSCY) the following five research questions were addressed: (1) How do child-level variables such as gender, temperament, and cognitive ability impact the development of prosocial behaviours among children between the ages of 4 and 11 years?; (2) How do microsystem variables such as the presence of siblings, parenting practices, the use of non-parental child care, and family SES impact Canadian children's prosocial behaviour trajectories while accounting for child-level variables?; (3) Is the impact of parenting practices on prosocial behaviour moderated by a child's gender and temperament, non-parental child care experiences, and family SES?; (4) Is the impact of use of non-parental care on prosocial behaviour in children moderated by family SES?; And (5) Of those children who experience non-parental care, how does licensing and hours per week in non-parental care impact prosocial behaviour trajectories? To address these questions, a series of growth curve analyses was conducted using Hierarchical Linear Modelling software (HLM).

The following chapter provides a critical review of the literature on prosocial behaviour in children, how it develops over time, and factors that impact trajectories of prosocial behaviours. This study contributes to the existent literature on prosocial development in children by providing a longitudinal examination of how prosocial behaviour develops in individual children over time, by examining what factors impact this development from a bio-ecological framework, and by examining how the impact of parenting practices and use of non-parental care is moderated by tertiary variables. This study informs child development policy and practice with critical information on how to foster the development of prosocial behaviour in children. Finally, this study provides insight into areas in need of further research on prosocial behaviour.

CHAPTER II

Review of the Literature

In this chapter, a review of the literature on prosocial behaviour, how prosocial behaviours develop over the childhood years, and factors that impact the development of prosocial behaviours is provided. The chapter is divided into two sections. The first section provides an overview of the theoretical concept of prosocial behaviour followed by a review of definitions of prosocial behaviour and how prosocial behaviour is typically assessed. The second section of this chapter includes a review of the theoretical and empirical literature on the development of prosocial behaviour over the childhood years followed by theoretical explanations of how child characteristics and microsystem variables impact prosocial behaviours in children.

Conceptual Definitions of Prosocial Behaviour

In the past 25 years there has been an increased interest in examining prosocial behaviours (Eisenberg, Lennon, & Roth, 1983). With this increased interest in prosocial behaviours came a need to conceptualize and clearly define prosocial behaviour. However, due to the complexity of the concept of prosocial behaviour, researchers have struggled to agree upon one concise definition. Currently, there are two categories of prosocial behaviours that have been assessed in the literature: situation specific prosocial behaviour and global prosocial behaviour (Carlo & Randall, 2001). Situation specific prosocial behaviours refer to prosocial behaviours within a specific situation, whereas global prosocial behaviours are defined as behaviours that occur across situations and are influenced by a variety of motivations. In the literature, there are four types of global prosocial behaviours that have been assessed: altruistic prosocial behaviour; compliant prosocial behaviour; emotional prosocial behaviour; and public or socially desirable prosocial behaviour.

Altruism is a type of global prosocial behaviour in which the intention behind the behaviour is intrinsically motivated (Bar-Tal, 1976; Eisenberg & Mussen, 1989; Hay, 1994). Hastings et al. (2007) noted that altruism is defined by sacrificing one's own gain to promote another's well being. Compliant prosocial behaviour is defined as caring, sharing or helping behaviours that are evoked in response to a verbal or non-verbal request (Carlo & Randall, 2001). The behaviour is non-spontaneous, meaning the behaviour occurs in response to another person's request for help. Emotional prosocial behaviour is defined as caring, sharing or helping behaviours that are expressed overtly in emotionally evocative circumstances such as seeing a friend in pain or distress (Eisenberg, 1982). Finally, socially desirable prosocial behaviours are helping, caring, and sharing behaviours that are based on the desire to gain others' approval (Carlo & Randall, 2001). These sub-types of global prosocial behaviour do not differ in their overt behaviour, only in the intention behind the behaviour.

In the existent literature the majority of researchers have defined overt prosocial behaviours as sharing, helping, empathetic responding, and cooperation (Caprara et al., 2000; Diener & Kim, 2004; Eisenberg, Cameron, Pasternack, & Tryon, 1988; Hastings, McShane, Parker, & Ladha, 2007; Kerr, Beck, Shattuck, Kattar, & Uriburu, 2003; Scourfield, Bethan, Neilson, & McGuffin, 2004). This latter definition of prosocial behaviour, which focuses on overt prosocial behaviour, is more often used in research. This is due to the difficulty in ascertaining the intention behind behaviours (Eisenberg et al., 1983).

Prosocial behaviours have been shown to be universal, that is, observed across cultures (Trommsdorff, Friedlmeier, & Mayer, 2007; Whiting, Whiting, & Longabough, 1975). For example, Whiting et al. (1975) examined prosocial behaviours in 134 children between the ages of three and eleven years from six unique cultures. These diverse cultures included the communities of Taira (on the Ruyukyu islands of Japan), Tarong (on the island of Luzon in the Philippines), Kalapur (a village in Uttar Pradesh, India), Nyansongo (located in western

Kenya), Santo Domingo (a barrio on Juxtlahuaca in Mexico); and Orchard Town (a small New England town composed predominately of members of a Baptist Church group). Researchers, using the same criteria for coding the observed children's behaviour across the six cultures, observed these children in their natural settings in the normal course of their day-to-day lives and found that prosocial behaviour, such as offering help or support, was evident in all six cultures. However, prosocial behaviour was measured in only one way, based only on the overt behavioural observations made by the researchers. Thus the prosocial behaviours identified consisted only of those witnessed by the researcher, and it is possible that the children's behaviour was influenced by the presence of the researchers.

In a more recent quasi-experimental study 212 preschool-age children across four different cultures (Germany, Israel, Indonesia and Malaysia) were examined and it was found that prosocial behaviours, defined as voluntary behaviour intended to benefit another person, were evident in children across the cultures (Trommsdorff et al., 2007). In this study, the children's emotional reactions and prosocial behaviours were observed during an interaction with an adult. This was the only measure of prosocial behaviour of the children and relied on the observer to impute intention to the behaviours observed. This study added to the Whiting et al. (1975) study by including modernized cultures, but only examined preschool-age children.

From this review of the research literature it can be concluded that the term overt prosocial behaviour is an umbrella term used to encompass overt behaviours such as helping, caring, and cooperating that are evident across cultures (Hay, 1994; Whiting et al., 1975). Although there are many sub-types of global prosocial behaviour, a common theme amongst these behaviours is a concern for others (Weir & Duveen, 1981). The current study defines prosocial behaviour as overt caring, sharing and helping behaviours.

Assessment of Prosocial Behaviour

There is no generally accepted method to assess prosocial behaviours in children (Eisenberg & Mussen, 1989; Trommsdorff et al., 2007). This may be because the different methods being used to assess prosocial behaviour tend to assess different types of prosocial behaviour; global and situation specific. Because of this lack of a generally accepted method, researchers of prosocial behaviour often develop their own methods or adapt/adopt methods from others' research. The most commonly used methods include: naturalistic observation; laboratory observation; ratings; sociometric questionnaires; and third party rating measures of prosocial responding (Eisenberg & Mussen, 1989). Third party rating scales have been used in many large scale surveys such as the Aboriginal Children's Survey (Statistics Canada, 2007), the Twins Early Development Study (Trouton, Spinath, & Plomin, 2002), the Head Start Family and Child Experiences Survey (West et al., 2007), and the National Longitudinal Survey of Children and Youth (NLSCY), which was used in the current study (Statistics Canada, 2005). Use of such rating scales is effective for large data collection when ease of administration is critical, and measures of general overt prosocial behaviours of children are desired.

Questionnaire ratings that are used to assess overt prosocial behaviour in children are completed by teachers and parents who know the child well and have observed the child numerous times, and in a variety of settings. Most of the rating scales require the rater to rank children's prosocial development on a continuum from high to low. Rating scales provide an assessment of children in their natural setting over many observation periods and situations. They are usually quick and easy to administer; thus, they are a commonly used technique when assessing children's prosocial behaviours for research purposes (Eisenberg & Mussen, 1989)

Third party ratings provide one individual's perspective of the child's behaviour. Some research has demonstrated that ratings of children's overt behaviours by parents differ

significantly from ratings by teachers (Achenbach, McConaughy, & Howell, 1987; Scourfield et al., 2004). Thus, it may be important to consider using multiple informants when assessing prosocial behaviour using third party ratings. However, it is important to note that teachers and parents rate children based on their observations of the children in different environments. Therefore, it is possible that differences in their ratings reflect actual differences in the child's behaviour at home compared with the child's behaviour at school, as it is plausible that children's prosocial behaviours may differ between home and school.

In the NLSCY, prosocial behaviour is assessed using parent and teacher ratings, with items adapted from Weir and Duveen's Prosocial Behaviour Questionnaire (Weir & Duveen, 1981) and the Montreal Longitudinal Survey (Tremblay, Vitaro, Nagin, Pagani, & Seguin, 2003). The items are combined to create a Prosocial Behaviour Scale that has been demonstrated to have good reliability (Cronbach's alphas .82; Kim & Brody, 2005; Romano et al., 2005). The Prosocial Behaviour Questionnaire (PBQ), created by Weir and Duveen (1981), was designed for use with school-age children, and consists of 20 items identified by teachers as prosocial behaviours. The items are scored on a 3-point Likert-type response scale labelled: doesn't apply; applies somewhat; certainly applies (Janssens & Dekovic, 1997; Statistics Canada, 1995; Weir & Duveen, 1981). Weir and Duveen (1981) conducted a factor analysis of the PBQ, examined test-retest reliability, inter-rater reliability and also assessed the validity of the PBQ by comparing the rating of prosocial behaviour based on the PBQ to measures of prosocial behaviour from naturalistic structured observations. The factor analysis revealed one general factor, prosocial behaviours. The test-retest reliability was good (.91), but inter-rater reliability for total scores on the PBQ was only moderate (.58). Weir and Duveen found low correlations between the PBQ and the naturalistic observations, but attributed this to a poor match between the coding system for the behavioural observations and the categories of prosocial behaviours of the PBQ. Janssen and Deković (1997) similarly found high internal

consistency (Cronbach's $\alpha = .94$) for the PBQ and low correlations between teacher ratings of prosocial behaviours and a sociometric questionnaire (.25). Thus, it is concluded that, based on the estimates of reliability, the PBQ is a useful research instrument for measuring prosocial behaviour in large numbers of children. However, due to the poor correlations between sociometric questionnaires and the PBQ rating scale, there is some indication that the sociometric questionnaires and rating scales used in these studies may not be assessing the same aspect of prosocial behaviour.

The Bio-Ecological Theory

There are a number of theories that can be applied to postulate how overt prosocial behaviours in an individual changes over time (Bandura, 1977; Bar-Tal, 1976; Bronfenbrenner, 1986; Kohlberg, 1969; Piaget, 1952). It has been suggested that the development of prosocial behaviours is impacted by cognitive development, positing that as a child's ability for complex thought increases, so does their overt prosocial behaviours (Kohlberg, 1969; Piaget, 1952). Others suggested that the development of prosocial behaviours is impacted by social-environmental factors such as interactions with parents and other children (Bandura, 1977; Bar-Tal, 1976). Currently, most researchers have accepted that both cognitive and social factors impact the development of prosocial behaviours (Bronfenbrenner, 1986; Bussey & Bandura, 1999). Thus, it is apparent that there are a number of factors that are associated with prosocial behaviour. From a bio-ecological perspective, one can posit the different levels of influence on prosocial behaviour (Bronfenbrenner, 1986). In recent years, Bronfenbrenner has modified his original ecological theory to include the impact of a child's own biological characteristics on their development (Bronfenbrenner, 2005). This bio-ecological theory is an appropriate model to guide the examination of the child development (Parrila, Darcy Fleming, & Rinaldi, 2002; Romano et al., 2005; Swick & Williams, 2006).

The bio-ecological theory posits that an individual child is nested within a series of contexts that impact their development. From the bio-ecological theory perspective, the child is considered an active agent in their development. Thus, individual characteristics of the child, such as age, gender, temperament and cognitive abilities, directly impact the child's developmental outcomes. The context of a child's immediate environment is composed of microsystems, individuals and places with which the child will have day to day experiences. This includes a number of variables such as the child's siblings, their parents and, potentially, their child care experiences. The exosystem, another aspect of the child's environment which is theorized to impact their development, refers to social settings that affect the child but do not include the child. The macrosystem, the most distal level of environmental influence on a child's development, consists of things such as cultural expectations for different genders, political influences, and government policies. Chronosystem refers to temporal changes in a child's environment which produce new conditions that affect development such as changes in reasoning ability or expectations with age. In addition, the bio-ecological theory posits that these systems interact with each other and the child; these interactions are referred to as the mesosystem.

Child characteristics such as age, gender, cognitive ability, and temperament are proposed to directly influence their development and indirectly impact their development through interaction with their environment (Bronfenbrenner, 2005). Thus, each individual child will react differently to similar environmental stimuli based on their own individual characteristics. In addition, the impact of a microsystem on a child may be moderated by a tertiary microsystem, macrosystem, or exosystem. This theory of child development has sparked the examination of interaction (i.e., moderating) effects of tertiary variables (Holmbeck & Kazdin, 2003; Rose, Holmbeck, Coakley, & Franks, 2004; Wu & Zumbo, 2008).

Moderation analysis is used to examine a causal relationship in a deeper manner (Wu & Zumbo, 2008). Specifically, a moderator is a tertiary variable that modifies the strength or direction of a causal effect by interacting with a predictor variable to have an impact on a dependent variable (Holmbeck & Kazdin, 2003; Rose et al., 2004). One can use the analogy of a moderator as “a dimmer that adjusts the strength of a switch on the lighting” (Wu & Zumbo, 2008, p. 370). In research, the term moderation is more commonly known as the statistical term “interaction effect”. More specifically, a moderation effect is a special type of interaction effect reserved only for models in which causal theory and design are utilized (Wu & Zumbo).

The bio-ecological model can be readily applied to the examination of prosocial behaviour in children (Parrila et al., 2002; Romano et al., 2005). Romano, Tremblay, Boulerice and Swisher (2005) utilized hierarchical linear modelling to account for children nested in families who are nested in neighbourhoods. Three level hierarchical linear models were constructed to assess the impact of child, family and neighbourhood-level variables on cross-sectional measures of prosocial behaviour in children. The results of this study demonstrated that individual-level variables, specifically age, gender, and individual exposure to parenting practices, accounted for 65% of the total variance in prosocial behaviour; family-level variables, specifically parent age, family SES, family size, parents’ depressed mood, family functioning, social support and parenting practices, accounted for 26% of the total variance in prosocial behaviour; and neighbourhood-level variables, specifically area size, neighbourhood poverty and neighbourhood problems, accounted for 9% of the total variance in prosocial behaviour. These researchers conclude that, although these findings indicated that most of the observed variation in the prosocial behaviour variable occurred between individuals, these findings do not mean that family and neighbourhood-level variables did not significantly impact prosocial behaviour in the children. Romano et al. argued that these findings suggest that individuals within the same family, within the same neighbourhood, may

be impacted differently by these environments based on individual differences. Further analyses of moderation effects were not examined in the study.

Parrila et al. (2002) utilized linear growth models to assess the impact of child, family, neighbourhood and school level predictor variables on the prosocial developmental trajectories of 847 children from the NLSCY. These children had their prosocial behaviours rated by their parents at 7, 9, and 11 years of age. Testing a linear model of growth, the authors reported that child-level predictors accounted for 17.5% of the intercept variance and 1.5% of the linear slope variance. The following child-level variables were found to be significant predictors of prosocial behaviour at 7 years (the intercept): gender, child health, physical condition, looks forward to school, number of close friends, gets along with teacher, gets along with parent, aggression, and recreational activities. Only the 'looks forward to school' variable was found to be a significant predictor of how prosocial behaviour changed over time (the linear slope). The authors also estimated a second model that included only family-level predictor variables; these were found to account for 16.6% of the intercept variance and 4.4% of the linear slope variance. The family-level variables that were found to be significant predictors of prosocial behaviour at 7 years (the intercept) were: PMK depression, health utility index, family functioning, positive interactions, and punitive discipline. The health utility index and punitive discipline variables significantly predicted the linear slope of prosocial behaviour. A third model was run including only community level predictors, which were found to account for 6.3% of the intercept variance and 4.5% of the linear slope variance. Neighbourhood cohesion and neighbour safety (community level variables) were found to be significant predictors of the initial level of prosocial behaviour (the intercept). Neighbourhood cohesion as the only community-level variable that significantly predicted the linear slope of prosocial behaviour. No school-level factors significantly accounted for variance in either the intercept or the linear growth coefficient. The authors of these two studies (Parrila et al., 2002;

Romano et al., 2005) concluded by calling for further studies utilizing a bio-ecological framework to examine the development of prosocial behaviour in children; specifically calling for longitudinal research examining the impact of child, family and neighbourhood-level variables and interactions between these variables. The current study addressed this need by utilizing longitudinal data and methodology to examine the impact of child characteristics, microsystem variables, and interactions between these variables on the development of prosocial behaviours in children from 4 to 11 years of age.

Prosocial behaviour has been demonstrated to be impacted by: individual child characteristics such as gender, temperament and cognitive abilities; and microsystem variables such as parenting practices, use of non-parental care, siblings, and family SES. Furthermore, it is posited that the impact of parenting practices on prosocial behaviour may be moderated by a child's gender, child temperament, family SES, and whether the child has experienced non-parental care. In addition, the impact of experiencing non-parental care on a child's prosocial behaviour may be moderated by the family's SES. In the following sections, a review of the empirical literature on how prosocial behaviour is directly impacted by a child's age, cognitive abilities, gender, temperament, the presence of siblings, parenting practices, family SES, and child care experiences is provided followed by a discussion on how the impact of parenting practices and child care experiences on prosocial behaviour may be moderated by each other and by tertiary variables such as child temperament and gender and family SES.

Age and Prosocial Behaviour

In a meta-analysis of studies examining the relationship between age and prosocial behaviour, Fabes and Eisenberg (1999) conclude that apparent age differences in prosocial behaviour are complex, and may be influenced by the way in which prosocial behaviour is assessed, the specific ages compared, and the type of data analysis utilized. Still, the authors reported that the literature generally supports the theory that, as children get older, prosocial

behaviours are more likely to occur. A concern noted in this paper was the lack of longitudinal research in the empirical literature. The studies included in the meta-analysis examined prosocial behaviour and age using cross-sectional data only. In the current study this was rectified by using longitudinal data and methodology to examine the development of prosocial behaviour in children from 4 to 11 years of age and the impact of child, family and community-level variables on this development.

Recent research supports the complexity of the relationship between prosocial behaviour and age. Hay et al. (1999) reported that prosocial behaviours decline over two time points during the preschool years. However, the authors suggested that the slight decline of prosocial behaviours found in preschool-age children was affected by gender and the age of the child. Older girls demonstrated an increase in prosocial behaviours, while boys showed less prosocial behaviours. Zahn-Waxler et al. (2008) examined the relationship between age and prosocial behaviour in 51 boys and 31 girls. Results showed that prosocial behaviours increased from 5 to 7 years of age and were more prevalent in girls than boys (Zahn-Waxler et al., 2008).

These studies draw attention to the lack of research that has used longitudinal data to examine the relationship between prosocial behaviour and age. To date, there are still relatively few studies that have examined the relationship between prosocial behaviour and age using longitudinal data and longitudinal data analysis methods such as growth curve modelling (Aber, Brown, & Jones, 2003; Cote, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006; Letourneau et al., 2006). One exception is the study by Cote et al. (2002) who examined the teacher-rated prosocial developmental trajectories of 1,903 French speaking children from rural and urban Quebec, Canada. It was reported that prosocial behaviour in children remained stable between 6 and 12 years. In contrast, Aber et al. (2003) reported a significant increase in teacher-rated prosocial behaviour

between the ages of 6 and 12 years in 11,160 predominately low SES children in the New York City public schools. Using linear growth modelling, Aber et al. found that as children get older their prosocial behaviours increase and the rate at which prosocial behaviours increases becomes greater, a non-linear pattern of growth. Even more divergent findings on the relationship between prosocial behaviour and age were reported by Kokka et al. (2006). In this study, the prosocial developmental trajectories of 1,025 low SES, French-speaking boys from Montreal, Canada were examined. It was found that teacher-rated prosocial behaviour declined significantly between the ages of 6 and 12 years.

One possible reason for such diverse findings across these three studies may be due, in part, to the varied demographic characteristics of the samples in each study. These three studies examine very diverse populations. The Cote study (2002) included only French speaking Canadians, of whom the majority, 83%, lived in two-parent homes. The Aber study (2003) included predominately low SES children from a very urban environment, New York City. Finally, the Kokka study (2006) only examined French speaking boys. From an ecological perspective, there are variables, such as SES, gender, and neighbourhood safety and cohesion, which are not accounted for in these studies that might be impacting the results.

To date, it appears that there are few studies that have examined prosocial developmental trajectories of children, using a nationally representative sample, controlling for the impact of gender, SES, and parenting practices. Letourneau et al. (2006) examined the prosocial developmental trajectories of 3,533 Canadian children between the ages of 2 and 8 years from the National Longitudinal Survey of Children and Youth (NLSCY). The focus of this study was to examine the impact of maternal depression on prosocial behaviours in children and to ascertain the impact of parenting practices, social support, and demographic variables on prosocial behaviour in children. This study was not based in an ecological framework and did not include a variety of child, family and neighbourhood variables, nor was

the impact of interactions between the variables on the prosocial behaviour trajectory examined in this study.

Letourneau et al. (2006) concluded that prosocial behaviours increase linearly with age and are impacted by a child's gender and the parenting practices of the child's parent, but are not directly impacted by SES. However, this study simultaneously included all the level 2 predictor variables (maternal education, single parent status, SES, sex of the child, maternal depression, and parenting practices), which were collected when the children were less than 24 months old, in their multi-level models. Thus it is unclear if each predictor variable would have the same impact if it had been entered into the model one at a time or in groups based on child, family and neighbourhood-levels. By entering the variables into the model based of child, family and neighbourhood-level, it is possible to ascertain the impact of each level of variables whilst accounting for variance explained by previously entered variables.

Letourneau et al. (2006) examined prosocial behaviours in children only up to the age of 8 years, utilizing a linear model of growth. Thus it is unclear how a child's prosocial developmental trajectory may change, if at all, after the age of 8 years, or if different results would have been obtained if a non-linear model of growth had been utilized.

Parrila et al. (2002) also utilized data from the NLSCY to conduct linear growth models of prosocial behaviour in 847 children between the ages of 7 to 11 years. Their results were similar to those of Letourneau et al. (2006). Prosocial behaviours, as rated by both parents and teachers, was found to increase in a linear fashion between the ages of 7 and 11 years, and these trajectories were impacted by a child, family and neighbourhood variables. No moderating effects were examined in this study and it is not clear whether a non-linear model of growth had been examined.

In the current study prosocial behaviour trajectories from 4 to 11 years of age were examined, thus building on Letourneau et al. and Parrila et al.'s studies, by examining how

prosocial behaviours change from 4 to 11 years of age. In addition, the current study examined how tertiary variables such as child temperament, child gender, family SES and use of non-parental care moderate the impact of parenting and how family SES can moderate the impact of use of non-parental care on prosocial behaviour in children. To date, there are no published studies that have examined how the impact of parenting practices and use of non-parental care on children's prosocial behaviour is moderated by tertiary variables using longitudinal data and methodology. This is an area in need of further study (Cote, Geoffreoy, Borge, Rutter, & Tremblay, 2008; Romano et al., 2005). In the current study this gap in the literature was addressed by examining these moderating effects using longitudinal data and methodology.

Gender and Prosocial Behaviour

It has been demonstrated in the research literature that gender is associated with an individual's prosocial behaviour, with females usually demonstrating higher rates of prosocial behaviours than males (Aber et al., 2003; Fabes & Eisenberg, 1999; Hay, Castle, Davies, Demetriou, & Stimson, 1999; Letourneau et al., 2006; Romano et al., 2005; Zahn-Waxler et al., 2008). In their meta-analysis of studies examining prosocial behaviour, Fabes and Eisenberg (1999) conclude that gender differences in prosocial behaviour varied with the type of prosocial behaviour assessed. Gender differences were larger when the measures of prosocial behaviour used in the study was an index of kindness/consideration or an aggregated index of prosocial, with females demonstrating higher rates of prosocial behaviour than males. The gender difference was weakest for studies that defined prosocial behaviour as instrumental helping. Studies of gender differences in the adult population indicate that males demonstrate more helping behaviours than females (Eagly & Crowley, 1986). Given the findings of Eagly and Crowley (1986), it appears that age may play a role in the relationship between prosocial behaviour and gender. It has been demonstrated that gender-differences in self-reported measures of prosocial behaviour tended to be larger with older samples of

children, however, this difference was eliminated once the methodological differences in the studies examined were eliminated (Fabes & Eisenberg, 1999).

There is still a lack of studies using longitudinal data analysis techniques to examine the relationship between gender and prosocial behaviours as a child gets older. To date, it appears that there is only one published study that examined the relationship between prosocial behaviour, gender and age (Letourneau et al., 2006). The results from this study indicate that prosocial behaviour when a child is two years of age differs based on gender. Females demonstrated higher rates of parent-reported prosocial behaviour, but that the rate of change in prosocial behaviour did not differ significantly between boys and girls (Letourneau et al., 2006). This may be due to the fact that prosocial behaviour in this study was assessed using parent report, not self report.

It has been posited that parenting practices differ in relation to a child's gender, suggesting that gender may indirectly impact prosocial behaviour in children (Hoffman, 1963; Lambert et al., 1979). In their 1979 study, Lambert and colleagues found that child gender was associated with parenting practices among parents from a variety of socioeconomic levels and countries including the United States, Canada, Belgium, Italy, Greece and Portugal. For example, it was found that parents encouraged more demonstrations of social aggressiveness, had more rigid sex-role standards, and were generally more lenient with male children compared with female children. Parents were found to exercise more control over the behaviour of their female children, give their female children more comfort, and have higher expectations for their female children's ability to control their temper. Further support for the claim that parenting practices are impacted by the sex of the child has been provided in a study conducted with the parents of 137 12- and 18-month-old children (Fagot & Kavanagh, 1993). Both mothers' and fathers' parenting practices appeared to be impacted significantly by the sex of their child. The relationship between parenting practices and the sex of the child was further

influenced by the attachment style of the child. The results from these studies indicate the importance of examining the impact of gender and parenting practices on prosocial behaviour trajectories in children.

Temperament and Prosocial Behaviour

Temperament refers to “constitutionally based differences in behavioural style that are visible from the child’s earliest years” (Sanson et al., 2004, p.143). Temperament traits have been demonstrated to be moderately stable over time, with correlations as high as .7 to .8 when measurement error is considered (Pedlow, Sanson, Prior, & Oberklaid, 1993). Since Thomas, Chess and colleagues (1963) first introduced the nine dimensions of temperament in their seminal paper on temperament, concerns over conceptual overlap in the domain have led to the refinement of the definition of temperament to include three broad domains. These domains of temperament, that have been gaining wide acceptance in the research literature, include: Negative Emotionality, which refers to irritability, negative mood and high-intensity negative reactions; Self-Regulation, which includes ability to sustain attention and self-soothe; and Sociability, which describes the tendency to approach or withdraw from new situations and people (Rothbart & Bates, 1998; Sanson et al., 2004). In the current study, temperament was defined as the constitutionally based individual difference in emotionality. Emotionality refers specifically to behaviours such as fussiness, loud crying, making happy noises, and laughter as well as the intensity of these behaviours. A child is conceptually defined as having either an ‘easy’ or ‘difficult’ temperament based on their displaying of these behaviours. Children who often make happy noises, laugh, and handle frustration with little fussing are categorized as having an ‘easy’ temperament. If a child often cried loudly, is fussy, and displays intense responses, that child is categorized as having a ‘difficult’ temperament.

Research findings suggest a link between temperament and prosocial behaviour (DiLalla, 1998; Eisenberg et al., 1993; Sanson et al., 2004). In a study of 124 five-year-olds, Dilalla (2004)

demonstrated that temperament, based on parent report, was a significant predictor of prosocial behaviours in young children in a novel laboratory setting. Children with ‘easy’ temperaments were found to be rated as more prosocial than children with ‘difficult’ temperaments. This study also examined the impact of the interaction between temperament and child care experiences on prosocial behaviours, the moderating impact of temperament on the relationship between child care experiences and prosocial behaviour. The results indicated that the interaction between temperament and child care experiences did not significantly impact prosocial behaviours. However, it was concluded that both temperament and child care experiences are important predictors of prosocial behaviours in children and should be included in future research on prosocial behaviour (DiLalla, 1998). In a study of 24 pre-school children it was demonstrated that temperament was significantly associated with prosocial behaviour in a laboratory setting but not at home (Stanhope, Bell, & Parker-Cohen, 1987). Specifically, children rated as being more ‘sociable’ were also noted to demonstrate higher levels of prosocial behaviour. It was also demonstrated in this study that parent behaviours differed based on child temperament. In a study examining 421 preschool children, it was demonstrated that temperament was a significant predictor of prosocial behaviour (Russell, Hart, Robinson, & Olsen, 2003). Specifically, children rated as being more ‘sociable’ were also noted to demonstrate higher levels of prosocial behaviour. Unfortunately, the majority of the research on the link between temperament and prosocial behaviour focuses on preschool-age children (Carlo et al., 1998). More research is needed to address the link between temperament and prosocial behaviour in school-age children (Carlo et al., 1998). The current study examined how one aspect of temperament, negativity, impacted the prosocial behaviour trajectories of children from 4 to 11 years of age.

Cognitive Characteristics and Prosocial Behaviour

Prosocial behaviour refers to helping, caring, and sharing. These prosocial behaviours are dependant on perspective-taking and moral reasoning abilities such as understanding the needs

of another person and an understanding of right and wrong. Perspective-taking and moral reasoning abilities are proposed to be the underlying cognitive skills required for prosocial behaviour. As a child's cognitive abilities develop, their ability to engage in moral reasoning grows. Thus, it is posited that cognitive ability is associated with prosocial behaviour.

It is important to distinguish between prosocial behaviour and moral reasoning, which is defined as “cognitive aspects of morality-conceptualizations and reasoning about moral issues” (Eisenberg & Mussen, 1989, p. 5). Piaget (1952) and Kohlberg (1969) described the development of moral reasoning as the basis of prosocial behaviours. Many researchers have examined the link between prosocial behaviour and moral reasoning with mixed results: some researchers have found significant correlations between higher level moral reasoning and higher levels of prosocial behaviour (Carlo, Koller, Eisenberg, Da Silva, & Frohlich, 1996; Eisenberg et al., 1983; Miller, Eisenberg, Fabes, & Shell, 1996), others have found this relationship only among younger children (Janssens & Dekovic, 1997) or not apparent at all in adults (Sochting & Skoe, 1994). This evidence suggests that relationship between prosocial behaviour and moral reasoning is complex, and may be dependant on multiple factors. Thus, when examining the development of prosocial behaviour it is important to take an ecological perspective (Romano et al., 2005). By doing so, it is possible to examine how prosocial behaviour is impacted by various levels of predictor variables including child characteristics and microsystem predictors. This provides a better understanding of the process by which prosocial behaviour develop and factors that are influential to the development of prosocial behaviour.

The proposition that cognitive abilities are associated with prosocial behaviours is supported by the literature. In a study of 87 four to six-year-old children, it was demonstrated that verbal intelligence, assessed using raw scores from the Peabody Picture Vocabulary Test (PPVT-R), was positively associated with teacher-rated prosocial behaviours (Slaughter et al.,

2002). In a study of 2230 preadolescent children (mean age of 11 years), it was found that general intelligence, as assessed using two subtests (block design and vocabulary) of the Wechsler Intelligence Scale for Children –Revised (WISC-R), was positively associated with prosocial behaviour, as rated by both parents and teachers (Veenstraa et al., 2008). The findings of these studies indicate that there is a significant association between prosocial behaviour and intelligence. However, these studies are both correlational in design and are based on cross-sectional data. Thus it is unclear if or how the association between prosocial behaviour and intelligence changes, if at all, over time and whether cognitive abilities are predictive of prosocial behaviour. The current study addresses these gaps in the literature by utilizing linear growth models to assess the impact of verbal intelligence on prosocial behaviour trajectories of Canadian children.

Siblings and Prosocial Behaviour

The majority of young children in Canada have one or more siblings (Government of Canada, 2000). As children, siblings often spend more time with each other than with any one else and it is assumed that the sibling relationship is likely to be the longest standing relationship for any individual (Connidis, 2001). Furthermore, the quality of sibling relationships has been demonstrated to be fairly consistent over time, in the absence of direct interventions (Kramer & Kowal, 2005; Slomkowski & Manke, 2004). The siblings relationship is “distinctive in its emotional power and intact, its qualities of competitiveness, ambivalence and of emotional understanding” (Dunn, 1988, p.119). Thus it is posited that the sibling relationship affects child development, particularly social emotional development (Sanders, 2004). Unfortunately, there are few studies that compare how only children and children with siblings differ in terms of their social emotional competence (Kitzmann, Cohen, & Lockwood, 2002). It has been demonstrated that preschool-age children with siblings demonstrate higher perspective-taking abilities than children without siblings (Perner, Ruffman, & Leekam, 1994). Perner et al. (1994) found that

family size (number of siblings living at home) was predictive of higher levels of perspective taking ability in 80 preschool-age children. As perspective-taking is theorized to be a cognitive ability that is necessary for prosocial behaviours, it is reasonable to theorise that having siblings will also impact prosocial behaviours in children. Meredith and Abbott (1992) examined a sample of 915 sixth grade children from China and compared prosocial behaviours demonstrated by only children and children with siblings. It was found that children without siblings were as likely or more likely to demonstrate prosocial behaviour as compared to children who have siblings (Meredith & Abbott, 1992). The impact of having siblings on prosocial behaviour trajectories of young children has not been examined in the empirical research. Based on the theoretical evidence indicating the importance of siblings on social competence, the current study included an examination of the impact of siblings on the prosocial behaviour trajectory of school-age children.

Socioeconomic Status and Prosocial Behaviour

The term socioeconomic status (SES) has historically been used to describe the relative position of an individual or group of individuals in a society in which hierarchical arrangements based on societal values such as occupational prestige, education, income are not equally distributed (Bornstein & Bradley, 2003). Currently, in most empirical research, SES is a multidimensional construct composed of parental education attainment, family income and parental occupation prestige (Bornstein & Bradley, 2003). Researchers have examined the association between SES and child outcomes for generations reporting that SES is associated with a number of child outcomes such as cognitive ability (Sigman, Neumann, Jansen, & Bwibo, 1989), academic achievement (Walker, Greenwood, Hart, & Carta, 1994), and aggressive behaviour (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995).

The association between family SES and child prosocial behaviour is complex. In some studies, children of low SES families have demonstrated higher levels of prosocial behaviours

(Chadha & Misraand, 2006), whereas in other studies, children of low SES have shown lower levels of prosocial behaviours (Dearing, McCartney, & Taylor, 2001; Eisenberg, Fabes, & Spinrad, 2006; Lichter, Shanahan, & Gardner, 2002). Still other researchers have found no association between SES and prosocial behaviour (Letourneau et al., 2006; Romano et al., 2005).

Although there is no conclusive evidence that children of different SES backgrounds behave differently in terms of prosocial behaviour (Eisenberg & Mussen, 1989; Letourneau et al., 2006; Romano et al., 2005), there are a number of studies indicating that SES may influence parenting practices which, in turn, may impact prosocial behaviours in children. According to the Family Stress Theory, families living in poverty are more likely to report experiencing stress due to finances than higher income families (Cadzow, Armstrong, & Fraser, 1999). This stress, in turn, may be linked to less positive parenting practices (Verhoeven, Junger, Van Aken, Dekovic', & Van Aken, 2007). Some research findings suggest that, relative to families not living in poverty, families living below the poverty line are more likely to practice harsh parenting practices characterized by strict control and less nurturing parenting practices (Allhusen et al., 2005; Aunola et al., 1999; Belsky, Bell, Bradley, Stallard, & Stewart-Brown, 2007; Melson et al., 1993). This relationship may be attributed to a range of factors such as parental education levels (Aunola et al., 1999), higher value placed on obedience and conformity (Goodnow, 1988; Piotrkowski & Katz, 1982), and a tendency to perceive social relationships in terms of power and authority (Mortimer & Kumka, 1982; Zussman, 1978).

SES may also impact a child's prosocial behaviour indirectly through access to differing quality child care experiences (NICHD Early Child Care Research Network, 1997b). It is theorized that the quality of child care experiences can directly impact a child's prosocial behaviour (NICHD Early Child Care Research Network, 1998). Families of higher SES are more likely to be able to afford higher quality non-parental care than families of lower SES. However,

families of very low SES may receive higher quality of child care than mid-level SES families if they have access to subsidized child care (Phillips & Bridgman, 1995).

Based on the review of this literature, it appears that the link between SES and prosocial behaviour is complicated. SES may directly impact prosocial behaviour and indirectly impact prosocial behaviour through its association with parenting practices and child care experiences. The current study examines the main effect of SES on prosocial behaviour and accounts for the impact of SES on parenting practices and early child care experiences using growth curve modelling.

Parenting Practices and Prosocial Behaviour

In the literature, researchers have used a number of terms to describe how parents interact with their children. However, researchers are still debating what specific aspects of parenting have the most significant impact on various child outcomes and how to best conceptualize and measure parenting. Some commonly used terms include: parenting practices and parenting styles. Although some researchers have used these terms interchangeably, others have argued that these terms actually encompass very different concepts (Darling & Steinberg, 1993).

Parenting style has been defined as a collection of “attitudes toward the child that are communicated to the child and that, taken together, create an emotional climate in which the parent's behaviors are expressed” (Darling & Steinberg, 1993, p.488). The term ‘parenting practices’ is more specific to parents’ behaviour, defined as specific goal-directed behaviours that parents use to socialize their children. Many studies have examined the impact of parenting styles on child outcomes (Eisenberg & Murphy, 1995; Maccoby & Martin, 1983). However, in recent years there has been a call for studies to examine the impact of specific parenting practices, rather than parenting styles, on children’s prosocial behaviours. This recommendation is based on the idea that the broad dimensions encapsulated by parenting

styles are not as effective predictors of prosocial behaviours as the more specific measures of parenting practices (Carlo, McGinley, Hayes, Batenhorst, & Wilkinson, 2007; Carlo et al., 1998; Darling & Steinberg, 1993). In the current study, the impact of parenting practices on prosocial behaviour was examined.

There are many theories in the literature positing how parenting impacts child development (Ainsworth, Blehar, Waters, & Wall, 1978; Baumrind, 1991; Bjorklund, Younger, Pellegrini, & Bornstein, 2002; Brooks Gunn & Markham, 2005; Darling & Steinberg, 1993). According to social learning/social cognitive theories, children who observe prosocial behaviours by their parents will most likely imitate these behaviours. Over time, the children will internalize these behaviour patterns, no longer imitating behaviours but producing them spontaneously. Furthermore, prosocial behaviours that are reinforced by parents are more likely to be repeated. Thus, it is hypothesized that early parenting practices plays a critical role in the development of prosocial behaviours in children.

It has been theorized that parenting practices are not consistent over time but change as a result of a number of child characteristics such as age, temperament, and gender (Holden & Miller, 1999). Research on the consistency of parenting practices over time has yielded inconsistent results. For example, in a study of 1364 participants from various locations in the United States, Dallairea and Weinraubb found that positive parenting practices increased from 6 months to 6 years. However, Forehand and Jones (2002) found contrasting results from a study of 124 low income African American mothers, reporting that positive parenting practices actually declined from 8 to 12 years. In a sample consisting of 1,517 boys, Loeber, Drinkwater, Yin, Anderson, Schmidt, and Crawford (2000) found that hostile parenting practices decreased, whereas positive parenting practices increased from 6 to 18 years. Taken together, this suggests that there may not be universal trends in parenting behaviours in relation to child age, but rather,

that parenting practices may change over time in response to child, family and neighbourhood characteristics.

It has been demonstrated in the research literature that parenting practices have a significant impact on a child's prosocial behaviour (Denham & Grout, 1992; Garner, 2006; Janssens & Dekovic, 1997; Lee & Bell, 2003; Letourneau et al., 2006; Matas et al., 1978; McDowell et al., 2002; Romano et al., 2005; Rubin et al., 2004; Spera, 2005). Two types of parenting practices are of particular interest when examining prosocial behaviour in children; positive parenting and hostile/ineffective parenting. Positive parenting practices are composed of responsive behaviours that parents use to reinforce their child's positive behaviour, for example, by using statements such as "good for you" (Wahler & Meginnis, 1997), and spending time with a child in a mutually enjoyable activity (Darling & Steinberg, 1993). Hostile/Ineffective parenting practices are composed of behaviours that parents use to discourage unwanted behaviour in their children, such as spanking, showing anger, and showing disapproval (Darling & Steinberg, 1993).

In 57 preschool-age children whose mean age was 46 months, it was demonstrated that higher levels of positive parenting practices and lower levels of hostile/ineffective parenting, as assessed through parent self-report, were associated with higher levels of prosocial behaviours, assessed through direct observation of the child in the preschool setting (Denham & Grout, 1992). Similar findings came from a study examining 70 preschool African American children whose mean age was 55 months (Garner, 2006). Janssens and Devovic (1997) also demonstrated that prosocial behaviours, as assessed through teacher and self-report, were higher for 6 to 11-year-old children who were exposed to higher levels of positive parenting and lower levels of hostile/ineffective parenting. These findings were further supported by the results of a study examining 103 grade 4 children (mean age was 10 years), in which a positive correlation between positive parenting practices and teacher and peer-rated prosocial behaviour was found.

Also reported was a negative correlation between hostile/ineffective parenting and teacher and peer rated prosocial behaviour (McDowell et al., 2002). In a study examining 2,745 11-year-olds nested in 1,982 families, it was demonstrated that higher rates of positive parenting and lower rates of hostile/ineffective parents, as assessed using parent self-report, were significantly predictive of higher levels of parent-rated prosocial behaviour (Romano et al., 2005). These studies all lend support to the theory that positive and hostile/ineffective parenting practices impact a child's prosocial behaviour. Furthermore, taken together these cross-sectional studies suggest that this relationship persists across a child's development from preschool to middle school years.

In a longitudinal study examining the impact of parenting practices on prosocial behaviour trajectories, the influence of parent-reported hostile/ineffective and positive parenting practices, assessed when a child was 2 to 3 years of age, on the child prosocial developmental trajectory between 2 and 8 years of age was examined (Letourneau et al., 2006). It was found that positive parenting practices at the age of 2 to 3 years was predicative of higher levels of prosocial behaviour at the age of 2 to 3 years; however, parenting practices did not significantly influence changes in prosocial behaviours changed over time (i.e., the slope of the trajectory). This indicates that current parenting practice may have a more significant impact on prosocial behaviours than previously experienced parenting practices. To date, there are no published longitudinal studies that have examined the impact of time varying parenting practices on prosocial behaviour trajectories of children. This study addressed this gap in the literature.

Moderating Variables

Some theorists have suggested that the impact of parenting behaviours on child outcomes variables, such as prosocial behaviour, is moderated by tertiary variables such as: child temperament (Carlo et al., 1998; Putnam, Sanson, Rothbart, & Bornstein, 2002; Russell et al., 2003), child gender (Conger et al., 1993; Gore, Aseltine, & Colten, 1993; Griffin, Botvin,

Scheier, Diaz, & Miller, 2000), family socioeconomic status (Aunola et al., 1999; Belsky et al., 2007; Goodnow, 1988; Hoff, Laursen, Tardif, & Bornstein, 2002; Piotrkowski & Katz, 1982), and use of non-parental care (Pierrehumbert et al., 1996). To date the impact of the moderating effects of these variables on the relationship between parenting practices and prosocial behaviour trajectories of children has not been examined in the empirical literature. This study will address this gap in the literature by examining the impact of these interactions on prosocial behaviour trajectories of Canadian children using growth curve modelling.

Temperament and parenting practices. A child's temperament may impact how the child responds to their environment. Specifically, a child's temperament is proposed to interact with parenting practices to impact children's outcomes. This is often referred to as the 'goodness of fit' hypothesis (Van Aken et al., 2007). One aspect of the 'goodness of fit' theory hypothesizes that a child's temperament can impact how a child responds to parenting practices (Chess & Thomas, 1991). Children with certain temperaments may be more or less sensitive to certain parenting practices than others. Thus, a child's temperament may impact the relationship between parenting practices and child outcomes. It has been proposed that children with 'difficult' temperaments may be more sensitive to parenting practices than children with 'easy' temperaments (Kochanska, 1993).

Support for this theory is found in a study by Belsky, Hsieh, and Crnic (1998) of 125 three-year-old boys. It was reported that infant negative emotionality and maternal parenting practices interact to predict externalizing behaviours. Specifically, parenting practices were more predictive of externalizing problems in children categorized as having a negative temperament, suggesting a moderating effect of temperament on the relationship between parenting practices and child outcomes (Belsky et al., 1998). If the relationship between parenting practices and child externalizing behaviour and the development of conscience is moderated by child temperament, it is plausible that the impact of parenting practices on the development of

prosocial behaviour is also impacted by child temperament. An examination of the moderating effect of temperament on the relationship between parenting practices and child prosocial behaviour has not been conducted in the existent literature. The current study addressed this gap in the literature by examining the moderating effect of temperament on the relationship between parenting practices and prosocial behaviour in children using individual growth curve models.

Gender and parenting practices. A child's gender may moderate the relationship between parenting practices and child outcomes. It has been theorized that females are more focused on relationships than males (Gilligan, 1982). Gilligan proposed a 'responsibility orientation' for females and a 'justice orientation' for males when considering morality. It is also theorized that females are concerned with interpersonal relationships than males. Thus it is possible that the parent-child relationship and parenting practices may have a differential impact on girls versus boys.

In research studies it has been demonstrated that the impact of parent-child relationships affects child outcomes for girls more than for boys (Conger et al., 1993; Fergusson et al., 1995). Davies and Windle (1997) reported that, in a sample of 443 middle adolescents, historical reports of poor parenting practices were significantly associated with depressive symptoms, poor academic achievement and conduct problems in girls but not boys. The findings of this study are hypothesized to be due to gender socialization; girls are socialized to value relationships and boys are socialized to value independent exploration and competition (Davis & Wendel, 1997). In a study of 177 children between the ages of 7 and 17, Foster et al. (2008) found that the relationship between parenting practices and externalizing behaviours is stronger for boys than girls and the relationship between internalizing disorders and parenting practices is stronger for girls than boys. This suggests that impact of parenting practices on various child outcomes may differ based on the gender of a child (Foster et al., 2008).

Based on the findings of these studies, it is evident that parenting practices may play a more important role in child outcomes in females than in males. However, the majority of the literature on the moderating effect of gender on the relationship between parenting practices and child outcomes has focused specifically on negative child outcomes, such as depressive symptoms and conduct/aggressive behaviours. More research is needed to assess the moderating effect of gender on the relationship between parenting practices and prosocial behaviour in children. Furthermore, in the published literature, this moderating effect has not been investigated using longitudinal data and methodology. The current study addresses this issue by examining the moderating effect of gender on the relationship between parenting practices and prosocial behaviour trajectories in children.

SES and parenting practices. It has been demonstrated in the literature that the impact of parenting practices on child outcomes may be mediated by family SES. It is also possible that the impact of parenting practices on a child's prosocial behaviour may be moderated by the family's SES. These are two very different theories. The mediating effect of SES on the relationship between parenting practices and child outcomes posits that parenting practices differ based on family SES, thus impacting child outcomes. The moderating effect of SES on the relationship between parenting practices and child outcomes posits that children of differing SES backgrounds will have different outcomes based on the same parenting practices. Although there is considerable research supporting the mediating effect of SES on the relationship between child outcomes and parenting practices (Allhusen et al., 2005; Verhoeven et al., 2007), few studies have examined the moderating effect of SES on the relationship between parenting practices and child outcomes (Spijkerman, Van den Eijnden, & Huiberts, 2008).

Theoretically, it is plausible that family SES could impact the relationship between parenting practices and prosocial behaviour in children. Some studies have provided support to the claim that children of higher SES families spend less time with their parents than children of

lower SES (NICHD Early Child Care Research Network, 1997b). If the children spend less time with their parents, it is possible that the impact of parenting practices may be muted compared to those children who spend more time with their parents. This suggests that the relationship between parenting practices and prosocial behaviours in children may not be strong for children in families of higher SES. To date, the moderating effect of SES on the relationship between parenting practices and prosocial behaviour in children has not been investigated. The current study addresses this gap in the literature by examining how the relationship between parenting practices and prosocial behaviours in children is moderated by family SES.

Non-parental care experiences and parenting practices. It has been suggested that the impact of parenting practices on a child's outcomes may be weakened if a child spends time in non-parental care experiences (Hungerford & Cox, 2006). If children receive non-parental child care, it is likely they are not spending as much time with their parents as children who do not receive non-parental care. This could impact the intensity of the relationship between parenting practices and a child's outcomes. In addition, if a child experiences non-parental care, the socialization experiences she receives in non-parental care may moderate the impact of the socialization experiences she receives through parenting practices. In a study of 47 preschool-age children who were insecurely attached to their mothers, extensive day care involvement protected the children from the risk for disruptive behaviours at 5 years of age (Pierrehumbert et al., 1996). There are no studies that have examined how the relationship between prosocial behaviour and parenting is moderated by the use of non-parental care. The current study addressed this gap in the literature by using linear growth models to examine if the impact of parenting practices on prosocial behaviour trajectories of children is moderated by early child care experiences.

Non-Parental Care Experiences and Prosocial Behaviour

As per the social learning/social cognitive theory, one way a child learns prosocial behaviour is through early modelling and reinforcement. Parents are a child's primary form of socialization; however, with the increasing rate of the use of non-parental care, it can be posited that non-parental child care acts as a significant additional source of socialization for children by providing them with an opportunity to interact socially with adults other than their parents and with same age peers. In industrialized societies, a high proportion of children are being cared for by adults other than their parents (Shpancer, 2002). Ross, Scott and Kelly (1996) reported that, in 1994 to 1995, approximately forty percent of Canadian children age five or younger were receiving some form of regular non-parental care. It has been reported that in the United States, eighty percent of children regularly experience non-parental care before school-age (West, Denton, & Germino-Hausken, 2000). More recent figures indicate that nearly half of North American children experience non-parental care in their preschool years (NICHD, 2005). Thus, early child care experiences may play an important role in the development of prosocial behaviours in children. In the case of children who are not yet in school, non-parental care experiences often serves as one of the child's primary forms of peer socialization. Thus the impact of early child care experiences, before a child starts attending school, may be even more critical in a child's development of prosocial behaviour.

Studies examining the relationship between non-parental care experiences and prosocial behaviours have provided inconsistent results (Austin et al., 1991; DiLalla, 1998; NICHD Early Child Care Research Network, 2000, 2006; Seifert, Canning, & Lindemann, 2001). Austin and colleagues (1991) examined the prosocial behaviours of three groups of children (N = 59) between the ages of 4 and 5 years; those who attended out-of-home child care centers, those who attended preschool centers, and those who were cared for at home by their mothers; assessments were based on the children's actions and responses during interviews with researchers. It was

found that the children in these groups did not differ significantly from each other in terms of prosocial behaviours. Using data from the National Longitudinal Survey of Children and Youth (NLSCY), Seifert et al. (2001) examined the impact of the type of child care experienced by 7,600 children under the age of four on prosocial behaviour. The researchers concluded that type of child care (categorized as no non-parental care experienced, care provided by a daycare center, and care provided by a non-relative) did not significantly impact a child's prosocial behaviour. In another study, the relationship between child care experiences and prosocial behaviours was examined in 124 five year old children in a novel play situation (DiLalla, 1998). It was reported that prosocial behaviours, as rated by parents and assessed through direct observation by researchers, were higher in children who did not experience non-parental care.

The results from these studies indicate that the relationship between early child care experiences and children's prosocial behaviour is complicated. It is important to note that the studies reviewed above did not consider either the quality of the child care experience or the quantity of time the child was in out-of-home care per week (Austin et al., 1991; DiLalla, 1998; Seifert, Canning, & Lindemann, 2001). When examining non-parental care it is important to consider both the quality of the non-parental care and the quantity of out-of-home care experienced by a child (NICHD Early Child Care Research Network, 1998, 2000; Norris, Brink, & Mosher, 1999).

SES and Non-parental Care Experiences

It has been posited that family SES may moderate the relationship between early child care experiences and child outcomes (Cote et al., 2008; Kohen, Hertzman, & Willms, 2002). Cote et al. report that children from high risk (i.e. low SES) families who did experience non-parental care exhibited less physical aggression and more emotional problems than children from high risk (i.e. low SES) families who did not experience non-parental care. Cote et al. note that the findings from this study were only moderately robust and that the interaction effect for use of

non-parental care and emotional problems only applied to the girls in the study. Similarly, Kohen et al (2002) reported that low income children between the ages of 4 and 5 years who received non-parental care were found to have higher levels of vocabulary skills as compared to low income children not experienced non-parental care. These results indicate that use of non-parental care may have a protective effect on child outcomes for children from low SES families. However, both studies utilized cross-sectional data and did not control for parenting practices.

There are a number of theories as to how SES would moderate the relationship. First, it is possible that non-parental care experiences may act as a protective factor for low SES children (Clarke-Stewart et al., 2002). Research on this theory has resulted in some supporting evidence. In a study of 94 low SES toddlers, those children whose mothers were employed, indicating that the children experienced non-parental care, were found to be less defiant than those children whose mothers were not employed (Crockenberg & Litman, 1991). Second, non-parental care may act as an additional risk factor for low SES children (Lamb & Sternberg, 1990; NICHD Early Child Care Research Network, 1997a). Child of low SES, who are already at risk for poor parenting, may be exposed to poor quality child care due to financial constraints of the family, resulting in poor child outcomes. And third, non-parental care may act as a risk factor for high SES children (NICHD Early Child Care Research Network, 1998). Children of high SES may not receive as much individual attention and opportunity to bond with their parents if they are placed in non-parental care. The moderating impact of SES on the relationship between non-parental care and prosocial behaviour trajectories has, to date, not been examined in the empirical literature. The current study addressed this gap in the literature by examining the moderating effect of family SES on the relationship between early child care experiences and prosocial behaviour trajectories in children.

Licensing of Non-parental Care

When assessing the quality of child care, experts agree that it is important to consider group size, quality of the physical setting, caregiver training, caregiver-child ratios and the caregiver's relationship quality with the child (NICHD Early Child Care Research Network, 2001a). In Canada, licensing of child care facilities involves the application of standards and rules to ensure the child care provider provides a minimum quality of care (Ferguson, 2000). Although each province and territory in Canada has different licensing requirements for child care providers, licensing of a child care provider across Canada ensures a basic level of quality of child care. In research studies, quantity of child care is usually measured in terms of the average number of hours of out-of-home child care that a child experiences in one week (NICHD Early Child Care Research Network, 2001b, 2006). The current study contributes to the published literature by providing insight into whether non-parental care experiences, before a child starts attending school regularly, fosters or inhibits the development of prosocial behaviours and if the relationship between child care use and prosocial behaviour trajectories is moderated by whether the child care received is licensed or not, the hours per week spent in child care, and family SES.

Hours in Non-parental Care and Non-parental Care Experiences

Theoretically it is plausible that the relationship between use of non-parental care and prosocial behaviour in children would be influenced by the number of hours per week a child spends in non-parental care. The more time spent in non-parental care would increase the exposure of the child to socializations experiences other than the home environment, thus affording the child greater opportunities to observe, model, and be reinforced for specific behaviours such as prosocial behaviours. The moderating effect of hours in non-parental care per week on the relationship between use of non-parental care and prosocial behaviours in children has not, to date, been examined in the empirical literature. The current study addresses this gap

in the literature by examining whether the hours per week in non-parental care influences the relationship between use of non-parental care and prosocial behaviour.

Summary

Overt prosocial behaviour, which is evident across cultures, is defined as sharing, helping, empathetic responding, and cooperation. Based on the empirical literature, it is advantageous for children in our society to develop high levels of prosocial behaviours. Thus, it is critical to gain an understanding of how prosocial behaviour changes over time and the factors that influence that change. The above review of the literature indicates there have been very few research studies using longitudinal data and methodology to examine how overt prosocial behaviours develop over time from a bio-ecological perspective. The bio-ecological theory provides an appropriate framework to examine prosocial behaviour in children, and the existent research literature provides evidence that child gender, temperament and cognitive abilities, family SES, presence of siblings, parenting practices, and use of non-parental care all may influence the development of prosocial behaviour in children. This is modeled in Figure 1. However, to date, no published studies have attempted to examine how the relationship between early socialization experiences, such as parenting practices and child care experiences, and prosocial behaviour trajectories of children are moderated by tertiary variables. The current study addressed this gap in the literature.

Purpose and Research Questions

It has been well established in the literature that overt prosocial behaviour increases as a child gets older and develops the cognitive abilities necessary for moral reasoning (Cote et al., 2002; Eisenberg et al., 1983; Fabes & Eisenberg, 1999; Kokko et al., 2006; Letourneau et al., 2006; Romano et al., 2005; Zahn-Waxler et al., 2008). The purpose of the current study was to: examine the main effect of a child's gender, temperament, cognitive ability, the presence of siblings present in the home, family SES, parenting practices, and the use of non-parental child

care on prosocial behaviour trajectories in children; to explore how the impact of parenting practices on prosocial behaviour is moderated by a child's gender and temperament, non-parental child care experiences, and family SES; to examine how the impact of using non-parental care is moderated by family SES; and, of those children who experience non-parental care prior to 4 years of age, to examine the main effect of licensed versus non-licensed non-parental care and hours in non-parental care per week on prosocial behaviour trajectories. To achieve these objectives, linear growth modelling was applied through Hierarchical Linear Modelling (HLM). By doing so, the current study contributes to the literature by using longitudinal data and growth curve analysis to provide valuable information on how prosocial behaviour changes over time.

Research Question 1

How do child characteristics, such as gender, temperament, and cognitive ability impact prosocial behaviour trajectories of Canadian children?

It was predicted that female children would demonstrate higher rates of prosocial behaviour than males at all ages, but that the rate at which prosocial behaviour increases with age would be consistent for males and females. This was based on previous studies that have demonstrated, with cross-sectional data that females demonstrate more prosocial behaviour than males but do not differ in their rate of growth of prosocial behaviour (Cote et al., 2002; Fabes & Eisenberg, 1999; Letourneau et al., 2006). It was predicted that children rated as having a 'difficult' temperament would display lower initial levels of prosocial behaviour rates of prosocial behaviour as compared to children rated as having an 'easy' temperament. These hypotheses were based on the empirical research demonstrating the significant impact of measures of temperament on social behaviours in children (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Sanson et al., 2004). However, it is still unclear how the rate at which prosocial behaviour increases with age would differ between these two groups. It was predicted that as a child's

cognitive abilities increased, more prosocial behaviour would be evident at the initial measurement of prosocial behaviour at four years of age. This hypothesis was based on the theoretical and empirical research that associates higher levels of prosocial behaviour with higher levels of cognitive ability (Fabes & Eisenberg, 1999; Slaughter et al., 2002; Veenstra et al., 2008). However, how a child's cognitive ability impacts the rate at which prosocial behaviour changes over time is not clear.

Research Question 2

How do microsystem variables, such as presence of siblings in the home, family SES, parenting practices, and use of non-parental care impact Canadian children's overt prosocial behaviour trajectories?

It was posited that children with siblings would display higher initial rates of prosocial behaviour than those without siblings. This was based on the theoretical literature positing that siblings provide children with an opportunity to practice and develop prosocial behaviours (Perner et al., 1994; Sanders, 2004). However, it is still unclear how the rate at which prosocial behaviour increases with age would differ based on whether the child had siblings or not.

It was theorized that family SES would not directly influence children's prosocial behaviour trajectories. This was based on the empirical research demonstrating that SES does not have a direct main effect on prosocial behaviour in children (Letourneau et al., 2006; Romano et al., 2005). SES was included in this study as it is posited that SES may impact prosocial behaviours in children through its interaction with other variables such as parenting practices and use of non-parental care (Verhoeven et al., 2007; Willms, 2003).

It was hypothesized that higher levels of positive parenting practices and lower levels of hostile/ineffective parenting practices would be associated with a higher frequency of overt prosocial behaviours at age 4 to 5 years. This hypothesis is based on the empirically supported theory that parents, through the employment of positive parenting practices, reinforce prosocial

behaviours in their children; this contributes to their children behaving in prosocial ways and children who observe their parents behaving in a hostile or ineffective manner will be likely to imitate that behaviour, resulting in less overt prosocial behaviours (Denham & Grout, 1992; Garner, 2006; Janssens & Dekovic, 1997; Letourneau et al., 2006; McDowell et al., 2002).

It was hypothesized that children who experience non-parental care will not differ significantly in their initial rates of overt prosocial behaviours than children who do not receive any non-parental care or that the rate at which the prosocial behaviours changes from 4 to 5 years until 10 to 11 years will differ significantly. These hypotheses were based on the theory that the impact of non-parental care on prosocial behaviour in children is complex and may be moderated by tertiary variables such as child care quality, quantity and family SES (Cote et al., 2008; NICHD Early Child Care Research Network, 1997b).

Research Question 3

How is the impact of parenting practices on prosocial behaviour trajectories of Canadian children moderated by child gender, temperament, family SES, and use of non-parental care?

It was hypothesized that the impact of parenting practices on prosocial behaviour trajectories of children would be significantly moderated by the child's temperament, child's gender, whether the family used non-parental care, and family SES. Specifically, the relationship between parenting practices and prosocial behaviour was predicted to be stronger in females than males consistent with the gender socialization theory that states girls are socialized to be more relationship-focused than boys (Gilligan, 1982). The relationship between parenting practices and prosocial behaviour was predicted to be weaker for children with an easy temperament, as children with a difficult temperament have been shown to be more sensitive to parenting practices than children with easy temperaments (Belsky et al., 1998; Kochanska, 1993). The relationship between parenting practices and prosocial behaviour was predicted to be stronger for children of lower SES families compared with children of higher SES families; this was based

on the theory that higher SES children spend less time with their parents than lower SES children (NICHD Early Child Care Research Network, 1997b). Finally, it was predicted that the relationship between parenting practices and prosocial behaviour would be weaker for those children who experienced non-parental care, as it was theorized that children who experience non-parental care spend less time with their parents and have an additional source of socialization experiences through non-parental care.

Research Question 4

How is the impact of use of non-parental care moderated by family SES?

It was hypothesized that the relationship between use of non-parental care and prosocial behaviour would be stronger for children of lower SES compared with children of higher SES. This was based on the theory that, for children of low SES, non-parental care would serve as a protective factor, resulting in more opportunities to learn and practice prosocial behaviours (Cote et al., 2008; Crockenberg & Litman, 1991; Kohen et al., 2002).

Research Question 5

Research question 5 pertains only to the subsample of children in the study who experience non-parental care prior at 2 to 3 years of age. Of those children who experience non-parental care, are prosocial behaviour trajectories impacted by quality of non-parental care and hour per week spent in non-parental care?

It was predicted that children in licensed care would display higher rates of prosocial behaviour than those in non-licensed care at four years of age, although it is unclear if these children would differ in the rate of growth of prosocial behaviour. This hypothesis was based on the theory that licensed child care facilities provide children with a higher quality of care that would emphasize the socialization of prosocial behaviours that is not ensured in non-licensed child care (Ferguson et al., 2000; NICHD Early Child Care Research Network, 2006).

It was also predicted that children who spend more hours in non-parental care would display higher rates of prosocial behaviours at four years of age, although it is unclear if these children would differ in the rate of growth of prosocial behaviour. This hypothesis is based on the theory that more time with a child care provider and other children will result in more opportunity for modelling and reinforcement prosocial behaviours (NICHD Early Child Care Research Network, 2006).

To address these research questions, data from the National Longitudinal Survey of Children and Youth (NLSCY) were examined. A series of growth curve analyses were conducted using Hierarchical Linear Modeling software (HLM) (Bryk & Raudenbush, 1992).

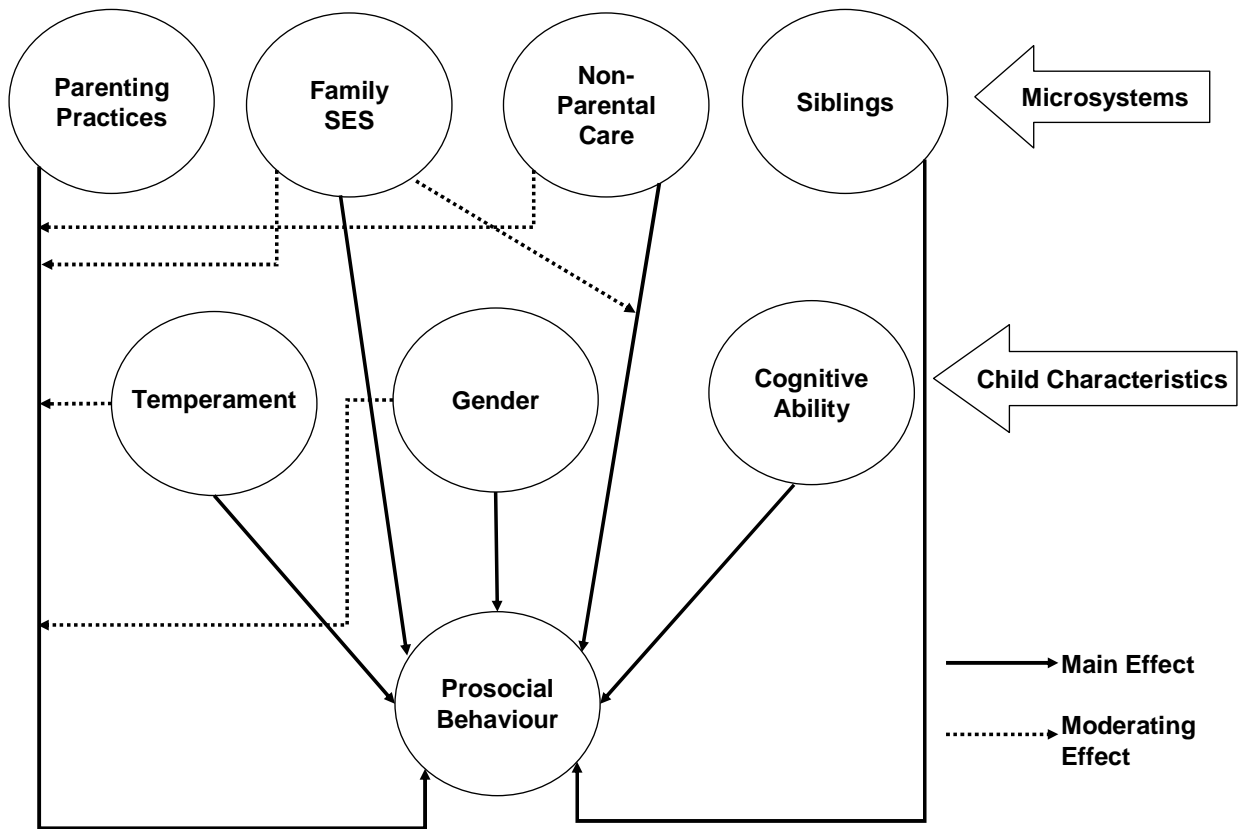


Figure 1. Bioecological theory of prosocial behaviour

CHAPTER III

Methods

In this chapter the methods of the current study are presented. The source of the data, participants in this study, and measures used are described. Descriptive statistics are presented for the demographic characteristics of the sample and other study variables. Finally, there is a discussion of the analytic strategies used to answer the research questions.

Source of Data

Data from the first six cycles of The National Longitudinal Survey of Children and Youth (NLSCY) were used in this study. The NLSCY is a longitudinal study of children in Canada conducted by Statistics Canada. The purpose of the NLSCY is to provide a source of data to researchers for the examination of children's health, language skills, cognitive abilities, and social, emotional, and behavioural development from birth to early adulthood and factors that may impact these developmental outcomes.

The NLSCY began in 1994 with a longitudinal sample of 22,000 children and their caregivers. The first cycle of the NLSCY consists of data collected on children between the ages of 0 to 11 years and their caregivers. These children and their caregivers are re-surveyed every two years until the children reach adulthood. By cycle 6, the children from the first NLSCY cycle were between the ages of 10 and 21 years. A new cohort of children was included in cycle 2 of the NLSCY. These children were 0 to 11 years of age at cycle 2 and are re-surveyed every two years until the children reach adulthood.

The NLSCY survey design is based on cluster sampling of households in Canada. One child between the ages of 0 and 11 years from each household is selected at random. If the household contains more than one child of appropriate age, additional children in the same household are selected at random, with a maximum of four children per household in Cycle 1, and 2 children per household thereafter. In the NLSCY, the child is considered the statistical

unit, not the household. The target population of the survey includes children from all ten Canadian provinces, but excludes children living on First Nations reserves or Crown lands, residents of institutions, children who do not speak either French nor English, full-time members of the Canadian Armed Forces, and residents of some remote regions. Thus, the sample does have some limitations with respect to its ability to generalize to the greater Canadian population.

The data collected in the NLSCY are dependant on the age of the child. Child-level data are collected from four sources. The person most knowledgeable (PMK) about the child is asked to answer questions about the child and family. In the NLSCY, the PMK is the child's biological mother for 90-92% of children, but the PMK may also be the father, step-parent or adoptive parent who lives in the same home as the child. As the PMK is the child's parent for the majority of the cases in the NLSCY, for the purpose of this study, the PMK may also be referred to as 'the parent'. Data were also collected from the child's teacher, and direct assessments of the child's cognitive and academic abilities were conducted, with the parent's permission. A self report survey is completed by the child for children over 10 to 11 years of age.

Family level data are collected from the parent for children 17 years of age and younger. The questions in the adult component are completed once per household, even if more than one child from the household participated in the NLSCY (Statistics Canada, 2005b). Questions in adult component of the NLSCY include basic demographic information and information about family processes such as family functioning and parenting behaviours.

Participants

The sample for this study consisted of two cohorts of children from the NLSCY (See Table 1). The first cohort consisted of children who were between the ages of 2 to 3 years in Cycle 1 (1994-1995) and between the ages of 10 to 11 years in Cycle 5 (2002-2003). The second cohort consisted of children who were between the ages of 2 to 3 years in Cycle 2 (1996-1997)

and between the ages of 10 to 11 years in Cycle 6 (2004-2005). Overall, the study included 8605 children.

Measures

The NLSCY is a comprehensive survey that covers a comprehensive range of topics including the health of children, information on physical development, learning and behaviour as well as information on their social environment (family, friends, schools and communities). For this study the following variables were included in the analysis: prosocial behaviour, gender, temperament, cognitive ability, family SES, positive parenting, hostile/ineffective parenting, non-parental child care use, licensed versus non-licensed care, and total hours of non-parental care per week.

Frequencies were run on all the predictor variables to ascertain the frequency of missing data for each variable. If a variable was missing more than 3% of the data, an attrition analysis was conducted to determine if the variable should be imputed or not (Bryk & Raudenbush, 1992). This was conducted using the missing values module in SPSS. The results of these analyses are discussed separately for each predictor variable in the following sections.

Prosocial Behaviour

This study included four assessments of prosocial behaviour, measured when the children were 4 to 5, 6 to 7, 8 to 9, and 10 to 11 years of age. Children's overt prosocial behaviour was measured with the Prosocial Scale, using the score calculated by Statistics Canada. Statistics Canada created this Prosocial scale score by summing 10 items on the NLSCY that reflect parents' views on the caring, helpful, sympathetic and supportive interpersonal behaviours of their children. Six of the ten items are from the Montreal Longitudinal Survey and four items are from a scale created by Weir and Duveen (Statistics Canada, 2005b) (See Appendix A). An example of an item on this scale is: "How often would you say that...will try to help someone who has been hurt?" The possible responses to these items include: 0 (never or not true); 1

(sometimes or somewhat true); and 2 (often or very true). Thus, scale totals may range from 0 to 20, with higher scores indicating higher levels of prosocial behaviour. It should be noted that scale scores were not calculated when any of the items had missing data (i.e., those coded as “Don't know”, “Refusal” or “Not stated”). This was based on the NLSCY non-response threshold value of 10% (Statistics Canada, 2005).

In the sample used for the current study, the prosocial behaviour scale scores ranged from 0 to 20 (See Table 2) and were noted to be fairly normally distributed (skewness values ranged from -.128 to -.545, kurtosis values ranged from -.207 to -.417). The reliability of the prosocial behaviour scale for each of the six cycles was assessed by Statistics Canada using Cronbach's alpha, a measure of the internal consistency of the items within the scale. The alpha values for the total NLSCY sample were acceptable, ranging from 0.77 to 0.85 (Statistics Canada, 2005). Cronbach's alpha values were calculated using the sample of 8605 participants selected for this study. The alpha values for the prosocial scale for this sub-sample were very high, ranging from 0.81 to 0.98.

Gender

A dichotomous male/female variable was used to mark each child's gender. Males were designated '0' and females were designated '1'. In the current study, gender was fairly evenly distributed, 49% female and 51% male. Of the 8,506 participants in the current study, no participants were missing data for this variable.

Temperament

In the NLSCY, temperament was assessed using an adaptation of the Infant Characteristics Questionnaire (ICQ). The ICQ, originally developed by Bates, Freeland, and Lounsbury (1979), is a short screening instrument used to assess parental perceptions of infant temperament. The original instrument was designed for assessment of six-month old infants (Bates, Freeland, & Lounsbury, 1979). However, it was later modified resulting in the Child

Characteristics Questionnaire (CCQ) for use with children up to 24 months (Lee & Bates, 1985), and revised again resulting in the Preschool Characteristics Questionnaire (PCQ) for use with preschool children up to the age of 47 months (Finegan, Niccols, Zacher, & Hood, 1989). The ICQ has been demonstrated to show satisfactory levels of internal consistency and test-retest stability, concurrent validity and convergent validity (Bates & Bayles, 1984; Bates, Bennett Freeland, & Lounsbury, 1979; Bates, Olson, G., & Bayles, 1982; Finegan et al., 1989; Lee & Bates, 1985).

The revised version of the ICQ used in the NLSCY for children from 1 and 3 years of age measures a specific dimension of temperament, the 'easy-to-difficult' construct. This construct assesses the degree to which a child's behaviour is perceived by the parent to be irregular, difficult, unadaptable, persistent or unstoppable, and affectively negative. The parent ranked the child's difficulty on a 7-point scale: 1, indicating that the child's response is "favourable, or usually exhibits the specified behaviour (rarely fussy)" to 7, indicating that the child reacts "negatively or infrequently displays the behaviour". In Cycle 1 of the NLSCY, 32 temperament items were included. However, based on the results of a factor analysis of the data, only the 8 difficult/fussy items factor loaded as expected. Therefore in Cycle 2, only the 8 items measuring the 'easy-to-difficult' construct were retained.

In the current study, these 8 items were used to assess 'easy-to-difficult' temperament. These items are provided in Appendix A. Factor analysis was conducted on these eight items for 8506 participants included in the current study. The results of the factor analysis indicate that the 8 items load on to one factor, 'easy-to-difficult' temperament. The sum of these eight items was used to create an 'easy-to-difficult' temperament scale score in which higher scores are indicative of a more difficult temperament and lower scores are indicative of an easy temperament. Internal consistency for this scale was good, ranging from .79 to .80. The temperament scale variable was fairly normally distributed (skewness = .370, kurtosis = .370).

Cognitive Ability

In the NLSCY a proxy measure of child cognitive ability was obtained using the Peabody Picture Vocabulary Test-Revised (PPVT-R). This is a revised form of the original PPVT. The PPVT-R is a measure of receptive vocabulary. Based on the standardization sample of PPVT-R, internal consistencies from .61 to .88 and alternate form reliability values from .71 to .91 were demonstrated (Dunn, Dunn, Robertson, & Eisenberg, 1981). In addition, the concurrent validity of the PPVT-R as a measure of general cognitive ability was assessed by comparing the PPVT-R scores to such the Wechsler Intelligence Scale for Children–Revised Full Scale Intelligence Quotient and Stanford-Binet Intelligence Quotient. This resulted in correlations ranging from .16 to .78 (Dunn et al., 1981). In a sample of school-age children, the PPVT-R has been demonstrated to have long-term test-re-test reliability and moderate concurrent validity with the Peabody Individual Achievement Test (PIAT) (Naglieri & Pfeiffer, 1983). In older individuals the PPVT-R standard score has been demonstrated to be correlated significantly ($r = 0.61$) with estimated WAIS-R FSIQ (Snitz, Bieliauskas, Crossland, Basso, & Roper, 2000).

In the current study, PPVT-R standard scores, collected when the children were 6 years of age, were utilized. Of the 8506 children included in the study, this data was available for only 5142 participants (60%). Inclusion of this variable with this missing data would have reduced the sample for this study by 40%. An attrition analysis was conducted to ascertain if the reduced sample differed significantly from the whole sample based on prosocial behaviour, gender, temperament, number of siblings, parenting practices, use of non-parental care, and family SES. The results of this attrition analysis indicated that children who had PPVT-R data and children who did not have PPVT-R data had significantly different means for family SES, $t(8512) = 5.809$, $p = .001$ and child temperament, $t(8338) = 5.240$, $p = .001$. These results indicate that the PPVT-R data are not missing completely at random (MCAR) but missing at random (MAR) and therefore should be imputed so as to avoid introducing bias into the study (Little & Rubin, 1987;

Singer & Willett, 2003). Currently, the most commonly utilized method of imputation for data that is MAR is maximum likelihood estimation (MLE). Therefore the PPVT-R variable in the current study was imputed using MLE. Family SES was used as the predictor variable for this imputation. The imputed PPVT-R variable did not differ significantly from the original PPVT-R variable in terms of mean and standard deviation. The original and imputed PPVT-R variables both demonstrated adequate skewness and kurtosis values (Original PPVT-R: Skewness = 0.053; Kurtosis = 0.721; Imputed PPVT-R: Skewness = 0.039; Kurtosis = 0.483).

Siblings

In the NLSCY, parents were asked how many siblings the child had. For this study, a variable was constructed to assess if a child had siblings before he or she was 4 years of age. Of the 8605 children included in the study, 75% had siblings. For the current study, a dummy variable reflecting this information was constructed. Having no siblings by age 4 to 5 years was the reference category.

Family Socioeconomic Status (SES)

In the NLSCY, a composite SES variable was computed by Statistics Canada for each household, based on the following five variables: level of education of the PMK; level of education of the PMK's spouse; the prestige of the PMK's occupation; the prestige of the PMK's spouse's occupation; and the household income. The SES composite was calculated by taking the mean of the five standardized variables. If one of the five variables was missing data, then the average of the remaining non-missing items was calculated. If two or more of the five variables were missing for two-parent families, then the SES was set to 'not stated'. If there was no spouse/partner in the household, the average was taken of the three applicable variables. If one or more variables were missing for single parent families, then SES was set to 'not stated'. The values for SES range from -2.00 to +1.75. The NLSCY provides examples of the types of families associated with the various SES scores (See Appendix B). For this study, SES was

assessed when the child was approximately 2 to 3 years old. Of the 8506 participants in the current study, data for this variable was missing for only 91 participants. Family SES was fairly normally distributed (skewness = 0.132, kurtosis = 0.451).

Parenting Practices

In the NLSCY, a set of 25 items are used to assess parenting practices. These 25 items were provided by Dr. M. Boyle of the Chedoke-McMaster Hospital, McMaster University and were based on the work by Dodge (Dodge, McClaskey, & Feldman, 1985; Dodge, Pettit, McClaskey, & Brown, 1986) and an adaptation of the 34-item Strayhorn and Weidman Parent Practice Scale. The Strayhorn and Weidman scale examines the frequency of praise, approval of the child's behaviour, involvement, consistency, and hostility used by parents when interacting with their child (Strayhorn & Weidman, 1988). As completed by parents, the scale was found to have good internal consistency ($\alpha = 0.79$). This corresponds to the mean of all possible split-half reliability coefficients resulting from various splitting of the scale, 6 month stability, and was significantly correlated with other concurrent measures of parent's behaviours with their children, such as direct parent-child observation using videotapes (Strayhorn & Weidman, 1988).

In this study, the Positive Parenting and Ineffective/Hostile Parenting Scale scores from the NLSCY were used to assess parent-reported parenting practices. These scales, which reflect the reported parenting for the individual child, were developed by Statistics Canada using factor analysis of all 25 parenting items included in the NLSCY. This factor analysis revealed two additional parenting factors: Consistent Parenting and Rational Parenting. However, these last two parenting practice scales were not included in this study due to weak reliability scores (Statistics Canada, 2005).

The Positive Parenting scale scores from the NLSCY were calculated using 5 items from the 25 parenting practices items in the NLSCY. An example of an item from the Positive Parenting scale is: "How often do you praise... by saying something like 'Good for you' or

‘What a nice thing you did’ or ‘That’s good going’?’ Possible responses for these items include: 1 (never); 2. (about once a week or less); 3 (a few times a week); 4 (one or two times a day); 5 (many times each day). Higher scores on this scale are indicative of higher levels of positive parenting practices. Appendix A provides a complete listing of the items on this scale. If any of the five items on this scale was missing a response, the scale score was not calculated, based on the NLSCY no response threshold value of 10% (Statistics Canada, 2005). Cronbach’s alpha for this scale across the six cycles was good, ranging from .71 to .97 for the 8605 participants included in this study.

The Ineffective/Hostile Parenting Scale developed by Statistics Canada was used as a measure of ineffective/hostile parenting practices in this study. The scale score was calculated by Statistics Canada using 7 items from the parenting questionnaire. An example of an item included in the Ineffective/Hostile Parenting scale is: “How often do you tell him/her that he/she is bad or not as good as others?” The 5-point response scale for these items is the same as the response scale for the positive parenting practices items. Appendix A provides a complete listing of the items on this scale. Higher scores on this scale are indicative of higher levels of ineffective/hostile parenting practices. If any of the seven items on this scale was missing, the scale score was not calculated, based on the NLSCY no response threshold value of 10% (Statistics Canada, 2005). Cronbach’s alpha for this scale was strong, ranging from .70 to .72 for the 8605 participants included in this study.

Non-Parental Care Experiences

Three measures of child care were included in this study: use of non-parental care at 2/3 years of age, whether the non-parental care used was licensed or not, and average hours of non-parental care used per week. For this study, the child care measures were selected specifically when the child was approximately 2 to 3 years old. This was done to ensure that child care

experiences of the child before entering formal schooling was assessed, as the impact of early socialization factors was of primary interest in this study.

In the NLSCY, the use of non-parental care is assessed by asking the PMKs whether their child was receiving any non-parental care (at the time of data collection), “such as daycare, babysitting, care by a relative or other caregiver, or a nursery school while you are at work or studying”. If the PMK indicates that their child received non-parental child care, they are asked a follow-up series of questions regarding the type of non-parental care their child received, whether the non-parental care was licensed or non-licensed, and the number of hours per week the child experienced that type of non-parental care. The categories of non-parental care included in the NLSCY are: care in someone else’s home by a non-relative, care in someone else’s home by a relative, care in child’s home by a non-relative, child in child’s home by relative other than child’s brother or sister, care in child’s home by child’s brother or sister, daycare centers, before and after school program, nursery school, and child in own care.

For this study, a new variable, use of child care, was constructed using the NLSCY child care variables. The use of child care variable reflects whether the child received non-parental care or not. In the sample used for the current study, 42% of participants used non-parental care.

Of the children who experienced non-parental care (3548 participants), two additional variables were constructed to assess whether the care they received was licensed or non-licensed and to assess the hours per week they spent in non-parental care. The licensed variable had two categories: received licensed non-parental child care and received non-licensed non-parental child care, where received non licensed care was designated as ‘0’ and licensed care was designated as ‘1’. Of the children who received non-parental care, 79% received non-licensed care.

The hours in non-parental care variable reflects the total hours of non-parental child care experienced by the child per week. To construct this variable, the following NLSCY variables

were utilized: “Do you currently use child care such as daycare, babysitting, care by a relative or other caregiver, or a nursery school while you or your spouse are at work or studying?”, and “For how many hours per week is that?”. The number of hours of the various forms of non-parental care were added together to create the hours in non-parental child care per week variable. This resulted in a continuous variable ranging from 1 to 160 hours of non-parental care per week (skewness = 1.045, kurtosis = 3.700).

Data for the licensed/non-licensed care and the hours variables were available for the proportion of the study’s sample that experienced non-parental care (42%). Therefore the analyses conducted in the current study that included either of these two variables resulted in a significant reduction in the sample size. An attrition analysis was conducted to ascertain if the reduced sample differed significantly from the whole sample based on prosocial behaviour, gender, temperament, PPVT-R, number of siblings, parenting practices, and family SES. The results of this attrition analysis indicated that children who experienced non-parental care and children who did not experience non-parental care had significantly different means for family SES, $t(8417) = 24.214$, $p = .001$ and PPVT-R scores, $t(5213) = 7.032$, $p = .001$. Children who experienced non-parental care at 2 to 3 years of age had higher levels of SES than those who did not experience non-parental care at 2 to 3 years of age.

No reliability or validity measures were reported by Statistics Canada for any of the child care questions asked in the NLSCY. However, the questions assessing type and quantity of non-parental care on the NLSCY are theorized to be of adequate reliability as the parent filling out the questionnaire does so based on current, rather than retrospective, experiences

Data Analysis

A series of 2-level growth curve analyses were conducted using Hierarchical Linear Modeling software (HLM, Bryk & Raudenbush, 1992) to describe the development of prosocial behaviour and examine the impact of early socialization experiences on the prosocial

developmental trajectories of children followed from 4 to 5 years until 10 to 11 years. HLM is used to describe intra-individual developmental patterns and to identify inter-individual predictors of developmental patterns. HLM allows the researcher to estimate individual growth curves using full maximum likelihood methods which allows the researcher to compare models that vary by fixed effects or random effects (Burchinal, Nelson, & Poe, 2006; Raudenbush & Bryk, 2002; Singer & Willett, 2003). This approach allows for missing data at the within-child-level (Level 1) but not at the between-child-level (Level 2). Thus the child remains in the sample as long as data on prosocial behaviour were collected at least once. For this study, only 3% of the sample had only one data point while the majority, 69%, of the sample had three or more data points. However, the child was excluded from the sample if data were missing for the level 1 or level 2 predictor variables.

When data are collected through surveys in which units (i.e., participants) have been selected with unequal probabilities, as in the NLSCY, sample weights are often applied to the data to produce unbiased estimates of population parameters. However, sample weights were not applied in this study because the sample was comprised of two “stacked” cohorts (e.g., data for 4-and-5 year-olds were drawn from both cycle 2 and cycle 3 data sets). It would have been inappropriate to apply sample weights from two different cycles for the same age group (as the weights are calculated per cycle of data); and using a sample weight drawn from one cycle only would also have been inappropriate. Moreover, the use of sample weights is generally considered less important in a theory testing study; and until recently, sample weights could not be applied to non-linear models when using HLM software.

Assumptions of Growth Curve Analysis

Growth curve analysis requires that the outcome variable, prosocial behaviour, be measured at the interval level and normally distributed (Burchinal, Nelson et al., 2006). In the NLSCY, prosocial behaviour items are measured at the ordinal level, with only 3 possible

responses; however, the scale total score, which ranges from 0 to 20, can be treated as an interval level measure. Descriptive statistics such as skewness and kurtosis were run to assess the normality of the data, and were found to be satisfactory.

Another assumption required for growth curve analysis is that of ‘measurement invariance’. Measurement invariance questions whether the measurement of a construct under varying research conditions, such as using different assessment tools or different assessment locations, or having heterogeneity in the sample, results in measurement of the same attributes (Horn & McArdle, 1992). Some concerns addressed by measurement invariance analysis are whether respondents interpret a given measure differently based on gender, SES, age, or other individual differences, and whether the measures used define the construct in the same manner each time it is used (Vandenberg, 2000). Singer and Willet (2000) noted that measurement invariance is facilitated when the same test instrument is administered throughout the growth period. In this study, the same measure of prosocial behaviour was used at each time point.

Ethical Considerations

In order to conduct this study, a number of ethical considerations were met. Researchers utilizing the NLSCY data are required to conform to confidentiality agreements and may only access the data through specific research data centers (See Appendix C). In addition to these ethical considerations specific to the NLSCY, this study was reviewed and approved by the Behavioural Research Ethics Board of the University of British Columbia (See Appendix D).

Table 1

NLSCY Longitudinal Cohorts in the Study

	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
Cohort 1 Ages in years	2 to 3	4 to 5	6 to 7	8 to 9	10 to11	
Cohort 2 Ages in years		2 to 3	4 to 5	6 to 7	8 to 9	10 to11

Table 2

<i>Sample Characteristics</i>				
	n (%)	Mean	SD	Range
Gender				
Male	4402 (51)			
Female	4203 (49)			
Temperament	8340 (97)	24.01	7.48	8.00 to 55.00
PPVT-R				
Original	5241(60)	99.13	14.62	45.00 to 160.00
Imputed	8542 (99)	99.02	14.60	45.00 to 160.00
Siblings				
Yes	6450 (75)			
No	2134 (25)			
SES	8514 (99)	-0.14	0.77	-3.32 to 2.82
Non-parental Care				
No	4915 (58)			
Yes	3548 (42)			
Licensed Care ^a				
Yes	751 (21)			
No	2787 (79)			
Hours in Child Care ^a	3540(100)	31.18	17.24	1.00 to 160.00
Positive Parenting				
Age 4 to 5	5471 (63)	14.62	2.59	3.00 to 20.00
Age 6 to 7	5175 (60)	13.31	2.59	0.00 to 20.00
Age 8 to 9	4826 (56)	12.69	2.57	3.00 to 20.00
Age 10 to 11	4557 (53)	12.21	2.63	2.00 to 20.00
Hostile/Ineffective Parenting				
Age 4 to 5	5471 (63)	8.96	3.57	0.00 to 23.00
Age 6 to 7	5175 (60)	8.70	3.46	0.00 to 26.00
Age 8 to 9	4826 (56)	8.60	3.54	0.00 to 24.00
Age 10 to 11	4557 (53)	8.36	3.63	0.00 to 25.00
Prosocial Behaviour				
Age 4 to 5	5471 (63)	11.99	3.90	0.00 to 20.00
Age 6 to 7	5175 (60)	13.61	3.78	0.00 to 20.00
Age 8 to 9	4826 (56)	14.20	3.61	0.00 to 20.00
Age 10 to 11	4557 (53)	14.56	3.58	0.00 to 20.00

^a Based on the 3548 children who received non-parental care before 4 years of age

CHAPTER IV

Results

This chapter presents the results from the series of growth models that were estimated to answer the five research questions: How do child gender, child temperament, and child cognitive abilities impact Canadian children's overt prosocial behaviour trajectories?; How do family SES, the presence of siblings, parenting practices and early child care experiences impact Canadian children's overt prosocial behaviour trajectories?; Is the impact of parenting practices on the prosocial behaviour trajectories moderated by child gender, child temperament, family SES, or the use of non-parental care?; Is the impact of use of use of non-parental care on the prosocial behaviour trajectories moderated by family SES?; and Are the trajectories of prosocial behaviours among children who experience non-parental care impacted by the licensed/non-licensed nature of the care or by the hours spent in non-parental care per week?

Hierarchical Linear Models

The data were analysed as follows. First, both a linear and a quadratic unconditional growth model were fitted for the prosocial behaviour variable to determine which model provided the best fit for the data. A cubic model was not explored in the current study as a minimum of five waves of data is needed to effectively model a cubic growth curve (Bickel, 2007). The analyses were conducted using full maximum likelihood (FML) estimation (Singer & Willett, 2003).

Linear Model:

$$\text{Level 1 } Y_{ti} = \pi_{0i} + \pi_{1i} (\text{age}_{ij}) + e_{ij}$$
$$\text{Level 2 } \pi_{0i} = \gamma_{00} + r_{0i}$$
$$\pi_{1i} = \gamma_{10} + r_{1i}$$

Quadratic Model: Level 1 $Y_{ti} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{age}_{ij}^2) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + r_{0i}$

$\pi_{1i} = \gamma_{10} + r_{1i}$

$\pi_{2i} = \gamma_{20} + r_{2i}$

Where:

π_{0i} = level of prosocial behaviour of person i at 4 years of age

$\pi_{1i}(\text{age}_{ij})$ = the growth rate for person i over the data-collection period

$\pi_{2i}(\text{age}_{ij}^2)$ = the curvature or acceleration in each growth trajectory for person i

γ_{00} = population mean of level 1 intercepts for individuals

γ_{10} = mean growth rate by age

γ_{20} = mean growth rate by age squared

r_{0i} = residual variance in the true intercept across all individuals

r_{1i} = residual variance in the true linear slope across all individuals

r_{2i} = residual variance in the true quadratic slope across all individuals

e_{ij} = residual variance across all occasions of measurement for person i

The model fit for the linear and quadratic models was assessed by comparing the deviance (-2 log likelihood) values of both models, where the likelihood value is that associated with the maximum likelihood estimates under the null hypothesis (Bickel, 2007; Bryk & Raudenbush, 1992). The difference in the deviance statistic (104,327 – 103,942) resulted in a chi square value that far exceeded 18.47, the critical value of a chi-square distribution on 4 degrees of freedom at the .001 level (See Table 3). Based on this result, it was concluded that the linear model provided a better fit than the quadratic model. Thus, a series of conditional models were conducted to examine the effect of various predictor variables on the initial measure (intercept: π_0) and the instantaneous rate of change (linear slope: π_1) of the prosocial behaviour trajectory. The linear unconditional model was designated as Model 1. The intercept for all the models were centered at 4 years of age, for ease of interpretation. Thus, the intercept parameter, π_0 , reflects the mean level of prosocial behaviour at age 4 years. For the unconditional model (model 1), with no level 2 predictor variables included, the level of mean prosocial behaviour for a child at age 4 years was 12.122 (SE = 0.053; range 0 - 20). The linear slope parameter, π_1 , reflects the mean

growth rate of prosocial for a child for each year. This suggests that, on average, a child's prosocial behaviour increases by 0.417 units per year (SE = 0.010).

In Model 1, the intercept variance of 7.562 indicates that there is significant variation in individual levels of prosocial behaviour at the age of 4 years. The variance for the linear slope (0.064) also suggests that there is significant variation in growth rates per year. The intercept and linear slope variance may be due to random error and not actually be reflective of true variation. Therefore, it is important to examine the reliability scores for the intercept and linear slope. The two reliability estimates were greater than .05, with the intercept demonstrating the stronger reliability at 0.55 compared with 0.14 for the slope. These results indicated that there are significant individual differences in the intercept, and linear slope (Bryk & Raudenbush, 1992) and that the modeling of the intercept and linear as a function of person-level variables is warranted. In Model 1, the initial rate of prosocial behaviour at age 4 years was negatively correlated with the linear slope. This indicates that higher levels of prosocial behaviour at age 4 years were associated with lower rates of growth of prosocial behaviour.

Research Question 1

Model 2 was run to address the first research question: how do child characteristics such as gender, temperament, and cognitive ability impact prosocial behaviour trajectories? Gender, temperament, and cognitive abilities were included as time invariant predictors of the intercept and linear slope in Model 2. Time invariant predictors are those variables expected to remain constant over time. The cognitive abilities and temperament variables were added as grand mean centered for ease of interpretation of the regression coefficients. In doing so, the value for the variables at 4 years of age represents the mean of the variables, in this case cognitive ability and temperament (Bryk & Raudenbush, 1992). In these equations, r_{0i} and r_{1i} represent residuals (i.e., the amount variance in the outcome variance that is not explained by the predictors).

Model 2: Level 1 $Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + r_{0i}$

Level 2 $\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + r_{1i}$

The results of this model (see Table 4) indicate that gender and temperament measured at 2 to 3 years were significantly predictive of prosocial behaviour at 4 to 5 years of age (γ_{01} and γ_{02} , respectively). On average, girls and children with an easy temperament were rated higher in prosocial behaviour at age 4 and 5 years. Girls were rated 1.080 units higher in prosocial behaviour than boys, and each unit of increase on the temperament scale, indicating a more ‘difficult’ temperament, prosocial behaviour at age 4 to 5 years decreased by 0.066 units. A child’s cognitive ability, as assessed by the PPVT-R was not significantly predictive of prosocial behaviour at 4 to 5 years of age (γ_{03}). The results of Model 2 also indicate that gender, temperament, and cognitive ability did not have a statistically significant effect on the growth of prosocial behaviours over time (γ_{11} ; γ_{12} ; γ_{13} ; respectively).

In Model 2, the proportion of variance explained for the intercept (7.23%) and the linear slope (0.00%) by gender, temperament, and cognitive abilities suggests that the inclusion of these variables did improve the model fit, but only slightly. Figure 2 illustrates the growth curves for prosocial behaviour in males and females showing the difference in intercepts, but no significant difference in the rate of growth between the ages of 4 and 11 years.

Figure 3 illustrates the growth curves for prosocial behaviour for children rated at the 75th percentile for (more difficult) temperament and the 25th percentile for (easier) temperament. This figure clearly illustrates the difference in intercepts, but similar trajectory shapes between the ages of 4 and 11 years.

Research Question 2

Model 3 examined the main effects of five microsystem variables, including number of siblings, family SES, positive and hostile parenting practices, and use of non-parental care. The

parenting practices variables, which reflect the parenting experiences of individual children, were added as level 1, grand-mean centered, time-varying predictors. These variables were time-varying to account for changes in parenting practices that happen as children get older, which are well documented (Holden & Miller, 1999). The family SES variable was also grand mean centered for ease of interpretation. The variances of the parenting practices variables were fixed in the models in the current study as an explanation of that variance was not an area of interest in the current study.

Model 3: Level 1 $Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{usecc}_i) + r_{0i}$

Level 2 $\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{usecc}_i) + r_{1i}$

Level 2 $\pi_{2i} = \gamma_{20} + r_{2i}$

Level 2 $\pi_{3i} = \gamma_{30} + r_{3i}$

This model assessed the effect of family SES, having siblings, and the use of non-parental care on prosocial behaviours present at the initial assessment age (4 to 5 years; γ_{04} , γ_{05} , and γ_{06} , respectively) and on the rate of growth of prosocial behaviours over time (γ_{14} , γ_{15} , and γ_{16} , respectively). Results indicated that SES and siblings variables significantly impacted prosocial behaviour at 4 to 5 years of age (see Table 5). Children who had siblings were, on average, rated as being 0.381 units lower in prosocial behaviour than children who did not have siblings. For each unit of increase on the SES scale, prosocial behaviour at age 4 to 5 years increased by 0.167 units. None of the Level 2 predictor variables significantly impacted the slope or rate of change of the prosocial behaviour trajectories.

Model 3 also assessed how parenting practices, specifically positive parenting and hostile/ineffective parenting practices (π_{2i} and π_{3i} , respectively), impacted the trajectories of prosocial behaviour in children from age 4 to 11 years. The results indicated that higher levels of positive parenting were predictive of higher levels of prosocial behaviour and that higher levels of hostile/ineffective parenting were predictive of lower levels of prosocial behaviour. Specifically, for every incremental increase in positive parenting, prosocial behaviour increased by 0.227 units; and for every incremental increase in hostile/ineffective parenting, prosocial behaviour decreased by 0.173 units.

In Model 3, the proportion of variance explained for the intercept was 14.24% and 5.59% for the linear. This indicates that including family SES, the presence of siblings, use of non-parental care, hostile/ineffective parenting, and positive parenting as predictors in the model did improve the model fit.

Figure 4 illustrates the growth curves for prosocial behaviour in children with siblings and children without siblings showing the statically significant but small difference in intercepts between the ages of 4 and 11 years. Figure 5 similarly illustrates the growth curves for prosocial behaviour in children from the 75th percentile of SES (higher SES) versus children from the 25th percentile of SES (lower SES) between the ages of 4 and 11 years. Figure 6 provides a visual representation of how the prosocial behaviour trajectories differ in relation to differences in levels of positive parenting, showing that higher levels of positive parenting are associated with higher rates of prosocial behaviour across the age groups. Figure 7 provides a similar visual representation of how the prosocial behaviour trajectories differ in relation to differences in levels of hostile/ineffective parenting, showing that higher levels of hostile/ineffective parenting are associated with lower rates of prosocial behaviour across the age groups.

Research Question 3

Models 4a to 4d examined the moderating effects of gender (4a), temperament (4b), family SES (4c), and use of non-parental care (4d) on the impact of parenting practices on trajectories of prosocial behaviour of children from 4 to 11 years of age. This was done by looking at the cross-level interactions between the parenting variables (at level 1) and the four level 2 predictors (see equations below).

Model 4a: Level 1 $Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{usecc}_i) + r_{0i}$

Level 2 $\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{usecc}_i) + r_{1i}$

Level 2 $\pi_{2i} = \gamma_{20} + \gamma_{21}(\text{gender}_i) + r_{2i}$

Level 2 $\pi_{3i} = \gamma_{30} + \gamma_{31}(\text{gender}_i) + r_{3i}$

Model 4b: Level 1 $Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{usecc}_i) + r_{0i}$

Level 2 $\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{usecc}_i) + r_{1i}$

Level 2 $\pi_{2i} = \gamma_{20} + \gamma_{21}(\text{temp}_i) + r_{2i}$

Level 2 $\pi_{3i} = \gamma_{30} + \gamma_{31}(\text{temp}_i) + r_{3i}$

Model 4c: Level 1 $Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{usecc}_i) + r_{0i}$

Level 2 $\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{usecc}_i) + r_{1i}$

Level 2 $\pi_{2i} = \gamma_{20} + \gamma_{21}(\text{SES}_i) + r_{2i}$

Level 2 $\pi_{3i} = \gamma_{30} + \gamma_{31}(\text{SES}_i) + r_{3i}$

Model 4d: Level 1 $Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$

Level 2 $\pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{usecc}_i) + r_{0i}$

Level 2 $\pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{usecc}_i) + r_{1i}$

Level 2 $\pi_{2i} = \gamma_{20} + \gamma_{21}(\text{usecc}_i) + r_{2i}$

Level 2 $\pi_{3i} = \gamma_{30} + \gamma_{31}(\text{usecc}_i) + r_{3i}$

Only one of the interaction terms was found to be statistically significant, and only for positive parenting. The results of Model 4b indicated that there was a moderating effect of temperament on the relationship between positive parenting practices and prosocial behaviour. Specifically, as can be seen in Figure 8, the beneficial effects of high levels of positive parenting on prosocial behaviour was not as strong for children with difficult temperaments as it was for children with easy temperaments (see Table 6 for the parameters and statistical tests). In Model 4b, the additional proportion of variance explained in the intercept was 14.71% and 9.38% for the linear slope suggesting a slight increase to the model fit.

Research Question 4

Model 5 was run to determine whether the relationship between prosocial behaviour trajectories and use of non-parental care was moderated by family SES. In contrast to Models 4a, 4b, 4c, and 4d which estimated cross-level interaction terms to test for moderating effects, in Model 5 the effect was estimated using the cross-product interaction terms within Level 2 (i.e., the interaction of child care and SES). Below is the equation that represented this analysis:

$$\text{Model 5: Level 1} \quad Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$$

$$\text{Level 2} \quad \pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{usecc}_i) + \gamma_{07}(\text{SES}_i) + \gamma_{08}(\text{usecc} * \text{SES}_i) + r_{0i}$$

$$\text{Level 2} \quad \pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{usecc}_i) + \gamma_{17}(\text{SES}_i) + \gamma_{18}(\text{usecc} * \text{SES}_i) + r_{1i}$$

$$\text{Level 2} \quad \pi_{2i} = \gamma_{20} + r_{2i}$$

$$\text{Level 2} \quad \pi_{3i} = \gamma_{30} + r_{3i}$$

The results of Model 5 indicated that there was a moderating effect of family SES on the relationship between use of non-parental child care and prosocial behaviour when children were 4 to 5 years of age, although the effect of non-parental child care on growth rate of prosocial behaviours was not influenced by SES. In other words, the use of non-parental care significantly impacted prosocial behaviour trajectories for only particular levels of SES (see Table 7).

This interaction effect is graphically displayed in Figure 9. This figure shows that children living in low-SES families were rated as having higher levels of prosocial behaviours if they had experienced non-parental child care at ages 2-3, than low-SES children who did not experience non-parental child care. The figure also suggests that, at higher levels of family SES, non-parental care does not confer the same benefits. In fact, children who experienced non-

parental care were rated as having lower levels of prosocial behaviour than children who had not received non-parental care.

Research Question 5

Research Question 5 asked, of those children who experience non-parental care, are prosocial behaviour trajectories impacted by quality of non-parental care and hour per week spent in non-parental care? To address this research question a sub-sample of the 3,234 children who had received non-parental care at 2 to 3 years of age was used. Model 6 (see below) included the same variables as Model 3 above, but with the reduced sample. This was done in order to have an accurate baseline to compare other models to. Model 7 was then run to estimate the effects of being in licensed versus non-licensed care, as well as the average hours of non-parental care experienced per week.

$$\text{Model 7: Level 1} \quad Y_{ij} = \pi_{0i} + \pi_{1i}(\text{age}_{ij}) + \pi_{2i}(\text{pospar}_{ij}) + \pi_{3i}(\text{hospar}_{ij}) + e_{ij}$$

$$\text{Level 2} \quad \pi_{0i} = \gamma_{00} + \gamma_{01}(\text{gender}_i) + \gamma_{02}(\text{temp}_i) + \gamma_{03}(\text{cog}_i) + \gamma_{04}(\text{SES}_i) + \gamma_{05}(\text{sibs}_i) + \gamma_{06}(\text{lic}_i) + \gamma_{07}(\text{hours}) + r_{0i}$$

$$\text{Level 2} \quad \pi_{1i} = \gamma_{10} + \gamma_{11}(\text{gender}_i) + \gamma_{12}(\text{temp}_i) + \gamma_{13}(\text{cog}_i) + \gamma_{14}(\text{SES}_i) + \gamma_{15}(\text{sibs}_i) + \gamma_{16}(\text{lic}_i) + \gamma_{17}(\text{hours}) + r_{1i}$$

$$\text{Level 2} \quad \pi_{2i} = \gamma_{20} + r_{2i}$$

$$\text{Level 2} \quad \pi_{3i} = \gamma_{30} + r_{3i}$$

The results of this model indicated that these variables did not significantly impact the prosocial behaviour trajectory of those children who experienced non-parental care prior to 4 years of age. As can be seen from Table 8, the results from Model 7 are not substantially different from those of Model 3, which includes the full sample of this study. This lends support to the claim that the sub-sample of children who received non-parental care prior to 4 years of

age did not differ significantly from the full sample with respect to the predictor variables considered in this study.

Table 3

Comparison of Linear and Non-Linear Unconditional Models

	Linear Model	Quadratic Model
Fixed Effects		
Initial Status		
Intercept	12.121***	11.658***
Linear Slope		
Intercept	0.417***	0.907***
Non-linear Slope		
Intercept		-0.072***
Random Effects		
Initial Status at 4/5	7.562***	7.884***
Linear Slope	0.064***	0.350
Non-linear Slope		0.003
Goodness of Fit		
Deviance	103942	104327
Tau ^a	-0.445	-0.347
Tau ^b		0.163

Note. Tau^a = correlation between linear slope and intercept

Tau^b = correlation between non-linear slope and intercept

*p < .05. **p < .01. ***p < .001.

Table 4

Growth Model Results for Research Question 1

Variables	Model 2
Fixed Effects	
Initial Status	
Intercept	11.595***
Gender (1 = girls, 0 = boys)	1.080***
Temperament	-0.066***
Cognitive Ability	0.006
Linear Slope	
Intercept	0.403***
Gender	0.028
Temperament	0.001
Cognitive Ability	0.000
Random Effects	
Initial Status at 4/5	7.016***
Linear Slope (Age)	0.064***
PV Intercept	7.23
PV Linear Slope (Age)	0.00

Note. PV = percent variance explained.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5

Growth Model Results for Research Question 2

Variables	Model 3
Fixed Effects	
Initial Status	
Intercept	11.604***
Gender	1.055***
Temperament	-0.023***
Cognitive Ability	0.001
Family SES	0.167*
Siblings	-0.381**
Use Non-Parental Care	0.065
Linear Slope	
Intercept	0.452***
Gender	-0.024
Temperament	-0.000
Cognitive Ability	0.001
Family SES	-0.014
Siblings	0.037
Use Non-Parental Care	-0.008
Positive Parenting	
Intercept	0.227***
Ineffective Parenting	
Intercept	-0.173***
Random Effects	
Initial Status at 4/5	6.486***
Linear Slope (Age)	0.060***
PV Intercept	14.24
PV Linear Slope (Age)	5.59

Note. PV = percent variance explained.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Growth Model Results for Research Question 3

Variables	Model 4a	Model 4b	Model 4c	Model 4d
Fixed Effects				
Initial Status				
Intercept	11.598***	11.603***	11.605***	11.592***
Gender	1.085***	1.062***	1.058***	1.060***
Temperament	-0.029***	-0.024**	-0.030***	-0.029**
Cognitive Ability	0.001	0.001	0.001	0.001
Family SES	0.169*	0.168*	0.148	0.167*
Siblings	-0.384**	-0.379**	-0.379**	-0.380**
Use Non-Parental Care	0.057	0.055	0.057	0.088
Linear Slope				
Intercept	0.456**	0.454***	0.453***	0.457***
Gender	0.016	0.0226	0.024	0.023
Temperament	-0.000	-0.002	-0.000	-0.000
Cognitive Ability	0.001	0.001	0.001	0.001
Family SES	-0.014	-0.014	-0.008	-0.014
Siblings	0.038	0.036	0.036	0.037
Use Non-Parental Care	-0.008	-0.008	-0.008	-0.023
Positive Parenting				
Intercept	0.240***	0.227***	0.227***	0.236***
Gender	-0.028	---	---	---
Temperament	---	-0.004*	---	---
Family SES	---	---	0.013	---
Use of Non-parental Care	---	---	---	-0.023
Hostile/Ineffective Parenting				
Intercept	-0.190***	-0.172***	-0.173***	-0.170***
Gender	0.033	---	---	---
Temperament	---	-0.001	---	---
Family SES	---	---	0.010	---
Use of Non-parental Care	---	---	---	-0.008
Random Effects				
Initial Status at 4/5	6.450***	6.455***	6.464***	6.456***
Linear Slope (Age)	0.058***	0.058***	0.059***	0.059***
PV Intercept	---	14.70	---	---
PV Linear Slope (Age)	---	9.38	---	---

Note. PV = percent variance explained.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 7

Growth Model Results for Research Question 4

Variables	Model 5
Fixed Effects	
Initial Status	
Intercept	11.611***
Gender	1.055***
Temperament	-0.029***
Cognitive Ability	0.001
Use of Non-Parental Care	0.046
Family SES	0.295**
Siblings	-0.376**
SES*Use Non-Parental Care	-0.301*
Linear Slope	
Intercept	0.451***
Gender	0.024
Temperament	-0.000
Cognitive Ability	0.001
Use of Non-Parental Care	-0.005
Family SES	-0.020
Siblings	0.037
SES*Use Non-Parental Care	0.015
Positive Parenting	0.227***
Hostile/Ineffective Parenting	-0.173***
Random Effects	
Initial Status at 4/5	6.496***
Linear Slope (Age)	0.060***
PV Intercept	14.10
PV Slope (Age)	6.25

Note. PV = percent variance explained.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 8

Growth Model Results for Research Question 5

Variables	Model 6	Model 7
Fixed Effects		
Initial Status		
Intercept	12.166***	13.140***
Gender		1.366***
Temperament		-0.032**
Cognitive Ability		0.000
Use of Non-Parental Care		---
Family SES		-0.019
Siblings		-0.444**
Licensed		-0.036
Hours		-0.001
Linear Slope		
Intercept	0.419***	0.401***
Gender		0.016
Temperament		0.001
Cognitive Ability		0.000
Use of Non-Parental Care		---
Family SES		0.005
Siblings		0.025
Licensed		-0.029
Hours		-0.000
Positive Parenting		0.217***
Hostile/Ineffective Parenting		-0.181***
Random Effects		
Initial Status at 4/5	5.763***	5.524***
Linear Slope (Age)	0.070***	0.062***
PV Intercept	---	---
PV Slope (Age)	---	---

Note. PV = percent variance explained.

* $p < .05$. ** $p < .01$. *** $p < .001$.

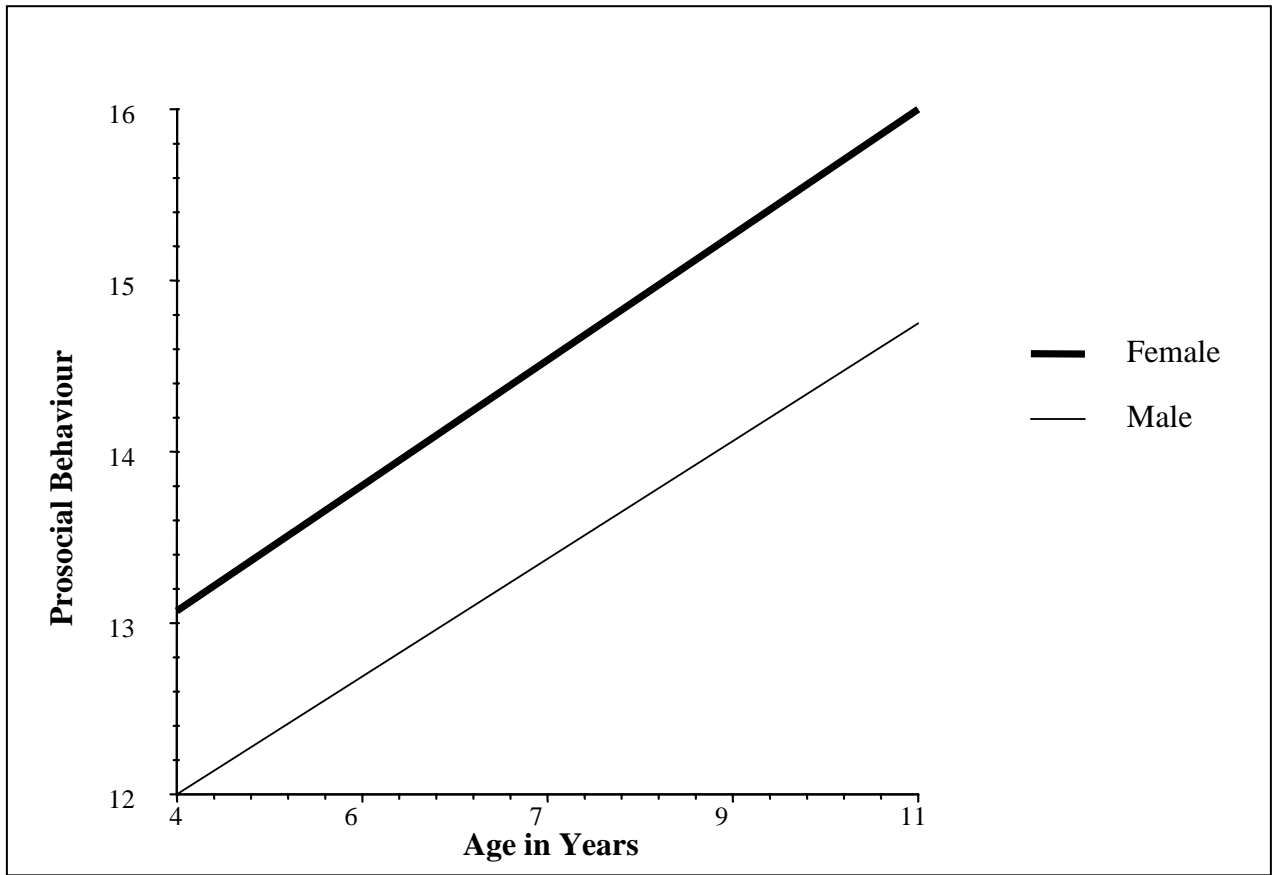


Figure 2. Gender differences in prosocial behaviour trajectories.

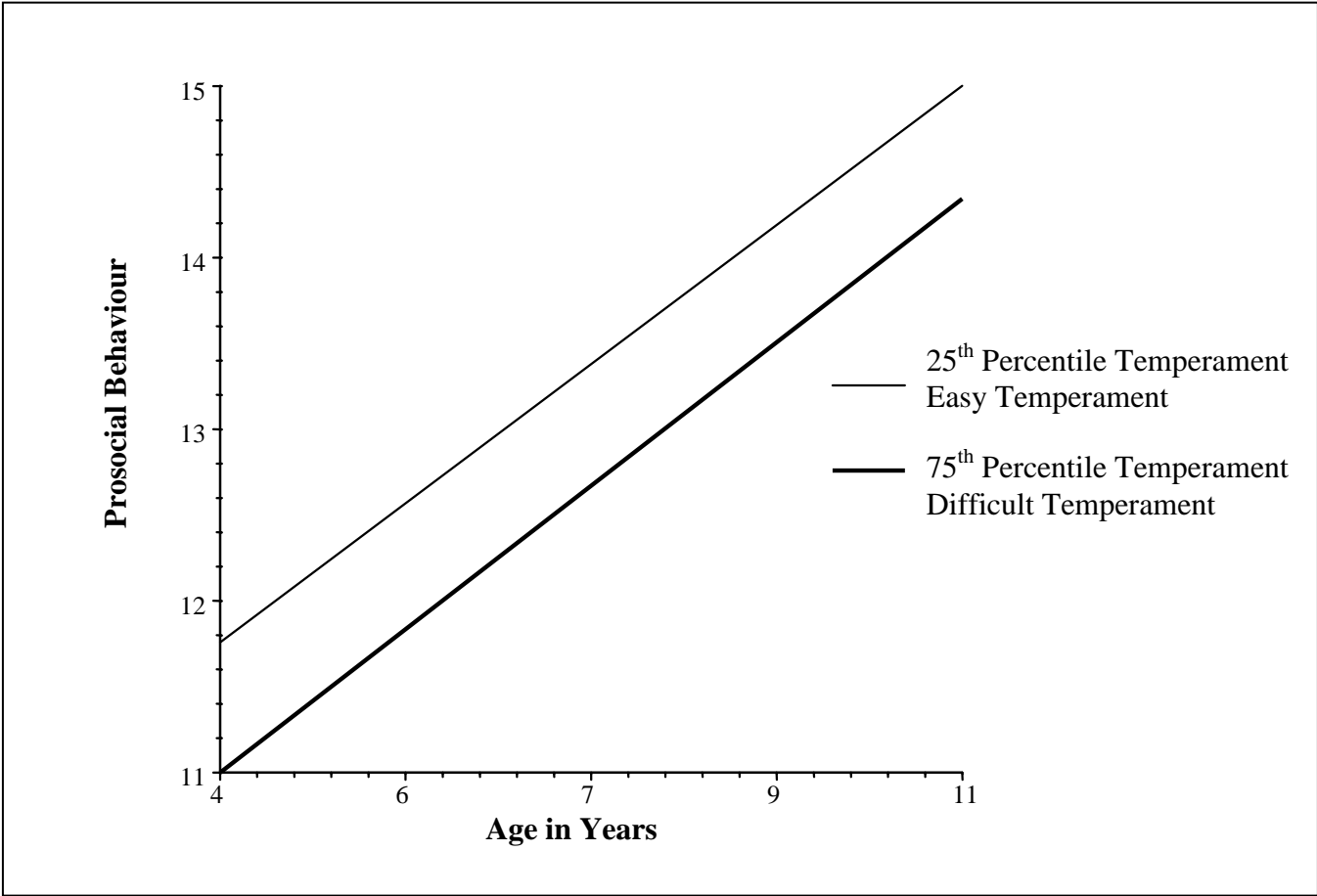


Figure 3. Temperament differences in prosocial behaviour trajectories.

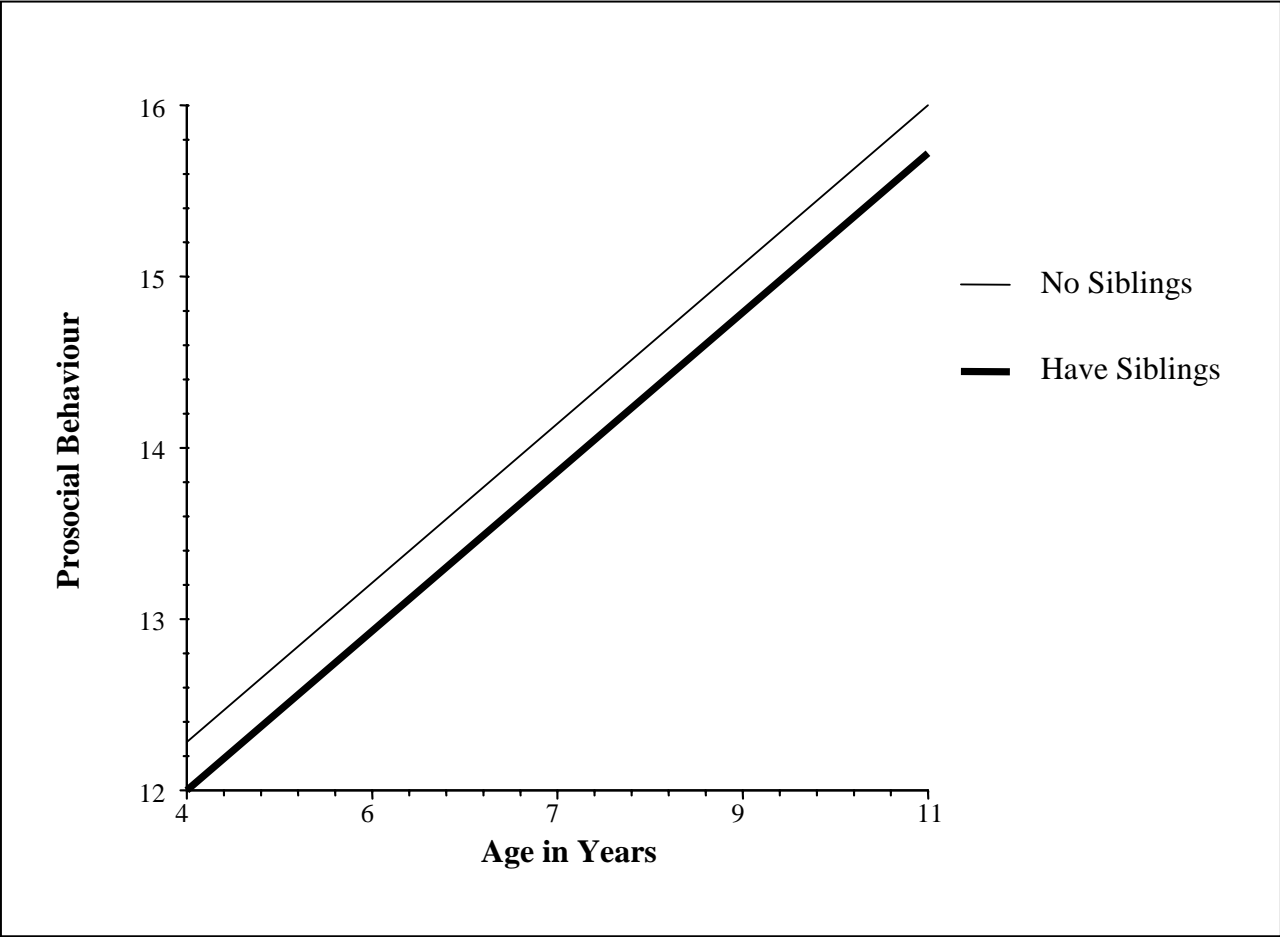


Figure 4. Sibling versus no siblings differences in prosocial behaviour trajectories.

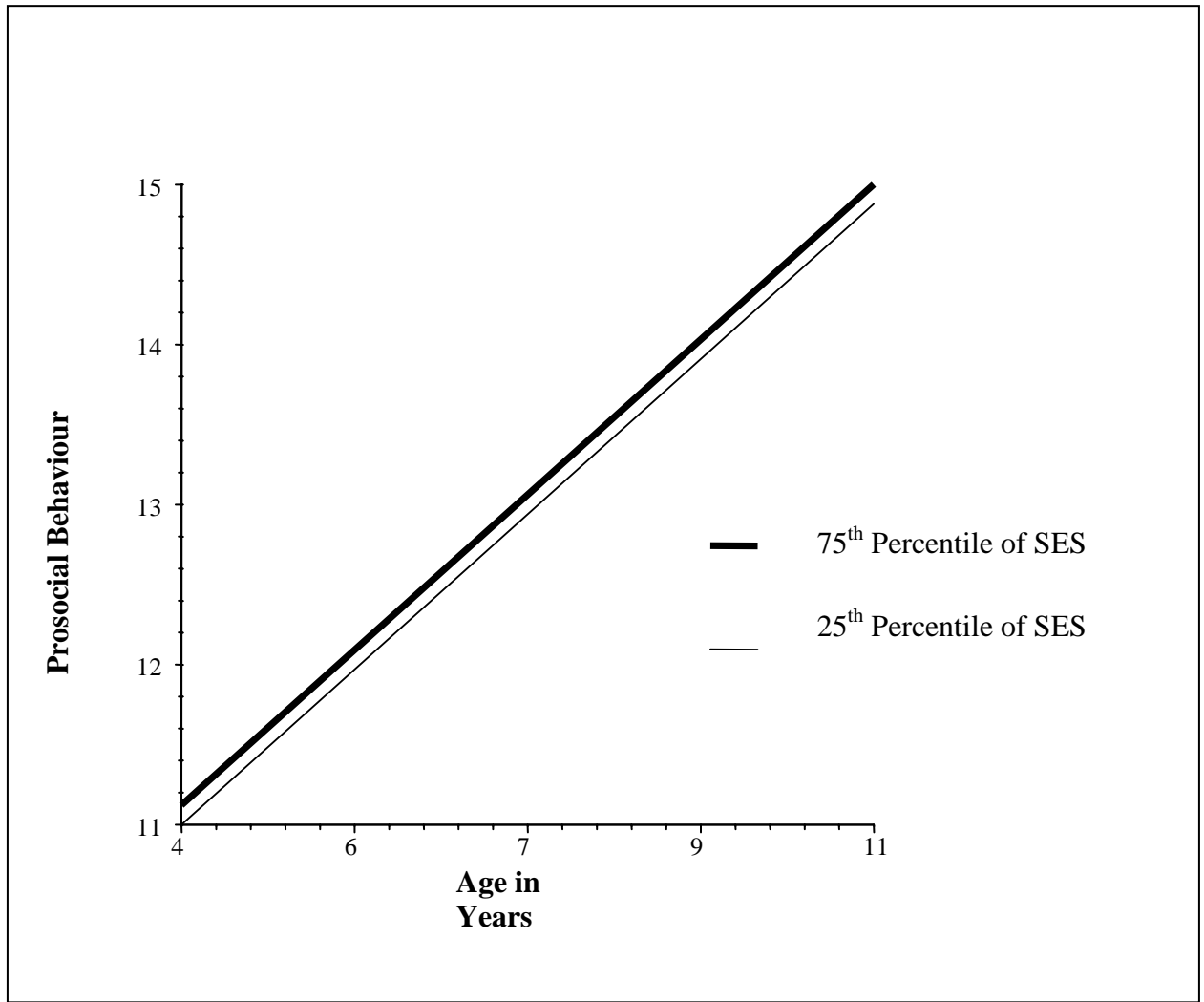


Figure 5. SES differences in prosocial behaviour trajectories.

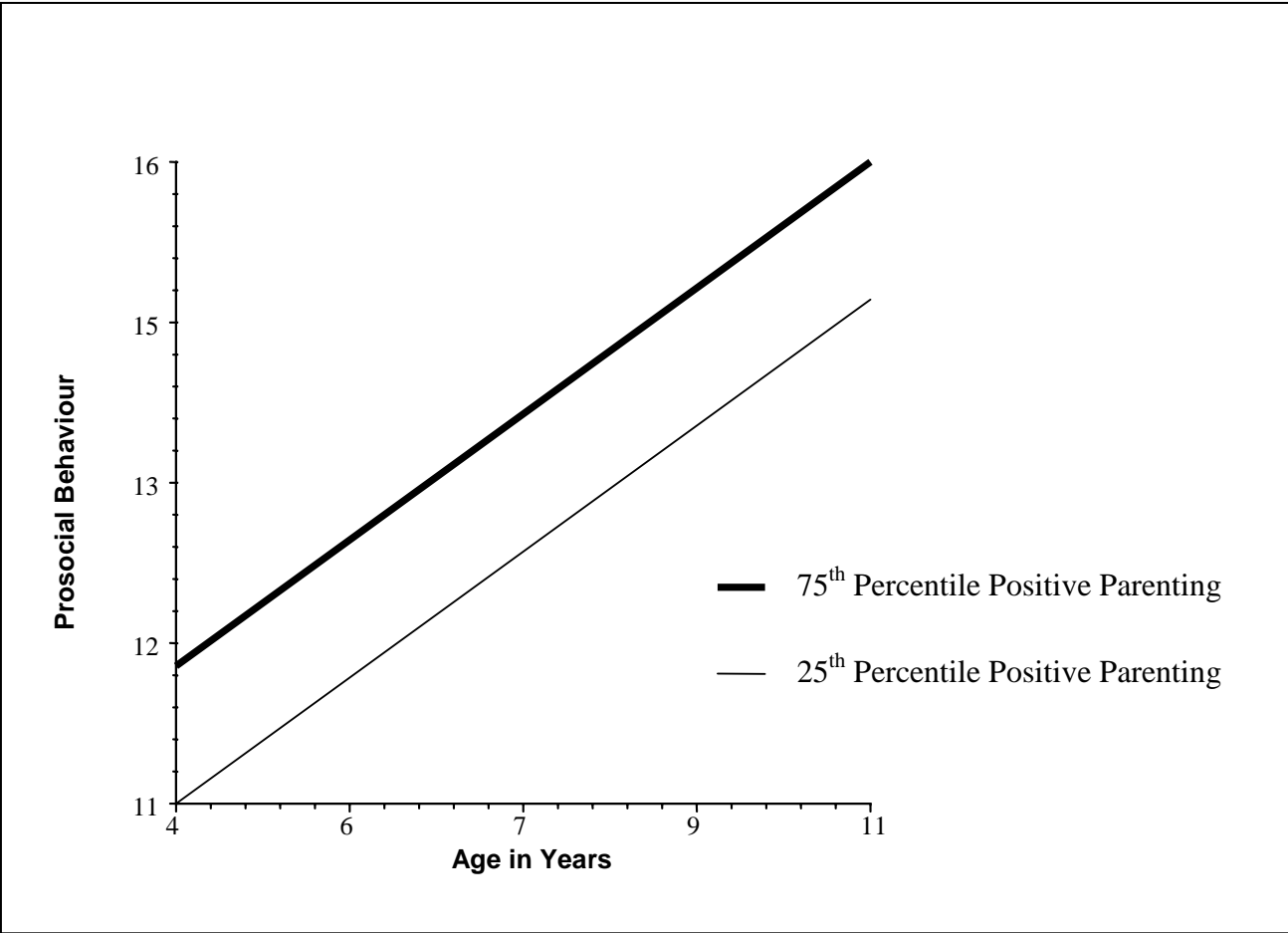


Figure 6. Positive parenting differences in prosocial behaviour trajectories.

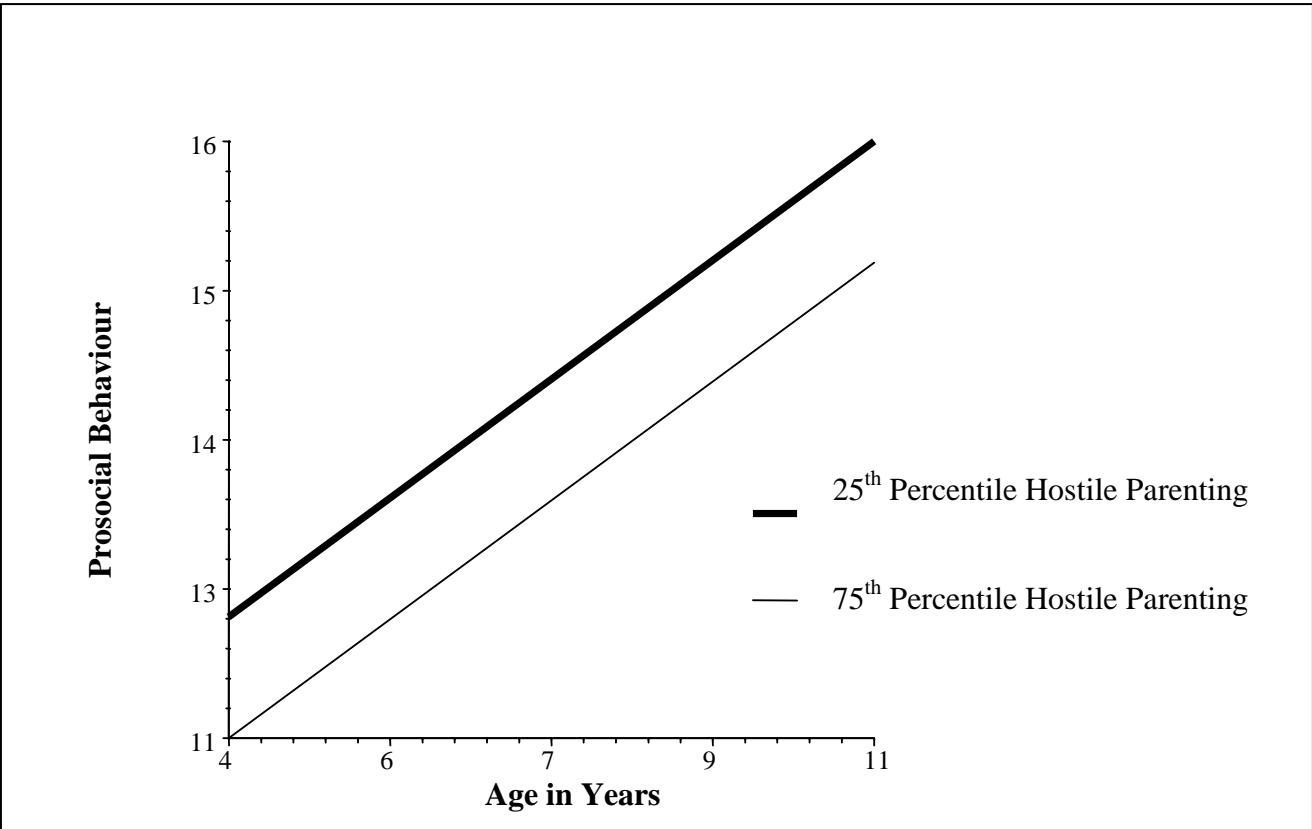


Figure 7. Hostile/Ineffective parenting differences in prosocial behaviour trajectories.

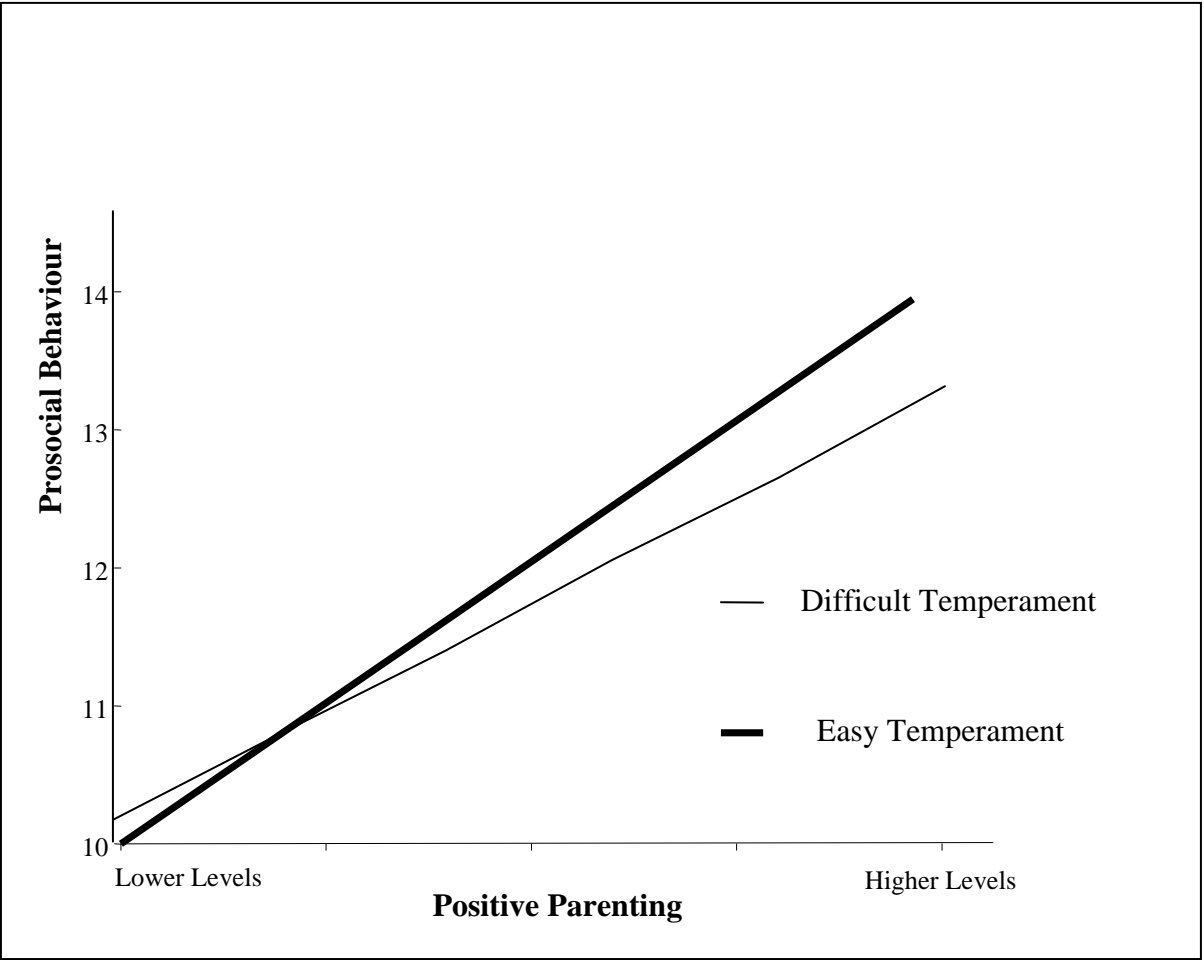


Figure 8. Relationship between positive parenting and prosocial behaviour moderated by temperament.

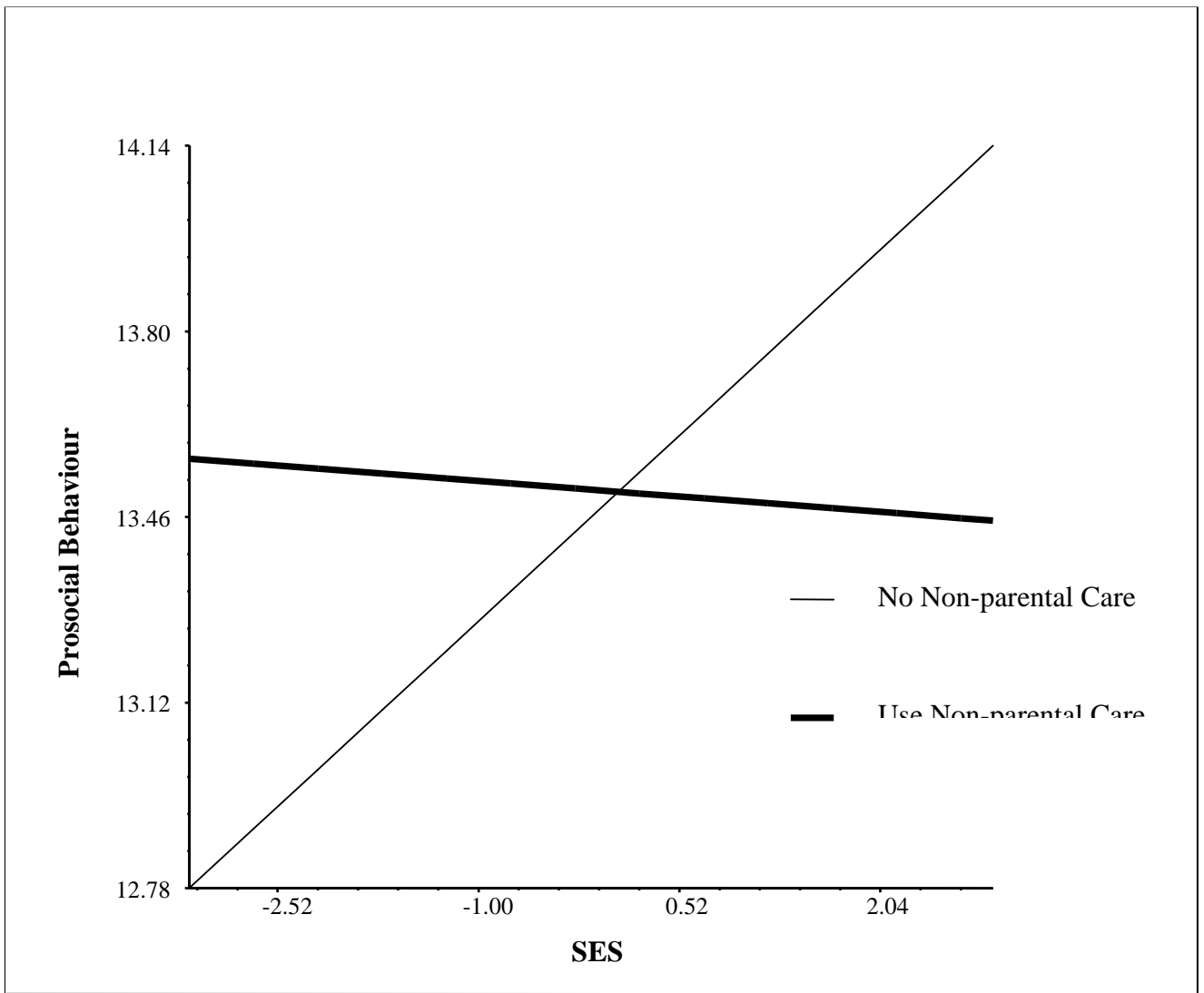


Figure 9. Relationship between use of non-parental care and prosocial behaviour moderated by family SES.

CHAPTER V

Discussion

This chapter presents the principal conclusions emerging from this study. The chapter is divided into five main sections: (a) a summary of the results, with an attempt to link the findings with other published literature; (b) study strengths and limitations; (c) implications of the study for practice, (d) recommendations for future research; and (e) study conclusions.

Prosocial behaviour, an integral component of social competence, has been found to be associated with numerous positive outcomes in children, including lower levels of aggression and delinquency, and increased academic success. The purpose of this study was to investigate the influence of a set of child characteristics and microsystem variables on the development of prosocial behaviour in children between the ages of 4 and 11 years of age. Specifically, the purpose of the current study was to: assess the impact of gender, temperament, cognitive ability, the presence of siblings, parenting practices, family SES, and the use of non-parental child care on the development of prosocial behaviour in children; to examine how the impact of parenting practices on prosocial behaviour is moderated by a child's gender and temperament, non-parental child care experiences, and family SES; to examine how family SES moderates the impact of use of non-parental care on prosocial behaviour in children; and, of children who experience non-parental care prior to 4 years of age, to determine if there is a difference in prosocial behaviour trajectories based on whether prior non-parental care was licensed or not and the number of hours per week spent in non-parental care.

Overview of Results

The results of the current study suggest that gender, temperament, the presence of siblings, family SES, and parenting practices impact levels of prosocial behaviour of children at 4 to 5 years of age; however, none of the variables in the model were found to influence the rate of growth in prosocial behaviour after age 4 to 5. The lack of significant findings for the slope of

the prosocial behaviour trajectories may be due in part to the fairly low reliability found in the growth rate parameter for the linear unconditional model, which may be partly due to 31% of the sample having had fewer than 3 data collection points for prosocial behaviour. Of greatest significance, the impact of parenting practices on prosocial behaviour trajectories was found to be moderated by child temperament whereas the impact of use of non-parental care on prosocial behaviour trajectories was moderated by the families' SES.

Relationship between Child Characteristics and Prosocial Behaviour Trajectories

With respect to child characteristics, it was hypothesized that girls, children with easy temperaments, and children with higher levels of cognitive ability would display higher levels of parent-rating prosocial behaviour at 4 to 5 years of age, but that gender, temperament, and cognitive ability would not significantly impact the rate at which prosocial behaviours changed over time (i.e., between the ages of 4-5 and 10-11 years). Two of these three hypotheses were supported by the findings of this study. Parents rated girls and children with 'easy' temperaments as having higher levels of prosocial behaviour between the ages of 4 and 11 years, but cognitive abilities were not found to influence prosocial behaviour trajectories. None of the three child-level variables were associated with the rate of change in levels of prosocial behaviour. Furthermore, the three child-level variables (e.g., gender, temperament, and cognitive ability) were not associated with the rate of change in levels of prosocial behaviour.

Gender. The findings regarding gender are consistent with previous studies that have also shown that girls typically demonstrate higher rates of prosocial behaviours than their male peers (Aber et al., 2003; Fabes & Eisenberg, 1999; Hay et al., 1999; Letourneau et al., 2006; Romano et al., 2005). Higher levels of prosocial behaviour in girls have been reported in preschool children assessed using direct observation assessment of prosocial behaviour (Hay et al., 1999) and across in middle childhood using teacher-rated prosocial behaviour (Aber et al., 2003). Based on data from the NLSCY, Romano et al. (2005) and Letourneau et al. (2006), reported

higher levels of prosocial behaviour in girls compared with boys. These results support the notion that, during childhood, females demonstrate higher levels of prosocial behaviour than males.

Fabes and Eisenberg (1999) noted that how prosocial behaviour is defined and measured, and the age at which it is assessed, may impact the relationship found between gender and prosocial behaviour. For example, using an adult sample, Eagly and Crowley (1986) found that prosocial behaviours, defined only as helping behaviours, were higher in adult males than females. Men in westernized societies may demonstrate higher levels of helping behaviours than women as this behaviour is congruent with the masculine ideal of being capable and competent (Levant et al., 1992; Cushman, 2008). They are also likely to be rewarded for such behaviours with gratitude or praise. In contrast, it is less likely that sharing and caring behaviours would be valued by men as highly as helping behaviours, as they are more likely to be considered typical female behaviours. The current study of prosocial behaviours in children prosocial behaviour was defined more broadly to comprise helping, caring and sharing behaviours. Thus, the inconsistent findings between the current study and the findings of Eagly and Crowley may be attributed to methodological differences such as the definition and measurement of prosocial behaviour, and the difference in age groups.

In the current study, prosocial behaviour was assessed through parent reports. Thus, the scores obtained are a measure of parents' perceptions of their child's prosocial behaviour, not a measure of directly observed, overt prosocial behaviour. The reported gender differences may be due to differences in how parents perceive girls and boys. For example, studies have found that parents perceive girls as more prosocial than self-reported data suggest (Fabes & Eisenberg, 1999). This may account for the difference found in the current study between parent ratings of prosocial behaviour in males and females. However, it has been demonstrated in other studies that parents are more likely to promote the development of prosocial behaviours in their female

children than their male children (Power & Parke, 1986) which may explain the gender differences found in many research studies of children's prosocial behaviours.

Temperament. The current study found that children who were reported to have 'easy' temperaments were more likely to show higher levels of prosocial behaviour than children with 'difficult' temperaments, but that the rate of change over time does not vary with temperament of the child. This may be an artefact of measurement, in that all data for this study were collected from the parents through survey methods, and parents may be biased towards positive or negative reporting. For example, parents who rate their children as having a more difficult temperament may be less likely to rate their children as prosocial. Another possible explanation for these findings is that there may be 'true' relationship between temperament and prosocial behaviour; that children who have an easy-going temperament may also interact more positively with others and may engage in more helping, caring and sharing behaviours than children who are more difficult or fussy.

The results from the current study support the findings of previous studies that have shown that children with 'easy' temperaments are rated as being more prosocial than children with 'difficult' temperaments (DiLalla, 1998; Russell et al., 2003; Stanhope et al., 1987). DiLalla reported that parent-rated temperament was predictive of prosocial behaviour in novel laboratory settings, as assessed through direct observation, whereas Russell and colleagues found that parent-rated temperament was predictive of teacher-rated prosocial behaviour. The design of these two studies obviated the possibility of response bias created by having the same respondent rating temperament and prosocial behaviour. In all these previous studies, the authors had identified a need for investigation of the link between prosocial behaviour and temperament in school-age children (as conducted in the current study) as opposed to the majority of the studies that have focused on preschool-age children.

Cognitive ability. Contrary to expectations, and in contrast to prior research based on cross-sectional data (Slaughter et al., 2002; Veenstraa et al., 2008), cognitive ability was not found to be predictive of the level of prosocial behaviour at age 4. Again, the conflicting results may be due to methodological differences between the current study and that of Slaughter et al. and Veenstraa et al. Veenstraa and colleagues drew on a sample of preadolescent children (mean age of 11 years), and measured cognitive development with two sub-tests (Vocabulary and Block design) of the Wechsler Intelligence Scale for Children –Revised (WISC-R). Slaughter et al., on the other hand, used the PPVT-R with a small sample (N=87) of 4- to 6-year-old children, compared with the population-based sample used in this study.

The PPVT-R, which is intended as a measure of receptive vocabulary, is often used in research as a proxy measure for general intelligence. The hypothesis that cognitive abilities predict prosocial behaviour is based on the notion that as an individual's capacity for higher level cognitive processes, such as moral reasoning, develops so will their overt prosocial behaviours. The results of the current study may have differed if a direct measure of moral reasoning had been applied as an alternative to the proxy measure of intelligence.

The current study also explored the rate of change in the trajectory of prosocial behaviour, and how cognitive development might have influenced that change. Due to the paucity of prior longitudinal research, no directional hypothesis was made. No significant association was found between PPVT-R scores and rate of change in prosocial behaviours between 4 and 11 years.

Relationship between Microsystem Variables and Prosocial Behaviour Trajectories

Four of the five variables from the child's microsystem in the model were found to influence children's trajectories of prosocial behaviour. Children who had siblings, were of lower SES, and those who experienced lower levels of positive parenting or higher levels of hostile/ineffective parenting were found to have lower levels of prosocial behaviour. The

presence of siblings and family SES influenced the level of prosocial behaviour at 4 years of age, but did not influence how prosocial behaviour changed over time. Children who received lower levels of positive parenting or higher levels of hostile/ineffective parenting, as rated by their parents, were found to have lower levels of prosocial behaviour at each data collection point between 4 and 11 years of age. The use of non-parental child care was not associated with the developmental trajectories of prosocial behaviour.

Siblings. In contrast to the hypothesis that children with siblings would display higher initial levels of prosocial behaviour than children without siblings (but that the two groups would not differ in their rate of growth of prosocial behaviour), results from the current study suggest that children with siblings are less prosocial at age 4 to 5 years than children without siblings. This finding is also inconsistent with previous research examining the relationship between prosocial behaviour and siblings (Perner et al., 1994; Sanders, 2004). The study hypothesis was based on the notion that children with siblings have greater opportunity to practice and develop prosocial behaviours. However, given that in the current study, prosocial behaviour was based solely on parent report, a possible explanation for the unexpected finding is that parents of multiple children are likely to see them engage in sibling rivalry and fighting, which may reduce their rating of prosocial behaviour. Furthermore, the study by Perner et al. (1994), reported that the number of siblings in a family impacted prosocial behaviour. In the current study the difference between “only” children and children with siblings was examined. Perhaps as the impact of siblings on prosocial behaviour trajectories may be moderated by number of siblings in a family. This is an area in need of further study.

Family SES. The findings from the current study showed a significant impact of SES on prosocial behaviour, which is seemingly contradictory to the findings of Letourneau et al., who also drew on NLSCY data. However, the study by Letourneau et al. (2006) included children from two to eight years of age whereas the current study included slightly older children between

the ages of 4 and 11 years. It is plausible that family SES plays a more significant role in predicting child outcomes in older children. As children get older, particularly among their elementary school years, they may be likely to spend more time out of the family home and may have differing experiences based on SES that, in turn, may impact their prosocial behaviour development. Children who live in families with higher SES may be more likely to participate in high quality out-of-home activities such as organized sports that the lower SES families may find financially prohibitive.

Parenting practices. The findings from this study fully support the hypotheses that (a) higher levels of positive parenting would be associated with higher levels of prosocial behaviour and (b) higher levels of hostile/ineffective parenting would be associated with lower levels of prosocial behaviour were, and are consistent with the social learning theory (Maccoby, 1968). Children learn how to behave by watching the people around them, modelling behaviours, and receiving reinforcement for socially desired or appropriate behaviours; a process often referred to as socialization. Given that the key socializing agents for young children are, typically, their parents (Hastings, McShane et al., 2007), it is expected that early parenting practices play a critical role in the development of prosocial behaviours in children. Children who are exposed to positive parenting practices are likely to model these behaviours, which are linked to helping, caring and sharing behaviours. Furthermore, parents who use more positive parenting practices may be more likely to reinforce their children's prosocial behaviour. In contrast, children who are exposed to hostile/ineffective parenting practices are likely to model these behaviours, which are linked to anger, frustration, and impatience, and their parents may be less likely to reinforce prosocial behaviour in their children. It is also possible that children who are less prosocial may invoke more hostile/ineffective parenting practices from their parents whereas children who demonstrate high levels of prosocial behaviour may invoke more positive parenting practices. However, the significant association may be a result of single-source, monomethod bias, in that

the current study used parent-ratings of children's prosocial behaviour as well as self-reported parenting behaviours. It is possible that parents who use more positive parenting practices are more likely to perceive their child as prosocial, and parents who use more hostile/ineffective parenting practices are more likely to perceive their child as less prosocial.

The results of the current study are consistent with those from previous cross-sectional studies (Denham & Grout, 1992; Garner, 2006; Janssens & Dekovic, 1997; McDowell et al., 2002; Romano et al., 2005) that have examined the relationship between parenting practices and prosocial behaviour. As expected, the findings are also consistent with those of Letourneau and colleagues' (2006) growth modelling study using NLSCY data, but with a slightly different child sample. However, although Letourneau et al.'s findings showed a similar influence of positive and hostile parenting behaviours on prosocial behaviour trajectories, their study modelled parenting practices as a time-invariant predictor measured when the child was less than 24 months old. The current study built on this study by modelling parenting practices as time-varying predictors of prosocial behaviour. Thus, this study was able to investigate the impact of parenting practices concurrent with each time point that prosocial behaviour was measured, while controlling for the effects of the three child-level variables and other family-level variables.

It was further hypothesized that the impact of parenting practices on prosocial behaviour trajectories would be moderated by gender, temperament, family SES, and use of non-parental care. Only one of these interactive effects, parenting-by-temperament, was found to be significant, and only for positive parenting. That the relationship between positive parenting and prosocial behaviour trajectories was moderated by child temperament supports the goodness of fit theory that biological traits, such as temperament, interact with environmental aspects, such as parenting practices, to impact child behaviour. However, the results of the current study are contrary to the hypothesis that children with a difficult temperament may be more sensitive to

parenting practices. The results from the current study suggest that the beneficial effects of a high level of positive parenting on prosocial behaviour is not as strong for children with difficult temperaments as it is for children who are rated as having an easy temperament.

The findings from the current study demonstrate some inconsistency with the findings from previous research examining the moderating effect of temperament on the relationship between parenting practices and child outcomes (Belsky et al., 1998). Previous research has supported the theory that the relationship between parenting practices and negative child outcomes, specifically externalizing problem behaviour, is stronger for children with difficult temperaments than for children with easy temperaments. In the current study, however, positive rather than negative child behaviours were examined. This may account for the different moderation effect found in the current study.

Non-parental care. In the current study it was hypothesized that children who had experienced non-parental child care would demonstrate higher initial rates of prosocial behaviour than children who did not receive any non-parental care, but that the rate at which the prosocial behaviours changed from 4 to 11 years would not differ significantly between the two groups. This hypothesis was based on the expectation that children who experienced non-parental care would have a greater opportunity to observe and model prosocial behaviours with non-parental care givers and same age peers. However, no significant association was found between non-parental care and prosocial behaviour. The non-significant finding may be due to having measured child care at only one time point, at age 2 to 3 years, which was designed to account for on-parental socialization prior to the child being exposed to non-parental socialization in school. The measure of child care in the model provided data on only the current child care experience of the child (at age 2 to 3 years) and did not take into account prior child care experiences, or child care experienced after age 2 to 3 years. The lag in time between the measure of child care and the first measure of prosocial behaviour at age 4 to 5 years may have

diluted the influence of child care experiences for those who did receive child care at age 2 to 3. It is also possible that at such a young age, the socialization experiences of the child in non-parental care are not fully incorporated into the child's internal working model of the world (Maccoby, 1968). Moreover, the failure to account for child care received at age 4 to 5 among those children who did not receive child care at age 2 to 3 might have further obscured any measureable relationship. It is also possible that the impact of early child care experiences is eclipsed by the impact of parenting practices, to which children may be more continuously exposed. It was noted by the NICHD team (2006), that the link between prosocial behaviours, defined as cooperative behaviours, and quality and quantity of non-parental care may be mediated by parenting practices.

Other studies, such as those by Austin et al. (1991) and DiLaala (1998), have also failed to find a significant relationship between non-parental care and prosocial behaviour. However, neither of these studies considered the impact of the quality or quantity of the non-parental care, leaving doubt as to the validity of the findings, given that both quality and quantity of non-parental care have been demonstrated to impact prosocial behaviour (NICHD Early Child Care Research Network, 2006). Furthermore, these studies did not consider the moderating effect of SES on the relationship between use of non-parental care and prosocial behaviours.

In the current study, it was hypothesized that the relationship between use of non-parental care and prosocial behaviour trajectories would be moderated by family SES. Specifically, it was predicted that non-parental child care would serve as a protective factor for children of low SES, a hypothesis that was fully supported by the results of the current study. Children of low SES families who received non-parental care demonstrated significantly higher levels of prosocial behaviour than those children of low SES who did not experience non-parental care.

This protective factor evident in lower SES children is not evident in higher SES children. There is no significant difference in prosocial behaviour between high SES children who

experience non-parental care and high SES children who do not experience non-parental care. This may be because high SES children do not need the additional promotion of prosocial behaviours that low SES children may receive through non-parental care. Higher SES children, who experience the benefits of the security of high income and the higher education level of their parents, may be exposed to positive socializing experiences with their parents, friends of their parents, and other programs that enhance prosocial behaviour even more so than non-parental care experiences.

These findings are consistent with those of Cote et al. (2008) and Kohen et al. (2002); both found that the relationship between use of non-parental care and various child outcomes was moderated by family SES. Taken together, these results lend substantial support to the theory that children of low SES families benefit from experiencing non-parental care prior to 4 years of age. This indicates that the use of non-parental care may serve as a protective factor to children of low SES, resulting in higher levels of positive outcomes such as prosocial behaviour and language skills and lower levels of negative outcomes such as physical aggression and emotional disturbances.

It was further hypothesized that of those children who received non-parental care, those who experienced licensed care and more hours of non-parental care would display higher rates of prosocial behaviour. These hypotheses were based on the theory that licensed care providers would be better prepared to model prosocial behaviours and to reinforce prosocial behaviours, and to provide programming specifically designed to increase prosocial behaviour than non-licensed facilities. Subsequently, longer time in non-parental care would allow for more opportunity to observe and model prosocial behaviours with other adults and similar-age peers.

However, neither of these hypotheses was supported by the findings of the current study. The hours spent per week in non-parental care and whether the care was licensed or not were not found to significantly moderate the relationship between prosocial behaviour trajectories and the

use of non-parental care. A possible factor that may have contributed to the non-significant findings is the lack of a direct measure of the child care quality. Instead, the model included a dichotomous variable indicating whether the non-parental care was licensed or not, which was used as a proxy measure of child care quality. Although the child care licensing requirements in Canada ensure a basic level of quality (e.g., child-to-caregiver ratios, physical environment safety standards), licensing does not ensure that positive child care practices, similar to positive parenting practices, are used by the non-parental care provider.

Strengths and Limitations

As in most studies, there are limitations that need to be discussed, most of which are due to constraints imposed by using previously collected data. The use of the NLSCY offered a number of advantages, such as having a representative population-based sample, large sample size, and multiple waves of longitudinal data. However, the use of the NLSCY also limited the study in a number of ways. The NLSCY used a single method for assessing prosocial behaviour. Although ratings of prosocial behaviours by teachers and parents have been found to be reliable and valid estimates of prosocial behaviours in children, the use of multiple methods of data collection and multiple raters is recommended when assessing prosocial behaviour (Scourfield et al., 2004). There are teacher-ratings of prosocial behaviour within the NLSCY, but including those ratings in the model would have reduced the age range of the prosocial behaviour trajectory as teacher-ratings were available only for school-age children. Using teacher-data would have reduced the sample size substantially, and possibly resulted in a biased sample, as these data are available only for those children whose parents have consented to teacher assessments, approximately 60% of the sample. Thus, teacher reports of prosocial behaviour were not included in the current study. In future research, it would be valuable to ascertain if the impact of early socialization experiences on parent-rated prosocial behaviour differs from the impact of early socialization experiences on teacher-rated prosocial behaviours.

In addition, in the NLSCY, the parenting practices data for children under 10 to 11 years of age are based on parent reports only. The scales used in the current study were shown to have good reliability, however, incorporating other assessment methods such as naturalist observations, not available in the NLSCY data set, would strengthen a similar study.

The current study may also have been strengthened if it had been possible to include a control for child cognitive development other than the PPVT-R, and a measure of moral reasoning. This might have provided more insight into the relationship between cognitive development, prosocial moral reasoning, and prosocial behaviours. No measure of moral reasoning is available in the NLSCY, and the PPVT-R is the only measure related to cognitive ability. Moreover, in the NLSCY, scores for the PPVT-R are only available for children 3 to 6 years of age.

Finally, there were limitations related to the measurement of child care experiences, with quality being assessed in this study utilizing a proxy measure of child care quality, licensing. Although licensing provides a basic level of quality, in most provinces in Canada this ensures that the child to childcare provider ratio does not exceed a certain level and that the child care providers have a basic level of training. A better measurement of the quality of child care would be based on direct observations of child care programming, most specifically, the interactions between a child and their childcare provider (NICHD, 2001). Also, using licensing as a broad measure of child care quality does not allow investigation of whether some aspects of child care quality are more important to consider than others when the association between child care quality and prosocial behaviour trajectories. For example, structural factors (e.g., child-adult ratio, group size, and physical characteristics of the child care setting), caregiver characteristics (e.g., education, specialized training, experience, and child rearing beliefs), and the relationship between child and child care provider, may impact prosocial behaviour trajectories in different ways. An examination of this type was not possible in the present study.

The current study examined the prosocial behaviour trajectories of young children from a bio-ecological framework, investigating the interaction of child characteristics and variables from the child's microsystem. This was a strength of the study, although the framework was delimited by the lack of neighbourhood characteristics (as these were not available for the particular cycles of data utilized in this study).

The current study has a number of additional strengths which leads to a number of unique contributions to the literature. The current study is unique in that it provided an examination of the moderating effects of gender, temperament, family SES, and use of non-parental care on the relationship between parenting practices and prosocial behaviour trajectories; and the moderating effect of family SES on the relationship between use of non-parental care and prosocial behaviour trajectories in children ages 4 to 11 years. The impact of two of the main early socialization experiences of children in Canada on the development of prosocial behaviours in children, parenting practices and early child care experiences, were examined in the current study. Furthermore, the current study included a proxy measure of child care quality, licensing, and a measure of child care quantity. The influence of these child care variables on prosocial development trajectories had not previously been investigated in the existent literature. Thus, in the current study, valuable information on how these socialization agents impact the development of prosocial behaviours while accounting for the other child and family characteristics that may influence these relationships is provided.

Implications of the Study for Policy and Practice

The results of the current study provide valuable information on how child characteristics and variables from the child's microsystem impact prosocial behaviour trajectories in Canadian children. Promoting the development of prosocial behaviour in young children is a highly desirable goal given the research that indicates the societal advantages of high prosocial behaviour. Thus, the findings of this study offer guidance for practice and policy.

A key finding of this study is that differences in prosocial behaviours were evident at four years of age, with levels of prosocial behaviours being related to child gender, temperament, the presence of siblings, family SES, and parenting practices. Notably, though, these variables did not impact changes in the growth rate of prosocial behaviour between the ages of four and eleven years. These results signify the importance of early intervention/prevention programs that target children at a very young age, prior to their fourth birthday.

From a school psychology perspective, these results also indicate that children will enter Kindergarten with differences in prosocial behaviours based on child gender, temperament, the presence of siblings, family SES, and parenting practices. As children with higher levels of prosocial behaviour are more likely to be academically successful, it is important that Kindergarten programs aimed to enhance prosocial behaviour in children consider that these differences in prosocial behaviour may already exist between children. In addition, teachers, school staff, and school administrators need to be aware that boys, children with difficult temperaments, children with siblings, children of low SES, and children who experience low levels of positive parenting and high levels of hostile/ineffective parenting may need additional support to enhance their development of prosocial behaviours.

The results from the current study indicate that prosocial behaviours vary in children by gender and temperament, with girls and children with easy temperament being rated by their parents as having higher levels of prosocial behaviour than boys and children with difficult temperaments. As these two variables are not easily modified, it is important to consider how early child care workers, family support workers, and elementary school staff can enhance the development of prosocial behaviour in these at-risk groups. Although the results of this study and previous research suggest that girls are more prosocial than boys, such findings may simply be reflecting societal expectations that girls should be more prosocial than boys. However, these results may also reflect a genuine discrepancy, that boys demonstrate lower levels of prosocial

behaviour than girls. Thus, it may be beneficial for school psychologists to target boys for prosocial behaviour programs. In addition, school psychologists may consider aiming awareness campaigns and educational programs at parents to increase their expectations of prosocial behaviours in their young male children. Similarly, whereas the relationship between easy temperament and high levels of prosocial behaviour may be due to measurement error, it may also be useful to target children whose parents rate them as having 'difficult' temperaments and their parents, for programs that encourage the development of prosocial behaviour.

In the current study the influence of family SES and parenting practices on prosocial behaviour trajectories is also highlighted. Children living in families of lower SES were found to have lower levels of prosocial behaviour than those of higher SES. This provides further incentive to the Canadian government to develop and implement policies aimed at reducing poverty or increasing support services and resources, particularly among families with young children. Perhaps the most important finding of this study is that children of low SES who received non-parental child care were shown to demonstrate higher levels of prosocial behaviour compared with children of low SES who did not receive non-parental child care. This suggests that the use of non-parental child care can serve as a protective factor in the face of risk due to low family SES, by enhancing the level of children's prosocial behaviour. In terms of policy formation, these results provide incentive for the development of affordable and accessible non-parental child care options for low SES families in Canada.

Findings from the current study also highlight the importance of parenting practices on the development of prosocial behaviour in children. Higher levels of positive parenting and lower levels of hostile/ineffective parenting were found to be associated with higher levels of prosocial behaviour in children from ages 4 through 11 years. Again this highlights the importance of both early intervention/prevention programs aimed at enhancing parenting practices and parenting programs aimed at parents of children in primary school years. Thus, it

may be beneficial for school psychologists to offer parenting workshops aimed to increase the use of positive parenting and to reduce the use of hostile/ineffective parenting.

Furthermore, findings from the current study indicate that the relationship between positive parenting and prosocial behaviour is moderated significantly by child temperament. The beneficial effects of a high level of positive parenting on prosocial behaviour was not as strong for children with difficult temperaments as it was for children who were rated as having an easy temperament. Although the difference was not large, this finding, in conjunction with the finding that children with difficult temperaments have lower levels of prosocial behaviour, suggests that parents may need to learn different or more effective ways of positive parenting specific to those children who are viewed as having difficult temperaments.

Recommendations for Future Research

The results of the current study highlight the importance of examining the relationship between prosocial behaviour and child characteristics and micosystem variables from a bio-ecological framework. To date, this is the only study that has used longitudinal data and growth curve modeling to examine the impact of multiple socialization experiences, parenting practices and child care experiences, on prosocial development. Furthermore, this is the only study that examined potential moderators of the relationships between parenting practices and prosocial behaviour, and the use of non-parental care and prosocial behaviour. However, replication of this study using more rigorous assessments of child care quality and cognitive ability, and multiple assessment methods and raters of prosocial behaviour and parenting practices, is needed. In addition, it would be useful to ascertain if the use of non-parental care serves as a protective factor for low SES children in population sub-groups, such as families of varying cultural backgrounds.

Further investigation is also required to assess the impact of socialization experiences on specific aspects of prosocial behaviour. In the current study, prosocial behaviour was defined as

caring, sharing and helping behaviours. It has been demonstrated that studies in which prosocial behaviour has been defined in different ways have yielded mixed findings in terms of relationships between prosocial behaviour, age, gender, and parenting practices (Fabes, 1999). This suggests that age, gender, and early socialization experiences may differentially impact different aspects of prosocial behaviour, such as helping behaviours versus caring or sharing behaviours. Modelling the development of these three aspects of prosocial behaviours over time, and examining the impact of socializations experiences on these trajectories, may provide a deeper understanding of prosocial behaviour in children.

The current study took a bio-ecological framework to examine the influence of child characteristics and microsystem variables on prosocial behaviour trajectories. Future studies examining prosocial behaviour trajectories could benefit from including neighbourhood variables such as neighbourhood cohesion, safety, level of transience of residents, and use of community centers. Some of these variables may have a direct influence on prosocial trajectories of children (e.g. witnessing violence) whereas others may influence children indirectly through their impact on parents (e.g., parental stress due to neighbourhood crime). In addition, the effects of some of these neighbourhood variables are likely to be dependant on the age of the child. Accounting for characteristics of the children's friends and friendship networks would also be important, particularly as children get older and their friends become more influential. Including neighbourhood and peer network variables, and their interactions with other predictors would build on the current study by providing a more comprehensive bio-ecological examination of predictors of prosocial behaviour trajectories.

Finally, the results from this study provide evidence that gender, temperament, the presence of siblings, family SES, and parenting practices all impact prosocial behaviour trajectories of Canadian children. In future studies it would be beneficial to examine if programs aimed at enhancing prosocial behaviour in children have different effects for males, children

with difficult temperaments, children with siblings, children of low SES, and parents who demonstrate low levels of positive parenting and high levels of hostile ineffective parenting.

Conclusions

In the current study the impact of child characteristics and microsystem variables on prosocial behaviour trajectories in children from 4 to 11 years was examined. In addition, the current study examined how the relationship between parenting practices and prosocial behaviour trajectories are moderated by gender, temperament, family SES and use on non-parental care. Finally, in the current study how the relationship between non-parental care and prosocial behaviour trajectories are moderated by family SES was examined.

The three key findings of this study were: (a) the effects of gender, temperament, the presence of siblings, family SES, and parenting practices on prosocial behaviour trajectories were evident by four years of age; (b) the influence of parenting practices is critical despite the use of child care; and (c) non-parental care for children living in low SES families serves as a protective factor.

This study advances our understanding of the development of prosocial behaviour through its findings that the relationship between positive parenting practices and prosocial behaviour is moderated by child temperament, and that the relationship between use of non-parental child care and prosocial behaviour is moderated by family SES. Findings of the current study highlight the importance of the parenting practices and lends support to the social-cognitive theory, which posits that prosocial behaviours is influenced by early socialization experiences, particularly parenting practices. Furthermore, the current study lends support to the notion that non-parental child care may serve as a protective factor to those children of low SES backgrounds. Promoting the development of prosocial behaviours in our young children is a critical strategy in our striving towards a more civil society. The findings of this study offer important guidance in this important endeavour.

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APPENDIX A

NLSCY Items

Table A1

Prosocial Behaviour Items from the NLSCY

Variable Name	Question*
Q6A	Shows sympathy to someone who has made a mistake
Q6M	If there is a quarrel or dispute, will try to stop it
Q6GG	Spontaneously help to pick up object which somebody has dropped
Q6OO	Will invite others to join in a game
Q6H	Volunteers to help clear up a mess someone else has made
Q6D	Will try to help someone who has been hurt
Q6U	Offers to help other children who are having difficulty with a task
Q6BB	Comforts a child who is crying or upset
Q6SS	Helps other children who are feeling sick
Q6UU	Helps those who do not do as well as he/she does

* For each question the following response scale is offered: 1- almost every time; 2- often; 3- about half the time; 4- sometimes; 5- almost never.

Table A2

Temperament Scale Items from the NLSCY

Variable Name	Question*
A(B)TMCQ01	How easy or difficult is it for you to calm or soothe... when he/she is upset?
A(B)TMCQ05	How many times per day, on average, does ... get fussy and irritable—for either short or long periods of time?
A(B)TMCQ06	How much does he/she cry and fuss in general?
A(B)TMCQ07	How easily does he/she get upset?
A(B)TMCQ08	When he/she gets upset, how vigorously or loudly does he/she cry and fuss?
A(B)TMCQ12	What kind of mood is he/she generally in?
A(B)TMCQ17	How changeable is ...'s mood?
A(B)TMCQ33	Please rate the overall degree of difficulty ... would present for the average parent.

*For each question the following response scale is offered from 1 to 7 where: 1- “very easy/little; much less than the average child” and 7- “very difficulty/a lot; much more than the average child”.

Table A3

Positive Parenting Scale Items from the NLSCY

Variable Name	Question*
PARQ01	How often do you praise (child's name) by saying something like 'good for you' or 'what a nice thing you did' or 'that's good going'?
PARQ02	How often do you and he/she talk or play with each other, focusing attention on each other for five minutes or more, just for fun?
PARQ03	How often do you and he/she laugh together?
PARQ06	How often do you do something special with him/her that he/she enjoys?
PARQ07	How often do you play sports, hobbies or games with him/her?

*For each question the following response scale is offered: 1-never; 2- about once a week; 3- a few times a week; 4- one or two times a day; 5- many times each day.

Table A4

Hostile/Ineffective Parenting Scale Items from the NLSCY

Variable Name	Question*
PARQ04	How often do you get annoyed with (child's name) for saying or doing something he/she is not supposed to?
PARQ08	Of all the times that you talk to (child's name) about his/her behaviour, what proportion is praise?
PARQ09	Of all the times that you talk to him/her about his/her behaviour, what proportion is disapproval?
PARQ13	How often do you get angry when you punish (child's name)?
PARQ14	How often do you think that the kind of punishment you give him/her depends on your mood?
PARQ15	How often do you feel you are having problems managing him/her in general?
PARQ18	How often do you have to discipline him/her repeatedly for the same thing?

*For each question the following response scale is offered: 1-never; 2- about once a week; 3- a few times a week; 4- one or two times a day; 5- many times each day.

APPENDIX B

NLSCY Composite Items

Table B1

NLSCY SES Composite Score Examples

SES Value	Type of Family
1.5	<p>A family in which:</p> <ul style="list-style-type: none"> • Both the PMK and spouse have a university degree (BA/BC) • They are both employed professionals • The household income is \$80, 000
0.5	<p>A family in which:</p> <ul style="list-style-type: none"> • The PMK and spouse have a university degree (BA/BSC) and the spouse has grade 13 • The PMK is employed as a semi-professional and the spouse if employed as a semi-skilled clerical position • The household income is approximately \$65, 000
0.0	<p>A family in which:</p> <ul style="list-style-type: none"> • The PMK has grade 13 and the spouse has grade 12 • The spouse if employed as a semi-skilled manual position and the PMK has a semi-skilled clerical position • The household income is approximately \$55, 000
-0.5	<p>A family in which:</p> <ul style="list-style-type: none"> • The PMK and spouse have both completed grade 12 • The PMK is employed in a semiskilled manual position and the spouse in a unskilled manual position • Household income is approximately \$30,000
-1.0	<p>A family in which:</p> <ul style="list-style-type: none"> • Neither the PMK nor the spouse have completed high school • The PMK is employed in an unskilled manual position and the spouse is employed in an unskilled manual position • Household income is approximately \$25, 000
-1.5	<p>A family in which:</p> <ul style="list-style-type: none"> • Neither the PMK not the spouse have completed high school • Neither the PMK nor the spouse are in the labour force • Household income is approximately \$15, 000
-2.0	<p>A family in which:</p> <ul style="list-style-type: none"> • There is no spouse • The PMK has not completed high school • The PMK is not in the labour force • The household income is less than \$10,000

APPENDIX C

Microdata Research Contract

Project ID number: 07-SSH-BCI-1354

Revised, August 22, 2007

MICRODATA RESEARCH CONTRACT

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA, represented by the Minister of Industry, designated as the Minister for purposes of the Statistics Act, (hereinafter referred to as "Statistics Canada"),

AND:

Sabrina Moraes, University of British Columbia (hereinafter referred to as the "Principal Investigator"), and, Susan Dahinten, University of British Columbia (hereinafter referred to as the "Co-investigators"), WHEREAS Statistics Canada requires the services of the Principal Investigator to undertake statistical research and analysis on National Longitudinal Survey of Children and Youth to fulfill its mandate under the *Statistics Act*; AND WHEREAS to perform these services and to have access to confidential information, the Principal Investigator and the Co-investigators must become "Deemed Employees" of Statistics Canada and are required to take the Oath of Secrecy; AND WHEREAS Statistics Canada wishes to make clear the terms and conditions under which access to the microdata will be granted; NOW THEREFORE the Parties agree as follows:

SERVICE PROVIDED BY PRINCIPAL INVESTIGATOR

1. (1) The Principal Investigator will carry out the research project and provide the report described under "Proposed Output". (2) It is understood that this is a contract for the performance of a service and the Principal Investigator and Co-investigators are engaged for the sole purpose of providing that service.

CONDITIONS OF ACCESS TO THE MICRODATA

2. The Principal Investigator and the Co-investigators must undergo an enhanced reliability check satisfactory to Statistics Canada and take the oath/affirmation of secrecy, pursuant to Subsection 6(1) of the Statistics Act, in order to obtain access to the non identifiable microdata file required to perform the analysis pursuant to this contract.

3. (1) Access to the non identifiable microdata file (no names, addresses or identifying numbers) and associated documentation shall be provided on Statistics Canada premises, which includes Headquarters and the Statistics Canada Regional Offices during normal hours of operation, Monday to Friday, and the Research Data Centres.

(2) The Principal Investigator and Co-Investigators will be provided with the necessary computing facilities, software and documentation as is reasonably necessary to complete the research and analysis pursuant to this contract.

DEPARTMENTAL REPRESENTATIVE

4. The Manager of the Research Data Centre Program is the designated Statistics Canada representative responsible for the administration of this contract.

LIMITATIONS ON USES OF THE MICRODATA FILE AND PROPOSED OUTPUT

5. (1) No person engaged in the course of carrying out this contract may use any of the information gained by accessing the confidential data for any other purpose except that which was agreed upon in this contract.

(2) Access to the microdata file is being provided for the statistical and research purpose outlined in the proposal attached as Appendix A and the microdata file shall not be used for any other purposes without the prior written consent of Statistics Canada.

(3) The Principal Investigator and the Co-investigators shall not disclose any of the information from the individual records obtained or produced pursuant to this contract to anyone other than current Statistics Canada employees involved in the review or evaluation of any aspect of the research project.

(4) The Principal Investigator and the Co-investigators shall ensure that no attempts are made to link the microdata file to any other files in order to relate the particulars to any identifiable individual person, business or organization.

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(5) The Proposed Output must meet the requirements of both peer and institutional review prior to being released by Statistics Canada, for example, in one of its publications or in a research paper.

(6) Thereafter, the Principal Investigator may, subject to subsection 6(5), carry out a secondary analysis, but such analysis shall be based solely on the approved “Proposed Output” produced pursuant to this contract and be related to the analytical work undertaken to produce the “Proposed Output”.

(7) The Principal Investigator agrees to work with Statistics Canada in trying to meet the requirements of peer and institutional review required for the publication or research paper.

(8) In the event that Statistics Canada decides not to publish the “Proposed Output”, Statistics Canada will give the Principal Investigator written notice to this effect within thirty days of having made the final decision.

(9) Subject to subsections 6(5) and 10(2), in the event Statistics Canada notifies the Principal Investigator in writing that the proposed output will not be published, the Principal Investigator may:

- (a) Publish the “Proposed Output” elsewhere, and/or
- (b) Use the “Proposed Output” for purposes of the attainment of an educational degree.

OWNERSHIP

6. (1) The microdata file and related documentation shall at all times be and remain the sole and exclusive property of Statistics Canada, it being mutually agreed that this contract pertains to the use of the microdata file and related documentation to produce a “Proposed Output” for Statistics Canada and that nothing contained herein shall be deemed to convey any title or ownership interest in the microdata file or the related documentation to the Principal Investigator or the Coinvestigators. The computer equipment provided for use by the Principal Investigator and the Co-investigators must never be removed from the premises of Statistics Canada or the Research Data Centre and remains the sole and exclusive property of the access facility.

(2) Statistics Canada reserves the right to publish in whole or in part, to publish an amended version or not to publish at all, as Statistics Canada deems appropriate, the “Proposed Output” produced by the Principal Investigator pursuant to this contract.

(3) Copyright in the “Proposed Output” produced by the Principal Investigator

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pursuant to this contract shall vest in Her Majesty the Queen in Right of Canada. The Principal Investigator shall provide to Statistics Canada at the completion of the contract or at such other time as Statistics Canada may require a written permanent waiver of Moral rights from every author who contributed to the aforementioned material.

(4) Statistics Canada (Her Majesty the Queen in Right of Canada) hereby grants to the Principal Investigator a non-exclusive license to use, reproduce, publish and distribute the "Proposed Output" for any purpose, including, without limitation, research, teaching and publication in any medium. Copyright in any subsequent work produced by the Principal Investigator using the “Proposed Output” shall vest in the Principal Investigator.

(5) Releases of the “Proposed Output” may be considered by Statistics Canada in consultation with the Principal Investigator.

(6) In publishing the “Proposed Output” elsewhere, using the “Proposed Output” in the attainment of an educational degree or carrying out any secondary analysis, any reports, documents, or materials which are subsequently prepared by the Principal Investigator which use, incorporate or are in any way based on any material produced under this agreement, shall prominently display the following notice: “The research and analysis are based on data from Statistics Canada and the opinions expressed do not represent the views of Statistics Canada.”

CONFLICT OF INTEREST

7. (1) All persons engaged in the course of carrying out this contract shall conduct themselves in accordance with the principles and spirit of the *Values and Ethics Code for Deemed Employees*.

Your initials

Insert below names of all Deemed Employees associated with this

Contract:

Sabrina Moraes

Susan Dahinten

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(2) Should a conflict exist prior to the commencement of this contract or be acquired or develop during the life of this contract, the person with the conflict engaged in carrying out this contract shall be responsible for discussing the conflict with the Director of the Division sponsoring the project or the Manager of the Research Data Centre Project and, should it be determined that a conflict exists, for completing the Confidential Report as required by the *Values and Ethics Code for Deemed Employees*

(3) No person engaged in the course of carrying out this contract may use any of the information gained by accessing the confidential data for any other purpose except that which was agreed upon in this contract.

(4) Notwithstanding subsection 7(3), it is understood that the principles of the *Values and Ethics Code for Deemed Employees* were not meant to prohibit the persons engaged in this contract from accomplishing any secondary analysis as permitted by the contract.

SECURITY REQUIREMENTS

8. (1) Any material to be removed from the Statistics Canada premises by the Principal Investigator or Co-investigators must first be screened by Statistics Canada to ensure that there is no risk of disclosure of confidential information or information that may lead to the identification of an individual person, business or organization. It is the responsibility of the Principal Investigator or Coinvestigators to take all precautions to avoid disclosure of confidential information or information that may lead to the identification of an individual respondent. The Principal Investigator or Co-investigators may remove summary files, tabulations and analytical output under the terms of this subsection.

(2) The Principal Investigator and the Co-investigators shall not remove any of the original data set or copies of subsets of the microdata file or any confidential sensitive statistical information provided pursuant to this contract from the premises of Statistics Canada.

(3) The Principal Investigator and the Co-investigators shall be provided with copies of all relevant Statistics Canada policies related to confidentiality, privacy and security and the standard operating procedures of the appropriate access facility and shall acknowledge in writing their compliance with all of the policies and operating procedures.

TERM

9. This contract comes into force when signed by both parties and shall continue in force until December 31, 2010 unless revoked or terminated at an earlier date.

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TERMINATION

10. (1) Where the Principal Investigator is in default in carrying out any of its obligations under this Contract, Statistics Canada may, upon giving written notice to the Principal Investigator, terminate the Contract immediately.

(2) The Contract may, by providing 30 days written notice, be terminated by mutual written consent between the Principal Investigator and Statistics Canada.

(3) Any notice to be given to Statistics Canada or the Principal Investigator shall be sent by registered mail to:

Gustave Goldmann, Ph.D. Sabrina Moraes
Manager, Research Data Centre Program Educational & Counselling Psychology, and
Special Education
Statistics Canada University of British Columbia
150 Tunney's Pasture Driveway 2125 Main Mall
Ottawa K1A 0T6 Vancouver V6T 1Z4

(4) Any notice shall be deemed to be effective on the day it is received at the address set out above.

PENALTIES

11. (1) As a Deemed Employee of Statistics Canada, the Principal Investigator and the Co-investigators are subject to all the applicable penalties provided for in the *Statistics Act* for contravention of any of the confidentiality provisions and is liable on summary conviction to any of the applicable fines or imprisonment terms.

(2) Subsection 11(1) survives indefinitely the completion of this contract or the termination of this Agreement pursuant to subsections 10(1) or 10(2).

AMENDMENT

12. No amendment to this contract shall be valid unless it is reduced to writing and signed by the Parties hereto.

CONSIDERATION

13. The Parties agree that consideration for this agreement shall be the mutual promises and covenants of the Parties included in this contract.

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ENTIRE AGREEMENT

14. This contract constitutes the entire agreement between the Parties listed below and Statistics Canada with respect to the subject matter described herein and supersedes all previous negotiations, communications and other agreements on the same issue with Statistics Canada unless they are specifically incorporated by reference in this contract. IN WITNESS WHEREOF, this Agreement has been executed in duplicate on behalf of

Statistics Canada and the Principal Investigator by:

FOR STATISTICS CANADA:

Witness Date Manager of the Research Data Centre
Program (as described in paragraph 4 above)

FOR THE PRINCIPAL INVESTIGATOR:

Witness Date Sabrina Moraes

Witness Date Susan Dahinten

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**The Impact of Parenting Practices and Early Child Arrangement on Prosocial
Development of Young Children in Canada: A Longitudinal Study using the NLSCY**

Submitted By: Gustave Goldmann

Statistics Canada

and;

Sabrina Moraes

Educational & Counselling Psychology and Special Education

University of British Columbia

2125 Main Mall

Vancouver, BC V6T 1Z4

Proposal

See the attached detailed description of the proposed research.

Data Requirements

National Longitudinal Survey of Children and Youth (NLSCY)

Proposed Output

- Thesis manuscript as required for completion of an academic degree.
- Manuscript for publication as an article in a peer-reviewed academic journal

Completion Date

December 31, 2010

Research Location

British Columbia Inter-university Research Data Centre

Source of Funding

Social Sciences and Humanities Research Council

APPENDIX D

Behaviour Ethics Research Board of the University of British Columbia Certificate of Approval



The University of British Columbia
Office of Research Services
Behavioural Research Ethics Board
Suite 102, 6190 Agronomy Road,
Vancouver, B.C. V6T 1Z3

CERTIFICATE OF APPROVAL - MINIMAL RISK

PRINCIPAL INVESTIGATOR: Laurie Ford	INSTITUTION / DEPARTMENT: UBC/Education/Educational & Counselling Psychology, and Special Education	UBC BREB NUMBER: H07-02753
INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:		
Institution		Site
N/A		N/A
Other locations where the research will be conducted: NONE		
CO-INVESTIGATOR(S): Sabrina C. Moraes		
SPONSORING AGENCIES: Social Sciences and Humanities Research Council of Canada (SSHRC)		
PROJECT TITLE: Examining The Impact Of Parenting Practices And Early Child Care Experiences On Developmental Trajectories Of Prosocial Behaviour In Canadian Children: A Longitudinal Study Using The NLSCY		

CERTIFICATE EXPIRY DATE: March 3, 2009

DOCUMENTS INCLUDED IN THIS APPROVAL:	DATE APPROVED: March 3, 2008	
Document Name	Version	Date
Other Documents: Statistics Canada Microdata Research Contract	N/A	February 22, 2008

The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval is issued on behalf of the Behavioural Research Ethics Board and signed electronically by one of the following:

Dr. M. Judith Lynam, Chair
Dr. Ken Craig, Chair
Dr. Jim Rupert, Associate Chair

Dr. Laurie Ford, Associate Chair
Dr. Daniel Salhani, Associate Chair
Dr. Anita Ho, Associate Chair