

CHILD HEALTH STATUS AS A CORRELATE OF CHILD BEHAVIOURAL OUTCOMES:
THE MEDIATING EFFECT OF PARENTING STYLE

by

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B.A., The University of Winnipeg, 2004

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENT FOR THE DEGREE OF

MASTER OF ARTS

in

The Faculty of Graduate Studies

(Family Studies)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

April 2008

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Abstract

The purpose of this investigation is to test the mediational effect of parenting style on the association between child health status and child behavioural outcomes in children. Using cross-sectional data of children 4 and 5 years old from National Longitudinal Survey of Children and Youth (NLSCY) Cycle 4 2000-2001 the paper explores the degree to which child health status is related to child behavioural outcomes. In addition, the present study investigates the extent to which child health status is linked to parenting style. Another aim of this study is to explore the association between parenting style and child behavioural outcomes. Child outcome measures assessed in this study include: hyperactivity-inattention, emotional-disorder anxiety, conduct disorder – physical aggression, and indirect aggression. Child health status is assessed using the Health Utility Index Mark 3. The Health Utility Index gives a description of an individual's overall functional health, founded on eight attributes that include: vision, hearing, speech, mobility, dexterity, cognition, emotion, pain and discomfort. Parenting style is measured using several parenting scales that consist of: positive interaction, hostile/ineffective parenting, consistent parenting, and rational (punitive/aversive) parenting. Statistical analysis was conducted using Ordinary Least Squares (OLS) and logistic regression to test the conceptual model and the significance of relationships between the variables of interest. There was partial support for the mediational model of parenting style on the association between child health status and children behavioural outcomes. Specifically, both ineffective and rational parenting each showed a mediational effect. Child health status and child behavioural outcomes were found to have a strong relationship to each other. However, ineffective parenting was more strongly related to child behavioural outcomes than child health status. This suggests that children that are exposed to ineffective parenting are at greater risk for developing behavioural

difficulties than children receiving other forms of parenting. Moreover, children who receive this type of parenting and have poorer health are at even greater risk for developing these behavioural problems. However, these conclusions are tentative as the directionality of these relationships is uncertain because of the cross-section design of this study.

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List of Abbreviations

National Longitudinal Survey of Children and Youth (NLSCY)

Person Most Knowledgeable (PMK)

Health Utility Index categorical variable (HUI)

Physical Aggression categorical variable (PA)

Indirect Aggression categorical variable (IA)

Acknowledgements

I would like to take this opportunity to thank those people who assisted me with the preparation of this thesis. First, I would like to thank Dr. James White for his guidance, patience and support through the entire process of developing this thesis. Dr. White, thank you so much for all the many hours you spent with me working in the lab. I would also like to thank Dr. Carrie Yodanis and Dr. Tim Stainton for their feedback and support. I would like to thank Lee Grenon and the other staff who work at the British Columbia Inter University Research Data Centre (BCIRDC) for providing information when I had questions and releasing my outputs so promptly. I am also very thankful for being granted access to the BCIRDC because without that permission this project would not have been possible. Finally, I would like to thank my family and friends for their support and encouragement during my graduate work.

Introduction

The present investigation used data from the National Longitudinal Survey of Children and Youth (NLSCY) Cycle 4 to determine whether to accept or reject a mediational model of parenting style as a mediator on the relationship between child health status and child behavioural outcomes. This model is founded on four assumptions that include: child behavioural outcomes varies as a function of child health status, child behavioural outcomes varies as a function of parenting style, parenting style varies as a function of child health status and the direct relationship between child health status and child behaviour outcomes is not significant or reduced when the influence of parenting style is considered. The conceptual model presented here and its assumptions were developed based on the empirical literature and reciprocal socialization as its theoretical framework. Presented below is a brief overview on research conducted in the area of parental stress in families of children with disabilities. This is followed by literature that has explored child behavioural problems in children with disabilities and research examining parenting styles and children with disabilities. It should be noted that it is likely that the literature discussed here on disability related issues is only a small proportion of what is available in this area of research. Hence, it is acknowledged that there are other perspectives and approaches that were not considered in the following literature review. The literature review closes with a description of research on the association of parenting and child outcomes and this is followed by a review of clinical interventions and research. Thereafter, an explanation of reciprocal socialization is provided and the hypotheses of the present study are then stated. This study seeks to answer four questions: Is child health status negatively related to child behavioural outcomes? Is child health status differentially related to parenting styles? Is

parenting differentially associated with child behavioural outcomes? If there is a relationship between child health status and child behavioural outcomes, does this relationship disappear or reduced to some degree when parenting styles is considered in the equation?

There is a large body of evidence indicating that parents of children with disabilities experience higher levels of stress than parents of children without disabilities (Beckman, 1991; Oelofsen & Richardson, 2006; Pelchat, Ricard, Bouchardy, Perreault, Saucier, Berthiaume & Bisson, 1999; Woolfson & Grant, 2006). A greater proportion of parents of children with developmental disabilities reported stress within the clinical range compared to parents of children without disabilities (Oelofsen & Richardson, 2006). In comparison to parents of typically developing children, parents of children with developmental disabilities tended to report a weaker sense of coherence and poorer health. Parents of children with disabilities reported more problems with personal aspects of parenting and parenthood (e.g. depression, restrictiveness of parental role, sense of competence, isolation, relationship with spouse, and health) on the Parent Domain of the Parenting Stress Index than parents of typically developing children (Beckman, 1991). Relative to parents of children without disabilities, parents of children with disabilities report problems with their child's temperament (e.g. adaptability, demandingness, mood, and overall distractibility) on the Child Domain of the Parenting Stress Index. Despite, these differences between these two groups of parents, both groups reported similar levels of stress related to their relationship to their child (e.g. attachment to their child, acceptability of their child and reinforcement of their child). Although, parents of children with disabilities are likely to report more stress than parents of typically developing children, scholars have acknowledged that there is a great deal of variation in the nature and degree of stress reported within these families. The nature and degree of stress experienced by these families varies as a function of a variety factors some of which include: the type of childhood disability

(Fuller & Rankin, 1994; Hansen & Hanline, 1990), developmental status of the child (Hansen & Hanline, 1990), parental expectations (Fuller & Rankin, 1994), caregiving requirements (Beckman, 1991), family environment (Krauss, 1993), gender of the parent (Beckman, 1991; Krauss, 1993; Oelofsen & Richardson, 2006), and social support (Beckman, 1991; Krauss, 1993; Li-Tsang, Yau & Yuen, 2001),

There are relatively few studies that have examined between group differences of stress reported by parents of children with various disabilities. From the studies reviewed there appears to be mixed evidence of a relationship between parental stress and type of childhood disability (Cummings, 1976; Fuller & Rankin, 1994; Hansen & Hanline, 1990; Pelchat, Ricard, Bouchardy, Perreault, Saucier, Berthiaume & Bisson, 1999). In an investigation exploring parental adaptation to a child's disability, Pelchat et al. (1999) compared between group differences of parents of six month old infants with Down Syndrome (DS), congenital heart disease (CHD), cleft lip and/or palate (CLP) and no disability. The authors reported that parents of infants with DS and parents of infants with CHD experienced higher levels of parenting stress (e.g. acceptance of their child, feels significantly more threatened by parental situation, perceives it as more uncontrollable, more stressful) and psychological distress in comparison to parents of infants with CLP or non-disabled infants. This finding was similar for both mothers and fathers. Fuller and Rankin (1994) conducted a study to examine parental and child-related stress between three groups of mothers which included: mothers of children in regular education, mothers of children classified as learning disabled, and mothers of children who were classified as emotionally impaired. The findings indicated no significant difference in levels of stress between mothers of children with learning disabilities and mothers of children with emotional impairments. However, group differences in maternal stress were found between mothers of children with emotional impairments and mothers of children in regular education. The authors

speculated that children with emotional impairments may have more behavioural problems associated with their impairment, which in turn, causes more stress for these parents than parents of children with learning disabilities and children without disabilities. Hanson and Hanline (1990) found few differences on reported levels of stress and parenting experiences between three groups of mothers that included: mothers of children with Down Syndrome, mothers of children with hearing impairments, and mothers of children with a neurological impairment. However, mothers of children with neurological impairments reported the greatest amount of stress compared to the other groups. For these mothers, maternal stress was related to the child's temperament (e.g. demandingness and acceptability). Fuller and Rankin suggested that the greater stress reported by mothers of children with neurological impairments may be related to the finding that children with neurological impairments experienced more developmental complications (e.g. hospitalizations and treatment charges). As well, this study found that mothers of children with Down Syndrome reported high stress scores which were associated with the children's acceptability. In a study exploring stress in fathers of children with mental retardation and fathers of children who are chronically ill Cummings (1976) reported that levels of stress tended to be higher for fathers of the mentally retarded than for fathers of chronically ill children. In summary, it does appear that there are at least some differences in levels of stress reported by parents depending on the child's type of disability.

Maternal stress has been found to be related to the developmental competence of children with disabilities (Hanson & Hanline, 1990). Mothers of less developmentally advanced children reported more stress. Mothers of children with disabilities reported that their children do not meet their developmental expectations (e.g. emotional, physical, intellectual) (Fuller & Rankin, 1994). That is, these parents view their children as being less pleasant, intelligent, and attractive as they wished. These high expectations of the child may contribute to maternal stress.

Caregiving needs have also been identified as related to increased stress in mothers of children with disabilities (Beckman, 1991). The level of care that children with disabilities require is typically greater than that of children without disabilities (Roberts & Lawton, 2001). Roberts and Lawton reported that the majority of disabled children in their sample required additional care and supervision with multiple facets of daily life such as: washing, dressing, meal times, during the night and keeping occupied. Beckman (1991) found that the number of additional or unusual caregiving requirements was highly correlated with the degree of stress reported by mothers of children with disabilities between the ages of 18 and 72 months. Specifically, mothers of children with disabilities reported high levels of stress with regards to restrictiveness of the parental role and their sense of competence in parenting. Another factor that has been identified as a contributing source to parental stress is aspects of the family environment (Krauss, 1993). Krauss found that the amount of stress reported by fathers of children with disabilities was associated with their perceptions of the family environment. These fathers perceived their families as less emotionally cohesive and adaptable.

There is a paucity of studies that have examined the differences in the perceptions of mothers and fathers with disabled children. The studies that were found have produced mixed results. Pelchat, Ricard, Bouchardy, Perreault, Saucier, Berthiaume and Bisson (1999) reported that in comparison to fathers, mothers of six month old infants experienced more stress related to restrictiveness of parental role, more threatened and stressed by their role, and a greater level of psychological distress. Similarly, Beckman (1991) found that mothers of children with disabilities between the ages of 18 and 72 months reported more stress than did fathers. However, the direction and strength of differences between mothers and fathers was specific to individual scales. For example, mothers reported more depression, more difficulties with their

sense of competence, more restrictions of parental role, more effects on their relationship with their spouse and more effects on their health than fathers, whereas fathers reported more problems with attachment compared to mothers. Krauss (1993) conducted a study of parents of toddlers with disabilities. The results revealed that overall mothers and fathers reported similar levels of stress that were below the clinical range. However, there were significant differences in reported levels of stress on particular scales. Data collected from questionnaires demonstrated that fathers reported more stress associated with their child's temperament and their relationship to their child, whereas mothers reported more stress in adjusting to personal aspects of parenting and parenthood (e.g. parental health, restrictions in role, and relations with spouse). In contrast to the findings of Beckman (1991), Krauss found that no differences occurred between mothers and fathers with regards to depression and sense of competence. An investigation conducted by Oelofsen and Richardson (2006) examined parental stress in parents of preschool children with developmental disabilities. Using questionnaires, the authors found that mothers experienced poorer health, higher levels of parenting stress, and a weaker sense of coherence than fathers. Taken together, these studies suggest that mothers and fathers of children with disabilities may be affected differently. In contrast, Ainge (1995) found important similarities between responses provided by mothers and fathers caring for their child with an intellectual disability. This author suggested that the consistency between the mothers and fathers reports provides evidence for the way in which one partner can affect the other, and vice versa. That is, one partners' outlook towards the child, may in fact, impact the outlook of their spouse. Despite, Ainge findings of similarity between mothers and fathers, the literature seems to indicate that there are indeed some differences between partners in their experience of parenting a child with a disability. In order to resolve the gap in research, investigations have been undertaken to specifically examine the experience of fathers of children with disabilities as the majority of previous work in this

field has been conducted with mothers. For a review of literature on the effects children with disabilities on fathers refer to Hornby (1994).

Caregiver differences have also been identified in research examining social support as a buffer against stress for parents of children with disabilities. For instance, Krauss (1993) found that social support had a significant impact on mothers level of stress whereas social support had no significant effect for fathers. More specifically, perceived helpfulness from social supports was related to lower levels of stress for mothers but not for fathers. However, there were no differences found between mothers and fathers on reported helpfulness received from their social support networks. Beckman (1991) found that for both mothers and fathers of children with disabilities, increased informal support was significantly related with decreased stress. In contrast to informal support, formal support was not significantly related to stress. However, for fathers formal support was negatively related to general life stress. The author suggested that different or additional sources of support may help fathers cope. Informal support was found to be a mediating variable between caregiving demands and maternal stress. It appeared that informal support lessens the burden of child caregiving requirements, which in turn, decreases maternal stress. Meadow-Orlans, Smith-Gray and Dyssegaard (1995) investigated levels of stress and its relationship with social support in mothers and fathers of deaf children, mothers of deaf multi-handicapped children and hearing infants. The data revealed that social support was negatively related to parenting stress for both mothers and fathers of deaf infants, but not for parents of hearing infants.

Social Support

The literature indicates that parents of disabled children can greatly benefit from participating in parent groups. Goodley and Tregaskis (2006) reported that parent groups were important sources of information about their rights and their children's rights and needs. Mothers reported that interacting with other parents was helpful because it enabled them to learn from another's experience in a similar situation. The involvement in parent groups also fosters friendship and mentorship. Similar findings were observed in a qualitative study (Li-Tsang, Yau and Yuen, 2001) that explored the characteristics of parents of children with a developmental disability who displayed positive adaptive coping behaviours. It was found that these parents were proactive in seeking support and participated in support groups. Moreover, the reciprocal sharing of experiences and advice with other parents in support groups appeared to bolster positive coping strategies of parents. In addition, these parents were also active in seeking out information and resources for their children and consulting with professionals when needed. During the early stages, professional support was found to be fundamental in facilitating acceptance of their child with a disability. Taken together, these studies provide evidence to suggest that social support is an important factor in abating parental stress related to having a child with a disability.

Positive Impact of Disability

Many studies report the difficult adjustment that families experience when a disabled child is born. In contrast, other studies indicate that families adjust to a family member's disability better than what previous studies have indicated. In a retrospective study examining attitudes and life commitments of older siblings of developmentally disabled adults, Cleveland

and Miller (1977) found that the majority of siblings reported positive adjustment to the developmentally disabled sibling and the experiences of having a disabled sibling. A significant proportion of participants perceived their families as having successfully coped with the stress of having a disabled child. The majority of participants indicated that their parents viewed the challenges of raising a developmentally disabled child in a positive manner.

CHAPTER II Review of Literature

Disability and Child Behavioural Outcomes

There is an abundance of literature that indicates that children with disabilities are at greater risk for psychiatric disorders and behavioural problems than children without disabilities. In a study comparing pre-school children with mild handicaps to those without these conditions, Tucker and Fox (1995) reported that parents of pre-schoolers with mild handicaps displayed more behaviour problems overall compared to parents of typical pre-school children. These parents also reported their pre-school children exhibiting higher levels of internalizing behaviour (e.g. withdrawn and anxious) compared to parents of non-handicapped pre-schoolers. Schachler, Pless and Bruck (1991) conducted a retrospective cross-sectional study of the occurrence of behavioural problems in children with learning disabilities who were attending a specialized learning centre. The children's behaviour was assessed using the Child Behaviour Checklist. The data revealed a strong relationship between learning disabilities and behaviour problems. It was reported that the prevalence for behavioural problems is four times of that reported in the standardized population.

McGee and Stanton (1990) explored the relationship between disabilities and DSM-III disorders in 13 year old adolescents. The classification of disability was based upon a measure of disability provided by the World Health Organization. It was reported that adolescents with multiple psychiatric disorders such as ADD and anxiety disorders were over three times more likely to have two or three disabilities compared to those without these mental health disorders. However, those with conduct disorder and depression did not differ significantly from those with no psychiatric disorder in terms of prevalence of disability. The authors suggested that when one

examines conduct disorder on its own it is not significantly related to disability. It was reported that those adolescents with multiple psychiatric disorders and ADD were more likely to have communication impairments (e.g. reading, writing and spelling) and behavioural disability (e.g. relations or social disabilities) compared to those without these conditions. Similarly, Levy, Hay, McLaughlin, Wood and Waldman (1996) found a significant association between ADHD symptoms and speech and reading problems. In addition, Bussing, Zima, Belin, and Forness (1998) explored the association between ADHD and children in special education classes with learning disabilities and with serious emotional disturbances. Parent and teacher ratings were used to identify high risk students for ADHD. Those who were identified as high-risk went under assessment for ADHD and possible comorbid disorders. It was found that children in special education classes who had a severe emotional disturbance were more likely to have met ADHD criteria than children in these classes with learning disabilities.

Psychiatric conditions are also commonly found in children and adolescents with developmental disabilities. For instance, Meyers (1987) conducted a study to assess the psychiatric conditions of 10-21 year old adolescents with developmental disabilities. The data revealed that these adolescents presented with a varied range of psychiatric conditions arising during childhood such as pervasive developmental disorders and disorders more often seen in adulthood such as schizophrenia. It was reported that those who were more severely intellectually challenged and those with epilepsy were three times more likely to develop a psychiatric disorder than those with a milder condition or without CNS difficulties. As well, the data indicated that conduct disorders were more prevalent than affective disorders but the author noted that this could be a result of sample bias.

Heinze, Matson, Helsel and Kapperman (1987) investigated the incidence of psychopathology in visually impaired children and youth using the Child Behaviour Checklist (RPRC), the School Behaviour Checklist (SRC), and the Problem Behaviour Checklist (PRC) and the evaluations were completed the students' teachers. The data revealed a strong association between psychopathology across the scales. It was reported that there were strong association between symptoms that are indicative of psychopathology such as schizophrenia, somatic complaints, aggression and delinquency. The researchers reported that the pattern of symptom clusters with the visually impaired persons were far different from that found in sighted persons.

The greater prevalence of behavioural problems has also been noted in children with developmental coordination disorder. A study on the socialization and deviant behaviour in children with developmental coordination disorder by Kanioglou, Tsorbatzoudis and Barkoukis (2005) reported that based on teacher's ratings on the Teacher Questionnaire children with severe developmental coordination disorder experienced more negative feelings such as tension and anxiety than children with a milder condition and controls. As well, children with severe developmental coordination disorder engaged in a greater amount of deviant behaviours (e.g. hyperactivity, inattentive-passive and conduct behaviour) in comparison to children with moderate or no coordination difficulties. In another study investigating behavioural deviancy in children Miniutti (1991) compared scores on the Behaviour Evaluation Scale (BSE) between three groups of children that included: language-deficit special education, language-competent special education and normal controls. It was reported that the language-deficit subgroup was significantly more deviate than the language-competent subgroup and the control group. Specifically, overt deviant behaviours were more common in the language-deficit subgroup and these behaviours were characteristic of conduct disorder. In contrast, there were no significant differences in deviate behaviour between the language-competent subgroup and controls. Taken

together, these two studies appear to suggest that differences in deviate behaviour are significant between children with more severe disabilities compared to controls while there is little difference when comparing moderately disabled children to controls.

Disability and Parenting

Studies indicate that a child's disability has an important impact on parent-child interaction and parenting styles during infancy and young childhood (for exception see Tucker & Fox, 1995). Woolfson and Grant (2006) compared parenting approaches used by parents of children with developmental delays and parents of typically developing children across two age-groups, 3-5 year olds and 9-11 year olds. The pattern of the data indicated that parents of developmentally delayed children tended to use authoritative parenting more often with younger children than parents of typically developing children of that same age group. In contrast, older children with developmental disabilities received less authoritative parenting than typically developing children.

Mothers of disabled children tend to be less responsive to their children, demonstrate lower levels of affect and tend to be more directive in their interactions with their children than mothers of non-disabled children (Kim and Mahoney, 2004). Marfo (1992) examined the interaction patterns of mothers and their children with developmental delays to determine whether maternal directiveness varied as a function of child developmental competence and behavioural engagement. Marfo found that behavioural engagement of children and child competence were two variables that contributed to mothers' directiveness in their interactions with their children. Specifically, mothers tended to be more directive with children who were less cognitively competent, as well as, with children who were less active in commencing or

responding to interaction. It was concluded that the data support the child-driven hypothesis which states that maternal directiveness can be an adaptive maternal strategy utilized to increase the child's activity level (Field, 1980, 1983 as cited in Marfo, 1992).

The finding that parents of children with disabilities exhibit more directive parenting strategies than parents of typically developing children was also noted in a study by Kekelis and Andersen (1984). The authors stated that the purpose of using directives by parents of visually impaired children is to encourage the children to take a more active role in communication and in exploring the environment. However, this strategy of using directives can in actuality hinder the child's development. Kekelis and Andersen argue that intrusive input from parents may deny the child the opportunity to create and implement their own ideas, and in turn, hamper the child's creativity and problem-solving skills. Furthermore, children who are blind also receive more repetitions of the same requests by their parents than their sighted peers. Thus, this persistent behaviour of parents' requests of their children may have negative effects on the child's communicative development.

Rowland (1984) conducted an observational study of interaction between mothers and their blind infants at regular intervals over six months to explore the development of communication abilities in each mother-child dyad. The findings indicated that the lack of vocal responsiveness by the mothers and infants was significantly different from communication of vocal exchanges in sighted mothers and infant dyads. Notably, some of these mothers continually vocalized without pausing and listening. The author argued that a pause and listening response to a vocalization may be as important as a vocal response. The author suggested that this failure to pause and listen could be damaging to patterns of mutual interaction as a lack of stimulation. It was posited that these mothers engaged in this behaviour out of a desire to

encourage their infants to respond. However, by constantly vocalizing the ability to have a natural communication was nearly impossible. Similarly, Kekelis and Andersen (1984) investigated the effects of visual impairment on parent-child interaction and found abnormal communication patterns. Natural interactions were video-recorded and then analyzed. The data revealed four important differences between blind children and their sighted peers in regards to the input they received. Parents of blind children frequently used language that encouraged their children to respond, typically by carrying out requests. As well, parents of blind children provide their children with fewer statements describing the persons, objects and events in their here and now. These parents instead identify objects at hand using labels and focus on the actions that the child is engaged in. The data also indicated that mothers of blind children initiated a larger amount of topics, and the majority of these topics were aimed at the child instead of other persons or events in the environment. In addition to the studies noted above, Moore and McConachie (1994) explored the communication directed toward children that were totally blind and children with severe visual loss by their parents. The authors noted that the significant differences between the interactions of the two groups' points to the notion that even a small amount of vision can make an important impact to the way in which parents interact with their visually impaired children. The data revealed that parents of blind children began interactions more often than parents of severely visually impaired (SVI) children. It was also reported that parents of children who were blind tended to request information more often from their children by directing requests to the child who required a verbal response such as "What's that?" In contrast, parents of SVI children tended to describe an object for their child or tell the child to do something. For a further review of research on the social interaction between sighted mothers and their visually impaired children see Urwin (1984). Urwin stated that development of interaction between parents and their visually impaired children can be problematic and that this in turn has consequences for the development of language in these children.

Abnormal interaction patterns have also been observed in parents interaction with their deaf children. Meadow-Orlans, Smith-Gray and Dyssegaard (1995) conducted an observational study to examine the differences in parent-child interaction of four groups. The groups included in this study were: multi-handicapped children (HI-MH), hearing impairment and at risk for additional disabilities (HI-AR), hearing impairment but not specifically at risk for other disabilities (HI-NR), and normal hearing infants as controls (HG). Contrary to what was expected, mothers of the HI-MH group did not differ significantly from the other two groups of deaf infants. The authors found this to be surprising given that the rating of the children's behaviours in the HI-MH were rated much lower than the other hearing impaired groups, as well as, the dyadic interaction. However, it was reported that the behaviours of mothers with deaf infants were rated more negatively than behaviours of mothers with hearing infants.

Rogers (1988) conducted a thorough review of the literature investigating the interaction between disabled infants and young children with their mothers. Based on this review Rogers concludes that interaction between infants and young children with disabilities is different from interaction between mothers and their non-disabled children. It was reported that during interaction with their children with disabilities mothers provide fewer positive responses and more negative responses, more frequently initiated interactions, lower levels of positive affect, engage in more avoidance behaviour, more controlling, less sensitivity to infant cues and trouble with reciprocity and synchrony than mothers of non-disabled children. Rogers asserted that some of the strategies used by mothers may be adaptive while others could be potentially damaging to the child's development. Ardito, Adenzato, Dell'Osbeland, Izard and Veglia (2004) explored whether mother directiveness and overprotection of sighted mothers in their interaction with their congenitally blind children is an adaptive strategy or if it causes negative effects on the child's

subsequent development and personality. The adult attachment inventory was administered to 19 adults who were congenitally blind. The data did not support the finding that was prevalent in previous literature that maternal directiveness and overprotection of mothers of children with congenital blindness as having an aversive effect on the developmental of their children. The data indicated that this behavioural strategy used by these mothers is considered encouraging and functional when it is accompanied with warmth, love and a supportive attitude. However, this finding may not apply to children who have other types of disabilities. Nevertheless, this study does provide a positive light on the strategies that mothers use when interacting with their disabled child.

Bradley, Rock, Whiteside, Caldwell and Brisby (1991) explored the link between parenting (as measured by the Home Observation for Measurement of the Environment HOME Inventory) and the severity of the child's disability of preschool and elementary school children. The authors reported that severity of disability is a significant predictor of a number but not all HOME subscales. Specifically, severity of disability was related to kinds of materials and enriching experiences a child obtains and the parent's responsiveness to the child. However, the severity of disability appeared to be unassociated with the amount of punishment the child received. Furthermore, the authors reported that the severity of disability appeared to have a stronger negative effect on the quality of age-appropriate stimulation and support the child obtained. Finally, the analyses indicated that severity of disability may have an increased effect on other areas of parenting during the elementary years. The authors suggested that this may reflect the increased challenges that parents have in coping with their children's disabilities year after year.

Parenting and Child Behavioural Outcomes

For numerous years, developmental researchers have acknowledged the fundamental role that parents play in the development of their children. The way in which mothers interact with their children has an important impact on the child's level of interactive engagement, which in turn, influences the child's cognitive development (Kim & Mahoney, 2004). Findings from a study conducted by Kim and Mahoney suggested that maternal responsiveness facilitated child engagement in activities that promote optimal developmental outcomes, for instance attention, persistence, and interest. The data suggested that children without disabilities demonstrated more engagement compared to age-matched disabled children. This finding points to the notion that mothers level of responsiveness to their children is, at least in part, a function of whether the child has a disability (Kim & Mahoney). As a consequence of this association, disabled children display less interactive engagement which results in lower levels of developmental functioning compared to their able-bodied peers. At the same time, however, the authors stated that the level of engagement produced by the children was better accounted for by mothers responsiveness than the child's developmental status. Thus, children with disabilities who have parents that are highly responsive are likely to demonstrate engagement and develop similar to their non-disabled peers.

Parents not only have a profound impact on the child's cognitive development but also on their personality. In an exploratory study, Cardinali and D'Allura (2001) investigated the association between parenting styles and self-esteem in visually impaired adolescents. The results revealed that adolescent reports of a permissive parenting style were positively linked to self-esteem whereas the mother reports of permissive parenting style were negatively associated with their children's self-esteem. Cardinali and D'Allura explained that these adolescents likely

viewed a permissive parenting style positively because it allowed them to be more autonomous. In contrast, it is likely that the mothers viewed a permissive parenting style as putting the adolescent's well-being and safety in jeopardy.

Although, parent-child interaction has an important impact on the child, one must be reminded that child characteristics influence this interaction. As noted earlier, child disability is just one factor that influences interaction. Another factor is the behaviour of the child on the parent. Tucker and Fox (1995) reported that child externalizing behaviour (e.g. acting out and aggression) was related to increased discipline by parents of pre-school children both with and without disabilities. Hence, a child disability may be associated with parent-child interaction just as child behaviour can be linked to parent-child interaction. Longitudinal studies are helpful in deciphering the directionality of these child characteristics on parenting.

Clinical Research and Intervention

The finding that a major proportion of parents of children with disabilities report stress in the clinical range has provoked design and research into interventions which can assist these parents to cope and learn skills to manage their child's behaviour (Woolfson & Grant, 2006). Specifically, clinical research and interventions have been designed to improve parent-child interaction, decrease parental stress and decrease child behaviour problems in families of children with disabilities (Roberts, Mazzucchelli, Studman & Sanders, 2006; Sanders, Mazzucchelli & Studman, 2004; Sharry, Guerin, Griffin & Drumm, 2005). Recently, a behavioural family intervention has been developed called Stepping Stones Triple P. This intervention targets families who have a child with a disability (Sanders et al., 2004). The general goal of the SSTP is to assist parents to develop effective problem-solving strategies for dealing

with various types of childhood behaviour difficulties and developmental issues (Sanders et al.). The program was in reaction to the knowledge that behavioural difficulties are more prevalent in children with disabilities than children without disabilities, which in turn, causes more stress on these parents. SSTP includes parent consultation strategies and brings in additional parenting and behaviour change strategies drawn from the disability literature. SSTP also includes discussion on family adaptation to a child's disability and being part of a community. Specific goals of the program include: increase parents ability to manage common behaviour problems and developmental issues of their disabled children, reduce parents use of coercive and punitive methods of disciplining children, improve parental coping skills and reduce parental stress, improve parental communication about parenting issues and help parents support one another in their parenting roles, and develop parents independent problem-solving skills (Sanders et al.). The program seeks to help parents apply the skills they learn to varied and novel situations rather than just applying these skills to just particular situations.

In a study to determine the effectiveness of the SSTP program Roberts, Mazzucchelli, Studman and Sanders (2006) conducted a randomized clinical trial with preschoolers with developmental and behavioural difficulties. The children were randomly selected into groups which included one group that participated in the program (treatment group) and the other was a waitlist group (control group). Parents reported on parenting style and stress, while independent observers recorded parent-child interactions. The results showed that SSTP was successful in reducing child behavioural problems as reported by mothers. Although, not as consistently observed in the children, parents behaviour did change as a result of the intervention. Reports from the independent observers indicated that mothers became less overreactive and fathers used fewer lax and verbose discipline strategies. It was also observed that parents were more likely to praise their children in target environments and this was maintained after follow-up. Counter to

what was anticipated there was no significant reduction in parental stress for the treatment group. The authors suggested that future studies are needed to replicate this finding.

Another intervention which has been developed and tested is the Parents Plus Early Years Programme (PPEY) which is a video-based early intervention for parents of pre-school children with behavioural and developmental impairments (Sharry, Guerin, Griffin & Drumm, 2005). The PPEY includes both parenting group sessions using video-based teaching and parent-child sessions using video feedback. In a study of children with various behavioural and developmental impairments, Sharry et al. (2005) tested the utility of this intervention program using a repeated measures design. Treatment effects were found that indicated a decrease in child behaviour difficulties (e.g. conduct problems and hyperactivity) and a decrease in parental stress using the Parenting Stress Index. As well, results revealed that there was a significant improvement in positive parent-child attention and a decrease in parent-child instruction from pre- to post-treatment. These improvements were present at the 5-month follow-up period.

CHAPTER III Orientation and Purpose

Reciprocal Socialization: A Theoretical Framework

For the last two decades a substantial amount of literature in the area of socialization has focused on the effects that parents have on their children (Peterson & Hann, 1999). This research tradition of parent-child research is known as the *parent effects* perspective which examines the way in which parental styles, behaviours, and characteristics impact a child's development (Maccoby & Martin, 1983; Peterson & Rollins, 1987; Rollins & Thomas, 1979 as cited in Peterson & Hann, 1999). From this perspective, parents are viewed as "conveyers of social reality who "model" or "shape" the young either into functional or deviate participants of society" (Peterson & Hann, 1999, p. 327). Parents are viewed as communicators and teachers of social norms. They are seen as role models of appropriate behaviour and provide children with emotional support. Although, the research from this perspective has provided many important insights in the area of parent-child relationships this unidirectional perspective has been criticized over the last two decades and other perspectives have been put forth (Petersen & Hann).

Another tradition in the area of parent-child relationships is known as the *child effects* perspective in which children "socialize" or "influence" their parents (Ambert, 1992, 1997; Bell & Chapman, 1986, Bell & Harper, 1997, Lytton & Romney, 1991 as cited in Petersen & Hann, 1999). This perspective investigates how children have an impact on the attitudes, behaviours, values, and experiences of parents (Bell & Harper, 1977, Maccoby & Martin, 1983, Petersen & Rollins, 1987 as cited in Petersen & Hann). This perspective is the reverse of the *parent effects* perspective whose premise is that socialization occurs in a one way direction from parent to the

child. The presence of a child can have consequences on parents such as a parent leaving the labour force, changes in the financial state of the family, and that parents adopt a new role in their identity as a “parent” (Petersen & Hann). Although, this perspective has countered the traditional view of *parent effects* and brought new knowledge into the area of parent-child relationships, this approach views interaction as a unidirectional process and does not account for bidirectional effects.

The third perspective in the parent-child literature is the *reciprocal interaction* approach (Petersen & Hann, 1999). This approach takes into account both *parent effects* and *child effects* simultaneously. From this perspective, socialization is viewed as a mutual process in which the parent and the child influence each others behaviour and development as well as themselves (Petersen & Rollins, 1987, Stafford & Bayer, 1993 as cited in Petersen & Hann). Petersen and Hann define *reciprocity* as “two actors have some manner of mutual influence on each other with great variability existing in (1) the relative strength of each actor’s influence, (2) the specific behaviours exchanged, and (3) the diversity of areas that are affected” (p. 345).

Research in the area of reciprocal interaction between parents and children has identified several concepts. One important concept is *synchrony* between parents and infants. Petersen and Hann (1999) define *synchrony* as “a type of interaction, indexes each participant’s capacity to maintain a mutual or shared focus in their dyadic relationship” (p. 345). Synchronous interactions are observed through both verbal and non-verbal communication such as the rhythm of conversation, tone, pauses in conversation, eye contact and facial expressions. These exchanges lead to social competence between parent and child in its most basic form (Petersen & Hann).

Other concepts that have been identified in the literature are the observations of “turn-taking”, “behaviour state matching”, and “coherence” between the parent and child (Petersen & Hann, 1999). Turn-taking is characterized by one actor being initially active while the other actor remains silent. Through these interactions the role of initiator gets redefined and role reversal occurs between who is active and who is silent (Brazelton et al., 1974; Schaffer, 1977; Tronick, 1989 as cited in Petersen & Hann). Behaviour state matching refers to the amount of time that both the mother and child engage in similar behaviours (e.g. mutual gazing) (Petersen & Hann). Another concept from this perspective is “coherence” which refers to one behavioural sequence that is initiated by one actor predicts a following behavioural sequence by the other actor (e.g. infant crying, mother’s vocalizations).

Another important concept that has been recognized is that of “follow in order to lead” (Shaffer, 1977 as cited in Petersen & Hann, 1999). This refers to a parent being aware of what the child is attending to and engaging the child with that stimulus as a way to facilitate interaction (Petersen & Hann). For instance, if a child’s focus is on a particular object the parent would take the object and give it to the child and initiate interaction which would involve mutual gazing and vocalizations. Furthermore, mothers that are sensitive to their child’s cues will allow periods of social withdrawal from social interaction when the mother observes that the infant shows little interest in interacting. Petersen and Hann suggest that healthy interaction involves a parent providing a moderate amount of stimulation to the child, while at the same time, allowing for periods of social withdrawal from the infant.

Hypotheses

The present study utilizes the reciprocal socialization perspective as a theoretical framework to understanding parent-child relationships. Child Health Status will be influential on both the child's behaviour (child behavioural outcomes) and on the parent (parenting styles). Parenting style will have an impact on the child's behaviour (child behavioural outcomes).

Hypotheses

Grounded on the theoretical and empirical literature reviewed, the following hypotheses have been developed:

H1: Parenting style will mediate the relationship between child health status and child behavioural outcomes.

H2: Child health status will be negatively associated with child behavioural outcomes.

- a. Child health status will be negatively related to hyperactivity-inattention.
- b. Child health status will be negatively related to emotional disorder-anxiety.
- c. Child health status will be negatively related to conduct disorder-physical aggression.
- d. Child health status will be negatively related to indirect aggression.

H3: Child health status will be differentially associated with parenting practices.

- a. Child health status will be positively related to positive parent-child interaction.
- b. Child health status will be negatively related to ineffective parenting.
- c. Child health status will be positively related to consistent interaction.
- d. Child health status will be negatively related to rational parenting.

H4: Positive parent-child interaction will be negatively associated with child behavioural outcomes.

- a. Positive interaction will be negatively related to hyperactivity-inattention.
- b. Positive interaction will be negatively related to emotional disorder–anxiety.
- c. Positive interaction will be negatively related to conduct disorder-physical aggression.
- d. Positive interaction will be negatively related to indirect aggression.

H5: Ineffective parenting will be positively associated with child behavioural outcomes.

- a. Ineffective parenting will be positively related to hyperactivity-inattention.
- b. Ineffective parenting will be positively related to emotional-disorder anxiety.
- c. Ineffective parenting will be positively related to conduct disorder-physical aggression.
- d. Hostile/ineffective interaction will be positively related to indirect aggression.

H6: Consistent interaction will be negatively associated with behavioural outcomes.

- a. Consistent interaction will be negatively related to hyperactivity-inattention.
- b. Consistent interaction will be negatively related to emotional-disorder anxiety.
- c. Consistent interaction will be negatively related to conduct disorder-physical aggression.
- d. Consistent interaction will be negatively related to indirect aggression.

H7: Rational parenting will be positively associated with behavioural outcomes.

- a. Rational parenting will be positively related to hyperactivity-inattentive.
- b. Rational parenting will be positively related to emotional-disorder anxiety.
- c. Rational parenting will be positively related to conduct disorder-physical aggression.
- d. Rational parenting will be positively related to indirect aggression.

CHAPTER IV Methods

Participants

In this investigation, analyses were conducted on cross-sectional data from the National Longitudinal Survey of Children and Youth (NLSCY) Cycle 4 2000-2001 collected by Statistics Canada and Human Resources Development Canada (Statistics Canada, 2001b). Access to the data was permitted through the BCIRDC (British Columbia Inter University Research Data Centre) located at the Walter C. Koerner Library, University of British Columbia. The NLSCY Cycle 4 cross-sectional data was composed of a representative probability sample of children who were aged 0 to 17 years as of January 1, 2001 ($N = 30,540$) (Statistics Canada, 2001b). The following description of the entire sample and sub-sample was derived from results using a cross-sectional population weight.

In the entire sample, the average age of the children was 8.83 ($SD = 5.10$) years in which 48.8% were girls and 51.2% were boys. The age group of the child's biological mother at birth ranged from 13-24 years (23.1%) to 40+ (1.3%) with a mean age of 28.19 ($SD = 5.09$) years and the child's biological father at birth ranged from 15-24 years (7.8%) to 40+ (5.1%) with a mean age of 31.06 ($SD = 5.49$). The majority of children lived with both their biological parents (74.4%). A smaller percentage of children (24.2%) lived with only one biological parent and a marginal percentage (1.4%) did not live with a biological parent. Children lived in a variety of family structures with the most prevalent being intact families (71.6 %). There were 5.3% of children living in a blended family and 9.8% living in a step family. Children lived in households with an average of 4.25 persons ($SD = 1.20$) including the selected child. The average number of

children in the household aged 0-17 was 2.15 ($SD = 0.98$). The selected child had an average number of 1.30 ($SD = 1.01$) siblings residing in the household.

Of the total responses provided by the Person Most Knowledgeable (PMK, as described below) on the child's behalf 90.7% were females and 9.2% were males. In the majority of cases (88.6%) the PMK was the biological mother of the selected child. In other instances, the PMK was the child's step mother (0.6%), adopted mother (0.6%), biological father (8.7%), step father (0.2%), adopted or foster father (0.1%), other related female (0.9%) and in 0.2% of cases was an other related male. The age group of the PMK ranged from 15-24 years (2.4%) to 40+ (43.9%) with a mean age of 37.90 ($SD = 7.13$) years. The marital status of the PMK varied with 71.5% of cases being married, 11.3% living common-law, 0.9% were widowed, 5.9% were separated, 5.2% were divorced and 5.1% were single, never married.

The PMK reported having a spouse living in the household in 81.9% of cases. In the most cases (67.9%) the spouse of the PMK was the biological father of the selected child. In other instances, the spouse of the PMK was the child's biological mother (6.7%), step mother (0.4%), adopted mother (0.1%), step father (5.3%), adopted father (0.6%), foster father (0.1%), other related or unrelated female or male (0.9%) and in 18.1 % of cases the PMK had no spouse. In situations where there was a spouse, the age group of the spouse ranged from 15-24 (0.8%) to 40+ (43.5%) with a mean age of 39.73 ($SD = 7.27$) years. Both the PMK and their spouse were asked to report their highest level of education. For the PMK, 41.1% had obtained a college or university degree, 23% had beyond high school education, 22% had secondary school graduation and 12.2% had less than secondary. For spouse of the PMK the highest level of education was a college or university degree in 36.1% of cases, beyond high school in 15.9%, secondary school graduation 16.7%, and less than secondary in 10.9%.

Both the PMK and their spouse were asked questions regarding their labour force participation. One item asked what the participants' main activity was currently. In the case of the PMK, 57.7% reported their main activity was taking care of family and working for pay or profit, 31.6% taking care of family, 5.5% working for pay or profit, 1.1% going to school, 0.9% recovering from own illness or disability, 0.5% looking for work and 0.1% were retired. In the most cases (79.4%) the PMK reported working for pay or profit during the past 12 months. The PMK was asked to report the number of hours per week worked for pay or profit and the largest percentage of responses was for the interval of 40-49 hours per week (25.3%) and second to it was 30-39 hours per week (25.0%). When the PMK was not working at the time of the interview the main reason in the greatest percentage of cases was to care for their children (4.6%). In other instances, the reason for not working was one's own illness or disability (0.8%), pregnancy (1.0%), caring for elder relative(s) (0.2%), other personal or family responsibilities (0.9%), school (0.8%), seasonal temporary lay-off (0.6%), non-seasonal temporary lay-off (0.4%), and unpaid or partially paid vacation (1.7%).

In terms of the PMK's spouse, 43.1% were reported their main activity as being taking care of family and working for pay or profit. In other situations, the spouse's main activity was caring for family (4.3%), working for pay or profit (26.9%), school (0.6%), recovering from own illness or disability (0.9%), looking for work (0.9%) and retired (0.4%). In the greatest percentage of cases (74.6%) the PMK reported that their spouse was working for pay or profit during the past 12 months. In most cases (39.5%) the spouse of the PMK worked 40 to 49 hours per week for pay or profit and second to this was working 50+ hours per week (22.0%). In instances where the spouse of the PMK was not working the most prevalent main reason was due to unpaid or partially paid vacation (1.0%). In other circumstances, the main reason was own

illness or disability (0.6%), pregnancy (0.2%)_caring for own children (0.5%), other personal or family responsibilities (0.3%), school or educational leave (0.5%), seasonal temporary lay-off ((0.7%), non-seasonal temporary lay-off (0.3%) and permanent lay-off (0.1%).

The PMK was asked several questions related to income. One item asked was what one's personal income was in the last 12 months from wages and salaries before deductions. The PMK reported an average of \$20,285.90 ($SD = \$25,987.05$) and for their spouse an average of \$38,160.89 ($SD = \$42,614.32$). The average for total estimated household income from all sources in the last 12 months before deductions was \$69,879.86 ($SD = \$58,171.90$). The PMK was asked to report the extent to which they agreed to the statement "You worry about whether the money you have will be enough to support your family" (Statistics Canada, 2005, p. 83). In response, 15.5% strongly agreed, 32.0% agreed, 34.6% disagreed, and 15.4% strongly disagreed.

The current investigation is focused on a narrower sub-sample of children aged 4-5 years old because items of the Health Utility Index Mark 3 (the independent variable in this study) were only asked of these children. In this sub-sample, responses were provided on behalf of 1274 children in whom the weighted proportion aged four was 69.8% and five 30.2% years with 45% girls and 55% boys. The age group of the child's biological mother at birth ranged from 13-24 years (21.5%) to 40+ (1.5%) with a mean age of 28.70 ($SD = 5.2$) years and the age group of the child's biological father at birth ranged from 15-24 years (4.9%) to 40+ (5.8%) with a mean age of 31.56 ($SD = 5.455$). The majority of children lived with both their biological parents (76.6%). A smaller proportion of children (22.2%) lived with only one biological parent and a marginal proportion (1.2%) did not live with a biological parent. Children lived in a variety of family structures with the most prevalent being intact families (69.6%). There were 8.8% of children living in a blended family and 11.3% living in a step family. Children lived in households with

an average of 4.15 persons ($SD = 1.105$). The average number of children in the household aged 0-17 was 2.20 ($SD = 0.89$). The selected child had an average number of 1.20 ($SD = 0.90$) siblings residing in the household.

Responses provided by the Person Most Knowledgeable (PMK, as described below) on the child's behalf included 93.5% females and 6.5% males. In the most cases (92.0%) the PMK was the biological mother of the selected child. In other instances, the PMK was the child's biological or foster father (6.5%), step, adopted or foster mother (0.5%) and in 0.9% of cases was an other related female. The age group of the PMK ranged from 15-24 years (3.1%) to 40+ (18.5%) with a mean age of 33.78 ($SD = 5.45$) years. The marital status of the PMK varied with 65.4% of cases having been married, 17.3% living common-law, 0.2% widowed, 8.1% were separated, 1.9% were divorced and 7.1% were single, never married. The PMK reported having a spouse living in the household in 82.5% cases. In most instances (71.4%) the spouse of the PMK was the biological father of the selected child. In other cases, the spouse of the PMK was the child's biological or step mother (5.3%), step father (3.8%), adopted father (0.5%), other related or unrelated male (1.6%) and in 17.5 % of cases the PMK had no spouse. In situations where there was a spouse, the age group of the spouse ranged from 15-24 (0.4%) to 40+ (23.6%) with a mean age of 36.23 ($SD = 5.715$) years. Both the PMK and their spouse were asked to report their highest level of education. For the PMK, 45.6% had obtained a college or university degree, 22.1% had beyond high school education, 19.0% had secondary school graduation and 11.8% had less than secondary. For spouses of the PMK the highest level of education was a college or university degree 40.0%, beyond high school in 14.0%, secondary school graduation 18.3%, and less than secondary in 11.4% of cases.

Both the PMK and their spouse were asked questions regarding their labour force participation. One item asked what the participants main activity was at the present time. In the case of the PMK, 53% reported their main activity was taking care of family and working for pay or profit, 39% taking care of family, 3% working for pay or profit, 1% going to school, 1% recovering from own illness or disability and 0.3% were looking for work. In the majority of cases (75.0%) the PMK reported working for pay or profit during the past 12 months. The PMK was asked to report the number of hours per week worked for pay or profit and the largest percentage of responses was for the interval of 30-39 hours per week (22%) and second to it was 40-49 hours per week (20.2%). When the PMK was not working at the time of the interview the main reason was to care for their children or other relatives (4.9%). In other instances, the reason for not working was one's own illness or disability (0.7%), pregnancy (1.6%), other personal or family responsibilities (0.3%), school (0.9%), seasonal and non-seasonal temporary lay-off (0.4%) and unpaid or partially paid vacation (1.5%).

In terms of the PMK's spouse, 44% percent reported their main activity being taking care of family and working for pay or profit. In other situations, the spouse's main activity was caring for family (6.7%), working for pay or profit (27.6%), school (0.3%), recovering from own illness or disability (0.7%) and looking for work (1.3%). In most cases (75.0%) the PMK reported that their spouse was working for pay or profit during the past 12 months. In majority of cases, (40.7%) the spouse of the PMK worked 40 to 49 hours per week for pay or profit and second to this was working 50+ hours per week (22.2%). In instances where the spouse of the PMK was not working the greatest percentage of cases reported the main reason was due to a seasonal or non-seasonal temporary lay-off or labour dispute (1.4%). In other circumstances, the main reason was own illness or disability, pregnancy or taking care of the children (1.2%), other personal or family responsibilities (0.3%), school (0.3%) and unpaid or partially paid vacation (1.2%).

The PMK was asked several questions related to income. One item asked was what one's personal income was in the last 12 months from wages and salaries before deductions. The PMK reported an average of \$16,865.92 ($SD = \$19,843.16$) and for their spouse an average of \$38,479.08 ($SD = \$53,362.29$). The average for total estimated household income from all sources in the last 12 months before deductions was \$63,643.33 ($SD = \$53,616.20$). The PMK was asked to report the extent to which they agreed to the statement "You worry about whether the money you have will be enough to support your family" (Statistics Canada, 2005, p. 83). In response, 15.8% strongly agreed, 33.5% agreed, 33.4% disagreed, and 16.6% disagreed.

Procedure

The aim of the National Longitudinal Survey of Children and Youth (NLSCY) is to record and track the development and well-being of Canadian children from infancy to young adulthood (Statistics Canada, 2001b). More specifically, the purpose of the NLSCY is to identify and measure forces that impact children's social, emotional and behavioural development and to monitor these influences over time. For the purposes of the NLSCY the unit of analysis is the child or youth. For each household that is being surveyed, for each selected child, the interviewer asks who in the household is the most knowledgeable about the selected child. This person was labeled the Person Most Knowledgeable (PMK). The PMK provides the interviewer with information of all selected children in the household on the Child Questionnaire and then provides answers items about themselves and their spouse on the Parent Questionnaire.

The selection of the variables from the NLSCY in the present investigation was based on the theoretical framework utilized and the review of the literature. For the purposes of this

investigation, the analyses will focus on the child health status as the independent variable, child behavioural outcomes as the dependent variable, and parenting styles as the mediating variable. In order to avoid any confounds several control variables will be included in the analyses which include: gender of the child, gender of the PMK, depression, family functioning, social support and income.

Validation

Many of the variables in the NSLCY are scale variables. Scales consist of several questions that measure a certain concept when the answer to the questions is compiled (Statistics Canada, 2001b). A score is created for each factor measured by a scale. Many of the scales used by the NSLCY have been used in other studies. Thus, the psychometric properties of the measures produced by each scale were accessible with references. However, to ensure that the psychometric properties in the literature would be consistent for the NSLCY an evaluation was conducted by Statistics Canada. This evaluation included; a new factor analysis calculated on all scales to identify the constructs or factors within each scale. Thereafter, scale scores were developed based on the factor structure. Lastly, reliability measures were developed.

Measurements

Independent Variable: Health Utility Index

The independent variable is child health status which was measured using the Healthy Utility Index Mark 3. In this investigation items on the Health Utility Index Mark 3 were only asked of four and five year olds, therefore, the findings can only be generalized to children of

this age group (Statistics Canada, 2001b). The HUI3 was created by McMaster University's Centre for Health Economics and Policy Analysis and is founded upon the Comprehensive Health Status Measurement System (CHSMS). The Health Utility Index has been used in all kinds of studies examining health topics such as: AIDS/HIV, Alzheimer's Disease, cancer, cardio-vascular disease, diabetes, epilepsy, extremely low birth weight, hypertension, orthopedic surgery and vaccinations (Furlong, Feeny, Torrance & Barr, 2001). Health status was defined as "within the skin" which means it includes physical and emotional health but excludes social interactions. Health status can be measured on three levels which include: impairment, disability and handicap. "Impairment refers to problems at the organ level, disability refers to problems at the person level, and handicap refers to problems people have in interacting with their surroundings due to disability" (Furlong, et al., p. 11). The Health Utility Index Mark 3 consists of a health-status classification system and a preference-based scoring function of importance. The health status classification system provides descriptive measures of disability. These measures of disability are transformed into measures of handicap using the preference-based scoring function. The health-status classification system focuses on functional capacity rather than performance (Boyle, Furlong, Feeny, Torrance & Hatcher, 1995). It provides for each participant descriptive measures of ability or disability for each attribute separately, as well as, an overall description of a persons level of health (the total of the attributes) (Furlong, et al.). The eight attributes included in the Health Utility Index Mark 3 are: vision, hearing, speech, mobility (ability to get around), dexterity (use of hands and fingers), cognition (memory and thinking), emotion (feelings) and pain and discomfort (Statistics Canada, 2005). There are five or six levels per attribute resulting in a total of 972,000 health states (Feeny, Furlong & Barr, 1998; Horsman, Furlong, Feeny & Torrance, 2003). The preference-based scoring function provides a measure of morbidity within each attribute and an overall measure of health-related quality of life (HRQL) (Furlong, et al.). The preference-based scoring function is founded on data collected from a

random sample of participants 16 years of age and older in Hamilton, Ontario Canada (Feeny, et al. 2002). The scale ranges from -0.36 (worse than death) through 0.00 (dead) to 1 (perfect health) (Grootendorst, Feeny & Furlong, 2000). Specific items of this scale can be found in Appendix A.

The Health Utility Index Mark 3 has been demonstrated to be a valid measure of health status and morbidity of health conditions in several studies (see for review Feeny, Furlong & Barr, 1998; Furlong, Feeny, Torrance & Barr, 2001). In a study to test the construct validity of the Health Utility Index Mark 3, Grootendorst, Feeny and Furlong (2000) assessed whether this measure was capable of detecting morbidity in specific health attributes associated with arthritis and stroke using data from the Ontario Health Survey. As anticipated, participants affected by stroke showed more impairment on the measure in areas related to speech and cognition compared to participants suffering from arthritis. Both groups demonstrated similar scores on areas of vision and hearing. It was also found that participants affected by arthritis and stroke scored lower on the total scale when compared to the general population. Additional evidence of validity was found in a clinical study of patients treated for intermittent claudication (Bosch & Hunink, 2000). Health status was compared before and after revascularization treatment as measured by the Health Utility Index Mark 3 and the EuroQol EQ-5D (EQ-5D). It was found that after one month of treatment patients experienced improvement on comparable dimensions related to disease symptoms on the Health Utility Index (ambulation and pain) and the EQ-5D (mobility, usual activities and pain/discomfort), while the other dimensions remained constant before and after treatment. The investigators also compared overall scores on each measure at pre- and post-treatment. At pre-treatment patients scored significantly higher on the Health Utility Index than on the EQ-5D, while 12 months after treatment there were no significant differences in scores between the two measures. Hence, both measures illustrated similar effects

of treatment on health status. The utility of the Health Utility Index as a measure of health status has also been illustrated in a study of children five years after surviving cancer (Speechley, et al., 1999). Health status of the children was compared on the Health Utility Index Mark 3 and the Child Health Questionnaire (CHQ). It was reported that children scored similarly on the Health Utility Index pain attribute and the bodily pain sub-scale of the CHQ. Similarity between the measures was also found for the emotion attribute on the Health Utility Index and the CHQ mental health sub-scale. The Health Utility Index ambulation attribute was moderately related to the CHQ physical functioning sub-scale. In terms of global health the two measures were moderately related to one another. These findings suggest that both these measures capture symptoms associated with surviving cancer in children and are valid in measuring overall health status.

The Health Utility Index Mark 3 has also been tested for its reliability (see for review Feeny, Furlong & Barr, 1998). To test the reliability of the Health Utility Index, Boyle, Furlong, Feeny, Torrance & Hatcher (1995) conducted a test-retest study using data from respondents who answered questions on the Health Utility Index which was a part of the Canadian General Social Survey (GSS) Cycle 6 1991. Participants were interviewed during August and September 1991 and one month later using the exact same questionnaire. Comparisons were made between time one and time two scores on an item-by-item basis, specific attributes and overall health index scores. The results indicated that health status was reliably measured over time by individual questions, specific attribute scores and overall health index in the GSS population sampled. However, the reliability found for speech and dexterity was much more modest, the authors suggest that this finding is likely explained by the low level of prevalence of these impairments in the general population. Nonetheless, agreement among the six other attributes was very high, and the intraclass correlation coefficient (ICC) for the overall health index

between the two time intervals was 0.77 suggesting good reliability. In a study of patients recovering from hip fracture, (Jones, Feeny & Eng, 2005) test-retest reliability of the Health Utility Index was assessed at three and six months post-surgery using the ICC. The ICC of patients who were classified as stable over time was 0.72 which is congruent with those found in other studies. Further evidence of the reliability of the Health Utility Index was tested in a sample of multiple sclerosis (MS) patients (Fisk, et al. 2005). Test-retest reliability was assessed between scores derived from the initial assessment and those provided two weeks later. The ICC on the measure was 0.87 which is sufficient for population surveys. In sum, the Health Utility Index Mark 3 has shown to be a reliable measure of health status and HRQL in samples drawn from the general population and clinical patient samples. A reliability analysis was conducted on the Health Utility Index (31 items) for the sub-sample weighted by a normalized weight which produced a Cronbach's alpha of 0.47. This coefficient is lower than those reported in other studies and suggests somewhat poor reliability between the items.

Mediating Variable

An important influence on child behaviour and development is parenting style. The NLSCY Cycle 4 includes several scales to measure parenting behaviours (Statistics Canada, 2001b). The NLSCY includes two categories of scales one that is designed to measure the positive interaction, hostile/ineffectiveness and consistency of parenting the child. The second is designed to measure parenting practices that may or may not provoke aversion. The positive interaction, hostility-ineffective parenting and consistency scales were provided by Dr. M. Boyle of the Chedoke-McMaster Hospital, based on the work of Dr. Ken Dodge (Vanderbilt University), as well as, an adaptation of the Parenting Practices Scale of Strayhorn and Weidman. For scales that may or may not provoke aversion seven questions were provided by Dr. M. Boyle. The specific

parenting scales used in the NLSCY is positive interaction, ineffective parenting, consistent parenting and rational parenting. The item non-response rate ranged from 3.07% to 3.69% (Statistics Canada, 2001b).

Positive interaction.

The positive interaction scale is comprised of five items (Statistics Canada, 2005). Positive interaction includes behaviours of the parent such as: praising the child, playing with the child just for fun, laughing with the child, doing something special with the child, and playing sports (Statistics Canada, 2001a; 2005). The total positive interaction score ranges from 0 to 20 with a high score indicating positive interaction (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix C. The Cronbach's alpha is 0.778 for the entire measure (Statistics Canada, 2001b).

Ineffective parenting.

The ineffective parenting scale is comprised of seven items (Statistics Canada, 2005). These items measure behaviours such as getting annoyed at the child for saying or doing something they aren't supposed to, giving little praise, giving disapproval, and getting angry when punishing the child (Statistics Canada, 2001a; 2005). The total ineffective parenting score ranges from 0 to 28 with a high score indicating hostile-ineffective interactions (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix C. The Cronbach's alpha is 0.701 (Statistics Canada, 2001b)...

Consistent parenting.

The consistent parenting scale is comprised of five items (Statistics Canada, 2005). Consistent parenting includes behaviours of the parent such as: when a parent gives a command makes sure the child does it, consistent with punishing a child, not letting the child get away with things when they should be punished, and the child is able to escape punishment even though the parent feels the child needs to be punished (Statistics Canada, 2001a; 2005). The total consistent interaction score ranges from 0 to 20 with a high score indicating consistent parenting behaviour (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix C. The Cronbach's alpha is 0.664 (Statistics Canada, 2001b).

Rational parenting.

The rational parenting scale is comprised of four items (Statistics Canada, 2005). Rational parenting includes behaviours of the parent such as: raising one's voice, scolding, yelling, unable to calmly discuss a problem, using physical punishment, and unable to provide alternative ways of behaving that are appropriate (Statistics Canada, 2001a; 2005). The total rational parenting score ranges from 0 to 20 with a high score indicating punitive and aversive interactions (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix C. The Cronbach's alpha is 0.551 (Statistics Canada, 2001b).

Dependent Variable

Child behavioural outcome measures included in this study were: hyperactivity inattention, emotional disorder-anxiety, conduct disorder-physical aggression and indirect aggression. The

item non-response rate was approximately 3.5% for most of the 47 items involved in the analysis for scales on hyperactivity-inattention, emotional disorder-anxiety, conduct disorder-physical aggression and indirect aggression (Statistics Canada, 2001b).

Hyperactivity-inattention.

The hyperactivity-inattention scale is comprised of seven items (Statistics Canada, 2005). Five items were taken from the Ontario Child Health Survey (OCHS) and two items were adopted from the Montreal Longitudinal Survey (Statistics Canada, 2001b). Hyperactivity-inattention is when children are unable to focus their attention and are typically impulsive and easily distracted (United States Department of Health and Human Services, 2003). Many children with Attention-deficit/hyperactivity disorder (ADHD) have a great deal of trouble remaining still, taking turns, and keeping quiet. The total hyperactivity-inattention score ranges from 0 to 14 with a high score indicating the presence of hyperactive-inattentive behaviour (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix B. The Cronbach's alpha is 0.815 for the entire measure (Statistics Canada, 2001b).

Emotional disorder - anxiety.

The emotional disorder - anxiety scale is comprised of seven items (Statistics Canada, 2005). Items were adopted from the Ontario Child Health Survey (OCHS) (Statistics Canada, 2001b). Emotional disorder is understood to be a condition where one or more of the following characteristics are observed in the child over a long period of time and to a marked degree: a) an inability to learn that cannot be explained by intellectual, sensory, or health factors, b) an inability to build or maintain satisfactory interpersonal relationships with peers and teachers, c)

inappropriate types of behavior or feelings under normal circumstances, d) general pervasive mood of unhappiness or depression, e) tendency to develop physical symptoms or fears associated with personal or school problems (National Dissemination Center for Children with Disabilities, 2004). Anxiety disorder is conceptualization as a disorder in children that is characterized by excessive fear, worry, and uneasiness (United States Department of Health and Human Services, 2003). The total emotional disorder anxiety score ranges from 0 to 14 with a high score indicating the presence of behaviours associated with anxiety and emotional disorder (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix B. The Cronbach's alpha is 0.736 for the entire measure (Statistics Canada, 2001b).

Physical aggression.

The conduct disorder - physical aggression scale is comprised of six items (Statistics Canada, 2005). One item was taken from the Montreal Longitudinal Survey and three items were adopted from the Ontario Child Health Survey (OCHS) (Statistics Canada, 2001b). Aggression is understood as intentional behaviours aimed at causing harm or pain, psychological harm, or personal injury (Child Development Reference, 2008). Physical aggression includes direct aggressive behaviours such as pinching, kicking and insulting. The total physical aggression score ranges from 0 to 12 with a high score indicating behaviours associated with conduct disorder and physical aggression (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix B. The Cronbach's alpha is 0.772 for the entire measure (Statistics Canada, 2001b).

Indirect aggression.

The indirect aggression scale is comprised of five items (Statistics Canada, 2005). These items were adopted from Lagerspetz Bjornqvist and Peltonen of Finland (Statistics Canada, 2001b). Indirect aggression refers to social manipulations (such as rumor spreading, peer group exclusion, or breaking confidence) that are indirect in their nature and that can be socially harmful (Crick, 1995; Crick & Grotpetar, 1995 as cited in Cote, Vaillancourt, Barker, Nagin & Tremblay, 2007). The total indirect aggression score ranges from 0 to 10 with a high score indicating behaviour associated with indirect aggression (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix B. The Cronbach's alpha is 0.766 for the entire measure (Statistics Canada, 2001b).

Control variables

Gender of the Child.

Research has indicated that some behaviour problems in children are more prevalent in boys than in girls. For instance, Skounti, Philalithis and Galanakis (2007) conducted a review of 39 studies on Attention Deficit/Hyperactivity Disorder (ADHD) prevalence. One conclusion drawn from this review was that ADHD is more common in boys than in girls. Hence, this study included gender of the child because the literature indicates differences between boys and girls on child behaviour outcomes. The variable was created as a categorical variable, coding "1" as girls and "0" as boys in order to explore gender differences in children.

Gender of the PMK.

In more recent literature it has been brought to the attention of scholars that mothers and fathers interact differently with their disabled children. The stress of having a child with a disability seems to have a different impact on mothers compared to fathers. Therefore, this investigation has included this variable in the analysis. The variable was created as a categorical variable, coding “0” as females and “1” as males in order to explore gender differences between parents.

Parental depression.

Parental depression can have a negative impact on children’s well-being and development. Children and adolescents of depressed parents are at greater risk for emotional and behavioural problems (Bosco, Renk, Dinger, Epstein & Phares, 2003; Copeland, 1999; Cummings, Keller & Davies, 2005; Elgar, McGrath & Waschbush, 2004; Low & Stockerl, 2005). Timko, Cronkite and Berg (2002) reported that children of parents with depression experience greater psychological distress and physical problems, and are more likely to engage in health risk behaviours and be labeled as disturbed compared to children of control parents. Children of depressed parents receive poor parenting behaviour that is characterized as too intrusive or withdrawn (Cummings, et al.; Elgar, et al.). As well, depressed parents are less positive and more negative in their interaction with their children (Timko, et al.). Specifically, these parents tended to express greater insensitivity, irritability, critical and hostile behaviour toward their children than non-depressed parents. These behaviours are likely to lead to significant life stress for children (Elgar, et al.). Given the significant effect of parental

depression on parent-child interaction this investigation has included parental depression as a control variable.

The depression scale used by the NLSCY was administered to the PMK as part of the Parent Questionnaire. The questions used were taken from the short version of the Depression Rating Scale (CES-D) and comprises of twenty questions which were developed by L. S. Radloff of the Epidemiology Study Centre of the National Institute of Mental Health in the United States (Statistics Canada, 2001b). The purpose of the scale is to measure the frequency of symptoms in the public at large. The scale measures the occurrence and severity of symptoms associated with depression during the previous week. The rating scale was reduced to 12 questions by Dr. M. Boyle of the Chedoke-McMaster Hospital of McMaster University.

The depression scale included 12 questions each of which includes four response categories. The total score ranges from 0 to 36 with a high score indicating the presence of depressive symptoms (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix D. The non-response rate for the total score was 2.2%. (Statistics Canada, 2001b) The Cronbach's alpha is 0.820.

Family functioning.

The items on family functioning were created by researchers at the Chedoke-McMaster Hospital of McMaster University and have been used a great deal both in Canada and internationally (Statistics Canada, 2001b). The purpose of the measure is to assess various components of family functioning such as problem-solving, communications, roles, affective involvement, affective responsiveness and behaviour control. The family functioning scale is

geared toward providing a general assessment of family functioning and an indication of the quality of relationships within the family. Research has demonstrated that the relationship between family members has an important impact on children (Statistics Canada, 2001b). Statistics Canada reported that results from the Ontario Child Health Study have shown that there is an important link between family dysfunction and certain mental health conditions in children. Therefore, family functioning was included in this investigation as a control variable.

The family functioning scale was completed by the PMK or his/her spouse as part of the Parent Questionnaire. The scale consists of twelve questions, each of which includes four response categories. The total score ranges from 0 to 36, with a high score indicating family dysfunction (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix D. The non-response rate for the total score was 1.9% (Statistics Canada, 2001b). The Cronbach's alpha was 0.880 for the entire measure.

Social support.

The social support scale is based on a shortened version of Robert Weiss's Social Provisions Model that identified six social functions or "provisions" that may be gained from relationships with others (Statistics Canada, 2001b). The items measure guidance, reliable alliance and attachment. As well, additional items were added to reflect other types of support such as religious and community services. These additional items were adopted from the F-COPES (Family Crisis Oriented Personal Evaluation Scales). The F-COPES was developed in line with coping dimensions of the Resiliency Model of Family Adjustment and Adaptation (McCubbin, Olson & Larsen, 1981 as cited in Statistics Canada, 2001b). The total social support scale includes eight items and focuses on the amount of social support and the quality of social

support. The final score ranges from 0-24 with a high score indicating a greater degree of social support (Statistics Canada, 2005). For a list of specific items of this scale refer to Appendix D. The non-response rate for the eight items varied averaged about 2.6% (Statistics Canada, 2001b). The Cronbach's alpha was 0.877 for the entire social support measure.

Income.

For parents of children with disabilities money can be an important resource to help with adaptation and coping. Income is particularly important in circumstances where the child must frequently visit specialists or often requires hospitalization because of the high cost for treatment and physician fees. Income was measured using one item from the NLSCY Cycle 4 which asked the PMK "What is your best estimate of your total household income from all sources in the past 12 months?" This item did not have specific categories of income for the PMK to select but rather let the respondent provide the actual dollar amount.

CHAPTER V Results

Entire Sample

Table 1 includes means, standard deviations and intercorrelations of the control variables, child behavioural outcomes, and parent styles for the entire sample of the NLSCY Cycle 4. The descriptive statistics were weighted using a cross-sectional population weight. The data for the correlational and regression analyses were weighted using a normalized weight which was created by taking the cross-sectional population weight for the sample and dividing it by its mean. Participants on average scored 13.65 ($SD = 3.05$) on the positive interaction scale. Descriptive statistics illustrate that most participants scored in the high range on the positive interaction scale. The sample mean for the ineffective parenting scale was 8.67 ($SD = 3.57$). This indicates that on average participants scored in the low range on this scale. The sample mean for consistent parenting was 15.14 ($SD = 3.20$). These descriptive statistics illustrate that on average participants scored in the high range on the consistent parenting scale. Participants on average scored 8.42 ($SD = 1.98$) on the rational parenting scale. Descriptive statistics illustrate that most participants scored in the low range on the rational parenting scale. The sample mean for hyperactivity-inattention was 3.82 ($SD = 3.01$). These descriptive statistics illustrate that on average participants scored in the low range on the hyperactivity-inattention scale. The sample mean for emotional-disorder – anxiety was 2.28 ($SD = 2.22$). These descriptive statistics illustrate that on average participants scored in the low range on the emotional disorder - anxiety scale. Participants on average scored 1.33 ($SD = 1.83$) on the physical aggression scale. Descriptive statistics illustrate that most participants scored in the very low range on the physical aggression scale. The distribution on the physical aggression score was highly skewed (skewness = 1.92, $SE = .001$) and had a kurtosis of 4.46 ($SE = .003$). As a result, this scale was transformed

into a categorical variable labeled PA with values of 1 or greater indicating physical aggression and all other values indicating no physically aggressive behaviours. Participants on average scored .23 on PA ($SD = .42$). This indicates that 23% of children engaged in physically aggressive behaviours and 77% did not. Participants on average scored 0.94 ($SD = 1.50$) on the indirect aggression scale. Descriptive statistics illustrate that most participants scored in the very low range on the indirect aggression scale. The distribution on the indirect aggression score was highly skewed (skewness = 1.93, $SE = .001$) and had a kurtosis of 3.84 ($SE = .003$). As a result, this scale was transformed into a categorical variable labeled IA with values of 1 or greater indicating indirect aggression and all other values indicating no indirect aggressive behaviours. Participants on average scored .17 on IA ($SD = .37$). This indicates that 17% of children engaged in indirect aggressive behaviours and 83% did not. Gender of the child was included as a control variable and was recoded into females = 1 and males = 0, the percentage of the sample for each was 48.8% and 51.2%, respectively. The gender of the PMK was recoded into females = 0 and males = 1, the percentage of the sample for each was 90.7% and 9.2%, respectively. The sample mean for depression was 4.42 ($SD = 5.43$). These descriptive statistics illustrate that on average participants scored in the low range on the depression scale. The sample mean for family functioning was 8.97 ($SD = 4.93$). These descriptive statistics illustrate that on average participants scored in the low range on the family functioning scale. Participants on average scored 18.45 ($SD = 3.66$) on the social support scale. Descriptive statistics illustrate that most participants scored in the high range on the social support scale. The sample mean for estimated household income was 69,879.86 ($SD = 58,171.90$).

As indicated in Table 1 there were significant negative relationships between positive parent-child interaction and hyperactivity-inattention ($r = -.07, p < .01$), emotional disorder anxiety ($r = -.12, p < .01$), physical aggression ($r = -.07, p < .01$), indirect aggression ($r = -.15, p$

< .01), PA ($r = -.25, p < .01$) and IA ($r = -.24, p < .01$). There were significant positive relationships between ineffective parenting and hyperactivity-inattention ($r = .42, p < .01$), emotional disorder anxiety ($r = .32, p < .01$), physical aggression ($r = .43, p < .01$), indirect aggression ($r = .30, p < .01$), PA ($r = .27, p < .01$) and IA ($r = .20, p < .01$). There were significant negative relationships between consistent parenting and hyperactivity-inattention ($r = -.15, p < .01$), emotional disorder anxiety ($r = -.10, p < .01$), physical aggression ($r = -.12, p < .01$), indirect aggression ($r = -.16, p < .01$), PA ($r = -.07, p < .01$) and IA ($r = -.09, p < .01$).

There were significant positive relationships between rational parenting and hyperactivity-inattention ($r = .19, p < .01$), emotional disorder anxiety ($r = .13, p < .01$), physical aggression ($r = .24, p < .01$), indirect aggression ($r = .15, p < .01$), PA ($r = .15, p < .01$) and IA ($r = .10, p < .01$). There were significant negative associations between gender of the child and family functioning ($r = -.01, p < .01$), income ($r = -.02, p < .01$), ineffective parenting ($r = -.06, p < .01$), consistent parenting ($r = -.02, p < .01$), rational parenting ($r = -.03, p < .01$), hyperactivity-inattention ($r = -.16, p < .01$), physical aggression ($r = -.09, p < .01$) and PA ($r = -.03, p < .01$).

There were significant positive relationships between gender of the child and indirect aggression ($r = .10, p < .01$) and IA ($r = .04, p < .01$). There were significant negative relations between gender of the PMK and depression ($r = -.04, p < .01$), social support ($r = -.07, p < .01$), HUI ($r = -.01, p < .05$), ineffective parenting ($r = -.06, p < .01$), rational parenting ($r = -.01, p < .05$), PA ($r = -.03, p < .01$) and IA ($r = -.02, p < .01$). There was significant positive relationships between gender of PMK and family functioning ($r = .04, p < .01$), income ($r = .01, p < .01$), and hyperactivity-inattention ($r = .02, p < .05$). Depression was significantly and positively associated with family functioning ($r = .25, p < .01$), ineffective parenting ($r = .19, p < .01$), rational parenting ($r = .14, p < .01$), hyperactivity-inattention ($r = .18, p < .01$), emotional-disorder anxiety ($r = .22, p < .01$), physical aggression ($r = .17, p < .01$), indirect aggression ($r = .11, p < .01$), PA ($r = .04, p < .01$), and IA ($r = .03, p < .01$). There were significant negative

relationships between depression and social support ($r = -.15, p < .01$), income ($r = -.14, p < .01$), positive parent-child interaction ($r = -.07, p < .01$), and consistent parenting ($r = -.14, p < .01$). Family functioning was significantly and negatively related to social support ($r = -.50, p < .01$), income ($r = -.09, p < .01$), HUI ($r = -.02, p < .01$), positive parent-child interaction ($r = -.12, p < .01$), and consistent parenting ($r = -.16, p < .01$). There were significant and positive relationships between family functioning and ineffective parenting ($r = .17, p < .01$), rational parenting ($r = .18, p < .01$), hyperactivity-inattention ($r = .12, p < .01$), emotional disorder – anxiety ($r = .10, p < .01$), physical aggression ($r = .10, p < .01$), indirect aggression ($r = .09, p < .01$), and IA ($r = .02, p < .01$). Social support was significantly and positively related to income ($r = .10, p < .01$), positive parent-child interaction ($r = .08, p < .01$), consistent parenting ($r = .13, p < .01$) and PA ($r = .02, p < .01$). There were significant negative relationships between social support and ineffective parenting ($r = -.03, p < .01$), rational parenting ($r = -.09, p < .01$), hyperactivity-attention ($r = -.04, p < .01$) and indirect aggression ($r = -.04, p < .01$). Income was significantly and positively related to positive parent-child interaction ($r = .01, p < .05$) and consistent parenting ($r = .10, p < .01$). There were significant negative relationships between income and ineffective parenting ($r = -.05, p < .01$), rational parenting ($r = -.03, p < .01$), hyperactivity-inattention ($r = -.09, p < .01$), emotional disorder – anxiety ($r = -.04, p < .01$), physical aggression ($r = -.06, p < .01$), indirect aggression ($r = -.04, p < .01$), PA ($r = -.03, p < .01$) and IA ($r = -.02, p < .01$)

Sub-sample of Four to Five Year Olds

Means, standard deviations and intercorrelations of the variables for the sample of four to five year olds are presented in Table 2. The means and standard deviations were weighted using a cross-sectional population weight while the correlations were weighted with the normalized

weight. The sample mean for the Health Utility Index Mark 3 was 0.94 ($SD = 0.12$). This indicates that on average participants scored in the high range on the Health Utility Index scale. The distribution on the Health Utility Index was highly skewed (skewness = -3.67, $SE = .006$) and had a kurtosis of 16.83 ($SE = .011$). Therefore, this scale was transformed into a categorical variable labeled (HUI) in which 1 equals 1 (perfect health) and all other values equal 0 (impaired health). This HUI categorical variable was used for all analyses that follow. Participants on average scored .67 on HUI ($SD = .46$). This indicates that 67% of the 4 to 5 year olds had perfect health while 32.3% had imperfect health. Because the Health Utility Index was transformed into a categorical variable the hypotheses for the effect of the effect of child health status has changed. The second hypothesis is revised as follows: Children in the perfect health group will score significantly lower on the child behavioural measures than children in the health impairment group. The third hypothesis is revised as follows: Children in the perfect health group will score significantly lower on ineffective and rational parenting than children in the health impairment group; children in the perfect health group will score significantly higher on positive interaction and consistent parenting than children in the health impairment group.

For the parenting variables, participants on average scored 14.55 ($SD = 2.49$) on the positive parent-child interaction scale. Descriptive statistics illustrate that most participants scored in the high range on the positive parent-child interaction scale. The sample mean for the ineffective parenting scale was 8.76 ($SD = 3.36$). This indicates that on average participants scored in the low range on this scale. The sample mean for consistent parenting was 15.01 ($SD = 3.27$). These descriptive statistics illustrate that on average participants scored in the high range on the consistent parenting scale. Participants on average scored 8.53 ($SD = 1.97$) on the rational parenting scale. Descriptive statistics illustrate that most participants scored in the low range on the rational parenting scale. The sample mean for hyperactivity-inattention was 4.29 ($SD = 2.99$).

These descriptive statistics illustrate that on average participants scored in the low range on the hyperactivity-inattention scale. The sample mean for emotional-disorder – anxiety was 2.07 ($SD = 1.93$). These descriptive statistics illustrate that on average participants scored in the low range on the emotional disorder - anxiety scale. Participants on average scored 1.72 ($SD = 2.06$) on the physical aggression scale. Descriptive statistics illustrate that most participants scored in the very low range on the physical aggression scale. The distribution on the physical aggression score was highly skewed (skewness = 1.39, $SE = .006$) and had a kurtosis of 1.57 ($SE = .011$). As a result, this scale was transformed into a categorical variable labeled PA with values of 1 or greater indicating physical aggression and all other values indicating no physically aggressive behaviours. Participants on average scored .61 on PA ($SD = .48$). This indicates that 61% of the 4 to 5 year olds engaged in physically aggressive behaviours and 39% did not. Participants on average scored 0.54 ($SD = 1.05$) on the indirect aggression scale. Descriptive statistics illustrate that most participants scored in the very low range on the indirect aggression scale. The distribution on the indirect aggression score was highly skewed (skewness = 2.31, $SE = .006$) and had a kurtosis of 5.62 ($SE = .011$). As a result, this scale was transformed into a categorical variable labeled IA with values of 1 or greater indicating indirect aggression and all other values indicating no indirect aggressive behaviours. Participants on average scored .28 on IA ($SD = .45$). This indicates that 28% of the 4 to 5 year olds engaged in indirect aggressive behaviours and 73% did not. Gender of the child was added as a control variable and was recoded into females = 1 and males = 0, the percentage of the sample for each was 45% and 55%, respectively. The gender of the PMK was recoded into females = 0 and males = 1, the percentage of the sample for each was 93.5% and 6.5%, respectively. The sample mean for depression was 4.85 ($SD = 6.09$). These descriptive statistics illustrate that on average participants scored in the low range on the depression scale. The sample mean for family functioning was 8.76 ($SD = 5.30$). These descriptive statistics illustrate that on average participants scored in the low range

on the family functioning scale. Participants on average scored 18.64 ($SD = 3.52$) on the social support scale. Descriptive statistics illustrate that most participants scored in the high range on the social support scale. The sample mean for estimated household income was 63,643.33 ($SD = 53,616.20$).

Table 2 indicates that there were significant positive relationships between the HUI and positive parent-child interaction ($r = .13, p < .01$) and consistent parenting ($r = .12, p < .01$). There were significant negative relationships between the HUI and ineffective parenting ($r = -.20, p < .01$), rational parenting ($r = -.12, p < .01$), hyperactivity-inattention ($r = -.32, p < .01$), emotional disorder anxiety ($r = -.21, p < .01$), physical aggression ($r = -.20, p < .01$) indirect aggression ($r = -.08, p < .01$), PA ($r = -.15, p < .01$) and IA ($r = -.05, p < .05$). There were significant negative relationships between positive parent-child interaction and hyperactivity-inattention ($r = -.10, p < .01$), emotional disorder anxiety ($r = -.06, p = .05$), and physical aggression ($r = -.09, p < .01$). There were significant positive relationships between hostile-ineffective parenting and hyperactivity-inattention ($r = .39, p < .01$), emotional disorder anxiety ($r = .25, p < .01$), physical aggression ($r = .35, p < .01$), and indirect aggression ($r = .20, p < .01$), PA ($r = .23, p < .01$) and IA ($r = .19, p < .01$). There were significant negative relationships between consistent parenting and hyperactivity-inattention ($r = -.20, p < .01$), emotional disorder anxiety ($r = -.08, p < .01$), physical aggression ($r = -.12, p < .01$), indirect aggression ($r = -.07, p < .01$), PA ($r = -.13, p < .01$) and IA ($r = -.10, p < .01$). There were significant positive relationships between rational parenting and hyperactivity-inattention ($r = .26, p < .01$), emotional disorder anxiety ($r = .17, p = .01$), physical aggression ($r = .29, p < .01$), and indirect aggression ($r = .15, p < .01$), PA ($r = .18, p < .01$) and IA ($r = .17, p < .01$). There were significant negative associations between gender of the child and hyperactivity-inattention ($r = -.18, p < .01$), physical aggression ($r = -.15, p < .01$) and PA ($r = -.08, p < .01$). There was a

significant positive relationship between gender of the child and HUI ($r = .10, p < .01$). There were significant negative relations between gender of the PMK and depression ($r = -.06, p < .05$). The gender of the PMK had no significance with any further variables. Depression was significantly and positively associated with family functioning ($r = .35, p < .01$), ineffective parenting ($r = .18, p < .01$), rational parenting ($r = .12, p < .01$), hyperactivity-inattention ($r = .20, p < .01$), emotional disorder – anxiety ($r = .21, p < .01$), physical aggression ($r = .17, p < .01$), indirect aggression ($r = .06, p < .005$), PA ($r = .12, p < .01$), and IA ($r = .09, p < .01$). Depression was significantly and negatively related to social support ($r = -.10, p < .01$), income ($r = -.16, p < .01$), HUI ($r = -.20, p < .01$) and consistent parenting ($r = -.22, p < .01$). There were significant and positive relationships between family functioning and ineffective parenting ($r = .14, p < .01$), rational parenting ($r = .17, p < .01$), hyperactivity-inattention ($r = .11, p < .01$), emotional disorder – anxiety ($r = .15, p < .01$), physical aggression ($r = .13, p < .01$), indirect aggression ($r = .09, p < .01$), PA ($r = .13, p < .01$) and IA ($r = .09, p < .01$). There were significant negative associations between family functioning and social support ($r = -.50, p < .01$), income ($r = -.06, p < .05$), HUI ($r = -.15, p < .01$), positive parent-child interaction ($r = -.14, p < .01$) and consistent parenting ($r = -.19, p < .01$). Social support was significantly and positively related to HUI ($r = .10, p < .01$), positive parent-child interaction ($r = .12, p < .01$) and consistent parenting ($r = .19, p < .01$). There were significant negative associations between social support and ineffective parenting ($r = -.05, p < .05$), indirect aggression ($r = -.08, p < .01$) and IA ($r = -.11, p < .01$). Income was significantly and negatively related to hyperactivity-inattention ($r = -.06, p < .05$), physical aggression ($r = -.06, p < .05$) and PA ($r = -.07, p < .05$).

Regression Analyses

Hierarchical Ordinary Least Squares (OLS) regression was conducted to test the hypotheses of the relationships between parenting and child behavioural outcomes for the entire sample. The purpose of conducting these regressions was to discover whether there were any differences between the results of the entire sample from that of the sub-sample. The most important difference found was that for the entire sample all the parenting styles were significantly related to each of the behavioural outcomes whereas for the sub-sample there were instances in which positive interaction and consistent parenting were unrelated to child outcomes measures. The regressions reported below are for the entire sample in which these two parenting styles were significantly associated with child behavioural measures.

In the first step of the regression model the control variables were entered (e.g. gender of the PMK, parental depression, family functioning, social support, and income). Gender of the child was not included in these particular analyses. The second step of the model included either positive parent-child interaction or consistent parenting. In the regressions, the six behavioural outcomes measures were entered as the dependent variable and these included: hyperactivity-inattention, emotional-disorder anxiety, physical aggression, indirect aggression, PA and IA. Correlations among the predictor variables indicated that multicollinearity was not a threat to the stability of the analyses. There was no instance in which the correlation between any two scales reached the mean scale reliability, Campbell and Fiske (as cited in Pakenham, 2005).

In the first six regressions positive parent-child interaction was entered in the second step of the model. In the first regression, the first step of the equation explained 4% ($R^2 = .04$) of variance in hyperactivity-inattention. This step of the model was statistically different from zero

$F(5, 1,013.85) = 116.21, p < .01$). The explained variability increased by .2% ($R^2 \Delta = .002$) when adding positive parent-child interaction to the equation. The second step of the regression was statistically different from zero $F(6, 888.40) = 102.07, p < .01$. The analysis indicated that hyperactivity-inattention was significantly and positively associated with depression ($\beta = .15, p < .01$), family functioning ($\beta = .08, p < .01$), social support ($\beta = .04, p < .01$) and gender of the PMK ($\beta = .02, p < .05$). The results indicated a significant negative relationship between hyperactivity-inattention and income ($\beta = -.07, p < .01$) and positive parent-child interaction ($\beta = -.04, p < .01$). In the second regression, the first step of the equation explained 5% ($R^2 = .05$) of variance in emotional disorder - anxiety. This step of the model was statistically different from zero $F(5, 663.44) = 141.78, p < .01$. The explained variability increased by 1% ($R^2 \Delta = .01$) when adding positive parent-child interaction to the equation. The second step of the regression was statistically different from zero $F(6, 666.48) = 144.10, p < .01$. The analysis indicated that emotional disorder - anxiety was significantly and positively associated with depression ($\beta = .20, p < .01$), family functioning ($\beta = .05, p < .01$), social support ($\beta = .07, p < .01$) and gender of the PMK ($\beta = .02, p < .05$). The results indicated a significant negative relationship between emotional disorder – anxiety and positive parent-child interaction ($\beta = -.10, p < .01$). There was no significant relationship between emotional disorder – anxiety and income ($\beta = -.01, p = .10$). In the third regression, the first step of the equation explained 3% ($R^2 = .03$) of variance in physical aggression. This step of the model was statistically different from zero $F(5, 310.06) = 94.86, p < .01$. The explained variability increased by .3% ($R^2 \Delta = .003$) when adding positive parent-child interaction to the equation. The second step of the regression was statistically different from zero $F(6, 282.25) = 86.65, p < .01$. The analysis indicated that physical aggression was significantly and positively associated with depression ($\beta = .14, p < .01$), family functioning ($\beta = .08, p < .01$), social support ($\beta = .06, p < .01$). The results indicated a significant negative relationship between physical aggression and income ($\beta = -.03, p < .01$) and positive parent-child

interaction ($\beta = -.05, p < .01$). There was no significant relationship between physical aggression and gender of PMK ($\beta = -.01, p = .26$). In the fourth regression, the first step of the equation explained 2% ($R^2 = .02$) of variance in indirect aggression. This step of the model was statistically different from zero $F(5, 109.33) = 48.33, p < .01$. The explained variability increased by 2% ($R^2 \Delta = .02$) when adding positive parent-child interaction to the equation. The second step of the regression was statistically different from zero $F(6, 188.84) = 85.31, p < .01$. The analysis indicated that indirect aggression was significantly and positively associated with depression ($\beta = .08, p < .01$) and family functioning ($\beta = .05, p < .01$). There were significant negative relationships between indirect aggression and income ($\beta = -.02, p < .01$), gender of the PMK ($\beta = -.01, p < .05$) and positive parent-child interaction ($\beta = -.14, p < .01$). Indirect aggression was not significantly related to social support ($\beta = .02, p = .053$). In the fifth regression, the first step of the equation explained 1% ($R^2 = .01$) of variance in PA. This step of the model was statistically different from zero $F(5, 10.33) = 42.43, p < .01$. The explained variability increased by 5% ($R^2 \Delta = .05$) when adding positive parent-child interaction to the equation. The second step of the regression was statistically different from zero $F(6, 45.38) = 198.17, p < .01$. The analysis indicated that PA was significantly associated with depression ($\beta = .07, p < .01$), family functioning ($\beta = .04, p < .01$) and social support ($\beta = .06, p < .01$). The results indicated a significant relationship between PA and gender of the PMK ($\beta = -.02, p < .01$) and positive parent-child interaction ($\beta = -.24, p < .01$). There was no significant relationship between PA and income ($\beta = -.00, p = .44$). In the sixth regression, the first step of the equation explained .8% ($R^2 = .008$) of variance in IA. This step of the model was statistically different from zero $F(5, 5.54) = 25.62, p < .01$. The explained variability increased by 5% ($R^2 \Delta = .05$) when adding positive parent-child interaction to the equation. The second step of the regression was statistically different from zero $F(6, 36.52) = 179.17, p < .01$. The analysis indicated that IA was significantly related to positive parent-child interaction ($\beta = -.24, p < .01$), depression ($\beta =$

.04, $p < .01$), family functioning ($\beta = .04$, $p < .01$) and social support ($\beta = .03$, $p < .01$). There was no significant relationship between IA and income ($\beta = -.01$, $p = .15$) and gender of the PMK ($\beta = -.00$, $p = .34$).

In the next six regressions consistent parenting was entered in the second step of the model. In the first regression, the control variables accounted for 4% ($R^2 = .04$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 1,063.14) = 122.37$, $p < .01$). The explained variability increased by 1% ($R^2 \Delta = .01$) when adding consistent parenting to the equation. The second step of the regression equation was statistically different from zero $F(6, 1142.22) = 133.42$, $p < .01$). The analysis indicated that hyperactivity-inattention was significantly and positively associated with depression ($\beta = .15$, $p < .01$), family functioning ($\beta = .07$, $p < .01$), social support ($\beta = .04$, $p < .01$) and gender of the PMK ($\beta = .02$, $p < .05$). The results indicated a significant negative relationship between hyperactivity-inattention and income ($\beta = -.06$, $p < .01$) and consistent parenting ($\beta = -.12$, $p < .01$). In the second regression, the control variables accounted for 5% ($R^2 = .05$) of the variance in emotional disorder - anxiety. This step of the model was statistically different from zero $F(5, 678.48) = 146.62$, $p < .01$). The explained variability increased by .6% ($R^2 \Delta = .006$) when adding consistent parenting to the equation. The second step of the regression equation was statistically different from zero $F(6, 622.38) = 135.31$, $p < .01$). The analysis indicated that emotional disorder anxiety was significantly and positively associated with depression ($\beta = .20$, $p < .01$), family functioning ($\beta = .06$, $p < .01$), social support ($\beta = .07$, $p < .01$) and gender of the PMK ($\beta = .02$, $p < .05$). The results indicated a significant negative relationship between emotional disorder - anxiety and income ($\beta = -.02$, $p < .05$) and consistent parenting ($\beta = -.07$, $p < .01$). In the fourth regression, the control variables accounted for 3% ($R^2 = .03$) of the variance in physical aggression. This step of the model was statistically different from zero $F(5, 326.62) =$

98.55, $p < .01$). The explained variability increased by .9% ($R^2 \Delta = .09$) when adding consistent parenting to the equation. The second step of the regression equation was statistically different from zero $F(6, 337.18) = 102.82, p < .01$). The analysis indicated that physical aggression was significantly and positively associated with depression ($\beta = .14, p < .01$), family functioning ($\beta = .07, p < .01$) and social support ($\beta = .07, p < .01$). The results indicated a significant negative relationship between physical aggression and income ($\beta = -.04, p < .01$) and consistent parenting ($\beta = -.09, p < .01$). There was no significant association between physical aggression and gender of PMK ($\beta = -.00, p = .34$). In the fourth regression, the control variables accounted for 2% ($R^2 = .02$) of the variance in indirect aggression. This step of the model was statistically different from zero $F(5, 122.02) = 53.76, p < .01$). The explained variability increased by 2% ($R^2 \Delta = .02$) when adding consistent parenting to the equation. The second step of the regression equation was statistically different from zero $F(6, 191.88) = 86.32, p < .01$). The analysis revealed that indirect aggression was significantly and positively associated with depression ($\beta = .09, p < .01$) and family functioning ($\beta = .05, p < .01$). Indirect aggression was significantly and negatively related to income ($\beta = -.02, p < .05$), gender of the PMK ($\beta = -.02, p < .05$) and consistent parenting ($\beta = -.14, p < .01$). There was no significant association between indirect aggression and social support ($\beta = .02, p = .052$). In the fifth regression, the control variables accounted for 1% ($R^2 = .01$) of the variance in PA. This step of the model was statistically different from zero $F(5, 10.17) = 41.68, p < .01$). The explained variability increased by .3% ($R^2 \Delta = .003$) when adding consistent parenting to the equation. The second step of the regression equation was statistically different from zero $F(6, 10.29) = 42.27, p < .01$). The analysis indicated that PA was significantly associated with depression ($\beta = .08, p < .01$), family functioning ($\beta = .06, p < .01$) and social support ($\beta = .05, p < .01$). The results indicated a significant relationship between PA and gender of the PMK ($\beta = -.02, p < .05$) and consistent parenting ($\beta = -.05, p < .01$). There was no significant association between PA and income ($\beta = -.00, p = .48$). In the sixth regression, the

control variables accounted for 1% ($R^2 = .01$) of the variance in IA. This step of the model was statistically different from zero $F(5, 6.45) = 29.71, p < .01$). The explained variability increased by .6% ($R^2 \Delta = .006$) when adding consistent parenting to the equation. The second step of the regression equation was statistically different from zero $F(6, 8.71) = 40.41, p < .01$). The analysis indicated that IA was significantly related to consistent parenting ($\beta = -.08, p < .01$), depression ($\beta = .05, p < .01$), family functioning ($\beta = .05, p < .01$) and social support ($\beta = .03, p < .01$). There was no significant association between IA and income ($\beta = -.01, p = .22$) and gender of the PMK ($\beta = -.01, p = .16$).

Data weighted with a normalized weight were analyzed using Ordinary Least Squares (OLS) regression to test the hypotheses of an association between child health status, parenting style and child behaviour outcomes for the sub-sample of four and five year olds. In the first step of the regression model the control variables were entered (gender of the PMK, parental depression, family functioning, social support and income). The HUI variable was entered in the second step of the regression. Each parenting style (e.g. positive parent-child interaction, hostile-ineffective parenting, consistent parenting and rational parenting) were entered on the third step of the regression separately. Correlations among the predictor variables indicated that multicollinearity was not a threat to the stability of the analyses. There was no instance in which the correlation between any two scales reached the mean scale reliability, Campbell and Fiske (as cited in Pakenham, 2005).

The six behavioural outcome measures were entered as the dependent variable in the regression models that included: hyperactivity-inattention, emotional-disorder anxiety, physical aggression, indirect aggression, PA and IA. Initially, there was a total of twenty-four regressions conducted (6 behavioural outcomes multiplied by 4 parenting measures). Following these

regressions, additional analyses were conducted to include the gender of the child and exclude the gender of the PMK. The gender of the child was included because it has a significant relationship to some of the behavioural outcome measures while gender of the parent did not within the sub-sample. As Table 2 indicates gender of the child was significantly correlated with hyperactivity-inattention, physical aggression and PA. Gender of the child was entered in the first step of the regressions along with the other control variables. There were a total of twelve additional regressions that were run (3 behavioural outcomes multiplied by 4 parenting styles).

In the first four regressions hyperactivity-inattention was entered as the dependent variable. In the first regression, the first step of the equation explained 4% ($R^2 = .04$) of variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 99.14) = 11.35, p < .01$). Hyperactivity-inattention was significantly related to HUI indicating that children in the perfect health group on average scored significantly lower than children in the health impaired group ($\beta = -.30, p < .01$). Hyperactivity-inattention was significantly and positively related to depression ($\beta = .11, p < .01$) and negatively related to positive interaction ($\beta = -.05, p < .05$). There was no significant association between hyperactivity-inattention and family functioning ($\beta = .03, p = .26$), social support ($\beta = .05, p = .06$), gender of the PMK ($\beta = .03, p = .19$) and income ($\beta = -.05, p = .06$). In the second regression, the first step of the equation explained 4% ($R^2 = .04$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 97.60) = 11.13, p < .01$). Hyperactivity-inattention was significantly related to HUI ($\beta = -.25, p < .01$). Hyperactivity-inattention was significantly and negatively related to income ($\beta = -.05, p < .05$) but was positively associated with depression ($\beta = .07, p < .01$) and ineffective parenting ($\beta = .32, p < .01$). Hyperactivity-inattention was unrelated to family functioning ($\beta = .01, p = .70$), social support ($\beta = .05, p = .09$) and gender of the PMK ($\beta = .02, p = .38$). In the third regression, the control variables accounted

for 4% ($R^2 = .04$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 94.22) = 10.79, p < .01$). The analysis indicated that hyperactivity-inattention was significantly related to HUI ($\beta = -.30, p < .01$). Hyperactivity-inattention was significantly and positively associated with depression ($\beta = .08, p < .01$) and social support ($\beta = .07, p < .05$) and negatively related to consistent parenting ($\beta = -.15, p < .01$). Hyperactivity-inattention was not related to family functioning ($\beta = .03, p = .26$), gender of the PMK ($\beta = .02, p = .38$) and income ($\beta = -.04, p = .10$). In the final regression, the first step explained 4% ($R^2 = .04$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 91.89) = 10.56, p < .01$). Hyperactivity-inattention was significantly related to HUI ($\beta = .28, p < .01$). Hyperactivity-inattention was significantly and positively related to depression ($\beta = .10, p < .01$) and rational parenting ($\beta = .21, p < .01$) but was negatively associated with income ($\beta = -.05, p < .05$). There was no significant relationship between hyperactivity-inattention and family functioning ($\beta = .00, p = .96$), social support ($\beta = .04, p = .15$) and gender of PMK ($\beta = .03, p = .16$).

The following four regressions were conducted to examine the extent to which variability in emotional disorder - anxiety could be explained by the control variables, HUI and parenting style. The first step of the equation explained 6% ($R^2 = .06$) of variance in emotional disorder - anxiety. This step of the model was statistically different from zero $F(5, 54.67) = 15.28, p < .01$). Emotional disorder - anxiety was significantly related to HUI indicating that children in the perfect health group on average scored lower than children in the health impairment group ($\beta = -.17, p < .01$). Emotional disorder – anxiety was significantly and positively related to depression ($\beta = .16, p < .01$), family functioning ($\beta = .09, p < .01$) and gender of the PMK ($\beta = .06, p < .05$). There was no significant association between emotional disorder – anxiety and social support ($\beta = .04, p = .15$), income ($\beta = .04, p = .14$) and positive interaction ($\beta = -.01, p = .53$). In the

second regression, the first step of the equation explained 6% ($R^2 = .06$) of the variance in emotional disorder - anxiety. This step of the model was statistically different from zero $F(5, 54.21) = 15.11, p < .01$). Emotional disorder - anxiety was significantly related to HUI ($\beta = -.14, p < .01$). Emotional disorder – anxiety was significantly and positively associated with depression ($\beta = .13, p < .01$), family functioning ($\beta = .08, p < .05$), gender of the PMK ($\beta = .05, p < .05$) and ineffective parenting ($\beta = .18, p < .01$). Emotional disorder - anxiety was unrelated to social support ($\beta = .04, p = .21$) and income ($\beta = .03, p = .16$). In the third regression, the control variables accounted for 6% ($R^2 = .06$) of the variance in emotional disorder - anxiety. This step of the regression was statistically different from zero $F(5, 52.32) = 14.82, p < .01$). The analysis indicated that emotional disorder - anxiety was significantly related to HUI ($\beta = -.18, p < .01$). Emotional disorder – anxiety was significantly and positively associated with depression ($\beta = .14, p < .01$) and family functioning ($\beta = .10, p < .01$). Emotional disorder – anxiety was not related to social support ($\beta = .04, p = .21$), gender of the PMK ($\beta = .04, p = .09$), income ($\beta = .03, p = .17$) and consistent parenting ($\beta = -.01, p = .62$). In the final regression, the first step explained 5% ($R^2 = .05$) of the variance in emotional disorder - anxiety. This step of the model was statistically different from zero $F(5, 51.01) = 14.31, p < .01$). Emotional disorder - anxiety was significantly associated with HUI ($\beta = -.16, p < .01$). Emotional disorder – anxiety was significantly and positively related to depression ($\beta = .14, p < .01$), family functioning ($\beta = .07, p < .05$), gender of the PMK ($\beta = .06, p < .05$) and rational parenting ($\beta = .11, p < .01$). There was no significant relationship between emotional disorder – anxiety and social support ($\beta = .04, p = .22$) and income ($\beta = .04, p = .15$).

The next four regressions were conducted to examine the amount of variance in physical aggression that could be explained by the control variables, HUI and parenting style. In the first regression, the first step of the equation explained 3% ($R^2 = .03$) of variance in physical

aggression. This step of the model was statistically different from zero $F(5, 39.66) = 9.42, p < .01$). Physical aggression was significantly associated with HUI indicating that children in the perfect health group on average scored lower than children in the health impaired group ($\beta = -.17, p < .01$). Physical aggression was significantly and negatively related to positive interaction ($\beta = -.06, p < .05$) and was positively related to depression ($\beta = .10, p < .01$) and family functioning ($\beta = .07, p < .05$). There was no significant association between physical aggression and social support ($\beta = .04, p = .15$), gender of the PMK ($\beta = -.01, p = .61$) and income ($\beta = -.04, p = .13$). In the second regression, the first step of the equation explained 3% ($R^2 = .03$) of the variance in physical aggression. This step of the model was statistically different from zero $F(5, 39.65) = 9.35, p < .01$). Physical aggression was significantly related to HUI ($\beta = -.13, p < .01$). Physical aggression was significantly and positively related to depression ($\beta = .06, p < .05$) and ineffective parenting ($\beta = .31, p < .01$). Physical aggression was unrelated to family functioning ($\beta = .04, p = .14$), social support ($\beta = .03, p = .24$), gender of the PMK ($\beta = -.02, p = .35$) and income ($\beta = -.04, p = .08$). In the third regression, the control variables accounted for 3% ($R^2 = .03$) of the variance in physical aggression. This step of the model was statistically different from zero $F(5, 38.68) = 9.20, p < .01$). The analysis indicated that physical aggression was significantly related to HUI ($\beta = -.18, p < .01$). Physical aggression was significantly and negatively related to consistent parenting ($\beta = -.07, p < .01$) and was positively associated with depression ($\beta = .08, p < .01$) and family functioning ($\beta = .07, p < .05$). Physical aggression was not related to social support ($\beta = .04, p = .13$), gender of the PMK ($\beta = -.02, p = .43$) and income ($\beta = -.04, p = .12$). In the final regression, the first step explained 3% ($R^2 = .03$) of the variance in physical aggression. This step of the model was statistically different from zero $F(5, 39.81) = 9.43, p < .01$). Physical aggression was significantly related to HUI ($\beta = -.16, p < .01$). Physical aggression was significantly and positively related to depression ($\beta = .09, p < .01$) and rational parenting ($\beta = .26, p < .01$). There was no significant relationship between physical aggression

and family functioning ($\beta = .03, p = .37$), social support ($\beta = .02, p = .46$), gender of PMK ($\beta = -.01, p = .61$) and income ($\beta = -.04, p = .07$).

The following four regressions were conducted to examine the extent to which variability in indirect aggression could be explained by the control variables, HUI and parenting style. The first step of the equation explained 1% ($R^2 = .01$) of variance in indirect aggression. This step of the model was statistically different from zero $F(5, 3.32) = 2.94, p < .05$). Indirect aggression was not significantly related to any of the variables entered in the regression. In the second regression, the first step of the equation explained 1% ($R^2 = .01$) of the variance in indirect aggression. This step of the model was statistically different from zero $F(5, 3.34) = 2.93, p < .05$). Indirect aggression was significantly and positively related to ineffective parenting ($\beta = .19, p < .01$). There was no significant association between indirect aggression and any remaining variables in the regression. In the third regression, the control variables accounted for 1% ($R^2 = .01$) of the variance in indirect aggression. This step of the regression was statistically different from zero $F(5, 3.41) = 3.00, p < .05$). The analysis indicated that indirect aggression was significantly related to HUI which means that children in the perfect health group on average scored significantly lower than children in the health impaired group ($\beta = -.06, p < .05$). Indirect aggression was unrelated to the remaining variables in the regression equation. In the final regression, the first step explained 1% ($R^2 = .01$) of the variance in indirect aggression. This step of the model was statistically different from zero $F(5, 3.54) = 3.12, p < .01$). Indirect aggression was significantly and negatively associated with social support ($\beta = -.06, p < .05$) and positively related to rational parenting ($\beta = .14, p < .01$). There was no significant relationship between indirect aggression and the remaining variables in the regression equation.

The next four regressions were conducted to examine the amount of variance in PA that could be explained by the control variables, HUI and parenting style. These regressions were logistic regressions because both HUI (independent variable) and the PA (dependent variable) were nominal variables. In the first regression, the first step of the equation explained 3% (Nagelkerke $R^2 = .03$) of variance in PA. PA was significantly related to HUI which indicates that children in the perfect health group scored more often in the no physical aggression category than children in the health impaired group ($B = -.67, p < .01$). PA was significantly associated with family functioning ($B = .04, p < .01$). There were no significant relationships between PA and any of the remaining variables in the equation. In the second regression, the first step of the equation explained 3% (Nagelkerke $R^2 = .03$) of the variance in PA. PA was significantly related to HUI ($B = -.58, p < .01$). PA was significantly related to family functioning ($B = .03, p < .05$), income ($B = .00, p < .05$) and ineffective parenting ($\beta = .14, p < .01$). PA was unrelated to any of the remaining variables in the equation. PA. In the third regression, the control variables accounted for 3% (Nagelkerke $R^2 = .03$) of the variance in PA. The analysis indicated that PA was significantly related to HUI ($B = -.72, p < .01$). PA was significantly related to family functioning ($B = .04, p < .01$) and consistent parenting ($B = -.05, p < .01$). There were no other significant associations between PA and the remaining variables in the equation. In the final regression, the first step explained 3% (Nagelkerke $R^2 = .03$) of the variance in PA. PA was significantly associated with HUI ($B = -.64, p < .01$). PA was significantly related to income ($B = .00, p < .05$) and rational parenting ($B = .17, p < .01$). PA was not related to any other remaining variables in the equation.

In the following four regressions IA was entered as the dependent variable. These regressions were logistic regressions because both HUI (independent variable) and IA (dependent variable) were nominal variables. In the first regression, the first step of the equation

explained 2% (Nagelkerke $R^2 = .02$) of variance in IA. IA was significantly associated with depression ($B = .02, p < .05$) and social support ($B = -.06, p < .01$). There were no significant relationships between IA and any of the remaining variables in the equation. In the second regression, the first step of the equation explained 2% (Nagelkerke $R^2 = .02$) of the variance in IA. IA was significantly related to ineffective parenting ($B = .13, p < .01$) and social support ($B = -.06, p < .01$). IA was unrelated to any of the remaining variables in the equation. In the third regression, the control variables accounted for 2% (Nagelkerke $R^2 = .02$) of the variance in IA. The analysis indicated that IA was significantly related to depression ($B = .02, p < .05$) and social support ($B = -.05, p < .01$). There were no other significant associations between IA and the remaining variables in the equation. In the final regression, the first step explained 2% (Nagelkerke $R^2 = .02$) of the variance in IA. IA was significantly associated with social support ($B = -.07, p < .01$), depression ($B = .02, p < .05$) and rational parenting ($B = .19, p < .01$). IA was not related to any other remaining variables in the equation.

As noted above, an additional 12 regressions were run with the gender of the child entered in the first step with the control variables while the gender of the PMK was removed. In the first four regressions the dependent variable was hyperactivity-inattention. In the first regression, the first step of the equation explained 7% ($R^2 = .07$) of variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 169.92) = 20.15, p < .01$). Hyperactivity-inattention was significantly related to HUI which indicates that children in the perfect health group on average scored lower than children in the impaired health group ($\beta = -.28, p < .01$). Hyperactivity-inattention was significantly and positively related to depression ($\beta = .11, p < .01$) and social support ($\beta = .07, p < .05$) and negatively related to positive interaction ($\beta = -.05, p < .05$) and gender of the child ($\beta = -.15, p = .06$). There was no significant association between hyperactivity-inattention and family functioning ($\beta = .04, p = .14$) and

income ($\beta = -.04, p = .07$). In the second regression, the first step of the equation explained 7% ($R^2 = .07$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 167.79) = 19.81, p < .01$). Hyperactivity-inattention was significantly related to HUI ($\beta = -.23, p < .01$). Hyperactivity-inattention was significantly and negatively related to income ($\beta = -.05, p < .05$) and gender of the child ($\beta = -.14, p < .01$) but was positively associated with depression ($\beta = .07, p < .01$), social support ($\beta = .06, p < .05$) and ineffective parenting ($\beta = .32, p < .01$). Hyperactivity-inattention was unrelated to family functioning ($\beta = .02, p = .47$). In the third regression, the control variables accounted for 7% ($R^2 = .07$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 168.58) = 20.04, p < .01$). The analysis indicated that hyperactivity-inattention was significantly related to HUI ($\beta = -.28, p < .01$). Hyperactivity-inattention was significantly and positively associated with depression ($\beta = .07, p < .01$) and social support ($\beta = .08, p < .01$). Hyperactivity-inattention was significantly and negatively related to gender of the child ($\beta = -.16, p < .01$) and consistent parenting ($\beta = -.16, p < .01$). Hyperactivity-inattention was not related to family functioning ($\beta = .04, p = .14$) and income ($\beta = -.04, p = .13$). In the final regression, the first step explained 7% ($R^2 = .07$) of the variance in hyperactivity-inattention. This step of the model was statistically different from zero $F(5, 160.38) = 19.06, p < .01$). Hyperactivity-inattention was significantly related to HUI ($\beta = .27, p < .01$). Hyperactivity-inattention was significantly and positively related to depression ($\beta = .09, p < .01$) and rational parenting ($\beta = .22, p < .01$) but was negatively associated with income ($\beta = -.05, p < .05$) and gender of the child ($\beta = -.15, p < .01$). There was no significant relationship between hyperactivity-inattention and family functioning ($\beta = .01, p = .71$) and social support ($\beta = .05, p = .06$).

The next four regressions were conducted to examine the amount of variance in physical aggression that could be explained by the control variables, HUI and parenting style. In the first regression, the first step of the equation explained 6% ($R^2 = .06$) of variance in physical aggression. This step of the model was statistically different from zero $F(5, 65.58) = 15.99, p < .01$). Physical aggression was significantly related to HUI indicating that children in the perfect health group scored lower than children in the impaired health group ($\beta = -.16, p < .01$). Physical aggression was significantly and negatively associated with gender of the child ($\beta = -.14, p < .01$) and positive interaction ($\beta = -.06, p < .05$) and was positively related to depression ($\beta = .10, p < .01$) and family functioning ($\beta = .08, p < .05$). There was no significant association between physical aggression and social support ($\beta = .05, p = .07$) and income ($\beta = -.03, p = .16$). In the second regression, the first step of the equation explained 6% ($R^2 = .06$) of the variance in physical aggression. This step of the model was statistically different from zero $F(5, 65.68) = 15.90, p < .01$). Physical aggression was significantly related to HUI ($\beta = -.12, p < .01$). Physical aggression was significantly and negatively related to gender of the child ($\beta = -.13, p < .01$) and positively related to depression ($\beta = .06, p < .05$) and ineffective parenting ($\beta = .31, p < .01$). Physical aggression was unrelated to family functioning ($\beta = .05, p = .07$), social support ($\beta = .04, p = .13$) and income ($\beta = -.04, p = .11$). In the third regression, the control variables accounted for 6% ($R^2 = .06$) of the variance in physical aggression. This step of the model was statistically different from zero $F(5, 38.68) = 9.20, p < .01$). The analysis indicated that physical aggression was significantly related to HUI ($\beta = -.17, p < .01$). Physical aggression was significantly and negatively related to consistent parenting ($\beta = -.07, p < .01$) and gender of the child ($\beta = -.14, p < .01$) and was positively associated with depression ($\beta = .08, p < .01$) and family functioning ($\beta = .08, p < .05$). Physical aggression was not related to social support ($\beta = .06, p = .06$) and income ($\beta = -.03, p = .17$). In the final regression, the first step explained 6% ($R^2 = .06$) of the variance in physical aggression. This step of the model was statistically different

from zero $F(5, 65.95) = 16.05, p < .01$). Physical aggression was significantly associated with HUI ($\beta = -.15, p < .01$). Physical aggression was significantly and negatively associated with gender of the child ($\beta = -.14, p < .01$) and positively related to depression ($\beta = .09, p < .01$) and rational parenting ($\beta = .26, p < .01$). There was no significant relationship between physical aggression and family functioning ($\beta = .04, p = .22$), social support ($\beta = .03, p = .26$) and income ($\beta = -.04, p = .09$).

The following four regressions were conducted to examine the amount of variance in PA that could be explained by the control variables, HUI and parenting style. These regressions were logistic regressions because both HUI (independent variable) and PA (dependent variable) were nominal variables. In the first regression, the first step of the equation explained 5% (Nagelkerke $R^2 = .05$) of variance in PA. PA was significantly related to HUI which indicates that children in the perfect health group scored more often in the no physical aggression category than children in the health impaired group ($B = -.64, p < .01$). PA was significantly associated with family functioning ($B = .04, p < .01$) and gender of the child ($B = -.43, p < .01$). There were no significant relationships between PA and any of the remaining variables in the equation. In the second regression, the first step of the equation explained 5% (Nagelkerke $R^2 = .05$) of the variance in PA. PA was significantly related to HUI ($B = -.55, p < .01$). PA was significantly and related to gender of the child ($B = -.42, p < .01$), family functioning ($B = .03, p < .05$) and ineffective parenting ($\beta = .14, p < .01$). PA was unrelated to any of the remaining variables in the equation. PA. In the third regression, the control variables accounted for 5% (Nagelkerke $R^2 = .05$) of the variance in PA. The analysis indicated that PA was significantly related to HUI ($B = -.68, p < .01$). PA was significantly related to family functioning ($B = .04, p < .01$), gender of the child ($B = -.46, p < .01$) and consistent parenting ($B = -.06, p < .01$). There were no other significant associations between PA and the remaining variables in the equation. In the final

regression, the first step explained 5% (Nagelkerke $R^2 = .05$) of the variance in PA. PA was significantly associated with HUI ($B = -.60, p < .01$). PA was significantly associated with gender of the child ($B = -.45, p < .01$), family functioning ($B = .03, p < .05$), income ($B = .00, p < .05$) and rational parenting ($B = .18, p < .01$). PA was not related to any other remaining variables in the equation.

Mediational Analyses

A mediator variable is a third variable which influences the direct relationship between the focal independent variable and the dependent variable (Baron & Kenny, 1986). Baron and Kenny outline criteria that specify when a variable is considered a mediator. A mediator must meet the following conditions: significant variation in the mediator variable must be function of the independent variable, significant variation in the dependent variable must be a function of the independent variable, when the associations between the independent variable and the mediator as well as the mediator and dependent variable are controlled, the direct relationship between the independent and dependent variable is less or no longer significant (Baron & Kenny). The regressions were conducted following the steps outlined by Baron and Kenny which include: “regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator. These three regression equations provide the tests of the linkages of the mediational model” (Barson & Kenny, 1986, p. 1177).

The first test of mediation was to examine whether positive parent-child interaction mediates the relationship between HUI and hyperactivity-inattention while the control variables were entered in the first step of the equation. Following the steps outlined above, positive

interaction was regressed on HUI; second, hyperactivity-inattention was regressed on HUI; third, hyperactivity-inattention was regressed on HUI and positive interaction. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). In the second equation, HUI was significantly related to hyperactivity-inattention ($\beta = -.30, p < .01$). In the third equation, hyperactivity-inattention was significantly related to HUI ($\beta = -.30, p < .01$) and negatively related positive interaction ($\beta = -.05, p < .01$). The results of these regressions do not support the mediational model of positive interaction on the relationship between HUI and hyperactivity-inattention because the effect of the independent variable (HUI) on the dependent variable (hyperactivity-inattention) is not less in the third equation than in the second (Baron & Kenny, 1986). The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and hyperactivity-inattention. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to hyperactivity-inattention ($\beta = -.30, p < .01$). In the third equation, hyperactivity-inattention was significantly related to HUI ($\beta = -.25, p < .01$) and positively associated with ineffective parenting ($\beta = .32, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and hyperactivity-inattention was weaker in the third equation than the second but the strength of this reduction was not substantial (a difference of .05). The Sobel test was used to determine the significance of the mediational effect of ineffective parenting on HUI and hyperactivity-inattention. The test statistic was $z = -4.72$ ($p < .01$) indicating a significant mediational effect. That is, children in the perfect health group scored significantly lower than children in the health impairment group on hyperactivity-inattention but the differences between the two groups on hyperactivity-inattention was less when ineffective parenting was in the equation. The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and hyperactivity-inattention. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$).

The first condition of a mediational effect is not met of a significant relationship between the independent variable and mediator, therefore, consistent parenting does not mediate the relationship between HUI and hyperactivity-inattention. The mediational effect of rational parenting on the association between HUI and hyperactivity-inattention was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .05$). The direct relationship HUI and hyperactivity-inattention was significant ($\beta = -.30, p < .01$). In the third equation, hyperactivity-inattention was significantly related to HUI ($\beta = -.28, p < .01$) and positively associated with rational parenting ($\beta = .21, p < .01$). The analyses demonstrate that the direct relationship between HUI and hyperactivity-inattention was weaker in the last equation but the strength of this reduction was not substantial (difference of .02). However, the reduction in the relationship was statistically significant ($z = -2.47, p < .05$)

The next set of regressions was conducted to test the mediational effect of parenting style on the relationship between HUI and emotional disorder – anxiety. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). In the second equation, HUI was significantly related to emotional disorder - anxiety ($\beta = -.17, p < .01$). In the third equation, emotional disorder - anxiety was significantly related to HUI ($\beta = -.17, p < .01$) and unrelated to positive interaction ($\beta = -.01, p = .53$). The results of these regressions do not support the mediational model of positive interaction on the relationship between HUI and emotional disorder – anxiety because the effect of the independent variable (HUI) is not less in the third equation than in the second and the variation in emotional disorder – anxiety was not significantly explained by positive interaction (Baron & Kenny, 1986). The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and emotional disorder - anxiety. In the first equation, HUI was significantly related to

ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to emotional disorder anxiety ($\beta = -.17, p < .01$). In the third equation, emotional disorder - anxiety was significantly related to HUI ($\beta = -.14, p < .01$) and positively associated with ineffective parenting ($\beta = .18, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and emotional disorder - anxiety was weaker in the third equation but the reduction is not substantial (difference of .03). The results of these regressions illustrate that the direct relationship between HUI and emotional disorder - anxiety was weaker in the third equation. The strength of the reduction is not substantial (difference of .03) but was statistically significant ($z = -3.96, p < .01$). The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and emotional disorder - anxiety. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect was not met, therefore, consistent parenting does not mediate the relationship between HUI and emotional disorder - anxiety. The mediational effect of rational parenting on the association between HUI and emotional disorder - anxiety was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .05$). The direct relationship HUI and emotional disorder – anxiety was significant ($\beta = -.17, p < .01$). In the third equation, emotional disorder – anxiety was significantly related to HUI ($\beta = -.16, p < .01$) and positively associated with rational parenting ($\beta = .11, p < .01$). The analyses demonstrate that the direct relationship between HUI and emotional disorder - anxiety was weaker in the last equation than the second. The strength of this reduction was not substantial (difference of .01) but was statistically significant ($z = -2.21, p < .05$).

The following set of regressions was conducted to test the mediational effect of parenting style on the relationship between HUI and physical aggression. In the first equation HUI was

significantly related to positive interaction ($\beta = .11, p < .01$). In the second equation, HUI was significantly related to physical aggression ($\beta = -.18, p < .01$). In the third equation, physical aggression was significantly related to HUI ($\beta = -.17, p < .01$) and negatively associated with positive interaction ($\beta = -.06, p < .05$). The results of these regressions illustrate that the direct relationship between HUI and physical aggression was weaker in the third equation but strength of the reduction was not substantial (difference of .01) nor was it significant ($z = -1.85, p = .06$).

The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and physical aggression. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to physical aggression ($\beta = -.18, p < .01$). In the third equation, physical aggression was significantly related to HUI ($\beta = -.13, p < .01$) and positively associated with ineffective parenting ($\beta = .31, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and physical aggression was weaker in the third equation. The strength of the reduction was not substantial (difference of .05) but statistically significant ($z = -4.68, p < .01$).

The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and physical aggression. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect is not met, therefore, consistent parenting does not mediate the relationship between HUI and physical aggression. The mediational effect of rational parenting on the association between HUI and physical aggression was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .05$). The direct relationship HUI and physical aggression was significant ($\beta = -.18, p < .01$). In the third equation, physical aggression was significantly related to HUI ($\beta = -.16, p < .01$) and positively associated with rational parenting ($\beta = .26, p < .01$). The analyses demonstrate that the direct relationship between HUI and physical aggression was weaker in the

last equation. The strength of the reduction was not substantial (difference of .02) but was statistically significant ($z = -2.50, p < .05$).

The next set of regressions was conducted to test the mediational effect of parenting style on the relationship between HUI and indirect aggression. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). In the second equation, HUI was significantly related to indirect aggression ($\beta = -.06, p < .05$). In the third equation, indirect aggression was not significantly related to HUI ($\beta = -.05, p = .06$) and positive interaction ($\beta = -.02, p = .51$). The results of these regressions do not support the mediational model of positive interaction on the relationship between HUI and indirect aggression because variation in indirect aggression is not significantly explained by the mediator (positive interaction). The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and indirect aggression. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to indirect aggression ($\beta = -.06, p < .05$). In the third equation, indirect aggression was not significantly related to HUI ($\beta = -.02, p = .36$) but was positively associated with ineffective parenting ($\beta = .19, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and indirect aggression was mediated by ineffective parenting because the direct relationship was not significant in the third equation (Baron & Kenny, 1986). The strength of this reduction was not substantial (a difference of .04) but was statistically significant ($z = 3.96, p < .05$). The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and indirect aggression. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect is not met, therefore, consistent parenting does not mediate the relationship between HUI and indirect aggression. The mediational effect of rational parenting on the association between HUI and

indirect aggression was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .05$). The direct relationship HUI and indirect aggression was significant ($\beta = -.06, p < .05$). In the third equation, indirect aggression was not significantly related to HUI ($\beta = -.04, p = .10$) and positively associated with rational parenting ($\beta = .14, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and indirect aggression was mediated by rational parenting because the direct relationship was not significant in the third equation (Baron & Kenny, 1986). The strength of this reduction was not substantial (a difference of .02) but was statistically significant ($z = -2.28, p < .05$).

The following set of regressions was conducted to test the mediational effect of parenting style on the relationship between HUI and PA. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). The next regression was a logistic regression because both the variables are nominal. In this analysis, HUI was significantly related to PA ($B = -.68, p < .01$). In the third equation, PA was significantly related to HUI ($B = -.67, p < .01$) and positive interaction ($B = -.01, p = .56$). The results of these regressions illustrate that the direct relationship between HUI and PA was weaker in the third equation. The strength of the reduction was not substantial (difference of .01). The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and PA. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to PA ($B = -.68, p < .01$). In the third equation, PA was significantly associated with HUI ($\beta = -.58, p < .01$) and ineffective parenting ($\beta = .14, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and PA was weaker in the third equation suggesting a partially mediated effect of ineffective parenting (difference of .10). The next three regressions examine the degree to which consistent parenting mediates the

relationship between HUI and PA. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect is not met, therefore, consistent parenting does not mediate the relationship between HUI and PA. The mediational effect of rational parenting on the association between HUI and PA was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .05$). The direct relationship HUI and PA was significant ($B = -.68, p < .01$). In the third equation, PA was significantly related to HUI ($\beta = -.64, p < .01$) and rational parenting ($\beta = .17, p < .01$). The analyses demonstrate that the direct relationship between HUI and PA was weaker in the last equation but the strength of the reduction was not substantial (difference of .04).

The next test of mediation was to examine whether parenting style mediates the relationship between HUI and IA. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). The next regression was a logistic regression because both the variables are categorical. In this analysis, HUI was not significantly related to IA ($B = -.07, p = .60$). Therefore, there is no evidence of a mediational effect of parenting style because condition two, significant variation in the dependent variable must be a function of the independent variable, is not fulfilled (Baron & Kenny, 1986).

An additional 12 regressions were run to test the mediational effect of parenting style on the direct relationship between HUI and hyperactivity-inattention, physical aggression and PA with the gender of the child entered in the first step with the control variables while the gender of the PMK was removed. In the first four regressions the dependent variable was hyperactivity-inattention. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). In the second equation, HUI was significantly related to hyperactivity-inattention ($\beta = -.29,$

$p < .01$). In the third equation, hyperactivity-inattention was significantly related to HUI ($\beta = -.28, p < .01$) and negatively associated with positive interaction ($\beta = -.05, p < .01$). The results of these regressions suggest that positive interaction mediates the relationship between HUI and hyperactivity-inattention because the effect of the independent variable (HUI) on the dependent variable (hyperactivity-inattention) is less in the third equation than in the second (Baron & Kenny) but the strength of this reduction was not substantial (a difference of .01). The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and hyperactivity-inattention. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to hyperactivity-inattention ($\beta = -.29, p < .01$). In the third equation, hyperactivity-inattention was significantly related to HUI ($\beta = -.23, p < .01$) and positively associated with ineffective parenting ($\beta = .32, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and hyperactivity-inattention was weaker in the third equation than the second but the strength of this reduction was not substantial (a difference of .06). The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and hyperactivity-inattention. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect is not met of significant relationship between the independent variable and mediator, therefore, consistent parenting does not mediate the relationship between HUI and hyperactivity-inattention. The mediational effect of rational parenting on the association between HUI and hyperactivity-inattention was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .01$). The direct relationship HUI and hyperactivity-inattention was significant ($\beta = -.29, p < .01$). In the third equation, hyperactivity-inattention was significantly related to HUI ($\beta = -.27, p < .01$) and positively associated with rational parenting ($\beta = .22, p < .01$). The analyses demonstrate that the direct relationship between HUI and

hyperactivity-inattention was weaker in the last equation but the strength of this reduction was not substantial (difference of .02).

The following set of regressions was conducted to test the mediational effect of parenting style on the relationship between HUI and physical aggression. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). In the second equation, HUI was significantly related to physical aggression ($\beta = -.16, p < .01$). In the third equation, physical aggression was significantly related to HUI ($\beta = -.16, p < .01$) and negatively associated positive interaction ($\beta = -.06, p < .05$). The analysis indicates that there is no mediational effect of positive interaction because the direct relationship between HUI and physical aggression is the same in the second equation as in the third. The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and physical aggression. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to physical aggression ($\beta = -.16, p < .01$). In the third equation, physical aggression was significantly related to HUI ($\beta = -.12, p < .01$) and positively associated with ineffective parenting ($\beta = .31, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and physical aggression was weaker in the third equation than the second. The strength of the reduction was not substantial (difference of .04). The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and physical aggression. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect is not met, therefore, consistent parenting does not mediate the relationship between HUI and physical aggression. The mediational effect of rational parenting on the association between HUI and physical aggression was conducted in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta =$

$-.07, p < .01$). The direct relationship HUI and physical aggression was significant ($\beta = -.16, p < .01$). In the third equation, physical aggression was significantly related to HUI ($\beta = -.15, p < .01$) and positively associated with rational parenting ($\beta = .26, p < .01$). The analyses demonstrate that the direct relationship between HUI and physical aggression was weaker in the last equation. The strength of the reduction was not substantial (difference of .01).

The last set of regressions was conducted to test the mediational effect of parenting style on the relationship between HUI and PA. In the first equation HUI was significantly related to positive interaction ($\beta = .11, p < .01$). The next regression was a logistic regression because both the variables are nominal. In this analysis, HUI was significantly related to PA ($B = -.65, p < .01$). In the third equation, PA was significantly related to HUI ($B = -.64, p < .01$) and unrelated to positive interaction ($B = -.01, p = .57$). The results of these regressions illustrate that the direct relationship between HUI and PA was weaker in the third equation. The strength of the reduction was not substantial (difference of .01). The next test of mediation was to examine whether ineffective parenting mediates the relationship between HUI and PA. In the first equation, HUI was significantly related to ineffective parenting ($\beta = -.14, p < .01$). As noted above, HUI was significantly related to PA ($B = -.65, p < .01$). In the third equation, PA was significantly associated with HUI ($\beta = -.55, p < .01$) and ineffective parenting ($\beta = .14, p < .01$). The results of these regressions illustrate that the direct relationship between HUI and PA was weaker in the third equation suggesting a partially mediated effect of ineffective parenting (difference of .10). The next three regressions examine the degree to which consistent parenting mediates the relationship between HUI and PA. In the first equation, HUI was not significantly related to consistent parenting ($\beta = .05, p = .06$). The first condition of a mediational effect is not met, therefore, consistent parenting does not mediate the relationship between HUI and PA. The mediational effect of rational parenting on the association between HUI and PA was conducted

in the following three regression analyses. In the first equation, HUI was significantly related to rational parenting ($\beta = -.07, p < .01$). The direct relationship HUI and PA was significant ($B = -.65, p < .01$). In the third equation, PA was significantly related to HUI ($\beta = -.60, p < .01$) and rational parenting ($\beta = .18, p < .01$). The analyses demonstrate that the direct relationship between HUI and PA was weaker in the last equation but the difference was not substantial (difference of .05).

Post-hoc Analysis

A post-hoc analysis was conducted to examine the relationship between the behavioural outcome measures and each item of the Health Utility Index Mark 3. The purpose of this analysis was to gain further insight into the direct relationship between the behaviour measures and Health Utility Index. The addition of this analysis is substantiated by the above results indicating a strong direct relationship between HUI and the child outcome measures. The relationships were assessed by examining the bivariate correlations. The Health Utility Index Mark 3 consists of 31 items which were categorized under eight types of health attributes. The number of items per attribute varies with vision = 5, hearing = 5, speech = 4, mobility = 7, dexterity = 4, emotion = 1, cognition = 2, pain and discomfort = 3. Because, the number of total items is large, the following describes the number of items that were significantly related within each attribute to each behavioural measure. The direction of these correlations is not included here because directionality of the relationship varied depending on the specific item. Hyperactivity-inattention was related to speech ($r = .12$ to $r = .14$) and was significantly related to all four items ($p < .01$). Hyperactivity-inattention was also associated with dexterity ($r = .07$) and was significantly related to three of the four items of this attribute ($p < .05$). Hyperactivity-inattention showed a relationship to cognition ($r = .07$ to $r = .11$) and was significantly related to both items of this

attribute ($p < .01$). Emotional disorder – anxiety was related to speech ($r = .08$ to $r = .18$) and was significantly related to all four items ($p < .05$). It was also found to be associated with emotion ($r = .07$) and was significantly related to this item ($p < .05$). Emotional disorder – anxiety was also related to cognition ($r = .07$ to $r = .09$) and was significantly related to these two items ($p < .01$). There was also a relationship between emotional disorder – anxiety and pain and discomfort ($r = .06$ to $r = .07$) and was significant for all three items ($p < .05$). Physical aggression was only found to be related to emotion ($r = .08$) and was significantly related to this item ($p < .01$). There was an association between indirect aggression and speech ($r = .07$) and was statistically significant for one out of the four items on speech ($p < .05$). Indirect aggression was also related to emotion ($r = .05$) and was significantly related to this item ($p < .05$). The PA variable was related to all four items on speech ($r = .06$ to $r = .07$) and these relationships were statistically significant ($p < .05$). PA was also associated with emotion ($r = .13$) and significantly related to this item ($p < .01$). PA was related to cognition ($r = .07$) and was significant with one of the two items ($p < .01$). IA showed a relationship to vision ($r = .05$) and was significantly related to two of the five items ($p < .05$). IA also showed an association with hearing ($r = .05$ to $r = .07$) and was significantly related to four of the five items of this attribute ($p < .05$).

Discussion

The purpose of the present investigation was to test the mediational model of parenting style on the direct relationship between child health status and child behavioural outcomes while controlling for parental depression, family functioning, social support, gender of the child, gender of the PMK and income. This model is partially supported by the data. A mediational effect was observed in two out of the four parenting styles. Ineffective parenting was found to be a significant mediator of child health status and five of the behavioural outcomes (hyperactivity-inattention, emotional disorder – anxiety, physical aggression, indirect aggression and PA) measured in this study. That is, children who were in the perfect health group scored significantly lower than children in the impaired health group on all the outcome measures except IA but the difference between these two groups of children was reduced when ineffective parenting was entered into the equation. Similarly, rational parenting significantly mediated the relationship between child health status and all the behavioural measures except IA. Therefore, the difference between the two groups of children, perfect health and impaired health was reduced when rational parenting was entered into the equation. Although, there was statistical significance of the mediational effect for both ineffective and rational parenting, the strength of the mediational effect was not that large with the change in the direct relationship between child health status and behaviour ranging from .01 to .05 excluding PA. Positive parent-child interaction and consistent parenting did not mediate the association between child health status and child behavioural outcomes in any instance. A plausible explanation for these findings is that ineffective parenting and rational parenting are more strongly associated with child behavioural outcomes than the health status of children. Indeed, as can be seen in Table 2 the correlations

between the behavioural outcomes and these two types of parenting styles is generally stronger than with HUI. Furthermore, when one compares the influence of ineffective parenting and rational parenting on child behavioural outcomes, ineffective parenting shows the greatest effect on all the dependent measures. The implication of these findings suggest that children who are exposed to ineffective parenting are perhaps at greater risk for developing or having behavioural problems regardless of their health status. This implication also appears to apply with respect to rational parenting, although to a smaller extent. Moreover, children that do have health impairment(s) and who receive ineffective or rational parenting may be at even higher risk of developing or having these behaviour difficulties. However, these implications are speculative because it is not certain whether child behavioural problems are a consequence of parenting or if child behaviour problems predict parenting, either of these directions could be argued theoretically and supported empirically. The conceptual model in this study explored how child behaviour problems vary as a function of parenting and child health status. There was partial support for this model based on the statistical analyses but the results cannot provide conclusive evidence of directionality.

In terms of direct relationships, one question this study sought to answer was whether child health status would be significantly related to child behavioural outcomes net parenting styles, parental depression, family functioning, social support, gender of the child, gender of the PMK and income. Generally, the answer to this question was affirmed, children in the perfect health group scored significantly lower than children in the impaired health group on child behaviour outcomes. Specifically, children in the perfect health group scored lower on hyperactivity-inattention, emotional disorder – anxiety, physical aggression and indirect aggression than children with health impairments. However, the health status of children was only related to indirect aggression in one instance in which consistent parenting was controlled.

Children with perfect health more frequently scored in the no physical aggression PA category than children with health impairments. There were no group differences on the IA categories. In terms of indirect aggression, the results suggest that parenting (particularly ineffective and rational parenting) have a large effect on indirect aggression beyond that of the child's health status. The reason that the health status of the child showed significance on indirect aggression when consistent parenting was in the equation is likely that health status was significant because ineffective and rational parenting were not being controlled. With the exception of indirect aggression, the data indicate a strong direct relationship between child health status and child behavioural outcomes. A caveat must be made here, statistical significance was found to support many of the predicted relationships between child health status and child behaviour but the direction of the relationship remains uncertain. Contrary to the model presented here, one could argue that child behavioural problems have an effect on child health status. The cross-sectional design of the present study is unable to answer the question of directionality between these variables.

However, the finding of a significant relationship between child health and behavioural difficulties is consistent with previous research that has reported an increased prevalence of behaviour problems in children with disabilities compared to healthy age matched controls (Heinze, Matson, Helsel & Kapperman, 1987; Kanioglou, Tsorbatzoudis and Barkoukis, 2005; McGee & Stanton, 1990; Miniutti, 1991; Pless & Bruck, 1991; Tucker & Fox, 1995). In the present study, the difference between children with perfect health and those with health impairments was greatest on the hyperactivity-inattention while the difference between the groups was less on the emotional disorder – anxiety and physical aggression measures, but still significant and comparable. The greater prevalence of certain behaviour problems in children with disabilities has been found in previous works (McGee & Stanton, 1990; Tucker & Fox,

1995). For instance, Tucker and Fox found that parents of pre-school children with mild handicaps reported higher levels of internalizing behaviours (e.g. withdrawn, anxious) compared to parents of non-handicapped children. In a retrospective study, McGee and Stanton reported that adolescents who reported one or more disabilities had a higher prevalence of ADD and anxiety disorders compared to those without a health condition. However, there was no significant difference between the groups on the reported presence of physical aggression and depression. In contrast, in a study of children and adolescents with developmental disabilities it was found that conduct disorders were more prevalent than affective disorders (Meyers, 1987). Children with severe developmental coordination disorder were reported to experience greater feelings of anxiety and tension, as well as, demonstrate higher levels of hyperactivity, inattention-passive and conduct behaviours than those children with moderate difficulties or no disability (Kanioglou, Tsorbatzoudis & Barkoukis, 2005). Similarly, deviant behaviours such as those characteristic of conduct disorder were also reported to be more prevalent in children with language deficits compared to normal controls (Miniutti, 1991).

The literature that has been reviewed has identified the prevalence of different types of behavioural difficulties in children and adolescents with disabilities. It may be that no single conclusion can be drawn from these studies on what type of behaviour problem is most prevalent given that these studies vary in the type of disability group assessed and age of the sample. In the present investigation, a possible explanation for child health status being most significantly related to hyperactivity-inattention is that children in this sample scored higher on specific items of the Health Utility Index which were highly associated with hyperactivity-inattention. Studies have illustrated that hyperactivity-inattention in children has been associated with learning disabilities (Masseti, Lahey, Pelham, Loney, Ehrhardt, Lee & Kipp, 2008), difficulties with working and semantic memory (Showronek, Leichtman & Pillemer, 2008), and speech, reading

and language impairments (McGrath, Hutaff-Lee, Scott, Boada, Shriberg & Pennington, 2008). Hence, the children in the current sample may have scored higher on areas of cognition and speech as measured by the Health Utility Index than on other attributes associated with other behavioural problems such as physical aggression and emotional – disorder anxiety.

Another aim of this study was to explore whether child health status would be differentially related to parenting styles. The data provide partial support for the specific hypotheses. Children in the perfect health group scored significantly higher on positive parent-child interaction than children in the health impaired group. It was also found that children in the perfect health group scored significantly lower on ineffective and rational parenting than children in the health impaired group. There were no group differences on consistent parenting. The difference between the two groups of children was most apparent with regards to ineffective parenting.

A further goal of this study was to determine the extent to which parenting style is related to child behavioural outcomes. Consistent with what was anticipated, ineffective parenting and rational parenting was positively and significantly related to all the child behavioural measures analyzed in this study (hyperactivity-inattention, emotional disorder – anxiety, physical aggression, indirect aggression, PA and IA). However, the predicted associations between positive parent-child interaction and consistent parenting were only partially supported. Positive parent-child interaction was significantly and negatively related to hyperactivity-inattention and physical aggression but was not significantly related to emotional disorder – anxiety, indirect aggression, PA and IA. A slightly different pattern emerged for consistent parenting in which it was negatively related to hyperactivity-inattention, physical aggression and PA but was unrelated to emotional disorder – anxiety, indirect aggression and IA.

For comparison purposes to the sub-sample, the relationship of parenting style on child behavioural outcomes was assessed for the entire sample. It was expected that positive parent-child interaction and consistent parenting would be negatively related to child behavioural outcomes whereas ineffective and rational parenting would be positively related to child behavioural outcomes. As anticipated, each parenting style was significantly related to each behavioural outcome measure in the predicted direction. Comparison between the correlations in Tables 1 and 2 showed that generally the strength of the relationship between the child behavioural measures and positive parent-child interaction, as well as, ineffective parenting was stronger for the entire sample than the sub-sample. In contrast, the strength of the relationship between the child outcomes and consistent, as well as, rational parenting was stronger in the sub-sample than the entire sample. Another difference between the samples was that all the parenting styles were significantly related to the outcomes measures for the entire sample whereas for the sub-sample there were instances in which positive interaction and consistent parenting were not significantly associated with the behavioural measures.

This study included several control variables that were expected to be linked to child behavioural outcomes as suggested by previous research. For the entire sample, it was found that parental depression was positively related to all the child behavioural outcomes while controlling for the other variables in the equations. Results from the sub-sample indicated that parental depression was significantly related to hyperactivity-inattention, emotional-disorder anxiety, physical aggression and IA (except for when ineffective parenting was controlled). Using data from the entire sample, the current study found that family functioning was positively related to hyperactivity-inattention, emotional-disorder anxiety, PA and IA controlling for other variables. Family functioning was also found to be related to physical aggression and/or indirect aggression

except when ineffective parenting was controlled. For the sub-sample, family functioning was associated with certain behaviours more than others. It was found to be related to emotional-disorder anxiety but unrelated to hyperactivity-inattention, indirect aggression and IA. Family functioning was related to physical aggression except when controlling for ineffective or rational parenting. PA was related to family functioning except when controlling for rational parenting.

The present investigation found that social support was significantly related to emotional-disorder anxiety, physical aggression and PA as derived using data from the entire sample. A different pattern was observed for hyperactivity-inattention. Social support was linked to hyperactivity-inattention in all instances except when controlling for ineffective parenting. It was found that social support was unrelated to indirect aggression. However, the categorical variable of indirect aggression (IA) was related with social support except when ineffective parenting was controlled. A rather different pattern emerged for the sub-sample of four and five year olds in which social support appears to have a much smaller influence on child behavioural outcomes. Social support was unrelated to emotional-disorder anxiety, physical aggression and PA. Hyperactivity-inattention was found to be associated with social support but only when consistent parenting was controlled. Social support was related to indirect aggression only when rational parenting was controlled. The results revealed that social support was negatively related to IA regardless of parenting style. For the entire sample, income was found to be negatively related to hyperactivity-inattention, physical aggression and indirect aggression in children. Income was only found to be associated with emotional disorder – anxiety when consistent parenting was controlled. Income was unrelated to PA and IA. For the sub-sample, the relationship between income and behavioural outcomes was found to be mostly null. However, hyperactivity-inattention was negatively related to income when ineffective and rational parenting was controlled. Also, PA was negatively related to income when controlling for

ineffective parenting. Surprisingly, income was positively related to PA when controlling for rational parenting.

The findings from the entire sample suggested that hyperactivity-inattention and emotional-disorder anxiety in children is related to the PMK being a male. Indirect aggression was found to be associated with the PMK being a female when consistent and rational parenting was controlled. There was a relationship between the PMK being a female and PA when positive interaction, consistent parenting and rational parenting were controlled. There was no significant association between the gender of the PMK and physical aggression and IA. The effect of gender of the PMK on the behavioural outcomes was less significant for the sub-sample compared to the entire sample. For the sub-sample, emotional-disorder anxiety was related to the PMK being a male when positive interaction was controlled. There was no significant association between gender of the PMK and hyperactivity-inattention. The last control variable which was added after the initial analyses were conducted was the gender of the child. As one might expect, the present study found that hyperactivity-inattention and physical aggression was significantly related to the gender of the child. That is, girls scored lower on hyperactivity-inattention and physical aggression than boys. This was also found for the sub-sample including the PA measure of physical aggression suggesting that these behaviours are more prevalent in boys than in girls.

The present investigation sought to understand how parenting style mediates the relationship between child health status and child behavioural outcomes. An assumption of this model is that child health status predicts, to some degree, child behavioural outcomes. However, the reverse could be argued, that child behavioural outcomes influence child health status. In this situation, parenting would be mediating the effect of child behavioural outcomes on health. Unfortunately, the cross-sectional design of this study does not allow for test a directional effect

of causation. The overall results of the analyses presented here show the strongest and most significant relationship between ineffective parenting and child behavioural outcomes above all others. Therefore, this does suggest that perhaps the child's behavioural difficulties may have a substantial impact on the way parents interact with their children in comparison to the health status of the child.

In an attempt to untangle the directionality of the relationship between child health status and child behavioural outcomes a post-hoc analysis was completed. This analysis involved correlating each item of the Health Utility Index Mark 3 with each behavioural outcome measure. Each of these items fall under one of eight attributes of health (vision, hearing, speech, mobility, dexterity, emotion, cognition, and pain and discomfort). The results of this analysis showed varied patterns of the relation between health attributes and child behavioural outcomes. Emotional disorder – anxiety was found to be related to the greatest number of attributes (speech, emotion, cognition and pain and discomfort). Hyperactivity-inattention was associated with speech, dexterity and cognition. Indirect aggression was related to speech and emotion. Physical aggression was only found to be related to emotion. The categorical variable of physical aggression (PA) did however show a stronger relationship to attributes of health than the actual scale. PA was related to emotion, speech and cognition. The categorical variable for indirect aggression (IA) also showed a greater relationship to health than the behavioural scale of indirect aggression. IA was associated with vision and hearing. Overall, it appears that specific attributes of health most highly related to child behavioural outcomes are speech, cognition and emotion.

Limitations

It is important to note some limitations of this study. The first is regarding the sample and its generalizability. The sample in this study was children four to five years of age. Therefore, the conclusions drawn from this study may not apply to children at other ages. As noted earlier in this paper the literature has indicated the stress that parents of children with disabilities experience may vary depending on the child's age and level of development. A second limitation is the method used in this study. This study used self-reports to gather the data. It is acknowledged that this method is vulnerable to reporter bias. Other methods such as natural observation by a neutral third party may provide a more accurate description of parenting behaviour. Another important limitation is this study's cross-sectional design. Cross-sectional designs do not allow for a test of directionality. As noted earlier, child health status may be a predictor of child behavioural outcomes but the reverse could be possible as well. These two variables are strongly related and one must caution their independence. Future studies using a longitudinal design should be conducted in order to assist in exploring the directionality of this relationship. Another limitation is that the data utilized in this study does not indicate whether the child has a diagnosed disability. It is possible that whether or not the child has been diagnosed with a condition may influence the way the parent interacts with the child. For instance, if the child has been diagnosed the physician may refer the family to support groups such as the CNIB. In these cases where the parents receive support from these groups it is possible that the effect of the child's disability on behaviour will be weaker. Unfortunately, this study is unable to control for diagnosis.

In summary, it is acknowledged that there are limitations to this study. The sample is restricted considerably in age range. Hence, caution should be taken in applying conclusions

from this study to other age groups. The self-report method used for collecting the data may bias the results. Another important limitation is the cross-sectional design of this study which does not allow for a test of causation. It is also recognized that this study cannot control for the diagnosis of a child's disability.

Conclusions and Strengths

There are several conclusions that may be drawn from the results of this study. The conceptual model of parenting styles mediating the relationship between child health status and child behavioural outcomes is supported in two of the four instances assessed in this study. These two parenting styles, ineffective parenting and rational parenting, were found to be mediators in this model. It was found that these two parenting styles each have a unique strong relationship to child behavioural outcomes. The strength of this relationship is probably the reason for these parenting styles to show a mediational effect while the other parenting styles were more weakly related to the child outcome measures. Ineffective parenting was found to be the strongest correlate of child behavioural outcomes above all the measures entered in the models. The implication of this finding indicates the possibility that children who are exposed to ineffective parenting are at greater risk for developing child behavioural difficulties when compared to children who are raised by parents using other parenting styles. As well, the direct relationship of child health status on child behavioural outcomes suggests that perhaps children that have health impairment(s) and whose parents are engaging in ineffective parenting are even at higher risk than those children who receive ineffective parenting alone.

The findings of this study also suggest that the directionality of the conceptual model tested here might actually be in the reverse direction. That is, child behavioural outcomes

influence child health status and this relationship is mediated by both ineffective and rational parenting. It is difficult, however, to draw any firm conclusions regarding directionality without longitudinal data. As well, child behavioural difficulties are often comorbid with health impairments such as the case of autism where behavioural difficulties and speech impairments are cooccurring. Future research should be directed towards determining the directionality of child health status and behavioural difficulties.

Table 1 Means, Standard Deviations, and Intercorrelations between Gender of the Child, Gender of the PMK, Depression, Family Functioning, Social Support, Household Income, Parenting Style and Child Behavioural Outcomes for the Entire Sample of the NLSCY Cycle 4

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Gender of the Child 1	0.48	0.49	-	-	-.00	-.01**	.00	-.02**	-.00	-.06**	-.02**	-.03**	-.16**	.00	-.09**	.10**	-.03**	.04**
Gender of the PMK 2	.09	.28		-	-.04**	.04**	-.07**	.01**	.01	-.06**	-.01	-.01*	.02*	.01	-.00	-.01	-.03**	-.02**
Depression 3	4.42	5.43			-	.25**	-.15**	-.14**	-.07**	.19**	-.14**	.14**	.18**	.22**	.17**	.11**	.04**	.03**
Family Functioning 4	8.97	4.93				-	-.50**	-.09**	-.12**	.17**	-.16**	.18**	.12**	.10**	.10**	.09**	.00	.02**
Social Support 5	18.45	3.66					-	.10**	.08**	-.03**	.13**	-.09**	-.04**	-.00	-.01	-.04**	.02**	.00
Income 6	69,879.86	58,171.90						-	.01*	-.05**	.10**	-.03**	-.09**	-.04**	-.06**	-.04**	-.03**	-.02**
Positive Interaction 7	13.65	3.05							-	-.16**	.10**	-.19**	-.07**	-.12**	-.07**	-.15**	-.25**	-.24**
Ineffective Parenting 8	8.67	3.57								-	-.26**	.47**	.42**	.32**	.43**	.30**	.27**	.20**
Consistent Parenting 9	15.14	3.20									-	-.20**	-.15**	-.10**	-.12**	-.16**	-.07**	-.09**

Table 1 Means, Standard Deviations, and Intercorrelations between Gender of the Child, Gender of the PMK, Depression, Family Functioning, Social Support, Household Income, Parenting Style and Child Behavioural Outcomes for the Entire Sample of the NLSCY Cycle 4

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Rational Parenting 10	8.42	1.98										-	.19**	.13**	.24**	.15**	.15**	.10**
Hyperactivity /Inattention 11	3.82	3.01											-	.38**	.41**	.25**	.32**	.21**
Emotional Disorder 12	2.28	2.22												-	.34**	.29**	.25**	.22**
Physical Aggression 13	1.33	1.83													-	.38**	.67**	.29**
Indirect Aggression 14	.94	1.50														-	.29**	.75**
PA 15	.23	.42															-	.51**
IA 16	.17	.37																-

Note. Gender was coded as 0 = male, 1 = female; Health Utility Index(3) was recoded HUI3 where 1 =< 1, all other values = 0; Physical Aggression was recoded PA where 1 => 1, all other values = 0; Indirect Aggression was recoded IA where 1 => 1, all other values = 0.

Note. Means and Standard Deviations were calculated using a cross-sectional population weight and Bivariate Correlations were calculated using a scaled weight.

* $p < .05$, ** $p < .01$

Table 2 Means, Standard Deviations, and Intercorrelations between Gender of the Child, Gender of the PMK, Depression, Family Functioning, Social Support, Household Income, HUI Categorical Variable, Parenting Style and Child Behavioural Outcomes for the Sub-Sample of 4-5 Year Olds in the NLSCY Cycle 4

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Gender of the Child 1	.45	.49	-	-	-.02	.00	.04	.01	.10**	.01	-.05	-.02	-.00	-.18**	.05	-.15**	.01	-.08**	.00
Gender of the PMK 2	.06	.24		-	-.06*	-.03	.00	-.01	.01	-.03	-.03	-.04	-.04	-.02	.03	-.03	.00	-.00	-.00
Depression 3	4.85	6.09			-	.35**	-.10**	-.16**	-.20**	-.04	.18**	-.22**	.12**	.20**	.21**	.17**	.06*	.12**	.09**
Family Functioning 4	8.76	5.30				-	-.50**	-.06*	-.15**	-.14**	.14**	-.19**	.17**	.11**	.15**	.13**	.09**	.13**	.09**
Social Support 5	18.64	3.52					-	-.04	.10**	.12**	-.05*	.19**	-.05	-.00	-.04	-.03	-.08**	-.04	.11**
Income 6	63,643.33	53,616.20						-	-.03	-.01	-.01	.03	.00	-.06*	.01	-.06*	-.02	-.07	-.015
HUI3 7	.67	.46							-	.13**	-.20**	.12**	-.12**	-.32**	-.21**	-.20**	-.08**	-.15**	.05*
Positive Interaction 8	14.55	2.49								-	-.23**	.10**	-.22**	-.10**	-.06*	-.09**	-.04	-.04	-.03
Ineffective Parenting 9	8.76	3.36									-	-.31**	.56**	.39**	.25**	.35**	.20**	.23**	.19**
Consistent Parenting 10	15.01	3.27										-	-.17**	-.20**	-.08**	-.12**	-.07**	-.13**	-.10**

Table 2 Means, Standard Deviations, and Intercorrelations between Gender of the Child, Gender of PMK, Depression, Family Functioning, Social Support, Household Income, HUI Categorical Variable, Parenting Styles and Child Behavioural Outcomes for the Sub-Sample of 4-5 Year Olds in the NLSCY Cycle 4

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Rational Parenting 11	8.53	1.97											-	.26**	.17**	.29**	.15**	.18**	.17**
Hyperactivity /Inattention 12	4.29	2.99												-	.34**	.35**	.18**	.23**	.17**
Emotional Disorder 13	2.07	1.93													-	.32**	.19**	.21**	.18**
Physical Aggression 14	1.72	2.06														-	.38**	.66**	.32**
Indirect Aggression 15	.54	1.05															-	.25**	.80**
PA 16																		-	.23**
IA 17																			-

Note. Gender was coded as 0 = male, 1 = female; Health Utility Index(3) was recoded HUI3 where 1 =< 1, all other values = 0; Physical Aggression was recoded PA where 1 => 1, all other values = 0; Indirect Aggression was recoded IA where 1 => 1, all other values = 0.

Note. Means and Standard Deviations were calculated using a cross-sectional population weight and Bivariate Correlations were calculated using a scaled weight.

* $p < .05$, ** $p < .01$

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Appendix A Health Utility Index Mark 3 Items

Health Utility Index (Age 4-5 Years)

The following items were responded to with most questions being responded to in the following approach:

Yes - 1

No – 2

6 – Not applicable

7 – Don't know

9 – Not stated

VISION

A. Is he/she usually able to see clearly, and without distortion, the words in a story book without glasses or contact lenses?

B. Is he/she usually able to see clearly, and without distortion, the words in a story book with glasses or contact lenses?

1 - Yes

2 - No

3 - Does not wear glasses or contact lenses

C. Is he/she able to see at all?

D. Is he/she able to see well enough to recognize a friend on the other side of the street without glasses or contact lenses?

E. Is he/she usually able to see well enough to recognize a friend on the other side of the street with glasses or contact lenses?

1 - Yes

2 - No

3 - Does not wear glasses or contact lenses

HEARING

A. Is he/she usually able to hear what is said in a group conversation with at least three other people without a hearing aid?

B. Is he/she usually able to hear what is said in a group conversation with at least three other people with a hearing aid?

1 - Yes

2 - No

3 - Does not wear a hearing aid

C. Is he/she able to hear at all?

D. Is he/she usually able to hear what is said in a conversation with one other person in a quiet room without a hearing aid?

E. Is he/she usually able to hear what is said in a conversation with one other person in a quiet room with a hearing aid?

1 - Yes

2 - No

3 - Does not wear a hearing aid

SPEECH

A. Is he/she usually able to be understood completely when speaking with strangers in his/her own language?

B. Is he/she able to be understood partially when speaking with strangers in his/her own language?

C. Is he/she able to be understood completely when speaking with those who know him/her well?

D. Is he/she able to be understood partially when speaking with those who know him/her well?

GETTING AROUND

A. Is he/she usually able to walk without difficulty and without mechanical support such as braces, a cane or crutches?

B. Is he/she able to walk at all?

C. Does he/she require mechanical support such as braces, a cane or crutches to be able to walk?

D. Does he/she require the help of another person to be able to walk?

E. Does he/she require a wheelchair to get around?

F. How often does he/she use a wheelchair?

1 - Always

2 - Often

3 - Sometimes

4 - Never

G. Does he/she need the help of another person to get around in the wheelchair?

HANDS AND FINGERS

A. Is he/she usually able to grasp and handle small objects such as a pencil or scissors?

B. Does he/she require the help of another person because of limitations in the use of hands or fingers?

C. Does he/she require the help of another person with:

1 - Some tasks

2 - Most tasks

3 - Almost all tasks

4 - All tasks.

D. Does he/she require special equipment, for example, devices to assist in dressing because of limitations in the use of hands or fingers?

FEELINGS

A. Would you describe your child as being usually:

- 1 - Happy and interested in life
- 2 - Somewhat happy
- 3 - Somewhat unhappy
- 4 - Unhappy with little interest in life
- 5 - So unhappy that life is not worthwhile

MEMORY

A. How would you describe his/her usual ability to remember things? Is he/she:

- 1 - Able to remember most things?
- 2 - Somewhat forgetful?
- 3 - Very forgetful?
- 4 - Unable to remember anything at all?

THINKING

A. How would you describe his/her usual ability to think and solve day-to-day problems? Is he/she:

- 1 - Able to think clearly and solve problems?
- 2 - Having a little difficulty?
- 3 - Having some difficulty?
- 4 - Having a great deal of difficulty?
- 5 - Unable to think or solve problems?

96 - Not applicable

97 - Don-t know

99 - Not stated

PAIN AND DISCOMFORT

A. Is he/she usually free of pain or discomfort?

B. How would you describe the usual intensity of his/her pain or discomfort:

1 – Mild,

2 – Moderate

3 – Severe

C. How many activities does his/her pain or discomfort prevent?

1 – None

2 – A few

3 – Some

4 – Most

Appendix B Child Behaviour Measures Items

Hyperactivity-Inattention Score (Age 4-11 Years)

The items were responded to in the following manner:

1 – Never or not true

2 – Sometimes or somewhat true

3 – Often or very true

6 – Not applicable

7 – Don't know

8 – Refusal

9 – Not stated

1. How often would you say that your child: Can't sit still or is restless?
2. How often would you say that your child: Is easily distracted, has trouble sticking to any activity?
3. How often would you say that your child: Can't concentrate, can't pay attention for long?
4. How often would you say that your child: Is impulsive, acts without thinking?
5. How often would you say that your child: Has difficulty awaiting turn in games or groups?
6. How often would you say that your child: can not settle on anything for more than a few minutes?
7. How often would you say that your child: Is inattentive?

Emotional Disorder – Anxiety Score (Age 4-11 Years)

The items were responded to in the following manner:

1 – Never or not true

2 – Sometimes or somewhat true

3 – Often or very true

6 – Not applicable

7 – Don't know

8 – Refusal

9 – Not stated

1. How often would you say that your child: Seems to be unhappy or sad?
2. How often would you say that your child: Is not as happy as other children?
3. How often would you say that your child: Is too fearful or nervous?
4. How often would you say that your child: Is worried?
5. How often would you say that your child: Cries a lot?
6. How often would you say that your child: Is nervous, high strung or tense?
7. How often would you say that your child: Has trouble enjoying him/herself?

Conduct Disorder - Physical Aggression Score (Age 4-11 Years)

The items were responded to in the following manner:

1 – Never or not true

2 – Sometimes or somewhat true

3 – Often or very true

6 – Not applicable

7 – Don't know

8 – Refusal

9 – Not stated

1. How often would you say that your child: Gets into many fights?
2. How often would you say that your child: When another child accidentally hurts him/her, he/she reacts with anger and fighting?
3. How often would you say that your child: Physically attacks people?
4. How often would you say that your child: Threatens people?
5. How often would you say that your child: Bullies or is mean to others?
6. How often would you say that your child: Kicks, bites, hits other children?

Indirect Aggression (Age 4 – 11 Years)

The items were responded to in the following manner:

1 – Never or not true

2 – Sometimes or somewhat true

3 – Often or very true

6 – Not applicable

7 – Don't know

8 – Refusal

9 – Not stated

1. How often would you say that your child: When mad at someone, tries to get others to dislike that person?

2. How often would you say that your child: When mad at someone, becomes friends with another as revenge?
3. How often would you say that your child: When mad at someone, says bad things behind the other-s back?
4. How often would you say that your child: When mad at someone, says to others: let's not be with him/her?
5. How often would you say that your child: When mad at someone, tells that person-s secrets to a third person?

Appendix C Parenting Measures Items

Positive Interaction Parenting (Age 2 – 11 Years)

The items were responded to in the following manner:

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

96 – Not applicable

97 – Don't know

98 – Refusal

99 – Not stated

1. How often do you praise your child, by saying something like "Good for you!" or "What a nice thing you did!" or "That-s good going!"?
2. How often do you and your child talk or play with each other, focusing attention on each other for five minutes or more, just for fun?
3. How often do you and your child laugh together?
4. How often do you do something special with your child that he/she enjoys?
5. How often do you play sports, hobbies or games with your child?

Hostile/Ineffective Parenting (Age 2-11 Years)

Most of the items were responded to in the following manner:

1 – Never

2 – Less than half the time

3 – About half the time

4 – More than half the time

5 – All the time

96 – Not applicable

97 – Don't know

98 – Refusal

99 – Not stated

1. How often do you get annoyed with your child for saying or doing something he/she is not supposed to?

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

96 – Not applicable

97 – Don't know

98 – Refusal

99 – Not stated

2. Of all the times that you talk to your child about his/her behaviour, what proportion is praise?
3. Of all the times that you talk to your child about his/her behaviour, what proportion is disapproval?
4. How often do you get angry when you punish your child?
5. How often do you think that the kind of punishment you give your child depends on your mood?
6. How often do you feel you are having problems managing your child in general?
7. How often do you have to discipline your child repeatedly for the same thing?

Consistent Parenting (Age 2-11 Years)

The items were responded to in the following manner:

1 – Never

2 – Less than half the time

3 – About half the time

4 – More than half the time

5 – All the time

96 – Not applicable

97 – Don't know

98 – Refusal

99 – Not stated

1. When you give your child a command or order to do something, what proportion of the time do you make sure that he/she does it?

2. If you tell your child he/she will get punished if he/she doesn't stop doing something, and he/she keeps doing it, how often will you punish him/her?
3. How often does your child get away with things that you feel should have been punished?
4. How often is your child able to get out of a punishment when he/she really sets his/her mind to it?
5. How often when you discipline your child, does he/she ignore the punishment?

Rational (Punitive/Aversive) Parenting (Age 2-11 Years)

The items were responded to in the following manner:

1 – Always

2 – Often

3 – Sometimes

4 – Rarely

5 – Never

96 – Not applicable

97 – Don't know

98 – Refusal

99 – Not stated

99 – Not stated

1. Please tell me how often you, as his/her parent, do each of the following: Raise your voice, scold or yell at him/her?
2. Please tell me how often you, as his/her parent, do each of the following: Calmly discuss the problem?

3. Please tell me how often you, as his/her parent, do each of the following: Use physical punishment?
4. Please tell me how often you, as his/her parent, do each of the following: Describe alternative ways of behaving that are acceptable?

Appendix D Control Measures Items

Depression Score

The items were responded to in the following manner:

1 - Rarely or none of the time (Less than 1 day)

2 - Some or a little of the time (1-2 days)

3 - Occasionally or a moderate amount of time (3-4 days)

4 - Most or all of the time (5-7 days)

6 - Not applicable

7 - Don-t know

8 - Refusal

9 - Not stated

1. How often you have felt or behaved this way during the past week: I did not feel like eating; my appetite was poor.
2. How often you have felt or behaved this way during the past week: I felt that I could not shake off the blues even with help from my family or friends.
3. How often you have felt or behaved this way during the past week: I had trouble keeping my mind on what I was doing.
4. How often you have felt or behaved this way during the past week: I felt depressed.
5. How often you have felt or behaved this way during the past week: I felt that everything I did was an effort.

6. How often you have felt or behaved this way during the past week: I felt hopeful about the future.
7. How often you have felt or behaved this way during the past week: My sleep was restless.
8. How often you have felt or behaved this way during the past week: I was happy.
9. How often you have felt or behaved this way during the past week: I felt lonely.
10. How often you have felt or behaved this way during the past week: I enjoyed life.
11. How often you have felt or behaved this way during the past week: I had crying spells.
12. How often you have felt or behaved this way during the past week: I felt that people disliked me.

Family Functioning Score

The items were responded to in the following manner:

- 1 – Strongly Agree
 - 2 – Agree
 - 3 – Disagree
 - 4 – Strongly Disagree
 - 6 – Not Applicable
 - 7 – Don't know
 - 8 – Refusal
 - 9 – Not Stated
1. Planning family activities is difficult because we misunderstand each other.
 2. In times of crisis we can turn to each other for support.

3. We cannot talk to each other about sadness we feel.
4. Individuals (in the family) are accepted for what they are.
5. We avoid discussing our fears or concerns.
6. We express feelings to each other.
7. There are lots of bad feelings in our family.
8. We feel accepted for what we are.
9. Making decisions is a problem for our family.
10. We are able to make decisions about how to solve problems.
11. We don-t get along well together.
12. We confide in each other.

Social Support Score

The following items were responded to:

1. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. If something went wrong, no one would help me.
2. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. I have family and friends who help me feel safe, secure and happy.
3. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. There is someone I trust whom I would turn to for advice if I were having problems.
4. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. There is no one I feel comfortable talking about problems with.

5. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. I lack a feeling of closeness with another person.
6. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. There are people I can count on in an emergency.
7. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. I feel part of a group of people who share my attitudes and beliefs.
8. For each of the following, please tell me whether you strongly disagree, disagree, agree, or strongly agree. There is no one who shares my interests and concerns.

Income

What is your best estimate of your total household income from all sources in the past 12 months, that is the total income from all household members, before taxes and deductions?