Disability-Based Disparities in Adolescent Subjective Well-Being

by

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ABSTRACT

Background: Hedonic subjective well-being (SWB) is now widely regarded as an important indicator of social progress and a goal of public policy. Research on SWB or 'the science of happiness' in high-income countries has proliferated, including studies examining the correlates, effects, and determinants of adolescent SWB. However, there is a paucity of data on the SWB of adolescents with disability. The available data suggest that adolescents with disability face a heightened risk of poor SWB or more specifically, low levels of happiness or satisfaction with life relative to non-disabled peers.

Few studies have investigated potential causes of disability-based differences in adolescent SWB. This absence of research may be due, in part, to what Amundson (2005) terms the 'standard view': the widely held but now contested assumption that disability is inherently negative and thus a direct cause of poor SWB. However, recent research refutes this view. Children and adolescents with disability in high-income countries are disproportionately exposed to adverse life conditions that are associated with poor SWB among adolescents in general including low socioeconomic status, impoverished peer relationships, and peer victimisation. This differential exposure may then explain disability-based differences in adolescent SWB.

Building on previous research, the purpose of this study was to investigate the life conditions and SWB of Canadian adolescents with disability, using a large population-based data set. One objective was to develop a cross-sectional profile of the life conditions and well-being of Canadian adolescents with disability relative to their non-disabled peers. Another objective, and the primary focus of the investigation, was to examine the potential mediating role of life conditions, specifically socioeconomic status and social relationships, measured in early childhood, middle childhood, and adolescence, in explaining the relationship between disability identified at age 4-5 and adolescent SWB.

Method: The methodology of this investigation was secondary data analysis of the National Longitudinal Survey of Children and Youth (NLSCY). Study 1 was an exploratory, descriptive and correlational study designed to create a profile of adolescent Canadians with and without disability. Multivariate regression was used to investigate the 'effect' of disability on components of SWB as well as indicators of socioeconomic status and social relationships. Study 2 primarily employed longitudinal structural equation modelling to investigate hypothesized pathways linking disability, socioeconomic status, and social relationships across childhood to adolescent SWB.

Results: Significant associations were found between disability and individual components of SWB, as well as the overarching latent construct. Children with disability identified at age 4-5 were found to be living at a lower socioeconomic status relative to comparison peers across childhood. Adolescents and preadolescents with disability also reported greater exposure to victimisation and impoverished peer relationships. The greatest parity was found on indicators of social participation. Structural equation modelling analysis permitted investigation of how life conditions across childhood may impact later SWB. Findings suggest that the relationship between early childhood identified disability and adolescent SWB is fully mediated by household socioeconomic status, peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.

Conclusion: There is mounting evidence of disability-based inequality in adolescent SWB. This dissertation provides further evidence that parity in SWB and life conditions has not yet been achieved for Canadian adolescents with disability. Further, results suggest that the relatively poorer SWB of adolescents with disability may be explained by exposure to low socioeconomic status, impoverished peer relationships and peer victimisation. Such findings indicate that disability-based differences in adolescent SWB are, at least in part, a result of differential exposure to adverse life conditions rather than a direct consequence of disability, and might therefore be more aptly described as disability-based *disparities*.

Findings may offer some insight into how disability-based disparities in adolescent SWB may be redressed. It appears increasing the participation of youth with disability in social leisure activities may not be the solution to closing the SWB gap. Findings from the longitudinal sample do however suggest that greater exposure to peer victimisation and impoverished peer relationships may explain disability-based disparities in youth SWB. Facilitating opportunities for children and adolescents with disability to form supportive peer networks, and developing ways to challenge stigma and deter victimisation, appear to be practical courses of action that could make a positive difference in the lives of adolescents with disability.

Preface

This thesis is an original work by Amber Savage. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board; No. Pro00029484, February 16, 2012.

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To my lifelong cheerleader, mom

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CHAPTER 1. INTRODUCTION

In line with growing academic and political interest in the subjective well-being of all people, a substantial research base examining the correlates, effects and determinants of adolescent subjective well-being (SWB) is beginning to take shape. However, there is a dearth of data on the SWB of adolescents with disability, i.e. “those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others” (UNCRPD, Article 1). Little is known about how these young people evaluate their own lives and life circumstances. Although further population-based research is needed to validate the claim, the available data suggest that adolescents with disability face a heightened risk of poor SWB or more specifically, low levels of happiness or satisfaction with life relative to their non-disabled peers (McNamara, Willoughby, Chalmers, & YLC-CURA, 2005; Rueda, Fernandez-Berrocal, & Schonert-Reichl, 2014; Sacks & Kern, 2008; Savage, McConnell, Emerson, & Llewellyn, 2014; Topolski, Edwards, & Patrick, 2005; Topolski et al., 2004).

Disability-based differences in adolescent SWB remain poorly understood: Few studies have investigated potential causes or factors that may contribute to disability-based differences in SWB. This neglect may be due, at least in part, to what Amundson (2005) terms the ‘standard view’: the widespread but now contested assumption that disability is ‘essentially’ negative, and *ipso facto*, a direct cause of poor SWB. Knowledge about disability-based differences in adolescent SWB is further limited by the methodological weaknesses that have, until quite recently, characterised this area of study. These include inconsistency in the operational definition of disability; the almost exclusive use of non-population based, cross-sectional samples; lack of proper control for life conditions when investigating the link between disability and SWB; and piecemeal operationalization of the SWB construct.

Recently, researchers have argued, with some supporting data, that disability-based differences in SWB could be explained by adverse life conditions (e.g., Edwards, Patrick, & Topolski, 2003; Emerson, Llewellyn, Honey, & Kariuki, 2012; Emerson, Honey, Madden, & Llewellyn, 2009). Adolescents with disability in high-income countries are disproportionately exposed to life conditions that are associated with poor SWB in non-disabled adolescents including low socioeconomic status (Emerson, Shahtahmasebi, Lancaster, & Berridge, 2010; Fujiura & Yamaki, 2000; Parish, Rose, Grinstein-Weiss, Richman, & Andrews, 2008; Statistics Canada, 2008), peer exclusion (Estell et al., 2008; Jamieson et al., 2009; Matheson, Olsen, & Weisner, 2007; Tipton, Christensen, & Blacher, 2013), and peer victimisation (Humphrey & Hebron, 2015; Jones, et al., 2012; Lindsay & McPherson, 2012; Rose, Monda-Amaya, & Espelage, 2011; Rose, Simpson, & Moss, 2015). The differential exposure of children and adolescents with disability to such adverse life conditions might then explain disability-based differences in adolescent SWB.

There are a variety of ways in which differential exposure to adverse life conditions may explain the relationship between disability and poor adolescent SWB. It is possible that the relationship/ correlation between disability and adolescent SWB is spurious, with adverse life conditions being a common cause of both disability and low adolescent SWB. Alternatively, there are potentially a number of paths connecting disability, adverse life conditions and SBW. One plausible hypothesis is that life conditions mediate the relationship between disability and SWB. Children and adolescents with disability may, for instance, face a heightened risk of exposure to socioeconomic hardship due to the out-of-the-ordinary direct and or indirect costs (e.g., reduced parent workforce participation) associated with their upbringing. Another plausible hypothesis is that disability (at least partially) mediates the relationship between adverse life conditions and poor adolescent SWB. Of course these paths are not mutually exclusive: there may be many paths of influence, including non-recursive and or recursive paths.

Building on earlier research, the purpose of this study was to investigate the life conditions and SWB of Canadian adolescents with disability, using a large population-based data set. One objective was to develop a cross-sectional profile of the life conditions and well-being of Canadian adolescents with disability relative to their non-disabled peers. Another objective, and the primary focus of the investigation, was to examine the potential mediating role of life conditions, specifically socioeconomic status and social relationships (i.e., peer friendship and acceptance, exposure to peer victimisation, and social activity/participation) measured in early and middle childhood and adolescence, in explaining the relationship between disability identified at age 4-5 years and adolescent subjective well-being.

1.1 Background

Hedonic subjective well-being may be defined as “people’s evaluations of their lives – the degree to which their thoughtful appraisals and affective reactions indicate that their lives are desirable and proceeding well” (Diener, Oishi, & Lucas, 2015, p.234). Beginning in the late twentieth century, research on subjective well-being or ‘the science of happiness’ in high-income countries has proliferated (Cummins, 1995; Davidson & Schuyler, 2015; Diener, 2000; Diener, Suh, Lucas, & Smith, 1999; Diener, Scollon, & Lucas, 2009). This field of research is concerned with understanding the factors and conditions that bring about an enjoyable and ‘desirable’ life (Diener, 2000; Diener et al., 1999) and is thereby distinct from, but related to, the study of ‘eudemonic well-being’, understood as the pursuit of personal growth, and self-actualization

(Deci & Ryan, 2008; Raibley, 2011; Ryan & Deci, 2001). Operationally defined, SWB consists of three components: life satisfaction (LS), positive affect (PA), and negative affect (NA). Happiness is a closely related construct. Indeed, SWB and happiness are terms that have been used interchangeably in the literature, although these are not always operationally defined in the same way (Diener, 2000; 2009; Diener, Sapyta, & Suh, 1998; Pavot, Diener, Colvin, & Sandvik, 1991).

Hedonic subjective well-being (hereon referred to as SWB) is today widely regarded as an important measure of social progress and a goal of public policy (Helliwell, Layard, & Sachs, 2015; Mulholland & Watt, 2010; OECD, 2013; Proctor, Linley, & Maltby, 2009; Royal Government of Bhutan, 2012; Stiglitz, Sen, & Fitoussi, 2009; United Nations, Department of Public Information, 2012). On July 19th 2011 the United Nations (UN) General Assembly adopted by consensus Resolution 65/309[1] which describes happiness as “a fundamental human goal and universal aspiration” and “invites Member States to pursue the elaboration of additional measures that better capture the importance of the pursuit of happiness and well-being in development with a view to guiding their public policies” (p.1). Shortly thereafter the United Nations held a landmark international congress entitled ‘Happiness and Well-being: Defining a New Economic Paradigm’ (April 2nd 2012). Congress attendee and director of Action for Happiness, Mark Williamson, explained “it's about redefining what we mean by progress. We should be aiming for growth in human happiness. A healthy economy is part of this, but

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[1] General Assembly resolution 65/309, *Happiness: towards a holistic approach to development,* A/RES/65/309 (19 July 2011) available from undocs.org/A/RES/65/309.

other things are essential too - like vibrant communities and greater equality" (Dagan, 2012, para. 8).

On March 20th 2013 the Organisation for Economic Co-operation and Development (OECD), released a set of detailed guidelines on collecting, publishing, and analysing subjective well-being data at a national level. The OECD conceptualization of SWB is intentionally broad including traditional hedonic SWB (i.e., a cognitive evaluation of one's life [life satisfaction] and emotional appraisal [positive and negative affect]), as well as domain specific hedonic SWB (e.g., satisfaction with finances, school, health), and eudemonic well-being (i.e., a sense of meaning and purpose) (OECD, 2013, p.10). The OECD cites several motivations for producing detailed, international guidelines including accumulating evidence that SWB can be measured in a reliable and valid way, and that these measures can usefully inform social policy (OECD, 2013, p.21). The OECD further cites recommendations from the Report by the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2009) calling on national statistical agencies to collect and publish measures of subjective well-being as a means to monitor social progress.

Parallel to increasing social and political interest in SWB, research into the SWB of adults in high-income countries is amassing. In the adult population, SWB has been linked to positive mental health (Cafasso, 1998; Diener & Seligman, 2002; KoivumaaHonkanen et al., 2001), improved resilience to physical illness and injury (Cohen, Doyle, Turner, Alper, & Skoner, 2003; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002), and greater overall longevity (Danner, Snowdon, & Friesen, 2001; Diener & Chan, 2011; Maruta, Colligan, Malinchoc, & Offord, 2000; Ostir, Markides, Black, & Goodwin, 2000). Socially, higher SWB is associated with stronger marital unions, plentiful and rewarding social interactions, and enduring support networks (Berry & Hansen, 1996; Dyrdal, Røysamb, Nes, & Vittersø, 2011; Harker & Keltner, 2001; Helliwell & Putnam, 2004; Lyubomirsky, Sheldon, & Schkade, 2005; Marks & Fleming, 1999).

The last two decades have also seen an increase in research on the subjective well-being of *adolescents* in high-income countries. High adolescent SWB is associated with a number of positive outcomes including physical health (Shaffer-Hudkins, Suldo, Loker, & March, 2010) and academic achievement (Bird & Markle, 2012; Heizomi, Allahverdipour, Asghari Jafarabadi, & Safaian, 2015). Research with adolescents highlights common associations between SWB components and youth characteristics. For example, several studies suggest that adolescent girls may be at greater risk of poorer SWB than adolescent boys (Froh, Yurkewicz, & Kashdan, 2009; Goldbeck, Schmitz, Besier, Herschbach, & Henrich, 2007; Sarriera, Bedin, Abs, Calza, & Casas, 2015; Tomyn, Norrish, & Cummins, 2013). SWB also appears to decrease as adolescents move through their teenage years (Goldbeck et al., 2007; Liu, Mei, Tian, & Huebner, 2016; Ozdemir, 2012; Park, 2005; Ronen, Hamama, Rosenbaum, & Mishely-Yarlap, 2016; Uusitalo-Malmivaara, 2014). In a two year study of 10 to 15 year olds, Gonzalez-Carrasco, Casas, Malo, Vinas and Dinisman (2016) report declines in levels of LS and happiness beginning at age 11-12, with a sharper decrease observed among girls. Canadian research further suggests that aboriginal adolescents may be at greater risk of poor SWB (Michalos & Orlando, 2006; Trull, 2003). Burton, Daley, and Phipps (2015) for example used data from the nationally representative Canadian Community Health Survey (CCHS) to show that aboriginal youth age 12-17 living in the northern territories were least likely to report being ‘very satisfied’ with their lives (32.5%, n=588), followed by aboriginal youth living in the provinces (36.8%, n=2,059), and then non-aboriginal adolescents living in the north (44.2%, n=391) and south (44.6%, n= 32,666) of

Canada. Associations between adolescent SWB and disability are far less researched in Canada or elsewhere. A quite recent review of life satisfaction data conducted by Proctor and colleagues (2009) highlights this gap stating the “evaluations of LS among children and adolescents with disabilities are sparse, especially those taking into consideration the specific effects of school and environmental variables” (Proctor et al., 2009, p. 599).

The, albeit limited, available data suggest that adolescents with disability (broadly defined) in high-income countries tend to report lower levels of happiness or life satisfaction than their non-disabled peers. Adolescents with learning disability, for example, have reported lower life satisfaction (McNamara et al., 2005; Topolski et al., 2004), less positive and more negative affect (Ginieri-Coccossis et al., 2013; Uusitalo-Malmivaara et al., 2012). Similar findings have been presented for adolescents with emotional and behavioral disorders (Sacks & Kern, 2008), mobility impairments (Patrick, Edwards, & Topolski, 2002; Topolski et al., 2004), Asperger Syndrome (Rueda, Fernandez-Berrocal, & Schonert-Reichl, 2014), and self-reported disability (Edwards et al., 2003; Emerson, Honey, & Llewellyn, 2008; Emerson et al., 2012; Emerson et al., 2009; Wolman, Resnick, Harris, & Blum, 1994). Further research is however needed to support the conclusion that there are disability-based differences in adolescent subjective well-being. Most studies to date have measured life satisfaction as a proxy for SWB (i.e., positive affect [PA], negative affect [NA], and life satisfaction [LS]), and or have not discriminated between the life satisfaction of adolescents and young adults with disability. Furthermore, inconsistencies in the operational definition of disability and the paucity of population-based data (although some population-based data are now emerging) limit the generalisability of research findings.

There is also mounting evidence that adolescents with disability in high-income countries are disproportionately exposed to life conditions that have been shown to predict poor SWB in non-disabled adolescents, including socioeconomic hardship and social exclusion. Nearly a fifth (19%) of Canadian children with disability under age 16 live in a household below the low-income cut-off (LICO) compared to 13% of their non-disabled peers (Statistics Canada, 2008). British families raising a child (under age 18) with disability are also significantly more likely to be living on a below average income and to be unable to afford items commonly owned by British families (Emerson & Hatton, 2007a; Emerson et al., 2010). Similarly, in the United States (US) families raising a disabled child are significantly more likely to experience housing instability, food insecurity, and restricted access to health care (Parish et al., 2008).

In addition, and perhaps related to their exposure to socioeconomic hardship, there are data showing that adolescents with disability tend to participate in fewer and less diverse activities with peers (Abells, Burbidge, & Minnes, 2008; Engel-Yeger, Jarus, Anaby, & Law, 2009; King, Petrenchik, Law, & Hurley, 2009; Law, Petrenchik, King, & Hurley, 2007; Solish, Perry, & Minnes, 2010), and report greater difficulty building and maintaining close bonds with peers by comparison with their non-disabled counterparts (Brantley, Huebner, & Nagle, 2002; Emerson & Hatton, 2007b; Estell et al., 2008; Gerhardt, McCallum, McDougall, Keenan, & Rigby, 2015; Jamieson et al., 2009; MacArthur, 2013; Matheson et al., 2007; Tipton et al., 2013; Zic Ralic & Ljubas, 2013). Furthermore, there is considerable evidence that adolescents with disability are more likely than their non-disabled peers to be exposed to harassment, bullying, and violence (Chan, Emery, & Ip, 2016; Cummings, Pepler, Mishna, & Craig, 2006; Flynt & Morton, 2004; Humphrey & Hebron, 2015; Jones, et al., 2012; Lindsay & McPherson, 2012; Rose et al., 2011; Rose et al., 2015; Sentenac et al., 2013). In the US in 2011, for example, adolescents with disability aged 16 to 19 had an average annual unadjusted rate of violent victimisation (123 per 1,000) over three times higher than peers without disability (37 per 1,000) (Harrell, 2012).

In examining the relationship between disability and adolescent SWB, few studies to date have properly controlled for differential exposure to adverse life conditions. The small number of studies that have done so have found that disability-based differences in the SWB (or more accurately, the LS) of young people are potentially attributable to adverse life conditions associated with disability, rather than disability *per se*. In the US, Edwards, Patrick and Topolski (2003), for example, investigated the SWB of high school students with and without self-reported disability and found that no statistically significance difference existed after controlling for social adversity. Similarly, in Australia, Emerson, Honey, Madden and Llewellyn (2009) conducted a secondary analysis of nationally representative data and found that under conditions of low financial hardship and high social support, young people with disability, including but not limited to adolescents, report levels of LS that are not significantly different from their non-disabled peers. However, most studies to date have been cross-sectional in design: Further research, utilising longitudinal data, is now needed to advance understanding of *how* adverse life conditions could explain disability-based differences in adolescent SWB.

Further research is also needed to investigate the role that early experience, including exposure to adverse life conditions in early and middle childhood, and adolescence might play in influencing the SWB of adolescents with and without disability. Evidence of the long-term impact of life conditions on SWB is beginning to emerge. Van Workum, Scholte, Cillessen, Lodder and Giletta (2013), for example, found that adolescent happiness can be significantly influenced by the happiness of their peers over a two year period (N= 426). In a 30-year prospective longitudinal study (N=996) Marion, Laursen, Zettergren, and Bergman (2013) observed that having at least one friend in adolescence acted as a buffer or protective factor against the negative impact of adolescent peer rejection on adult LS. Similar studies suggest that childhood and adolescent socioeconomic disadvantage may negatively impact LS in adulthood (Bertoni, 2015; Louis & Zhao, 2002). Sheikh, Abelsen, and Olsen (2014) for example observed that low childhood SES increased the risk of low adult LS by 24% among men and 26% among women (N = 12,984). While these studies highlight a potential causal link between life conditions in childhood and later SWB, there is a paucity of research investigating early childhood determinants of later childhood SWB, specifically subjective well-being in adolescence.

In summary, there is mounting evidence of disability-based differences in adolescent SWB. The research to date is however limited in a number of ways. Firstly, disability has been operationally defined in a variety of ways making cross-study comparisons problematic. Second, research to date has employed proxy measures of SWB: Whether disability-based differences in SWB are found when the full three-part SWB construct is measured is uncertain. Third, and with a few notable exceptions (Emerson et al., 2008; Emerson et al., 2012; Emerson et al., 2009; Maatta et al., 2013), the majority of studies investigating the SWB of adolescents with disability have relied on non-population based samples that may be biased. Moreover, the population-based studies that have been conducted have in most cases grouped adolescents together with young adults, limiting the generalisability of the findings to adolescents. Fourth, existing work that examines differences in SWB (or components of SWB) between adolescents with disability and their non-disabled peers has rarely controlled for between group differences in life conditions. Finally, the available research is largely cross-sectional and as such does not allow for investigation of the direct and in-direct (mediating) effects of adverse life conditions, in early and middle childhood, and adolescence on adolescent SWB.

To advance understanding of the life conditions and SWB of adolescents with disability, this investigation aims to redress the limitations of the existing evidence-base by: (1) operationally defining disability in a way that is consistent with other comparable population-based studies and with the way in which disability is defined in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006); (2) employing statistical techniques that allow for examination of LS, PA, and NA as manifest indicators of a higher order latent SWB construct; (3) comparing the SWB of adolescents with and without disability in a population representative sample; and, (4) investigating whether life conditions in early and middle childhood, and adolescence including household socioeconomic status and social relationships, mediate any observed relationship between disability and adolescent SWB.

1.2 Study Aims

This dissertation examines disability-based differences in adolescent subjective well-being (SWB) by way of two complementary studies. Study 1 was exploratory, descriptive and correlational. Utilising cross-sectional data, the life conditions and subjective well-being (or rather components of SWB) of adolescent Canadians with disability relative to same age peers are profiled. Study 2 utilises longitudinal data to explore potential pathways linking disability identified in early childhood to SWB in adolescence. The second study can be broken down into three stages of inquiry; (1) exploring the relationship between disability and household socioeconomic status across childhood, (2) exploring the relationship between disability and social relationships (i.e., peer friendship and acceptance, exposure to peer victimisation and social participation) across childhood, and (3) investigating pathways between early childhood disability and adolescent subjective well-being by way of household socioeconomic status and social relationships. The primary hypothesis is that life conditions across childhood, including household SES and social relationships, mediate the relationship between early childhood disability and adolescent subjective well-being.

1.3 Methodology

The methodology of both studies is secondary analysis of data pulled from a large Canadian dataset: the National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY followed a number of childhood cohorts over a fourteen-year period: 1994/95 - 2008/09. The resultant database permits extensive research at a national level and analysis of both cross-sectional and longitudinal samples. The current investigation utilizes data from the ‘original’ NLSCY cohort. Original cohort data were collected over the full term of the NLSCY and, when appropriately weighted, are representative of children living in any Canadian province aged 0-11 years as of December 31, 1994 (Statistics Canada, 1996). Data contains both ‘parent-report’ by the Person Most Knowledgeable (PMK) about the child and, after age ten, child self-report.

Study 1 uses data from the two most recent NLSCY cycles to create a profile of the life conditions and (components of) subjective well-being of Canadian adolescents relative to their non-disabled peers. Multivariate linear regression is used to investigate the ‘effect’ of disability on scale variables adjusting for potentially confounding child characteristics (i.e., gender and aboriginal status). In investigating the ‘effect’ of disability on binary outcomes/variables, logistic regression modelling is employed to calculate odds ratios for univariate and multivariate analyses.

Study 2 employs longitudinal structural equation modelling techniques by way of graphical chain models to investigate hypothesized pathways linking disability identified in early childhood, and socioeconomic status and social relationships across childhood, to subjective well-being in adolescence. Data are examined across three segments of childhood; the preschool years or ‘early childhood’, preadolescence or ‘middle childhood’, and adolescence. Linked hypotheses are examined systematically. First, univariate and/or multivariate comparisons are conducted. If results of the initial evaluation support investigation of the hypothesized model, a more in-depth analysis is conducted. Hypothesized measurement models are tested by way of Confirmatory Factor Analysis employing Maximum Likelihood estimation with Satorra–Bentler adjustments. If acceptable fit is achieved, a structural model in line with the hypothesis is tested. With acceptable fit established, structural models are analyzed using Quasi- Maximum Likelihood estimation and normalized sample weights.

1.4 Overview of Thesis

Chapter 2 begins by exploring subjective well-being (SWB): what it is, why it is important, and whether it can be influenced. Debate around the ‘causes’ or determinants of subjective well-being, and critically whether it *can* be meaningfully improved, is examined in detail. Two views are discussed; (1) that intrinsic factors like genetic predisposition and stable personality traits govern SWB, and (2) that SWB varies as a function of life conditions and circumstances. The available evidence suggests that subjective well-being is at least partially influenced by life conditions. With this insight, research investigating disability-based differences in the life conditions and subjective well-being (or rather components of SWB) of adolescents in high-income nations is critically examined.

Chapter 3 presents the methodology of the investigation: secondary data analysis of the National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is described in detail including design, sampling frame, and methods of data collection. Operationalization of central concepts including but not limited to disability, subjective well-being, social relationships, and household socioeconomic status are discussed in the context of available data. Next, the analytic approach taken to both Study 1 and Study 2 is specified. An introduction to structural equation modelling (SEM) is presented as it pertains to Study 2, as well as graphic representations (where appropriate) of each longitudinal hypothesis. In addition, the rationale behind a number of decisions made throughout the course of data analysis are explained; this discussion includes strategies to deal with missing and non-normally distributed data, case weighting, and choosing a method of estimation.

Chapter 4 systematically details the results of both studies. First, characteristics of the cross-sectional sample are described. Next, findings from comparisons of adolescent Canadians with disability to same age peers across measures of subjective well-being, socioeconomic status and social relationships, and a selection of supplementary indicators are presented. The result is a nationally representative profile of the life conditions and SWB of adolescents with disability relative to their non-disabled peers. Characteristics of the longitudinal sample utilized in Study 2 are then described. Study 2 results are reported systematically: findings based on the relationship between disability and household socioeconomic status are presented first, followed by the relationship between disability and social relationships, and finally hypothesized pathways between disability and adolescent subjective well-being by way of household socioeconomic status and youth social relationships.

In Chapter 5 the study findings are discussed, including implications for policy and future research. This section begins with an overview of the results of Study 1 and Study 2. Next, results are discussed in the context of existing theoretical and empirical literature. Limitations of both studies are presented. This investigation worked to redress limitations in the existing literature by utilizing nationally representative data; examining life conditions previously linked to adolescent SWB including socioeconomic exposures and social relationships, and employing longitudinal modelling techniques to examine whether life conditions across childhood mediate any observed relationship between disability identified in early childhood and adolescent SWB.

CHAPTER 2. SUBJECTIVE WELL-BEING: THEORY AND RESEARCH

Broadly, well-being research examines two sides of human experience; (1) the objective circumstances of life (e.g., income level and stability, access to education and health care), and (2) the subjective experience of life (e.g., happiness, satisfaction, meaning) (see Figure 2-1). Scorsolini-Comin and Dos Santos (2010) further this distinction by suggesting that objective indicators reflect 'welfare' while subjective accounts reflect 'well-being'. The way objective well-being or welfare is measured varies with the use of differing conceptual frameworks. For example, the Canadian Index of Well-being bases objective measures on 'Canadian values' determined by consensus (Michalos et al., 2011). Other researchers adopt an approach rooted in a broad human rights or human development framework (see for example: Bradshaw, Hoelscher, & Richardson, 2007; Camfield, Streuli, & Woodhead, 2008; Lau & Bradshaw, 2010). Such frameworks may assess objective well-being by identifying rights based indicators; i.e. pieces of information used to measure the extent to which a right is being fulfilled or enjoyed (Green, 2001, p.1064). The current investigation examines objective indictors as context for understanding subjective well-being. The selection of objective indicators was guided by research supporting a social determinants perspective on subjective well-being (which will be explored in detail below) within the constraints of the information available.

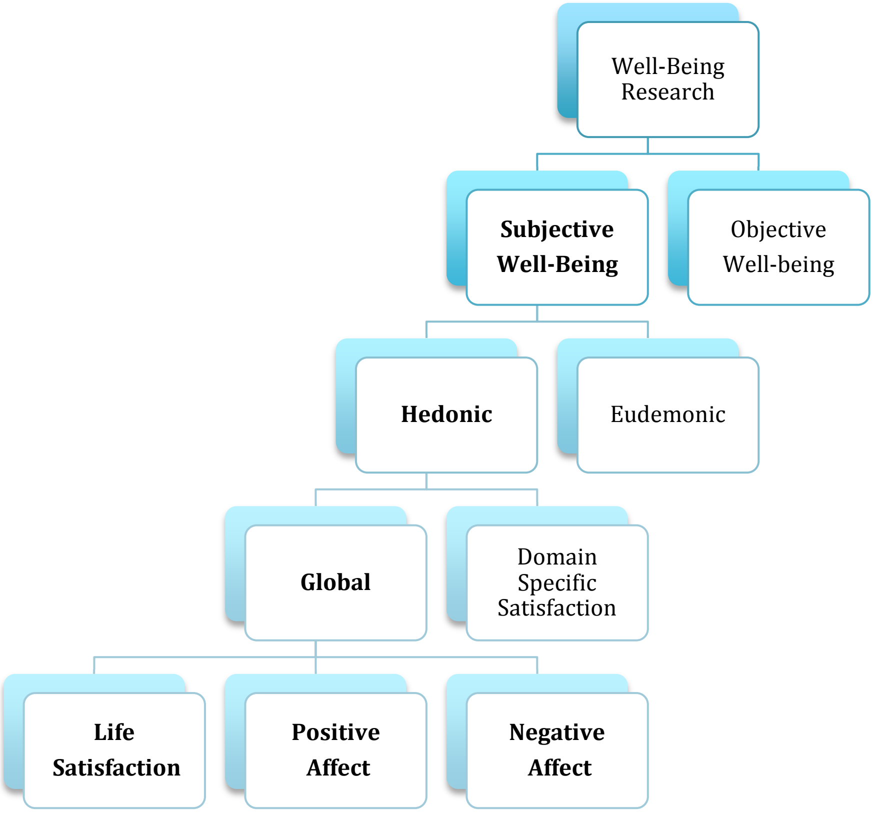

Figure 2-1. Taxonomy of well-being

The primary focus of the current work is on *subjective* rather than objective well-being. Hedonic and eudaimonic well-being constitute the two primary traditions of subjective well-being research. Hedonic notions of well-being stem from a desire to investigate the human drive toward pleasure, i.e., hedonism. The scientific study of hedonic subjective well-being is concerned with understanding the factors and conditions that bring about a pleasurable and 'desirable' life (Diener, 2000; Diener, Suh, Lucas, & Smith, 1999). Eudaimonia is typically conceptualized as 'living well' or as a process of realizing one's human potential (Deci & Ryan, 2008; OECD, 2013; Waterman, 1993). The two traditions capture different aspects of subjective experience and as such relate to different areas of inquiry. Specifically, whether the aim is to explore (A) emotive evaluation and life satisfaction, or (B) the pursuit of personal growth, purpose, or meaning (Deci & Ryan, 2008; Ryan & Deci, 2001). Research explicitly investigating subjective well-being (as opposed to ‘psychological well-being’ for example) refers almost exclusively to the hedonic tradition in as much as it explores feeling happy and satisfied with life (e.g., Diener, Oishi, & Lucas, 2015; Diener, Scollon, & Lucas, 2009; Dinisman & Ben-Arieh, 2016; Eryilmaz, 2012; Fisher, 2009; Galinha & Pais-Ribeiro, 2008; Scorsolini-Comin & Dos Santos, 2010). Within this tradition a further distinction can be made between studies that focus on global SWB and those that have examined domain specific SWB (e.g., satisfaction with finances, school, health, etc.) (see for example: Biswas-Diener & Diener, 2006; Dinisman, Montserrat, & Casas, 2012; Dinisman & Ben-Arieh, 2016; Vera et al., 2012). The current investigation follows the hedonic tradition and focuses on global SWB, not only to explore potential disability-based differences in how adolescents evaluate their lives, but also to better understand the factors and conditions that may contribute to those differences.

2.1 Hedonic Subjective Well-Being

Hedonic subjective well-being (hereon referred to as SWB) may be defined as “people’s evaluations of their lives – the degree to which their thoughtful appraisals and affective reactions indicate that their lives are desirable and proceeding well” (Diener et al., 2015, p.234). There is broad consensus that global SWB should be measured in terms of three principle components (positive affect [PA], negative affect [NA], and life satisfaction [LS]) and that these components should be measured independently (Andrews & Withey, 1976; Diener, 1984; 2000; Diener, Suh, Smith, & Shao, 1995; Diener, Sapyta, & Suh, 1998; Diener et al., 1999; Diener, Lucas, & Scollon, 2009; Lucas, Diener, & Suh, 1996; Oishi, Diener, & Lucas, 2007; Pavot, Diener, Colvin, & Sandvik, 1991; Pavot, Diener, & Fujita, 1990). However, this approach is not entirely uncontested. Deci and Ryan (2008) for example suggest that a more accurate understanding of hedonia should exclusively reflect the interplay between positive and negative emotion, arguing that a cognitive evaluation of one's life more accurately suits the eudaimonic tradition.

While arguments for the three part conceptualization of SWB were, for several decades, predominantly theoretical, recent research has begun to provide the empirical evidence needed to move the field forward. Busseri and Sadava (2011) present four models representing the most common conceptualizations of SWB in the literature: (1) as a broad domain of inquiry composed of all three distinct phenomena; (2) a hierarchical construct modeled as a higher order latent factor; (3) a causal system in which independent PA and NA are treated as inputs to LS; and (4) a composite denoted by the combination of LS, PA, and NA[2] (see Figure 2-2). These competing models lead to diverse operational definitions of SWB and consequently muddy the comparability of empirical findings. For example, researchers that understand SWB as a field of inquiry (Model 1) consider each component to be independent and as such are under no theoretical obligation to study all three components together. Similarly, an understanding of SWB as a causal system wherein PA and NA predict LS (Model 3) may result in studies of LS only as measuring affective well-being may be considered superfluous.

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[2] Busseri & Sadava (2011) also put forward a conceptually partitioned, less common fifth understanding of SWB that asserts different combinations of PA, NA, and LS are configured differently in different people resulting in a categorization of persons into 'hedonic profiles' rather than viewing components as dimensional in nature.

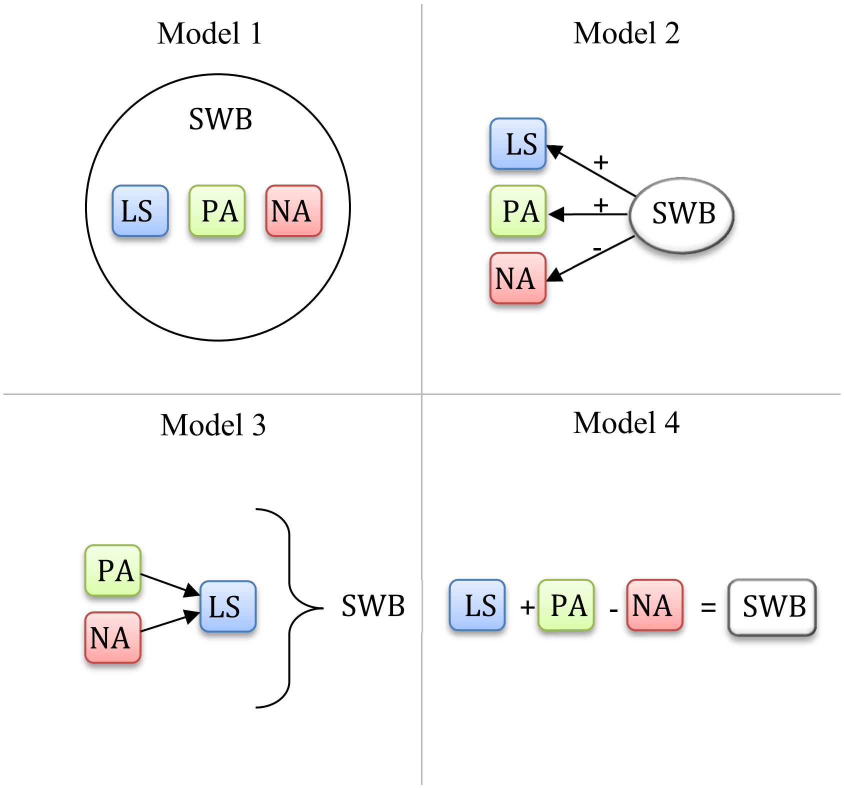

Figure 2-2. Common conceptualizations of global hedonic well-being (Busseri & Sadava, 2011)

A growing body of evidence supports the conceptualization of SWB as a higher order latent factor (Model 2). In one large study Arthaud-day, Rode, Mooney and Near (2005) conducted a series of factor analyses on SWB responses from three large samples of American young adults ($N_1 = 880$, $N_2 = 731$, $N_3 = 1,799$). A variety of commonly employed items and scales were used, differing across samples. The frequently cited Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; α_1=.82, α_2=.86) and singe item Life-3 Delighted-Terrible Scale (Andrews & Withey, 1976) were among the cognitive component measures employed, while the 20 item Positive Affect and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988; PA α_1=.88; NA α_1=.84) and the ten item Affect-Balance Scale (ABS; Bradburn, 1969; PA α_1=.64, α_3=.64; NA α_1=.55, α_3=.62) were used to measure affective components. The researchers investigated whether a one factor (total SWB), two factor (LS and affective well-being), or three factor (PA, NA, and LS) solution best fit the data. A one factor solution may support the idea that measuring LS is sufficient to measure SWB while a two factor solution casts doubt on the independence of PA and NA. Data from each sample revealed that a three factor solution best represented participant responses supporting a hierarchical tripartite understanding of SWB (Arthaud-day et al., 2005). Similarly, Joshanloo (2015) utilized the 12 item Mroczek and Kolarz Scales of positive and negative affect (Mroczek & Kolarz, 1998; PA α=.85, NA α=.84) and the SWLS (α=.85) to demonstrate that a three factor model (PA, NA, LS) fit SWB data provided by over 2,000 Iranian adults better than one or two factor models. In a separate study Joshanloo and Bakhshi (2015) conducted factor analyses on responses of 2,154 American adults in addition to 2,391 Iranian adults on the Mroczek and Kolarz Scales finding further support for the separation of NA and PA.

Recently, Busseri (2015) attempted to compare the four models longitudinally by analyzing data from a sample of middle-aged Americans (N = 3,707) at two time points from the mid 1990's to the mid 2000's. LS was assessed with the single item Cantril Ladder (Kilpatrick & Cantril, 1960) while the Mroczek and Kolarz Scales (PA α =.91, NA α =.85) were used to measure participant affect. Busseri concluded that Models 1 and 4 are substantially limited by an inability to account for the joint relatedness and independence of PA, NA, and LS observed over time. Joint relatedness was demonstrated by strong factor loadings (Model 2) and the significant concurrent effect of PA and NA on LS (Model 3). Independence was demonstrated by unique variance in manifest PA, NA and LS (Model 2) and residual variance in LS unaccounted for by PA and NA (Model 3). However, longitudinal analysis did not produce evidence of a causal relationship between affect indicators and LS over time as would be predicted by Model 3.

Metler and Busseri (2015) conducted further comparative analyses on Models 2 and 3 employing the Cantril Ladder and the PANAS (PA α=.84, NA α=.84) to evaluate the SWB of 452 Canadian university students across a three year period. The researchers report that associations between indicators over time (e.g., $PA_1 \rightarrow PA_2$) were largely accounted for by the relationship between higher order latent SWB over time (e.g., $SWB_1 \rightarrow SWB_2$). In addition to this evidence in support of Model 2, Metler and Busseri (2015) found no evidence of a causal relationship between affect components and LS (Model 3).

Together, this research suggests that studies investigating hedonic SWB should employ techniques that allow for examination of LS, PA, and NA as manifest indicators of a higher order latent SWB construct. While uptake of this framework is evident in research with adults, few studies have conceptualized SWB in this way within an adolescent population. One exception is a study conducted by Eryılmaz (2011). The study analyzed the SWB of 255 Turkish high school students (age 14-16 years) using the SWLS and the PANAS (PA α =.83, NA α =.86). The study found that modelling SWB as a higher order latent construct fit the data well. Further, the study found that select SWB improvement strategies had a moderate positive effect on SWB conceptualised and measured in this way. To my knowledge, no research employing the hierarchical tripartite conceptualization of SWB has been conducted with adolescents with disability.

2.2 Determinants of Subjective Well-being

Improving the subjective well-being of the population at large is now a topic of discussion among researchers and policy makers (Centre for the Study of Living Standards, 2011; Diener et al., 2015; EKOS Politics., 2011; Helliwell, Layard, & Sachs, 2015). For example, former Prime Minister of the United Kingdom, David Cameron, has been an avid public supporter of monitoring SWB as a means to understand the impact of policy. In support of his 2010 campaign for a national well-being monitoring strategy, Cameron was noted to remark "you can't legislate for fulfilment or satisfaction, but I do believe government has the power to improve well-being" (Mulholland & Watt, 2010, para 9). However, debate persists around the 'causes' or determining factors of hedonic SWB and critically, whether it can be improved in a substantive way. Theories around the determinants of subjective well-being tend to reflect one of two positions; (1) that intrinsic factors like genetic predisposition and personality principally determine SWB, and (2) that SWB varies as a function of life conditions and circumstances. Much of the research undertaken over the past decade acknowledges the influence of both intrinsic and contextual factors to at least some extent (Caunt, Franklin, Brodaty, & Brodaty, 2013; Cheng, Cheung, Montasem, & Int. Network Well-Being Studies, 2016; Coyle & Vera, 2013; Rodriguez-Fernandez et al., 2016; Woyciekoski, Stenert, & Hutz, 2012; Woyciekoski, Natividade, & Hutz, 2014).

2.2.1 Intrinsic Factors

Set-point theory posits that there is an inherent, stable well-being baseline or 'set-point' for each individual. As Weiss, Bates and Luciano (2008) explain, major life events may cause temporary deviations, however, people inevitably return to their set-point after a period of time. Those who subscribe to the notion that SWB is intrinsically fixed cite heritability, stable temperament, or personality as the homeostatic force that brings an individual back to their well-being baseline (DeNeve, 1999; Fujita & Diener, 2005; Lykken & Tellegen, 1996). The idea that an individual's subjective judgment of their own well-being is determined wholly by genetic endowment may be a discouraging one. Such a notion implies that communities and governments are incapable of enhancing the subjective well-being of their people through public policy or social initiatives; any attempt made to improve SWB will lose salience overtime providing little evidence of a net positive impact from the perspective of the individual.

There is evidence supporting at least partial acceptance of an intrinsic determinants approach. In one large study Steel, Schmidt and Shultz (2008) examined 1,645 correlation coefficients from 223 studies in an attempt to clarify the relationship between personality and SWB. Steel et al., (2008) present indications of several strong relationships including the link between neuroticism and NA ($\rho = .54$, $k = 24$)[3] and neuroticism and LS ($\rho = -.42$, $k = 12$), as well as extroversion and PA ($\rho = .31$, $k = 24$) and extroversion and LS ($\rho = .29$, $k = 7$). In a national sample of 3,032 American adults Keyes, Shmotkin, and Ryff (2002) similarly found that participants with concurrently low SWB and psychological [eudemonic] well-being (PWB) reported higher levels of neuroticism (mean= 2.77, SD= .63) and lower levels of extraversion (mean= 2.87, SD=.59) relative to persons with concurrently high SWB and PWB (neuroticism: mean= 1.84, SD= .57, $p<.05$; extraversion: mean= 3.51, SD=.47, $p<.05$)[4].

Twin studies have provided further empirical support for set-point theory and hedonic adaptation (Bartels & Boomsma, 2009; Caprara et al., 2009; Lykken & Tellegen, 1996; Lyubomirsky, Sheldon, & Schkade, 2005; Rushton, Bons, & Hur, 2009; Weiss et al., 2008). For example, David Lykken, one of the researchers who coined the term ‘happiness set-point’, cites findings from a study of 131 pairs of American monozygotic twins that suggest that one twin’s SWB score predicts the other twin’s score nine years later better than current income or marital

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[3] ρ= population correlation coefficient, k= number of studies (Hunter & Schmidt, 2004)

[4] SWB was assessed with the Cantril Ladder and Mroczek and Kolarz’s Scales of Positive and Negative Affect (PA items α=.91, NA items α=.87) whereas extraversion (α=.78) and neuroticism (α=.78) were evaluated with measures of the five factor personality dimensions (Lachman & Weaver, 1997).

status (Lykken, 2000). This said, correlations between Time 1 and Time 2 scores for the individual themselves (r= .55, p<.05) or their twin (r= .54, p<.05) are arguably too weak to support an exclusively intrinsically determined model; If SWB was completely 'set' we would expect an individual's scores (on average) to correlate very highly over time. The legitimacy of twin studies in general as evidence of the heritability hypothesis is also contested (Easterlin, 2003a; Headey, 2010a). Huppert (2005) for example suggests that any assumption that monozygotic twins reared together are bound to report similar SBW due to heritability alone is dubious, as gene expression is at least somewhat dependent on life experience, especially the experiences of childhood. Further, distributions of SWB have been found to vary dramatically between countries and as such likely signal much more than individual differences in personality or temperament (Burns, 2011; Helliwell & Wang, 2012; Helliwell, Huang, & Wang, 2015).

The most frequently cited support for hedonic adaptation after a destabilizing event is the case presented by Brickman, Coates and Janoff-Bulman (1978). Brickman et al., report that following a period of adaptation, people who become severely disabled as a result of accident (paraplegia and quadriplegia) are not significantly less happy than controls, who themselves are not significantly less happy than lottery winners. Many researchers have upheld this study as evidence that major life events, whether negatively or positively perceived, do not impact SWB in any meaningful or enduring way and that those impacted will inevitably adapt (see for example: Di Tella & MacCulloch, 2006; Loewenstein & Ubel, 2008; Stones, Worobetz, & Brink, 2011; Wilson & Gilbert, 2008). However, concerns have been raised about the validity of the claims made by the authors of this seminal work. Brickman's support for adaptation is based on the finding that recently disabled participants "did not appear nearly as unhappy as might have been expected" (1978, p. 921) despite reporting significantly poorer SWB than controls. Here, ‘might have been expected’ is not clarified but is apparently intended to be self-evident. Regardless of how one interprets the findings, the sample itself is arguably too small and biased to permit generalization (newly paraplegic or quadriplegic persons n =29; controls n =22) (Headey, 2010; Oswald & Powdthavee, 2008).

In sum, intrinsic factors do appear to be linked to components of SWB, which supports at least partial acceptance of set-point theory. However, the existing evidence does not support the notion that SWB is *wholly* intrinsically determined or fixed by way of hedonic adaptation. Understanding that SWB is not entirely intrinsically determined carves out a space for the possibility of change. The following section considers additional factors that may account for the variance in SWB unaccounted for by intrinsic determinants; specifically, the potential impact of life conditions on SWB.

2.2.2 Life Conditions

Evidence is mounting to support the inclusion of contextual determinants in SWB theory. One strong indication that SWB can be shaped by life conditions is research demonstrating malleability in SWB, occasionally by substantial amounts (Diener et al., 2009; Helliwell et al., 2015; Lucas, 2007). Headey (2010) for instance cites over 20 years of German Socio-Economic Panel (SOEP) data as evidence against set-point theory; almost 20% of this nationally representative adult sample (N= 2,105) reported substantial and persistent changes in life satisfaction (LS) over two decades. These changes occurred in a period of relative peace and economic security in West Germany. Six per cent of the sample gained nearly 1.5 standard deviations on a 10-point scale of life satisfaction, while 13% demonstrated statistically significant, stable declines (Headey, 2010b, p.8). Similarly, Barrington-Leigh (2011) analyzed eleven cycles of the Canadian General Social Survey finding a dramatic increase in the LS of Québécois over the past two decades (1985-2008), relative to residents of the rest of Canada.

An additional body of evidence shows that major life events that dramatically alter an individual's social and/or economic circumstances can have a sustained impact on their SWB. Lucas (2005) utilized 18 annual waves of SOEP panel data to examine the impact of divorce on the life satisfaction of 817 German adults. The researcher concluded that complete hedonic adaptation to divorce does not occur; the average LS of divorcees two or more years post-divorce, remained significantly lower than baseline (three or more years prior to divorce) across the 18 year period ($\beta = -.22$, $SE = .08$, $p < .01$). Repeated bouts of unemployment have also been shown to produce a long-term 'scarring effect' on LS (Lucas, Clark, Georgellis, & Diener, 2004; Luhmann & Eid, 2009) that cannot be accounted for by loss of income alone (Winkelmann & Winkelmann, 1998). Severely debilitating accident or illness may lead to a persistent decrease in SWB (Conceição & Bandura, 2008; Easterlin, 2003b; Mehnert, Krauss, Nadler, & Boyd, 1990). The death of a spouse (Frederick & Loewenstein, 1999; Lucas, Clark, Georgellis, & Diener, 2003; Specht, Egloff, & Schmukle, 2011) or child (Wortman & Silver, 1987) has demonstrated significant detrimental effects on SWB components that remain evident up to a decade later. There too is evidence of significant *improvements* in how people feel and think about their lives. Entry into marriage can persistently improve ones' SWB (Carstensen, Graff, Levenson, & Gottman, 1996; Lucas et al., 2003) as can cosmetic surgery (Frederick & Loewenstein, 1999). In a meta-analysis of longitudinal data from 188 publications (313 samples, $N = 65{,}911$), Luhmann and colleagues (2012) found evidence that many different life events can significantly impact SWB; and, that different experiences impact different hedonic components. For example, after the birth of a child parents report being less satisfied with life in general but also report feeling more positive affect (PA) in their daily lives (Luhmann et al., 2012, p.18).

There is some debate as to whether changes in income have a sustained impact on SWB. The idea that greater economic resources equate to greater SWB at least in as much as it pulls one from poverty is generally agreed upon (Cummins, 2000; Diener & Biswas-Diener, 2002; Frijters, Haisken-DeNew, & Shields, 2004; Howell & Howell, 2008). Whether income can alter SWB beyond this remains a point of contention. Much of the debate centers on the Easterlin Paradox; i.e., that while individual happiness may vary with income, rising incomes on a national scale do not lead to mass increases in SWB (Easterlin, 1974). Easterlin has put 'social comparison' forward as an explanation suggesting that it is only changes in income relative to those around us that will produce concordant changes in how we feel and think about our lives (Easterlin, 2003b; Easterlin, 1995; Easterlin, 2005). However, there is also evidence against this claim (Headey, Muffels, & Wooden, 2008; Pischke, 2011). Stevenson and Wolfers (2008), for example, utilized data from a range of sources including the World Values Surveys (1981-2004), Gallup World Poll (2006), Life in Nation surveys (1958-2007), the Eurobarometer (1973-2007), and several national population surveys to refute the existence of the Easterlin Paradox. The authors report that the SWB-income gradient is not only significant but also robust within countries, across countries, and over time.

Beyond financial factors, evidence suggests that social relationships can influence SWB. Strong informal social networks and community involvement are consistently positively linked to high SWB (Bradburn, 1969; Chou, 1999; Gulacti, 2010; Mochon, Norton, & Ariely, 2011; Wang, 2016). Helliwell and Putnam (2005) for example examined the correlates of LS in pooled data from the Canadian Equality, Security and Community (ESC) survey (years 2000-2003, N=7,483) and correlates of happiness in the United States (US) Benchmark Survey (year 2000, N=28,645). Time spent with friends was positively associated with SWB components in both samples (Canada: β =.51, p<.01; US: β =.52, p<.01); time spent with neighbours (β =.13, p<.01) and increased engagement with community organizations (β =.03, p<.01) were positively linked to happiness in the US sample. Using data from the landmark Framingham Heart Study (N= 4,739), Fowler and Christakis (2008) further demonstrated the social spread of happiness among adults in that when members of an individual's extended social network become happier, they are more likely to report greater happiness and life satisfaction in the future. Looking at the full tripartite construct, Siedlecki, Salthouse, Oishi, and Jeswani (2014) observed that different types of social support may differentially impact SWB components. In a study of 1,111 18-95 year old adults Siedlecki and colleagues found that perceived social support predicted both life satisfaction (β =.18, p<.01) and negative affect (β = -.25, p<.01), while providing support (i.e., supporting others) was predictive of positive affect (β =.13, p<.01).

In summary, set-point theory asserts that SWB must be highly stable over time. Contrary to this assertion, a growing body of evidence is demonstrating malleability in SWB (Diener et al., 2009; Headey, 2010b; Lucas, 2007). Major life events including marriage (Carstensen et al., 1996; Lucas et al., 2003), divorce (Lucas, 2005; Mancini, Bonanno, & Clark, 2011), unemployment (Clark & Oswald, 1994; Lucas et al., 2004; Luhmann & Eid, 2009), and the death of a spouse (Frederick & Loewenstein, 1999; Lucas et al., 2003; Specht et al., 2011) have a demonstrable, long-term impact on SWB. Beyond major life events, there is increasing evidence demonstrating that a number of life conditions may impact SWB including socioeconomic status (Cummins, 2000; Frijters et al., 2004; Pischke, 2011; Stevenson & Wolfers, 2008) and social relationships, including social participation (Bradburn, 1969; Helliwell & Putnam, 2005; Fowler

& Nicholas, 2008). With an understanding that life conditions can play a meaningful role in shaping SWB within adulthood, the potential impact of childhood life conditions on later SWB will be discussed.

2.2.3 The Long-term Impact of Childhood Life Conditions

A large body of research suggests that exposure to persistent socioeconomic disadvantage in childhood is predictive of lifelong health and well-being. Exposure to persistent socioeconomic disadvantage in childhood has, for example, been linked to alcohol and drug addiction (Melchior, Moffitt, Milne, Poulton, & Caspi, 2007; Poulton, Caspi, Milne, Thomson et al., 2002), cancer (Naess, Strand, & Smith, 2007), coronary heart disease (Lawlor et al., 2005; Wamala, Lynch, & Kaplan, 2001), diabetes (Lidfeldt, Li, Hu, Manson, & Kawachi, 2007; Maty, Lynch, Raghunathan, & Kaplan, 2008), periodontal disease (Poulton, Caspi, Milne, Thomson et al., 2002; Thomson et al., 2004), obesity (Ball & Mishra, 2006; Giskes et al., 2008; Laitinen, Power, & Jarvelin, 2001; Langenberg, Hardy, Kuh, Brunner, & Wadsworth, 2003; Power, Manor, & Matthews, 2003), poor self-rated health (Hyde, Jakub, Melchior, Van Oort, & Weyers, 2006; Sheikh, Abelsen, & Olsen, 2014) and depression in adulthood (Gilman, Kawachi, Fitzmaurice, & Buka, 2003).

While far less researched, a small number of studies have explored the impact of socioeconomic status in childhood on later life satisfaction yielding somewhat mixed results. In one study Louis and Zhao (2002) analyzed data from the American General Social Survey (N= 9,024) finding that family socioeconomic status (SES) at age 16 predicts level of life satisfaction (LS) in adulthood, but that this link is no longer significant when adult SES is included in the model. However, the authors caution that as a cross-sectional study relying on adult (age 18-89) memory of ‘childhood’ SES, the results may be subject to recall bias. Sheikh, Abelsen and Olsen

(2014) similarly employed adult recall of childhood factors finding that low childhood SES increased the risk of low adult LS by 24% among men (RR=1.24, 95%CI= 1.18, 1.30) and 26% among women (RR=1.26, 95%CI= 1.19, 1.33, Total N = 12,984). Examining objective indicators of child socioeconomic disadvantage has produced similar results. Bertoni (2015), for example, analyzed population data from eleven European countries (N = 4950) demonstrating that exposure to episodes of food scarcity in childhood is associated with poor LS in adulthood. Conversely, two recent longitudinal studies, both analyzing 1970 British Cohort Study data, found that childhood socioeconomic circumstances had a negligible impact on adult life satisfaction (Frijters, Johnston, & Shields, 2011; Layard, Clark, Cornaglia, Powdthavee, & Vernoit, 2014). The long-term impact of childhood socioeconomic disadvantage on a higher order SWB construct has yet to be explored empirically.

The impact of social relationships in childhood on later SWB is an equally under studied area of research. A small number of studies have explored the effect of adverse social experiences in childhood on components of adult SWB. In one recent study Oshio, Umeda and Kawakami (2013) observed a small but statistically significant link between adult report of bullying in school (ages 7–14) and perceived happiness in adulthood (r = -0.065, p<.001) as well as evidence for partial mediation of this link by adult social support and SES (39.1% mediation, SE= 18.6, p<.05, N =3,292). In analyzing data provided by a large sample of Norwegian adults (N = 12,981) Sheikh, Abelsen and Olsen (2016) similarly found that adult report of bullying or violence in childhood increased individual risk of poor LS in adulthood (RR= 1.48, 95%CI= 1.34, 1.64) even after controlling for age, gender and childhood SES (RR= 1.46, 95%CI= 1.37, 1.51). Conversely, Marion and colleagues (2013) examined the protective potential of positive peer relationships in adolescence on later LS in a 30-year prospective longitudinal study. The researchers observed that friendships at age 15 (reported by the adolescent) moderated the association between adolescent peer rejection (reported by peers) and LS in middle adulthood (age 43-48); Among ‘friendless adolescents’ (n = 74), greater peer rejection predicted lower LS at middle adulthood (r= -.40, p <.01), whereas no impact was found for ‘friended adolescents’ (n = 922, r= .02, p > .05) (p.1303). Having at least one friend in adolescence acted as a buffer or protective factor against the long-term negative impact of peer rejection (Marion et al., 2013). While these studies highlight a potential causal link between social relationships in childhood and later SWB, outcomes remain piecemeal and do not capture the complete SWB construct.

Akin to research examining correlates of SWB, much of the limited research examining the long-term impact of childhood life conditions on future ‘SWB’ uses life satisfaction and/or happiness as a proxy. There is a notable divide between the empirically supported conceptualization of SWB, i.e., a higher-order latent construct, and the amassing body of research that purports to study hedonic SWB. To my knowledge, there is no published research on the long-term impact of childhood life conditions on the full tripartite SWB construct. Further, there is a dearth of research investigating early childhood determinants of later childhood SWB, specifically subjective well-being in adolescence. The current investigation begins to address these gaps by employing longitudinal methods and structural equation modelling to investigate pathways linking socioeconomic status and social relationships in early and middle childhood and adolescence, to adolescent subjective well-being measured as a higher order latent construct.

2.3 Adolescent Subjective Well-Being

In line with growing academic and political interest in the subjective well-being of all people, a substantial research base examining the correlates, effects, and determinants of *adolescent* SWB is beginning to form. High adolescent SWB is associated with a number of positive outcomes including academic success (Bird & Markle, 2012; Heizomi, Allahverdipour, Asghari Jafarabadi, & Safaian, 2015), physical health (Shaffer-Hudkins, Suldo, Loker, & March, 2010), and greater ability to cope with adversity (Coyle & Vera, 2013; Jaafar, Ismuni, Fei, Ahmad, & Hussin, 2014). Consistent with studies investigating SWB across adulthood, research on SWB in adolescence demonstrates that adolescent cognitive and affective evaluations of life are associated with socioeconomic status and social relationships.

2.3.1 The Impact of Life Conditions on Adolescent SWB

Research suggests that adolescent SWB is linked to family socioeconomic status (SES). In the most recent review of the literature related to adolescent SWB, Proctor, Linley, and Maltby (2009) examined 141 studies on adolescent life satisfaction (LS)[5], which they recognize as a “key indicator of SWB” (p.584). The findings indicate that household SES tends to be positively associated with adolescent LS (p.586) while indicators of economic disadvantage (e.g., poorly maintained housing, resource scarcity) appear to be consistently negatively linked to adolescent LS (Proctor, Linley, & Maltby, 2009, p.594-5). More recent research supports these conclusions. Ozdemir (2012) for example, looked at the relationship between parental/household factors and the SWB of 14-19 year old adolescents (N= 643) finding that youth age was positively linked to negative affect (NA), while household income was positively linked to adolescent LS. Hudson (2013) examined data on 6,559 13-17 year old Irish adolescents pulled from the Health Behaviour in School-aged Children (HBSC) Survey finding that gender (male) and high household SES were positively linked to adolescent LS, while age was negatively

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[5] Notably, several studies of adolescent ‘happiness’ were also included in the review (Proctor, 2009)

associated with youth report LS. One recent study conducted by Orkibi and Dafner (2016) examined SWB as a composite construct formed by scores from the Student's Life Satisfaction Scale (SLSS; Huebner, 1991; $\alpha = .85$) and the PANAS for Children (PANAS-C; Laurent et al., 1999; PA $\alpha = .89$ and NA $\alpha = .90$). The researchers observed that adolescents aged 14 to 16 living in low SES neighbourhoods (n= 129) reported significantly lower SWB (Cohens *d*= -.21, p<.05) than their peers housed in middle and high SES neighbourhoods (n= 331).

The link between social relationships and SWB has received considerable attention in youth well-being research (Gilman & Huebner, Sum 2003; Proctor et al., 2009). In a recent study of 401 high school students, Raboteg-Saric and Sakic (2014) found that the presence of at least one high-quality friendship was linked to both high self-reported LS as measured by the SLSS (α =.87) and happiness as measured by the four item Subjective Happiness Scale (SHS, α =.73) (Lyubomirsky & Lepper, 1999). In line with evidence for the social spread of happiness among adults observed within the Framingham Heart Study (Fowler & Nicholas, 2008), Van Workum, Scholte, Cillessen, Lodder and Giletta (2013) found that adolescent happiness can be significantly influenced by the happiness of their peers over time (N= 426). Adolescent SWB has further been positively linked to levels of participation in social activities (Gilman, 2001; Huebner, 1991; Lewis, Huebner, Malone, & Valois, 2011; Orkibi, Ronen, & Assoulin, 2014; Proctor et al., 2009). Trainor, Delfabbro, Anderson and Winefield (2010) examined this link within a sample of 621 tenth grade students noting a positive association between adolescent LS and time spent participating in social activities (r =.22, p<.01), as well as a negative association between adolescent LS and time spent engaging in solo activities (r = -.09, p<.01).

Strong relationships with parents are also positively linked to adolescent SWB both directly and as a protective factor. For instance, Gudmundsdottir and colleagues (2016) analyzed data from 84% of Iceland's population of 14-15 year olds (n= 28,484) to examine how the recent economic crisis impacted adolescent happiness; the authors found that youth who maintained strong bonds with emotionally available parents consistently reported the highest levels of happiness across ten years of data (2000- 2010). Yucel and Yuan (2015) analyzed population level data on 2,617 10-15 year olds finding that parent-child relationship quality explained more variance in youth report LS than victimisation by siblings or by peers. That said, peer rejection and victimisation have been shown to be negatively linked to adolescent SWB across a wide range of studies (Annerback, Sahlqvist, & Wingren, 2014; Goswami, 2012; Jankauskiene, Kardelis, Sukys, & Kardeliene, 2008; Lambert et al., 2014; Lemstra, Nielsen, Rogers, Thompson, & Moraros, 2012). Suldo Gelley, Roth, and Bateman (2015) for example analyzed self-report SWB data provided by 500 American high school students using the SLSS (α =.89) and the PANAS-C; (PA α=.90, NA α=.91). The researchers found that adolescent LS and positive affect (PA) were inversely associated with both overt (LS: r = -.12, p<.01; PA: r = -.20, p<.01) and relational (LS: r = -.18, p<.01; PA: r = -.17, p<.01) peer victimisation, whereas negative affect (NA) demonstrated a positive association (r = .14, p<.01 and r = .27, p<.01 respectively).

Despite the growing body of research examining predictors and correlates of adolescent SWB, there remains a dearth of knowledge on the SWB of adolescents with disability. The life satisfaction review conducted by Proctor and colleagues (2009) briefly touches on research with disabled youth. The authors highlight the gap in research stating that "evaluations of LS among children and adolescents with disabilities are sparse, especially those taking into consideration the specific effects of school and environmental variables" (Proctor et al., 2009, 599). Of the research that has been conducted, the evidence suggests that adolescents with disability in high-income countries tend to report poorer SWB than their non-disabled peers.

2.4 The SWB of Adolescents with Disability

Research into the subjective well-being (SWB) of adolescents with disability is in its infancy. The limited available data suggest that adolescents with disability (broadly defined) in high-income countries tend to report lower levels of happiness or life satisfaction relative to their non-disabled peers. While the available literature provides much needed insight into the way adolescents with disability evaluate their own lives and life circumstances, it remains limited in several respects. First, operational definitions of disability are inconsistent across studies thereby complicating comparison of findings. Second, much of the existing research measures life satisfaction or happiness as a proxy for SWB. No study of adolescents with disability operationally defines SWB as a tripartite construct; consequently whether disability-based differences exist in *complete* adolescent SWB remains unknown. Third, with a few noteworthy exceptions (Emerson, Honey, & Llewellyn, 2008; Emerson, Llewellyn, Honey, & Kariuki, 2012; Emerson, Honey, Madden, & Llewellyn, 2009; Maatta, Hurtig, Taanila, Honkanen, Ebeling, & Koivumaa-Honkanen, 2013), there is a paucity of population-based studies; the vast majority of studies use small, potentially biased samples. Further, much of the existing population-based research does not differentiate between adolescents and young adults. Fourth, existing research investigating disability-based differences in SWB (or components of SWB) has rarely controlled for between group differences in life conditions. Finally, there is a dearth of longitudinal research: To date, no study has investigated the direct and in-direct (mediating) effects of adverse life conditions across childhood on adolescent SWB.

2.3.2 Disability-based differences in subjective well-being

A growing body of research suggests that adolescents with disability face a heightened risk of poor SWB or more specifically, low levels of happiness and satisfaction with life relative to their non-disabled peers. While, to my knowledge, there is no published work exploring SWB conceptualized and measured as a higher order latent construct within this population, several studies have found disability-based differences, or inequality, in components of SWB. The bulk of the available evidence examines disability-based differences in adolescent life satisfaction (LS) without full investigation of separate affective components. Table 2-1 presents published research in high-income countries from the past decade and a half examining the relative global life satisfaction of adolescents with disability, long-term conditions, and or impairments.

Research to date has found that adolescents with a variety of chronic conditions including learning disabilities (McNamara, Willoughby, Chalmers, & YLC-CURA, 2005; Topolski et al., 2004), emotional and behavioral disorders (Sacks & Kern, 2008), mobility impairments (Patrick, Edwards, & Topolski, 2002; Topolski, Edwards, & Patrick, 2005; Topolski et al., 2004), clinical overweight /obesity (Domoslawska-Zylinska & Pyrzak, 2014), and hearing impairment (Gilman, Easterbrooks, & Frey, 2004) report poorer LS than their non-disabled peers. The majority of these studies however are not population-based, and consequently the generalizability of the research findings is questionable.

Emerson and colleagues have published three population-based studies revealing that Australian adolescents and young adults with self-reported disability (defined as an impairment, long-term health condition or disability that restricts participation in everyday activities), express lower LS than their non-disabled counterparts (Emerson et al., 2008; Emerson et al., 2012; Emerson et al., 2009). For instance, Emerson, Honey, and Llewellyn (2008) analyzed data provided by a cross-sectional sample of adolescents and young adults (age 15-29) drawn from the Household Income and Labour Dynamics in Australia (HILDA) survey finding that those with self-report disability (n=558) rated themselves significantly lower in LS than their peers without disability (n=3,423). To the best of my knowledge, only one study to date investigating disability-based differences in adolescent LS employs a longitudinal sample. Määttä and colleagues (2013) examined data from the 1986 Northern Finland Birth Cohort Survey. The researchers found that parent report chronic condition at age 7 only (n=380), age 16 only (n=731), or both at age 7 and 16 (n=456) were not associated with greater risk of poor LS at age 16 relative to ‘typical’ peers (n=4,299).

Table 2-1.

Adolescent self-report global life satisfaction (2000-2015)

Author(s)	**Population**	**Measure**	**Global Life Satisfaction Item(s)**	**Relative Life Satisfaction Outcomes**
(Patrick et al., 2002) (See also Topolski et al., 2005)[1]	Youth age 12-18 with ADHD (n=68); or mobility impairment (MI) (n=52) *Peers (n=116)	Youth Quality of Life-Research (YQOL-R)	General QoL (3) e.g. "I'm satisfied with my life now" [Not at all =0 to A great deal or completely =11]	General QoL, Adjusted Mean: Peer = 86.85 ADHD =79.87, p< .05 MI = 77.91, p< .05
(Edwards, Patrick, & Topolski, 2003)	Students grades 7-12 with self-reported disability (n=220) Peers (n =740)	Youth Quality of Life-Surveillance (YQOL-S)	Perceptual QoL (5) e.g. "Compared to others my age I feel my life is. . ." [Much worse than =0 to Much better than =9 others]	Perceptual QoL, Adjusted Mean: Peer = 79.1 Self-report disability = 66.2, p< .001
(Gilman et al., 2004)	Students age 8-18 who are deaf or hard-of-hearing (D/HH) (n=86) Peers (n=71)	MSLSS with additional Global life satisfaction items	Global LS (7) e.g. "My life is going well" [Strongly disagree =1 to Strongly agree =6]	Global LS, Mean(SD): Peer = 4.54(1.08) D/HH = 3.74(0.88), p< .001
(Topolski et al., 2004)	Youth age 11-18 with ADHD (n=55); or mobility impairments (MI) (n=51) Peers (n=107)	Youth Quality of Life-Research (YQOL-R)	General QoL (3) e.g. "I'm satisfied with my life now" [Not at all =0 to A great deal or completely =11]	General QoL, Adjusted Mean: Peer = 86.18 ADHD = 78.64, p< .05 MI = 77.45, p< .05
(Kef & Deković, 2004)	Blind or visually impaired youth age 14-18 years (n=178) Peers (n= 338)	The Cantril Ladder	Global LS (1) 'which step of the ladder do you currently stand?" [0-10 scale increasing with higher life satisfaction]	Global LS: No significant difference

(McNamara et al., 2005)	Youth age 13-18 with learning disabilities (LD) (n=230); or with LD and ADHD (n=92) Peers (n= 322)	Researcher derived survey	Global LS (1) “I am happy with my life” [Always =1 to Never =4]	Global LS, Mean(SD): Peer = 1.83(.83) LD = 2.27(.89), p< .01 LD & ADHD = 2.27(.95), p< .01
(Barf et al., 2007)	Young adults age 16-25 with Spina Bifida (n=179) Peers (n=132)	Life Satisfaction Questionnaire [LiSat-9]	Global LS (1): “Life as a whole is…” [Very dissatisfying =1 to Very satisfying =6]	Global LS: No significant difference
(Emerson et al., 2008)	Youth age 15-29 with self-reported disability (n=558) Peers (n=3423)	Secondary analysis of HILDA population survey Wave 4	Global LS (1) ‘All things considered, how satisfied are you with your life?” [0-11 scale increasing with higher life satisfaction]	High life satisfaction (>7): Peer =90% Self-report disability =78%, p< .001
(Sacks & Kern, 2008)	Students age 12-18 with emotional and behavioral disorders (EBD) (n=86) Peers (n=99)	Youth Quality of Life-Research (YQOL-R)	General QoL (3) e.g. “I’m satisfied with my life now” [Not at all =0 to A great deal or completely =11]	General QoL, Adjusted Mean: Peer = 85.1 EBD =76.6, p= .006.
(Emerson et al., 2009)	Youth age 15-29 with self-reported disability (n=1037) Peers (n=6857)	Secondary analysis of HILDA population survey Waves 1 and 6	Global LS (1) ‘All things considered, how satisfied are you with your life?” [0-11 scale increasing with higher life satisfaction]	High LS (2001): Peer =88%, Self-report disability =75%, p< .001 High LS (2006): Peer =90%, Self-report disability =76%, p< .001
(Emerson et al., 2012)	Youth age 15-29 with self-reported disability (n=898) Peers (n=7,217)	Secondary analysis of HILDA population survey Waves 1-8	Global LS (1) ‘All things considered, how satisfied are you with your life?” [0-11 scale increasing with increased life satisfaction]	Low LS (<7): Peer =8.6% Self-report disability =15.4%, p= .001 Mean normalized LS: Peer = -0.007 Self-report disability =-0.280, p< .001

(Maatta, Hurtig, Taanila, Honkanen, Ebeling, & Koivumaa-Honkanen, 2013)	Children with parent report chronic conditions (CC) at both age 7 & 16 (n=456), age 7 only (380), age 16 only (n=713) Peers (n=4,299)	Secondary analysis of Northern Finland Birth Cohort (1986) at age 7 and 16 years	Global LS (1) “What is your opinion about your current life situation in general?” [Cannot say =1, Dissatisfied =2, Satisfied =3]	Low LS (Dissatisfied): No significant difference
(Domoslawska-Zylinska & Pyrzak, 2014)	Overweight/ Obese youth age 14-17 (n=76) Peers (n=73)	The Cantril Ladder	Global LS (1) ‘which step of the ladder do you currently stand?” [0-10 scale increasing with higher life satisfaction]	Global LS, Mean(SD): Peer = 7.1(1.1) Obese youth = 5.89 (1.3), p< .01

Note. Number of Global life satisfaction items in brackets. QoL= Quality of Life; LS=Life Satisfaction; *Peers = non-disabled peers

[1] Additional group with ‘facial differences’ (FD; e.g. cleft palate; n=56) compared to youth with MI, ADHD and peers. Youth with FD reported significantly lower general QoL relative to non-disabled peers (p<.025)

Studies investigating disability-based differences in the affective components of adolescent SWB rarely follow theoretical convention, which is to look at PA and NA as separate constructs rather than ends of a continuum (Eryilmaz, 2012; Joshanloo & Bakhshi, 2015; Lucas et al., 1996). The psychological module of the KIDSCREEN-27 is one tool that evaluates affect but integrates positive items (e.g., “been in a good mood”) and negative items (e.g., “felt sad”) rather than separating the two (The KIDSCREEN Group Europe, 2006). Adolescents with diverse diagnosed chronic conditions have participated in studies using the KIDSCREEN with varied results (Dey, Mohler-Kuo, & Landolt, 2012; Dickinson et al., 2007; Janiec, Werner, Sieminska, & Ravens-Sieberer, 2011; Wille et al., 2010). Wille and colleagues (2010) for example used this tool to assess clinically overweight and obese adolescents age 12-16 (n= 1141) relative to an aged matched reference group (n=884) finding higher negative affect and lower positive affect among overweight and obese adolescents. Dickinson et al., (2007) in contrast found no significant difference among children and adolescents with Cerebral Palsy (n=397) and non-disabled peers (n=3,219) with respect to affective components. The KINDL^R is another tool that has been used to assess affect among children and adolescents with disability, although like the KIDSCREEN, it evaluates affect but does not differentiate between negative and positive affective states (Ginieri-Coccossis et al., 2013; Neuner et al., 2011; Perez-Mora et al., 2012; Ravens-Sieberer & Bullinger, 1998; Rotsika et al., 2011; Warner-Czyz, Loy, Tobey, Nakonezny, & Roland, 2011). Ginieri-Coccossis et al. (2013) recently published research using this measure showing that preadolescents with learning disabilities (n=70) reported significantly lower ‘affect balance’ than matched peers (n= 69).

The blending of affective components is a major methodological weakness of the existing literature; Positive and negative affect are not only theoretically distinct (Diener, 1984; Diener, 2000; Diener et al., 1999; Lucas et al., 1996; Oishi et al., 2007; Pavot et al., 1990), but have been empirically shown to be independent constructs (Arthaud-day et al., 2005; Busseri & Sadava, 2013; Busseri & Sadava, 2011; Joshanloo & Bakhshi, 2015; Joshanloo, 2015; Metler & Busseri, 2015). One exception is a recent study conducted by Rueda, Fernandez-Berrocal, and Schonert-Reichl (2014). Rueda and colleagues compared adolescents with Asperger Syndrome (n=42) to non-disabled peers (n=44) on both the Subjective Happiness Scale (SHS; α= 0.57) and the PANAS (PA: α= 0.84, NA α= 0.80) finding that adolescents with Asperger Syndrome reported significantly lower happiness and PA. Uusitalo-Malmivaara and colleagues (2012) also utilize the SHS finding that a sample of special education students age 11-16 (n=75) reported significantly lower happiness relative to non-disabled peers matched on gender and age (n=77).

Beyond the traditional scope of hedonic SWB, it is worth noting that findings have been less consistent when considering disability-based differences in adolescent satisfaction with specific life domains (e.g., satisfaction with school) rather than a global assessment of life satisfaction. For example, the Pediatric Quality of Life Inventory (PedsQL; Varni, Seid, & Rode, 1999) is a problem-focused questionnaire that explores self-report functional and domain specific well-being while not directly addressing global life satisfaction. Some studies utilizing the PedsQL have published results suggesting the comparatively poor domain specific QoL of adolescents with disability relative to their non-disabled peers (Kim et al., 2014; Maher, Olds, Williams, & Lane, 2008) while others report no significant difference (Colville & Pierce, 2010). Watson and Keith (2002) analyzed responses of 140 school age children (grades K-12) on the Quality of Student Life Questionnaire (QSLQ; Keith & Schalock, 1994) finding that students with disability reported lower satisfaction with school and lower social belonging relative to their non-disabled classmates. Similarly, the Multidimensional Students' Life Satisfaction Scale

(MSLSS; Huebner, 1994) has been used to measure levels of satisfaction with various aspects of the lives of children and adolescents with disability. Studies employing the MSLSS to examine potential disability-based differences in the domain specific satisfaction of adolescents yield mixed results (Awan, Samargandi, Aldaqal, & Sehlo, 2014; Brantley, Huebner, & Nagle, 2002; Chong, Mackey, Broadbent, & Stott, 2012; Hatami & Motamed, 2014; Lu et al., 2015; McCullough & Huebner, 2003a). McCullough and Huebner (2003) for example report no disability-based differences across MSLSS domains (i.e., family, friends, school, self, and living environment) in a sample of 80 American adolescents diagnosed with a learning disability and matched non-disabled peers. In contrast Gilman, Easterbrooks, and Frey (2004), found that students age 8-18 years diagnosed as deaf or hard-of-hearing (n=86) reported significantly lower satisfaction in the family, friends, self, and living environment domains compared to 'hearing peers' (n=71).

In summary, the extant literature investigating disability-based differences in components of adolescent SWB highlights an apparent increased risk of poor life satisfaction and less happiness among adolescents with disability. However, this relationship remains poorly understood. There is growing support for the notion that the lower subjective well-being of persons with disability is not an intrinsic function of impairment (Amundson, 2005; Asch, 2001; Wachbroit, 2005). One potential explanation for the noted differences in components of adolescent SWB is differential exposure to socioeconomic disadvantage and adverse or impoverished social relationships.

2.3.1 Disability-based disparities in life conditions

Extensive research shows that families raising a child with disability in high-income countries are more likely to live in poverty and less likely to escape poverty than families who are not supporting a disabled child (Emerson, Shahtahmasebi, Lancaster, & Berridge, 2010; Fujiura & Yamaki, 2000; Parish & Cloud, 2006; Parish, Rose, Grinstein Weiss, Richman, & Andrews, 2008; Shahtahmasebi, Emerson, Berridge, & Lancaster, 2011). In 2006, results from the Participation and Activity Limitation Survey (PALS), which is the most recent national disability survey, found that 19% of Canadian children with disability lived in a household below the low-income cut-off (LICO)[6], compared with 13% of non-disabled children (Statistics Canada, 2008). More recent research also found that Canadian families raising children and adolescents with disability report lower household incomes and heavier financial burdens than population norms (Brehaut et al., 2009; Breitkreuz, Wunderli, Savage, & McConnell, 2014; Cohen, Yantzi, Guan, Lam, & Guttmann, 2013; Garner et al., 2013). In the United States, research has found that families raising a child under age 18 with disability are significantly more likely to experience food insecurity, to have phone services cut due to lack of payment, and to find themselves unable to pay their rent (Parish et al., 2008). In Britain too, the available data suggest that these families are significantly more likely to be living on a below average income and to be unable to afford items commonly possessed by British families (Emerson et al., 2010).

Three alternate hypotheses have been proposed to explain the economic gap between families who are and are not raising children with disability (Emerson & Hatton, 2009). The first hypothesis suggests that the direct and indirect cost of raising a child with a disability increases the risk of falling into poverty and decreases the likelihood of regaining financial security. For example, an inability to access suitable childcare may force mothers to abandon full-time employment thereby reducing family income (Gordon, Rosenman, & Cuskelly, 2007; Parish &

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[6] The low-income cut-off (LICO) is the income below which most Canadians spend at least 20 percentage-points more than the average on the basic necessities - i.e. food, shelter and clothing (Statistics Canada, 2008).

Cloud, 2006). Canadian statistics demonstrate that over half (53%) of parents raising a child with disability report an inability to locate appropriate child care, while nearly half (49%) report disruption of employment as a direct result of trying to meet their child's care needs (Canadian Institute of Child Health, 2000 p.236-237). However, a longitudinal analysis of exposure to poverty in the UK found that, while families supporting a child with disability are more likely to become and remain impoverished than other families with children, these differences are primarily attributable to the characteristics of the family (e.g., parental education) rather than the presence of a disabled child *per se* (Shahtahmasebi et al., 2011). Further research is needed to disentangle the effects of parent and child characteristics. A second hypothesis is that the experience of poverty exposes children to a myriad of harmful environmental and psychosocial hazards that increase their risk of health conditions or impairments linked to disability (Emerson et al., 2012; Emerson et al., 2015). One example is severe pediatric asthma. This condition has been causally linked to poverty through exposure to elements known to impact airway hypersensitivity including dust mites, cockroaches, cigarette smoke or pollutants common in densely populated urban areas (Aligne, Auinger, Byrd, & Weitzman, 2000; Jackson, Kubzansky, Cohen, Weiss, & Wright, 2004; Sarpong, Hamilton, Eggleston, & Adkinson, 1996). The third hypothesis considers the impact of an unmeasured third factor, for example parental intellectual or other disability, on both child disability and family poverty (IASSID Special Interest Research Group on Parents and Parenting with Intellectual Disabilities, 2008; National Council on Disability, 2012).

A small but growing number of studies have also found disability-based differences respect to childhood social relationships, or rather, the quality of childhood social relationships including peer friendship and acceptance, social participation, and exposure to peer victimisation. The available research suggests that at least some groups of children and adolescents with disability may have more difficulty acquiring and maintaining peer relationships relative to non-disabled peers (Brantley et al., 2002; Emerson & Hatton, 2007b; Estell et al., 2008; Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010; Siperstein, Leffert, & Wenz-Gross, 1997). In a study of 398 elementary school children Chamberlain, Kasari and Rotheram-Fuller (2007) found that children with Autism experience far lower peer acceptance and companionship at school than their non-disabled classmates. Similar findings have been reported for children and adolescents with a range of chronic conditions (Estell et al., 2008; Guralnick, Neville, Hammond, & Connor, 2007; Koster, Pijl, Nakken, & Van Houten, 2010). Preliminary analysis of the Canadian National Longitudinal Survey of Children and Youth (NLSCY) Cycle 1 public micro-data[7] (N= 3,434) demonstrated that a greater proportion of preadolescents with disability report being excluded by peers (7.4% vs. 1.8% respectively, p <.01) and feeling like an 'outsider' (13.2% vs. 4.8% respectively, p <.01) relative to their classmates (Savage, 2011).

There are likely many factors contributing to the quality of social relationships for these young people. For instance, on an individual level, children and adolescents with impairments that detrimentally impact social problem solving or emotion regulation (e.g., Autism Spectrum Disorder) may be more likely to be rejected by peers than those who do not have difficulties in these areas (Odom et al., 2006; Solish, Perry, & Minnes, 2010; Wiener, 2004). At the community and societal level, stigma and poor accommodation of individual needs may cultivate and compound the social exclusion of disabled youth (Jamieson et al., 2009; Kalymon, Gettinger, &

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[7] NLSCY public use micro-data is available to Canadian postsecondary faculty, staff and students through the Statistics Canada Data Liberation Initiative.

Hanley-Maxwell, 2010; Law, Petrenchik, King, & Hurley, 2007; McDougall, DeWit, King, Miller, & Killip, 2004; Vignes et al., 2009).

Additionally, the available data suggest that adolescents with disability participate in social activities at a lower rate, and report feeling ‘left out’ at a higher rate, than same age peers (Engel-Yeger, Jarus, Anaby, & Law, 2009; King, Petrenchik, Law, & Hurley, 2009; Kleinert, Miracle, Sheppard-Jones, & Taylor, 2007; Law et al., 2006). Lack of basic accommodation (e.g., modified sporting equipment) is often cited as a barrier to full and equal participation (Engel-Yeger et al., 2009; King et al., 2010; Law et al., 2007). Simply increasing the availability of accessible activities has been shown to increase engagement by children with disability (Abells, Burbidge, & Minnes, 2008; Almqvist, 2006). In addition, Thompson and Emira (2011) suggest that formal leisure staff often lack the training and understanding to actively engage children and adolescents with disability. Anderson, Wozencroft and Bedini (2008) highlight the dual disadvantage facing girls with physical limitations; these youth must not only contend with the general lack of encouragement typically given to girls to engage in sport, but also the stigma and physical barriers to participation with mobility restriction.

Finally, children and adolescents with disability appear to be more likely than their non-disabled peers to be exposed to victimisation, including high rates of bullying or harassment in school and community settings (Chan, Emery, & Ip, 2016; Cummings, Pepler, Mishna, & Craig, 2006; Flynt & Morton, 2004; Humphrey & Hebron, 2015; Jones et al., 2012; Lindsay & McPherson, 2012; Rose, Monda-Amaya, & Espelage, 2011; Rose, Simpson, & Moss, 2015; Son, Parish, & Peterson, 2012). In the US in 2011, for example, disabled adolescents aged 16 to 19 had an average annual unadjusted rate of violent victimisation (123 per 1,000) over three times higher than peers without disability (37 per 1,000) (Harrell, 2012). Jones and colleagues (2012) further found that children and adolescence with disability were at a significantly higher risk of violence in a meta-analysis of 11 studies from high-income countries (Pooled OR= 3.68, 95%CI 2.56–5.29).

2.3.3 The impact of life conditions on subjective well-being

Despite evidence demonstrating the relatively poor life conditions of adolescents with disability, and research showing that poor life conditions negatively impact SWB in adolescents without disability, there is a paucity of research investigating the impact of life conditions on the subjective well-being of adolescents with disability. Adolescents with disability report that social relationships by way of participation in social activities of their choosing, being with friends, feeling valued and capable, and having the support of friends and family are important to their subjective well-being (Foley et al., 2012; Garrod & Oakes, 2014; Shikako-Thomas et al., 2009; Uusitalo-Malmivaara et al., 2012). Participation in team sport as well as freedom in leisure pursuits have also been positively linked to the life satisfaction (LS) of preadolescent boys with developmental coordination disorder (age 10-13; N=173) (Poulsen, Ziviani, Johnson, & Cuskelly, 2008). In addition, Maher, Toohey and Ferguson (2016) found that adolescents with cerebral palsy (N=70) who reported greater participation in physical activities also rated themselves as happier. The life satisfaction of children with diagnosed hearing impairments has also shown a significant positive association with participation in sport and social activity (Karademir, 2012).

Beyond leisure participation, support from peers appears to be positively associated with subjective well-being among adolescents with disability. Uusitalo-Malmivaara and colleagues (2012) for example found that Finnish special education students (n= 77; age 11-16) reported significantly lower subjective happiness than gender and age matched non-disabled peers (n=77).

When asked what would make them happier, the most common response among students with disability was ‘more friends’ (p.429). Supportive friendships have been shown to act as a protective factor for adolescents with disability against anxiety and depression (Mcdougall, 2006). Kef and Deković (2004) describe a significant positive linear relationship between peer support and subjective happiness among visually impaired adolescents (N=178). Further, there are data showing that peer exclusion and victimisation have a negative association with subjective well-being among children and adolescents with disability (Cummings et al., 2006; Flynt & Morton, 2004; Lindsay & McPherson, 2012). In a recent multi-national secondary data analysis (N=55,030) Sentenac and colleagues (2013) found that youth with disability ages 11-15 years were more likely to report being bullied than same age peers in 11 western countries, and exposure to bullying was negatively associated with self-rated health and life satisfaction.

Recent research suggests that the SWB gap between adolescents with and without disability may be explained, in part, by differential exposure to adverse life conditions. Edwards, Patrick and Topolski (2003) found that adolescents with self-report disability (n= 220) reported a lower subjective quality of life than their non-disabled peers (n= 740), however when controlling for hypothesized correlates of quality of life (e.g., adverse family and peer relationships) no statistically significant difference was found. Analyzing nationally representative data at two points in time (2001, N= 3,465; 2006, N= 3,392) Emerson, et al. (2009) found that Australian young people with disability aged 15-29 years consistently report poorer LS, lower social support, and greater financial hardship than their non-disabled counterparts. The study further found that under conditions of low financial hardship and high social support, youth with disability reported levels of LS that were not significantly different from their non-disabled peers. Similarly, Emerson and colleagues (2012) examined the LS and psychological health of a nationally representative group of Australians ages 15-29 years utilizing two additional waves of the same population dataset (2004, N= 3,360; 2008, N= 3,557). The researchers found that the lower LS and poorer health reported by those with disability could be largely explained by higher exposure to adverse life conditions (e.g., unequal access to personal, economic, material, social, and community resources) rather than individual long-term condition or impairment. Research has found that differences in the mental and physical health of young adults (Honey, Emerson, & Llewellyn, 2011) and children (Emerson & Hatton, 2007a) with disability may be at least partially explained by concurrent socioeconomic disadvantage and social adversity.

There are a number of ways differential exposure to adverse life conditions, specifically low household socioeconomic status and impoverished social relationships, may explain the observed disability-based differences in adolescent SWB (and or SWB components). The link between disability and adolescent SWB may be spurious, with adverse life conditions being a common cause of both disability and low adolescent SWB (see Figure 2-3). Alternatively, there are potentially a number of paths connecting disability, adverse life conditions, and adolescent SBW (see Figure 2-4). One plausible hypothesis is that disability indirectly affects (mediates) the link between adverse life conditions and poor adolescent SWB. For example, children raised in a household with low socioeconomic status may be exposed to harmful environmental and psychosocial hazards associated with poverty that may increase their risk of health conditions or impairments linked to disability (Emerson et al., 2012; Emerson et al., 2015) which could then increase their risk of poor SWB. Another plausible hypothesis is that life conditions mediate the relationship between disability and SWB. For instance, families raising a child with disability may be at greater risk of low socioeconomic status due to the direct and or indirect costs (e.g., decreased parental workforce participation) of caregiving, which in turn may lead to poor adolescent SWB. However, these paths are not mutually exclusive: there may be a number of mediating effects, including non-recursive and or recursive paths.

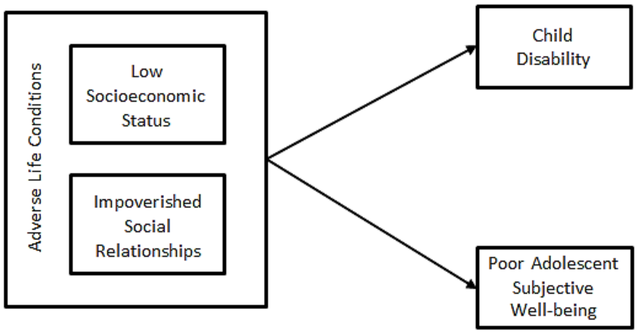

Figure 2-3. Plausible spurious relationship between disability and SWB

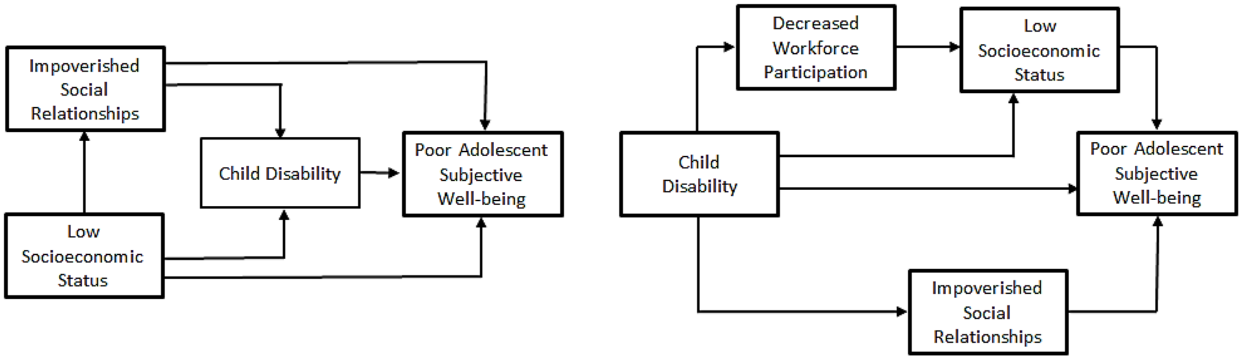

Figure 2-4. Example path models explaining the relationship between disability and SWB

Disability-based differences, or inequalities, in adolescent SWB remain poorly understood. Despite research showing the relatively poor life conditions of adolescents with disability, and evidence demonstrating that adverse life conditions are negatively linked to SWB in adolescents without disability, there is a death of research investigating the impact of adverse life conditions on the subjective well-being of adolescents with disability. This absence may be partially due to what Amundson (2005) describes as the 'standard view': i.e., that disability has an inherently negative effect on subjective well-being. Recent research counters this view by suggesting that the disability-based SWB gap in adolescence may be explained, at least in part, by differential exposure to adverse life conditions. The primary focus of the current investigation is to examine the plausible mediating role of life conditions, specifically socioeconomic status and social relationships (i.e., peer friendship and acceptance, exposure to peer victimisation, and social activity/participation) across childhood, in explaining the relationship between disability identified at age 4-5 years and adolescent subjective well-being (see Figure 2-5).

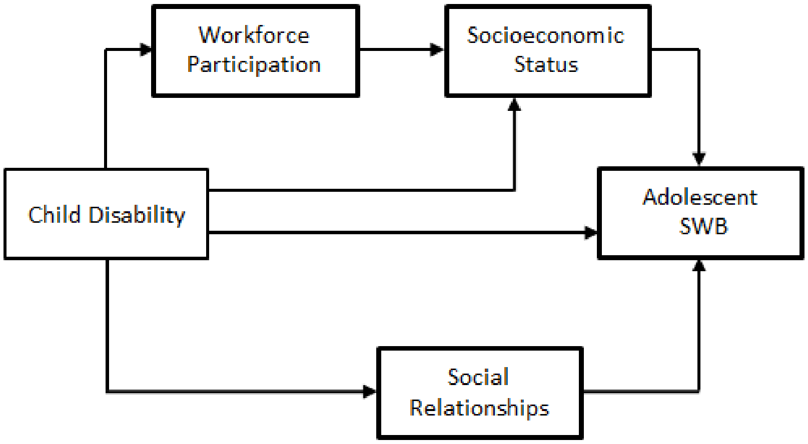

Figure 2-5. Heuristic of hypothesized relationships tested in Study 2

2.5 Summary

In summary, hedonic subjective well-being (SWB), defined as 1) life satisfaction or 'happiness' with life, 2) the presence of positive affect, and 3) the relative absence of negative affect, is increasingly considered an important measure of social progress (Helliwell et al., 2015;

OECD, 2013; Proctor et al., 2009; Royal Government of Bhutan, 2012; Stiglitz, Sen, & Fitoussi, 2009; United Nations, Department of Public Information, 2012). Despite growing interest in SWB, how to go about improving the subjective well-being of the population at large, or critically, *if* SWB can be improved, continues to be debated (CSLS, 2011; Diener et al., 2015; EKOS Politics, 2011; Helliwell, Layard, & Sachs, 2015). The theoretical approaches most frequently brought to this debate include those focused on the inherent immutability of SWB, and theories that emphasize the malleability of SWB to life conditions. While intrinsic factors appear to be linked to components of SWB, the existing evidence does not support the notion that SWB is wholly intrinsically determined. Rather, research supports the notion that life conditions play a meaningful role in shaping SWB within adulthood and potentially across the life span.

Exploring adolescent SWB is an area of research that is gaining momentum. Understanding disability-based disparities in SWB is a new branch of this research. Mounting evidence suggests that adverse life conditions are linked to SWB in adolescents without disability, and, that adolescents with disability are more likely to be exposed to those adverse life conditions. This differential exposure to adverse life conditions, specifically low household socioeconomic status and impoverished social relationships, may therefore explain the observed disability-based differences in adolescent SWB.

While existing research with disabled adolescents provides valuable insight into their subjective well-being, it suffers from five substantial limitations. First, disability is operationally defined inconsistently thereby complicating cross-study comparison of findings. Second, to date, no studies have investigated the SWB of adolescents with disability utilizing the full tripartite construct. Third, with a few notable exceptions (Emerson et al., 2008; Emerson et al., 2012;

Emerson et al., 2009; Maatta, et al., 2013), the majority of studies investigating the SWB of adolescents with disability rely on non-probability samples that may not be representative of the greater population. Fourth, existing studies that examine relative differences in SWB (or components of SWB) between adolescents with disability and their non-disabled peers have rarely controlled for between group differences in life conditions. Finally, the available research is largely cross-sectional and as such does not allow for examination of the direct and mediating effects of adverse life conditions across childhood on adolescent SWB.

This investigation aims to redress the limitations of the existing evidence-base by (1) employing a broad operational definition of disability that is consistent the UNCRPD (Article 1), as well as a number of recent studies of disability-based differences in SWB or components of SWB (Edwards et al., 2003; Emerson et al., 2008; Emerson et al., 2012; Emerson et al., 2009), thereby permitting more valid comparisons of study findings; (2) using statistical techniques that allow for examination of LS, PA, and NA as manifest indicators of a higher order latent SWB construct; (3) comparing the SWB of adolescents with and without disability in a population representative sample; (4) investigating disability-based differences in life conditions linked to adolescent SWB including socioeconomic status and social relationships; and (5) determining whether any observed disability-based difference in adolescent SWB could plausibly be attributed to between-group differences in life conditions across childhood.

The following chapter will detail the method used to address the primary objectives of this investigation: (1) to develop a cross-sectional profile of the life conditions and (components of) subjective well-being of Canadian adolescents with disability relative to their non-disabled peers; and (2) to examine the potential mediating role of life conditions, specifically socioeconomic status and social relationships measured in early and middle childhood and adolescence, in explaining the relationship between disability identified at age 4-5 years and adolescent subjective well-being.

CHAPTER 3. METHOD

The current investigation was designed as two complimentary studies. This chapter will detail the methodology of both studies. The purpose of Study 1 was to construct a profile of the life conditions and subjective well-being (SWB) of adolescent Canadians with disability. It provides a 'snapshot' of comparative life conditions, subjective well-being components, and other indicators of how adolescents are faring at a specific point in time. Study 2 examines the potential mediating role of life conditions, measured at three points across childhood, in explaining the hypothesized relationship between disability identified at age 4-5 years and adolescent subjective well-being. The second study is divided into three stages: (1) exploring the relationship between disability and household socioeconomic status across childhood, (2) exploring the relationship between disability and social relationship across childhood, and (3) investigating the pathways between disability and adolescent subjective well-being by way of household socioeconomic status and social relationships (i.e., peer friendship and acceptance, peer victimisation, and social participation). Specific hypotheses are listed in Section 3.3.4.

Approval was sought from Statistics Canada via the Social Sciences and Humanities Research Council (SSHRC) to gain access to seven biennial cycles of nationally representative Canadian data. The application to access confidential micro data files within the University of Alberta Research Data Centre (RDC) was then approved by Statistics Canada (Project ID: 11-SSH-UAB-2876). Ethics approval for this study was granted by the University of Alberta Research Ethics Office (Study ID: Pro00029484).

3.1 Research Design

The methodology of this investigation is secondary data analysis of the Canadian National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY follows a number of childhood cohorts over a fourteen-year period: 1994/95 - 2008/09. The stated objective of the survey is to monitor the prevalence of selected biological, social and economic factors thought to influence child development over-time as a means to inform Canadian policy and program development (Statistics Canada, 1996). The resultant database permits extensive research at the national level and production of both cross-sectional and longitudinal estimates.

3.1.1 Strengths and limitations of secondary data analysis

A large and representative sample is a core strength of secondary analysis of population-based datasets like the NLSCY. A substantial sample allows for greater statistical power and more complex statistical modelling (Bryne, 2010; Kline, 2010). National level datasets may also capture sub-groups of the population that are difficult to locate and follow over long periods (Hofferth, 2005). This point is especially relevant when studying minority groups, such as young people with disability. The notable rigor evidenced by large government maintained datasets encourages acceptance by academic peers and reduces the need for meticulous justification of data collection methods by researchers analyzing and interpreting the resultant data (Hofferth, 2005). Access to population-based datasets also reinforces academic integrity by facilitating replication and expansion of seminal work using identical data (Duncan, 1991).

Generalizability of study findings adds much to the appeal of population-based datasets. The design and implementation of national longitudinal surveys are often informed by diverse professional expertise beyond what is reasonable to expect from a small research team. This additional resource allows for complex sample designs and weighting systems that permit secondary researchers to generate population based estimates both cross-sectionally and over time (Boslaugh, 2007; Carle, 2009; Statistics Canada, 2010b). Nationally representative datasets characteristically have systematic procedures in place to maximize response rates thus reducing potential bias and maintaining population representation (Hofferth, 2005). Great lengths are frequently taken to retain participants. In the case of the NLSCY, policy dictates that should an interviewer be unable to gather follow-up data on a particular case, that case is reassigned to a senior interviewer and further attempts are made (Statistics Canada, 2010b). The resources required for this level of follow-up bolster response rates but are often beyond the capacity of a single research team.

An additional pragmatic benefit to secondary data analysis is a considerable decrease in time and financial investment (Boslaugh, 2007; Duncan, 1991). Investigating pathways linking life conditions in early and middle childhood to outcomes in adolescence requires a substantial amount of data spanning a vast period of time. This manner of investment in data collection necessitates ample and consistent financial backing, a sizeable qualified research team, and a decisive organizational structure with embedded protocol for inevitable employee turnover. The intensive structure required simply isn't practical for most established researchers let alone early career researchers and students (Brooks-Gunn, Phelps, & Elder, 1991).

Despite the advantages of secondary data analysis there are considerable drawbacks to these sources. Perhaps most apparent is that the data selected for collection is completely outside the control of the end-user. Consequently research aims may have to be altered to suit what data are available (Boslaugh, 2007; Duncan, 1991). Some research questions may simply be unanswerable given the design of available datasets (e.g., consistency, breadth, depth and scope of survey items). Many national surveys focus on breadth rather than depth of information and in doing so may take methodological short cuts (e.g., using un-validated short versions of measures or outdated measures) that impact items available for use. A great deal of time must be invested by the researcher to investigate each available dataset and discern which might be most applicable to their research question(s). Once chosen, learning the ‘ins and outs’ of a specific dataset may take additional time and resources (Hofferth, 2005). The secondary analyst must become as familiar as possible with the limitations of a chosen dataset to avoid unintentionally going beyond the scope of what conclusions can reasonably be drawn (Boslaugh, 2007).

It has been suggested that data-mining may be a consequence of easy access to secondary datasets which could cast doubt over findings (Hofferth, 2005). Several sources of nationally representative data have put measures in place to mitigate issues of data-mining as well as concerns around participant anonymity. Statistics Canada speaks to these concerns via access restrictions maintained by the Data Liberation Initiative (DLI) and Research Data Centre (RDC) network (Statistics Canada, 2012; Statistics Canada, n.d.). To access complete datasets held by these federal bodies a researcher must be affiliated with an authorized organization or institution, submit a research proposal to be approved by Statistics Canada, pass security clearance, and become a deemed Statistics Canada employee. Even after meeting these requirements data is only to be analyzed within the walls of the local RDC; final results may only be removed after approval of an RDC manager. While such measures encourage adherence to scientific rigor and ensure participant privacy, they also add numerous complications to the research process which may deter some from attempting to tap into the wealth of data held by large, government databases.

3.1.2 The National Longitudinal Survey of Children and Youth

Analysis of the NLSCY databases permits detailed research at a national level. Population representation varies depending on the selected cohort (i.e., the original v. the early childhood development [ECD] cohorts), scope (i.e., longitudinal v. cross-sectional), and time point (e.g., only ECD cohorts are considered cross-sectionally representative of the current

Canadian population beyond the year 2000). The current investigation focuses on the original, longitudinal NLSCY cohort. When appropriate weighting procedures are employed, the original longitudinal cohort is representative of children living in any Canadian province aged 0-11 years as of December 31, 1994 (Statistics Canada, 1996). The composition of the original and ECD NLSCY cohorts are illustrated in Figure 3-1.

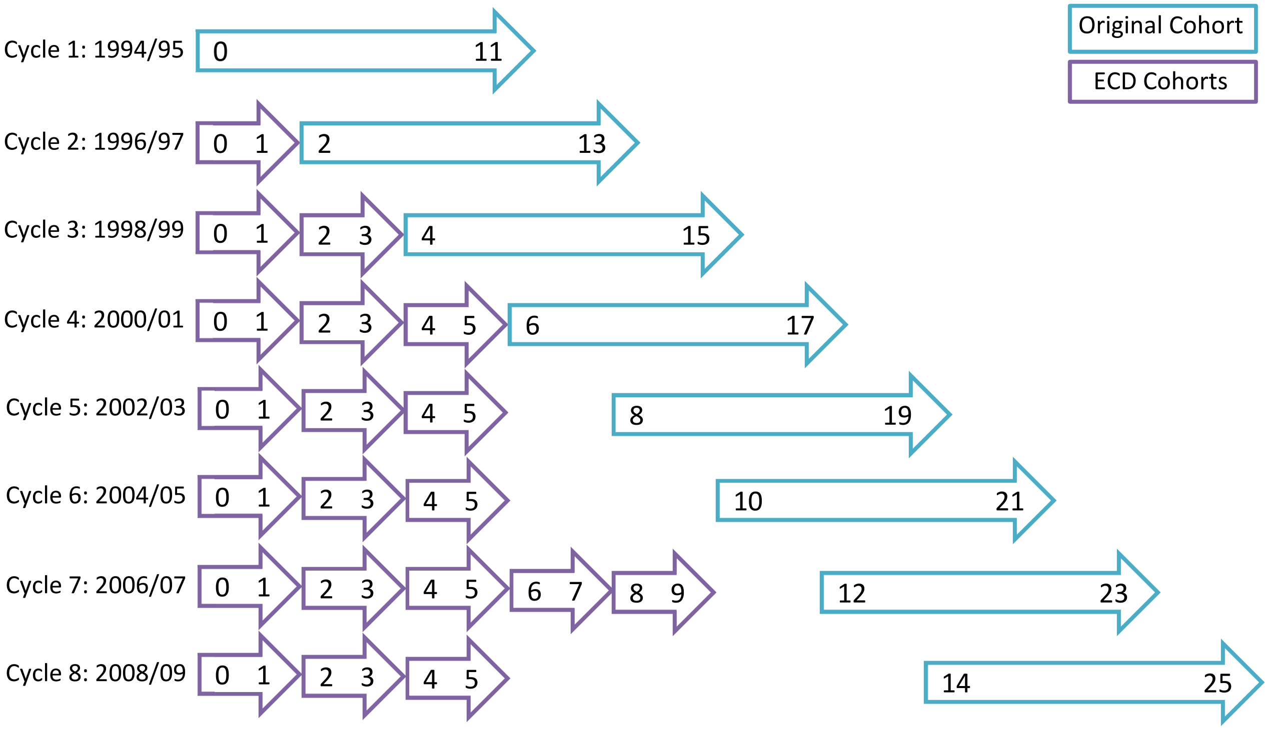

Figure 3-1. Original and ECD cohorts: Age range of children at each NLSCY cycle

Children represented in the original NLSCY cohort were selected from households sampled by Statistics Canada’s Labour Force Survey (LFS) and the National Population Health Survey (NPHS). In line with the vast majority of Canadian population surveys, ‘national representation’ refers to persons residing in the ten Canadian provinces (i.e., 98% of the population) (Statistics Canada, 1996). This sample does not contain nor represent children residing in the territories (the Yukon, Nunavut and the Northwest Territories), on First Nation's reserves, on military bases, or those living in institutions. The original cohort was followed over 14 years culminating in 2008 with the eighth and final Cycle. Due to budget constraints all children selected from the NPHS (n=5,000) were dropped at Cycle 2, and the maximum number of children that could be surveyed in any one household was reduced from four to two (Statistics Canada, 2002). As there is no longitudinal data on these children they were not included in the current investigation. See Table 3-1 for respondent counts and response rates over the eight NLSCY cycles.

Table 3-1.

NLSCY Original Cohort: Response Rates

Cycle	Year	Child Age Range	Total Respondents	Response Rate	Cumulative Response Rate
Cycle 1	1994 - 95	0-11	22,831	86.5%	-
Cycle 2	1996 - 97	2-13	15,391	91.5%	79.1%
Cycle 3	1998 - 99	4-15	14,777	89.2%	76.0%
Cycle 4	2000 - 01	6-17	13,173	84.5%	67.8%
Cycle 5	2002 - 03	8-19	12,280	81.3%	63.1%
Cycle 6	2004 - 05	10-21	11,178	82.4%	57.6%
Cycle 7	2006 - 07	12-23	10,966	80.5%	56.6%
Cycle 8	2008 - 09	14-25	10,208	68.0%	52.7%

Source: National Longitudinal Survey of Children and Youth, Cycle 8 – User Guide

Data collection. Statistics Canada employees collected data through computer-assisted interviewing (CAI) methods and paper questionnaires. The majority of data collected on children over age 10, and all data collected on those less than 10 years, was reported by the person most knowledgeable (PMK) about the child; i.e., the child's primary caregiver. The PMK was most frequently the child's mother, but in some cases was the father, a step-parent, or an adoptive parent living in the same dwelling. Data collected from the PMK were gathered by way of computer assisted personal interviewing (CAPI) or computer-assisted telephone interviewing (CATI). CAI methods were employed to ensure appropriate and consistent technique across interviewers and to limit errors that may threaten data quality (Statistics Canada, 2010b).

Children aged 10 and older were asked to complete their own questionnaire independent of the PMK. CAI methods were not utilized in youth data collection. While data pulled from the child self-complete surveys provides much-needed self-report data, it is of note that this data source does not capture all children's voices directly. Those with profound intellectual or physical impairment are likely unaccounted for due to limitations of data collection. Children who were unable to complete a pencil and paper questionnaire, or alternatively, respond to questions verbally with a researcher over the phone, are not represented[8].

3.1.3 Study Samples

Two samples were drawn from the original cohort to address the aims of each study: (1) to profile the life conditions and subjective well-being (SWB) components of adolescent Canadians with disability relative to same age peers; and (2) investigate pathways linking disability, socioeconomic status, and social relationships in early and middle childhood, to subjective well-being in adolescence. The Study 1 sample was comprised of all adolescents age 14-15 years in either of the two most recent NLSCY cycles (7 or 8) regardless of participation in

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[8] Email correspondence with Pierre Bérard; Data Dissemination Officer for Statistics Canada: "We do not have any special instructions regarding children or youth with disability. We do not have any variable on the master data files that indicates if a child received assistance to complete the self-complete questionnaire by the interviewer, or if the self- complete was done over the phone. We also do not indicate why a child or youth did not complete the self-complete portion of the NLSCY questionnaire" (30/08/2010).

previous cycles (N=4,415). Appropriately weighted, this sample is representative of Canadian adolescents born in the early 1990's, specifically 1991 to 1994.

A longitudinal sample was drawn to address the aims of the second study; three chronological age groups are represented: age 4-5 years [early childhood or EC], age 10-11 years [middle childhood or MC], and age 14-15 years [adolescence or AD]. To maximize sample size, age groups were stacked by selected chronological age ranges. Children aged 4-5 years in Cycle 2 or 3 were merged to create the early childhood group. As these children grew to age 10-11 years they became the middle childhood group (now in Cycle 5 and 6 respectively). These same cases are examined again at age 14-15 years as they reach adolescence (in Cycle 7 and 8 respectively). Cycle 2 was selected as a starting point rather than Cycle 1 to avoid a myriad of Cycle 1 specific issues including, but not limited to, restricting cases to two children per household and dropping all NPHS sourced cases post Cycle 1 (Statistics Canada, 2010b, p.23-24). The longitudinal dataset affords exploration of the social, economic, and personal trajectories of NLSCY children who remained in the study for a full decade (early childhood through to adolescence, Cycle 2-3 to 7-8). Table 3-2 illustrates how the stacked samples were drawn from the original longitudinal cohort.

Table 3-2.

Stacked samples drawn from original NLSCY cohort

Age in 94’	**Cycle 1 94-95**	**Cycle 2 96-97**	**Cycle 3 98-99**	**Cycle 4 00-01**	**Cycle 5 02-03**	**Cycle 6 04-05**	**Cycle 7 06-07**	**Cycle 8 08-09**
0	0	2	4	6	8	10	12	14
1	1	3	5 (n=3,507)	7	9	11 (n=2,825)	13	15 (n=2,501)
2	2	4	6	8	10	12	14	16
3	3	5 (n=2,928)	7	9	11 (n=2,179)	13	15 (n=1,914)	17

Early Childhood [EC]
(n=6,435)

Middle Childhood [MC]
(n=5,004)

Adolescence [AD]
(n=4,415)

3.2 Item Selection

Peer-reviewed research was examined to explore ways of operationalizing central concepts including but not limited to disability, subjective well-being, household socioeconomic position and social relationships. A detailed description of all measures pulled from the NLSCY database, including corresponding database variable codes, indicator labels and response categories can be found in Appendices A (Study 1) and B (Study 2).

3.2.1 Operational Definition of Disability

Researchers utilizing the NLSCY have operationally defined disability in various ways. This variation reflects, in part, changes across NLSCY Cycles in items that could conceivably be used to operationally define disability. Ferro and Boyle (2013) for example utilized a checklist of reported chronic conditions, available in Cycle 6, to identify ‘physical illness or developmental disability’ in youth age 10 to 19. This approach reduces disability to, or equates it with the presence of a chronic health condition or impairment. Other researchers have operationally defined disability on the basis of child functioning (e.g., speech, mobility, dexterity, cognition) and/or a measure of activity limitations and participation restrictions associated with (but not assumed to be directly caused by) a chronic condition. Burton, Lethbridge and Phipps (2008) for instance, defined a ‘disabled child’ as one who: has broad participation restriction or participation restriction due to asthma; a diagnosis of bronchitis, heart condition, epilepsy, cerebral palsy, kidney condition or mental health condition; or cannot see even with glasses, cannot hear without an aid, or cannot walk without mechanical assistance (p. 1172).

The second approach was taken in the current investigation. That is, children and adolescents with disability were ‘identified’ on the basis of limitations in functioning, activity limitations or participation restrictions associated with a chronic condition or impairment (e.g., physical, intellectual, sensory). One reason why this approach was taken is that it is arguably more congruent with the way in which persons with disability are ‘identified’ in the UNCRPD. Accordingly, persons with disability “include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (UNCRPD Art. 1). Disability has also been operationally defined in this way (or in a similar way) in a number of recent studies of disability-based differences in subjective well-being (SWB), or components of SWB (Emerson, Honey, & Llewellyn, 2008; Emerson, Llewellyn, Honey, & Kariuki, 2012; Emerson, Honey, Madden, & Llewellyn, 2009). Defining disability in this way therefore permits more valid comparisons of study findings.

Study 1 utilizes data from Cycles 7-8 to identify adolescents with disability. Study 2 utilizes data from Cycles 2-3 to identify children with disability at age 4 to 5 years. In this way Study 2 may be thought of as prospective; children are identified as ‘disabled’ in early childhood then followed for a decade to investigate pathways linking disability, socioeconomic position, and social relationships to subjective well-being in adolescence. However, due to changes over time (from Cycles 2-3 to Cycles 7-8) in the scope, structure and availability of items, the operational definitions of disability used in studies 1 and 2 are not identical.

Adolescents with disability were identified, in Cycles 7 and 8, based on PMK responses to four questions. Three of the questions were designed to collect information on activity limitations or participation restrictions. Specifically, the PMK was asked "*does a physical condition or mental condition or health problem* [that has lasted or is expected to last 6 months or more] *reduce the amount or the kind of activity this child can do* (1) *at home* [_HLCDQ5B]; (2) *at work or at school* [_HLCDQ5C]; or (3) *in other activities, for example, transportation, play, sports or games* [_HLCDQ5D]'. The fourth question collected information on functional limitations. Specifically, the PMK was asked, "*does this child have any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities?* [_HLCDQ5A]" Response options for all four questions were 1 = yes, sometimes, 2 = yes, often, and 3 = no. For the purposes of this study, disability was operationally defined as a PMK response of "yes, sometimes" or "yes, often" to any one or more of these four questions.

Children with disability were identified, in Cycles 2 and 3, in two ways. First, children were categorized as disabled if the PMK responded yes to the question "*does this child have any long term conditions or health problems* [that has lasted or is expected to last 6 months or more] *which prevent or limit his/her participation in school, at play, or in any other activity for a child of his/her age* [_HLCQ45L]". Second, children with disability were identified using the PMK completed Health Utilities Index (HUI; Horsman, Furlong, Feeny, & Torrance, 2003). Developed at the McMaster University's Centre for Health Economics and Policy Analysis, the now well validated HUI assesses eight functional dimensions - vision, hearing, speech, mobility, dexterity, cognition, affect, and pain and discomfort (Horsman et al., 2003). Total HUI scores range from 0.0 to 1.0, with 1.0 representing highest overall function. A total HUI score equal to or less than 0.88 denotes disability, defined as a reduced level of function that cannot be corrected (e.g., with technical aids) and/or prevents activity participation (Elliott & Mares, 2012; Feng, Bernier, McIntosh, & Orpana, 2009; Gariepy, Wang, Lesage, & Schmitz, 2011; Santana et al., 2010).

3.2.2 Adolescent Subjective Well-being

Items were selected from the Cycle 7 and 8 NLSCY youth self-report questionnaire to measure the three components of SWB: Life satisfaction, positive and negative affect. Life satisfaction was measured by the item, “in general, I am happy with how things are for me in my life now”, with 4 response options, ranging from 1 = strongly disagree to 4 = strongly agree. The youth questionnaire does not include a positive and/or negative affect scale, such as the Positive Affect and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999). Scales were therefore purpose-created, by pulling items in the youth questionnaire that most closely approximated items in commonly employed affect scales (e.g., Bradburn, 1969; Diener et al., 2010; Laurent et al., 1999; Mroczek & Kolarz, 1998; Watson, Clark, & Tellegen, 1988). Items selected to assess positive affect include measures of pride, “I have a lot to be proud of”, esteem, “a lot of things about me are good” and enjoyment, “I enjoy the things I do” with 4 response options ranging from 1 = false/mostly false/rarely true of me, to 4 = true/very often true of me. Items selected to assess negative affect include measures of relative unhappiness, “I am not as happy as other people my age”, sadness, “I am unhappy or sad”, and apathy, “I have trouble enjoying myself” with 3 response options ranging from 1 = never or not true, to 4 = often or very true.

In addition to items measuring components of subjective well-being, supplementary indicators of how adolescents were faring were included in Study 1 (see Appendix A for details). The purpose of including these additional variables in the analysis was three-fold. Firstly, by including these variables in the analysis a more comprehensive profile of adolescents with disability could be created. Secondly, with these variables included in the analysis, a more detailed comparison could be made between the NLSCY sample and samples of adolescents drawn in other studies, facilitating a more informed comparison and contrast of study findings. Third, the inclusion in the analysis of supplementary indicators of how the adolescents were faring and in turn, the convergence of evidence from multiple indicators could potentially strengthen study conclusions.

Supplementary to SWB, items were pulled from the Cycle 7 and 8 NLSCY youth questionnaire to measure suicidal ideation as well as actual suicide attempts over the preceding year. Youth were also asked to assess their general health. Previous research has demonstrated that a single self-report health question allows respondents to judge their health over multiple domains and predicts mortality while controlling for co-morbidity (Burström & Fredlund, 2001; DeSalvo, Bloser, Reynolds, He, & Muntner, 2005; Knäuper & Turner, 2003). Further items were selected asking youth to report on a number of health risk behaviours including their experience smoking cigarettes, drinking alcohol, and using cannabis products. One PMK response item was selected reporting on the number of serious injuries sustained by the young person during the past 12 months. Details on all supplementary items, including level of measurement, are provided in Appendix A.

3.2.3 Life conditions

Indicators were selected to represent contextual factors or ‘life conditions’ that have been linked to adolescent well-being. Separating the material/economic from the social/relational allows for greater conceptual clarity and is intended to aid in the intricate task of disentangling the hypothesized pathways of disability-based inequality and potential inequity.

3.2.3.1 Household socioeconomic status

A variety of measures are routinely used to measure household socioeconomic status. Typically, researchers have used all or any combination of household income, educational attainment and occupational status (Bradley & Corwyn, 2002; Braveman et al., 2005; Galobardes, Shaw, Lawlor, Lynch, & Davey Smith, 2006a; 2006b; Hagger-Johnson, Batty, Deary, & von Stumm, 2011; Laaksonen, Rahkonen, Martikainen, & Lahelma, 2005). In the current investigation household socioeconomic status was measured by household income, educational attainment and occupational status. Due to variation across cycles in the scope, structure and availability of items, different methods had to be used in Cycles 2-3, 5-6 and 7-8 to obtain these measures.

Income. A measure of raw annual household income was available in Cycles 5-6 and 7-8 [_INHD03A]. Raw annual income was not available in Cycles 2-3. However, household income could be calculated by multiplying the household specific LICO ([B/C]INHD03A) by household Ratio to the LICO ([B/C]INHD04A). Calculated incomes were then compared to a ‘recoded household income’ variable (1= < $10,000 to 8= > $80,000; [B/C]INHD01B) to ensure accuracy. In each cycle the income variable displayed an extremely non-normal distribution owing to outliers with some incomes 30-35 times that of the average Canadian family[9]. Therefore, a winsorized, ordered categorical measure of annual household income was generated with 22 ascending categories (i.e., 1=< $9,999; 2= $10,000- $19,999; 3= $20,000- $20,999; ... 20= $190,000- $190,999; 21= $200,000- $249,999; 22= $250,000+). The distribution of the categorized household income variable fell within an acceptable range in all cycles (Bulmer, 1979; George & Mallery, 2010).

Occupation. The National Occupational Classification (NOC) system is the most widely used classification system in Canada currently (Government of Canada, 2013). NOC codes may be ranked on the 26-point Canadian Occupational Prestige Scale from 1= ‘professional occupations in health’ to 26= ‘elemental sales and service occupations’ (Adamuti-Trache, Anisef, & Sweet, 2013; Banerjee & Phan, 2014; Girard, 2010; Goyder & Frank, 2007; McLaren & Godley, 2009; Parrott et al., 2013).

Data from Cycles 5-6 and 7-8 could be fitted to the Occupational Prestige Scale. Cycles 5-6 utilize the Standard Occupational Classification 1991 (SOC-91) to categorize occupation for the PMK and spouse, whereas Cycles 7-8 utilize the National Occupational Classification for Statistics (NOC-S). SOC-91 and NOC-S codes were manually converted into NOC codes using a conversion matrix provided by Statistics Canada (Statistics Canada, 2013a). Newly created PMK and spouse NOC codes were then ranked on the Occupational Prestige Scale (Goyder & Frank, 2007). Scores were reversed to rank low to high, and a new lowest category introduced to denote dual unemployment. The higher occupational ranks between PMK and spouse (if applicable) were transferred to a new variable indicating highest household occupational prestige. Next, the

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[9] Release of exact maximum value was not permitted by Statistics Canada

ordered categories were reduced to 1-9 (collapsed by 3) to correct a bimodal distribution. The newly created 9-point ‘highest household occupational status’ variable demonstrated an acceptable distribution ranking occupation from 1= [‘no caregiver in household employed’, ‘elemental sales and service occupations’ or ‘labourer in primary industry’] to 9= [‘professional occupations in health’, ‘technical and skilled occupations in health’ or ‘professional occupations in social science, education, government and religion’]. Comparison of NOC, NOC-S and SOC-91 codes and complete list of ranked occupations can be found in Appendix A.

Cycles 2-3 do not utilize any national level coding scheme, rather the 16-point ‘Pineo Scale’ classification system is employed to group PMK and spouse occupations from 1 = ‘farm labourer’ to 16 = ‘self-employed professional’ (Pineo, Porter, & Mcroberts, 1977; Statistics Canada, 1996; 2000; 2002). While not directly comparable with the NOC Scale, the Pineo scaling technique was used by Statistics Canada to inform public policy recommendations during the mid to late 1990s (Statistics Canada, 1996). As with Cycles 7-8 and 5-6, higher occupational rankings between PMK and spouse (if applicable) were transferred to a new variable. A household unemployment category was generated and rankings collapsed by two creating a 9-point ‘highest household occupational status scale’ for Cycles 2-3. Finally, a single manifest indicator of PMK (maternal) workforce participation was generated ranging from 0.0 (no paid employment) to 6.0 (50 hours or more of paid employment per week) across all Cycles (2-3, 5-6, and 7-8).

Education. In Cycles 2-3, 5-6 and 7-8, different ordered-categorical scales were used to measure parent educational attainment. To create a common scale across cycles, categories were collapsed, creating a uniform 6-point scale: 1= < high school diploma; 2= high school graduate; 3= some post-secondary without graduation; 4= post-secondary diploma or certificate; 5=

undergraduate degree; 6= graduate school degree or greater. The highest level of education attained in the household (comparing PMK with spouse where applicable) was used in this investigation.

3.2.3.2 Social Relationships

The current study investigates disability-based differences with respect to childhood social relationships, or rather, the quality of childhood social relationships including peer friendship and acceptance, social participation, and exposure to peer victimisation.

Peer friendship and acceptance. Cycles 5-6 and 7-8 include the Friends Scale; a four-item measure of the breadth and quality of peer networks based on the Peer Relations Subscale in the Marsh Self-Descriptive Questionnaire (Herbert, Smith, & Barnes, 1983; Statistics Canada, 2008; 2010b). Scores from the full scale are presented in Study 1. Study 2 pulls the three most internally consistent items from the measure to serve as manifest indicators of peer friendship and acceptance at Cycles 5-6 and 7-8; “most others my age like me”, “others my age want me to be their friend”, and “I have many friends” rated from 1=false to 5= true.

Peer victimisation. Both Cycles 5-6 and 7-8 contain variables on experience of peer victimisation. In Cycle 5-6 preadolescents are asked how often they are bullied, and how often others say mean things to them, from 1 = all of the time to 5 = never. Both items were reverse scored prior to analysis. In Cycles 7-8 the now-adolescents are asked about the frequency of intimidation (‘someone [said] something personal about you that made you feel extremely uncomfortable’), threats (‘someone threaten[ed] to hurt you but did not actually hurt you’), and physical violence (“someone physically attack[ed] or assault[ed] you”) endured over the previous year; 1 = never, 2 = once or twice, 3 = 3 or 4 times, or 4 = 5 times or more.

Social Participation. In Cycles 7-8 three youth report items measure frequency of adolescent participation in recreation and leisure activities outside of school by way of team sport (e.g., hockey, soccer), artistic social activities (e.g., dance, music clubs), and participation in community organizations (e.g., Scouts, church youth group) from 1= never to 4 = 4 or more times a week. In Study 2 social activity is measured by way of a composite indicator at Cycle 2-3, 5-6, and 7-8. Domain specific participation indicators (i.e., sport, arts, active group, and community) cannot be entered into a hypothesized model as separate manifest indicators because no one social pursuit can be considered a greater indicator of leisure participation than any other. For instance, a child that participates frequently in community groups to the exclusion of all other activity domains is not necessarily more or less engaged with peers than one who participates in a greater variety of social activities less frequently. For the same reason these items themselves are not expected to 'hang together', or correlate highly. The composite measures were obtained by calculating the mean of all participation raw item scores for each age (see Appendix B for item details).

3.2.3.3 Supplementary indicators of life conditions: Expanded exploratory analysis

Study 1 includes supplementary indicators of adolescent life conditions, derived from NLSCY Cycles 7 and 8, to create a more comprehensive profile of adolescents with disability relative to their non-disabled peers. See Appendix A for detailed descriptions of each variable.

Socioeconomic exposures. As described in Chapter 2 of this work, research suggests an inverse relationship between socioeconomic disadvantage and SWB among non-disabled adolescents (Hudson, 2013; Ozdemir, 2012; Proctor, Linley, & Maltby, 2009). One supplementary indicator used in Study 1 is a dichotomous measure of whether a family is living at or below the Low Income Cut Off (LICO). Specifically, whether the family is likely to dedicate a greater portion (at least 20 percentage-points more) of their income to basic necessities (food, shelter and clothing) relative to the average Canadian family of the same size in a similar community (Statistics Canada, 2013c). The PMK was also asked to report on current employment status and housing tenure.

Beyond objective income-based measures, items were selected to gauge family financial security from the parent's perspective. The PMK was asked to report whether they worried about not having enough money, and whether they felt their family's financial situation was improving or worsening. Finally, parent report neighbourhood safety was assessed based on items from the Simcha-Fagan Neighbourhood Questionnaire (Simcha-Fagan & Schwartz, 1986; Statistics Canada, 2010b). The three item scale asks parents to report if "it is safe to walk alone in [their] neighbourhood after dark", if "it is safe for children to play outside during the day", and if "there are safe parks, playgrounds and play spaces in [their] neighbourhood".

Social Relationships. Supplementary indicators of social relationships include measures of adolescent relationships with family and peers, as well as social participation**.** To augment items measuring peer friendship and acceptance, peer exclusion was measured by an item asking "how often do you feel like an outsider at your school". Adolescents also reported how frequently they saw their friends outside of school hours.

Family relationships, particularly strong relationships with parents, are positively linked to adolescent SWB both directly and as a protective factor (Gudmundsdottir et al., 2016; Lambert et al., 2014; Ozdemir, 2012; Yap & Baharudin, 2016; Yucel & Yuan, 2015). Two scales used in the NLSCY, and previously in the Western Australia Child Health Survey, were selected to assess adolescent perceptions of parental nurturance and rejection (Lempers, Clark-Lempers, & Simons, 1989; Statistics Canada, 2010b; Zubrick et al., 1995). Additionally, the 'Conflict

Resolution Scale' was selected to evaluate the level of conflict (e.g., everyday tension, hostility) between the adolescent and parent from the parent's perspective (Statistics Canada, 2010b).

Research suggests a positive link between adolescent social participation and subjective well-being (Lambert et al., 2014; Lewis, Huebner, Malone, & Valois, 2011; Proctor et al., 2009; Schmiedeberg & Schroder, 2016). Beyond indicators of participation in structured activities, Study 1 includes measures of involvement in employment and volunteer activities. All adolescent participants in the NLSCY sample attended formal education. Youth are asked to make a personal valuation of participation in extracurricular activities at school and assess their actual level of extracurricular participation. Finally, an additional item was selected to address school-based inequity by way of adolescent response to the item: "in general, my teachers treat me fairly".

3.3 Analytic Approach

The analytic approach was designed to make the most of available data while taking data release restrictions put in place by Statistics Canada and the Research Data Centre (RDC) into consideration. Data screening and cleaning took place within the University of Alberta RDC. Individual hypotheses were then investigated with both raw and weighted data using SPSS v.22 and Stata v. 12.

3.3.1 Preparing the data

Raw data were held by Statistics Canada at the University of Alberta RDC. Master files were saved and new working files created. First, all relevant files (longitudinal cohort Cycles 2 through 8 plus child self-report Cycles 6 through 8) were examined for completeness. Some files were found to have incomplete software categorization of missing values while others lacked value labels. Data dictionaries provided with each cycle were compared to the corresponding SPSS file to appropriately label the data. Next, all variables of interest - those to be explored as potential manifest indicators, descriptives, or items that were considered potentially context relevant to later analysis - were identified in each SPSS file. Order, wording and number of response categories were examined for each variable by cycle and age range (early childhood, middle childhood, and adolescence). When differences were noted, a new variable was created and identically labeled for each dataset[10]. Responses for each variable were examined to ensure that responses fell within the valid range. Once every variable in each file was examined, relabeled and altered if necessary, data were merged to create stacked datasets. A unique, 14-character child identification code (PERSRUK) as well as child birthdate (date, month and year variables) were matched continuously throughout data preparation to ensure accurate file merging. Derived variables were transferred in each merge as well as a new variable citing cycle of data procurement (e.g., Cycle 2 or 3).

A cross-sectional adolescent sample was created for Study 1 comprised of all youth age 14-15 years in either of the two most recent NLSCY Cycles (7 or 8) regardless of participation in previous cycles. The dataset consisted of 4,415 cases; 3,785 of these cases included both PMK and youth report data. A longitudinal sample was drawn for Study 2. Data was pulled for

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[10] For example, the population density of each child's area of residence (i.e., urban to rural) was a desired variable for descriptive purposes. In Cycle 1, Statistics Canada derived values are: 1= Urban, population >= 500,000; 2= Urban, population 100,000 to 499,999; 3= Urban, population 30,000 to 99,999; 4= Urban, population between 15,000 and 29,999; 5= Urban, population < 15,000; 6= Rural area (AGEHD01). At cycle 2 these categories are trimmed and reversed: 1= Rural area; 2= Urban, population < 30,000; 3= Urban, population 30,000 to 99,999; 4= Urban, population 100,000 to 499,999; 5= Urban, population 500,000 or over (BGEHbD05). Here, a new variable would be created for each file with reduced common categories.

children at age 4 or 5 years in Cycles 2- 3, age 10 or 11 years in Cycles 5- 6 and again at age 14 or 15 years in Cycles 7- 8 respectively. Due to the nature of analysis - longitudinal structural equation modelling - cases with total non-response at any age point had to be removed from the sample. The final longitudinal sample includes all cases for whom PMK and youth report data is available at early, and middle childhood and adolescence (n=3,199). Figure 3-2 summarizes the formation of the longitudinal sample.

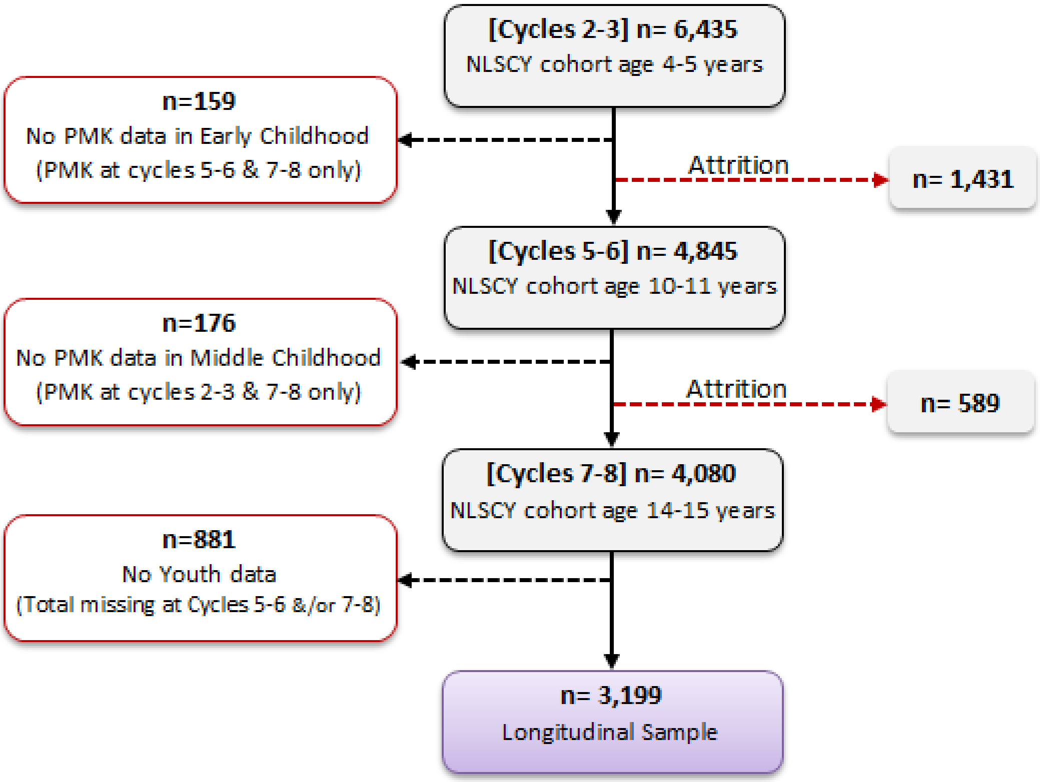

Figure 3-2. Formation of the longitudinal sample

Treatment of partially missing data. Approval was sought from the University of Alberta RDC Statistics Canada representative for temporary installation of the IBM SPSS Missing Values Module v. 20. Temporary access to the module was granted thereby affording appropriate analysis and imputation of partially missing values using raw data. Listwise, pairwise, and mean substitution methods of dealing with partially missing data each depend on the assumption that the data is missing completely at random (MCAR); i.e., the pattern of missing responses does not depend on the data values (Donders, van der Heijden, Geert, Stijnen, & Moons, 2006; IBM, 2011; Schafer & Graham, 2002). This is rarely the case in practice. More commonly, data are found to be MAR or 'missing at random' (Muthén, Kaplan, & Hollis, 1987; Raghunathan, 2004). If data do not meet the strict definition of MCAR, but appear to be MAR, either single imputation maximum likelihood (ML) estimation or multiple imputation methods can be employed to generate relatively unbiased estimates (Allison, 2003; Donders et al., 2006; Enders, 2001; Little & Rubin, 2002; Schafer & Graham, 2002; Shin, Davison, & Long, 2009). While multiple imputation is the preferred method in some cases, the limitations far outweigh the potential benefits if the percentage of missing values is low (Dong & Peng, 2013; Little & Rubin, 2002; Rubin & Scehnker, 1986). Arguably the most limiting factor associated with multiple imputation are the restrictions put on both the type of analysis that can be conducted as well as the range of estimates that can be produced (Donders et al., 2006; IBM, 2011; Kristman, Manno, & Côté, 2005; Rubin, 1987; StataCorp, 2013). For example, currently, -mi estimate- (multiple imputation) run in Stata does not support the -sem- command. The SPSS Missing Values module includes access to a single imputation expectation maximization (EM) algorithm that employs ML estimation. Running the EM algorithm executes an iterative process that utilizes existing data to estimate probable values (Acock, 2005; Allison, 2003).

Missing values were found to be low (<5%) for all youth and PMK report variables with the exception of one item in the PMK report community cohesiveness scale (10.3%). Little's test suggested the configuration of missing data was significantly different from what would be expected if data were MCAR ($p < .001$) on each set of variables (Little, 1988). However, pattern examination suggested that the small proportion of missing data was likely MAR. Specifically, dummy variables created to depict 'missingness' for each variable (0=observed, 1=missing) did not demonstrate a notable pattern of collinearity. Maximum likelihood estimation using the SPSS EM algorithm was therefore employed to impute all partially missing data.

Data distribution. It is generally understood to be good practice to screen data for normality assumptions, risk of multicollinearity, and extreme outliers prior to data analysis (Field, 2005; Kline, 2010; Weston & Gore, 2006). Outliers were not an issue for the vast majority of data given that response categories were often categorical, ordered categorical (herein treated as ordinal), or a defined scale. The only variables susceptible to outliers were those related to household income. Indeed, extreme outliers as well as a dramatic positive skew were noted in all household income variables. As detailed above, recoding income into a 22-point scale greatly reduced non-normality and eliminated outliers. As described above, response categories were also collapsed for occupation variables to correct for a multimodal distribution.

Univariate normality was further assessed by examining the data skew and kurtosis estimates and with visual inspection of quantile-quantile plots[11]. Skewed data is to be expected given that the variables we are testing are typically skewed in the population. Self-rated health is a well-validated measure but is consistently skewed toward the more positive health categories, particularly for young people (Burström & Fredlund, 2001; DeSalvo et al., 2005; Knäuper & Turner, 2003). Similarly, indicators of life satisfaction tend to be skewed in favour of positive

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[11] Judging normality by the frequently employed Kolmogorov–Smirnov test and Shapiro–Wilk test was discarded as an option due to very large sample sizes (Field, 2005)

responses (Andrews & Withey, 1976; Diener, 2009). Household income is also typically positively skewed with the vast majority earning considerably less than the wealthy minority (Alzubaidi, Carr, Councell, & Johnson, 2013; Statistics Canada, 2013b; U.S. Census Bureau, 2013).

Data skew between -1.0 and 1.0 falls within an acceptable range for most statistical analysis (Bulmer, 1979; George & Mallery, 2010). Data skew of variables in the current investigation universally fell within these bounds with the exception of raw household income. However, Mardia's test of multivariate normality demonstrated both non-normal skewness and kurtosis across each set of variables (Mardia, 1970; StataCorp, 2015). Data transformation was considered as a means to treat data non-normality. However, transforming data (e.g., square root transformation, box cox, log transformation) is highly controversial. Robust estimation approaches are becoming the preferred alternative technique of dealing with non-normality (Field, 2005; Henderson, 2005; Little, 2013). Little (2013), further suggests that a consistent data metric - or similarity of scale - is considerably more important than data normality when employing structural equation modelling (SEM) techniques. Variables in the current investigation have a generally comparable metric in that most variables that were analyzed with SEM techniques fall on a Likert-type scale. In addition, analysts have argued that with a sufficiently large sample data non-normality has little influence on conclusions that may be drawn from results (Field, 2005; Field, 2012; Little, 2013; Schermelleh-Engel, Moosbrugger, & Müller, 2003). The largest concern with respect to SEM analysis appears to be artificial inflation of the chi-squared (χ^2) statistic (Chou, Bentler, & Satorra, 1991; Curran, West, & Finch, 1996; Hu, Bentler, & Kano, 1992) and deflation of the comparative fit index (CFI; Hutchinson & Olmos, 1998). After careful consideration of contemporary approaches to dealing with data non-normality, it was decided to reject data transformation in favour of robust estimation methods and informed interpretation of SEM analysis results.

Utilising sample weights. The literature on analysis of complex survey designs generally recommends that survey weights be applied any time cases are sampled with unequal probability (Asparouhov, 2005; Chambers & Skinner, 2003; Lumley, 2004; Pfeffermann, Skinner, Holmes, Goldstein, & Rasbash, 1998). Likewise, application of survey weights is strongly recommended by Statistics Canada (Statistics Canada, 2000; 2002; 2003; 2005; 2006; 2008; 2010b); "In order for survey estimates and analyses to be free from bias, the survey weights must be used" (Statistics Canada, 2004, p.49). With respect to the NLSCY, each child's survey weight denotes the average number of children in the population that he or she represents - either cross-sectionally or longitudinally (Statistics Canada, 2010b). When cases are weighted by a study specific re-scaled or 'normalized' sample weight, the total number of cases is identical to the raw total generated by an individual researcher's inclusion/exclusion criteria; Each case is given greater or lesser influence based on Statistics Canada's stratified sampling methods thereby ensuring 'unbiased' estimates with respect to the survey design. Previous NLSCY research identifying children with disability or chronic condition(s) consistently employ normalized sample weights (see for example: Arim et al., 2012; Burton et al., 2008; Ferro & Boyle, 2013; McDougall et al., 2004).

Beyond adjusting for properties of survey design, weighting is often recommended to adjust for attrition in longitudinal studies (Ahern & Le Brocque, 2005; Alderman, Behrman, Kohler, Maluccio, & Watkins, 2001; Kristman et al., 2005; Vandecasteele & Debels, 2007). Great lengths have been taken by Statistics Canada to generate survey weights that adjust for total non-response. Specifically, attrition (or non-response) is built into NLSCY survey weights in the following way:

> "Starting with the design weights, a contact/noncontact model was constructed, and response homogeneous groups (RHG) were formed using PROC FASTCLUS in SAS, which is a procedure in SAS that performs disjoint cluster analysis. Noncontact adjustments were calculated within the RHGs. Afterwards, a nonresponse model was created, and again RHGs were formed using PROC FASTCLUS. Nonresponse adjustments were calculated with these RHGs based on the noncontact adjusted weights. The final adjusted weight (adjusted for noncontact and nonresponse) were post stratified to counts corresponding to the cross-classification of age, sex, and province, where the age, sex, and province refer to either the Cycle of introduction of a particular cohort in the case of longitudinal weighting or the reference year in the case of cross-sectional weighting. The formation of the RHGs for each of the sets of weights was done by first modelling the noncontact or nonresponse using logistic regression models. Then, using PROC FASTCLUS in SAS, the observations were grouped into clusters based on how similar their estimated probabilities were from the logistic models." (Personal communication with Stephanie Lalonde, Chief Analyst, Statistics Canada Special Surveys Division; 12/03/2015)

Dozens of explanatory variables are included in the models that align with factors most commonly associated with attrition such as type of dwelling, age of youngest child, highest level of education, total number of unemployed persons in the economic family, detailed labour force status, and marital status (personal communication with Stephanie Lalonde, Chief Analyst, Statistics Canada Special Surveys Division; 12/03/2015). However, appropriate weighting does not account for partial non-response or total loss of cases exhibiting a specific trait of interest. The Cycle 8 NLSCY user guide presents a particularly apt example:

> "Non-response cumulates over time. As we have fewer and fewer participants, the estimated sampling error increases, and the potential for bias also increases. / In

> extreme cases, certain subsets of the population may no longer be represented by the remaining sample. For a purely hypothetical example, assume the initial sample contained 20 girls with autism in some province, yet none of these 20 responded at Cycle 8. Regardless of the weighting procedure, the survey could no longer produce estimates for autistic girls in that province" (Statistics Canada, 2010b, p.112).

National representation is similarly impacted by the longitudinal nature of the data. Up to and including Cycle 4, estimates generated using original (weighted) cohort data can be considered nationally representative both cross-sectionally and longitudinally. Beyond Cycle 4, the absence of new immigrants within the cohort biases the representativeness of the sample to the extent that it can no longer be used to make inferences about cross-sectional populations (Statistics Canada, 2005; Statistics Canada, 2006). Thus the population of inference for the original cohort is children aged 0 to 11 as of December 31, 1994, who were living in any province in 1994/95. Despite this limitation to the generalizability of findings, the benefits of applying normalized weights far outweigh the drawbacks. To accommodate the NLSCY's complex multi-staged, stratified, non-random survey design, account for unequal probabilities of selection and attrition as much as possible, and to ensure comparability between the NLSCY and Canadian population estimates, a decision was made to apply normalized survey weights to all analyses.

3.3.2 Structural Equation Modelling

Longitudinal structural equation modelling (SEM) methods were employed using Stata v.12 software to investigate the association between disability, socioeconomic status, social relationships, and subjective well-being. Two options were initially considered to test the proposed models: Traditional structural equation modelling (SEM) and generalized structural equation modelling (GSEM). GSEM in STATA v. 13 was considered due to its ability to handle non-normal data; however, this option was set aside owing to a number of limitations associated with GSEM. Unlike traditional SEM, GSEM cannot utilize survey weights, cannot identify indirect effects, and does not generate common fit statistics or modification indices (StataCorp, 2013). Such limitations outweigh GSEM's ability to handle non-normal data.

An increasingly employed modelling technique, SEM can essentially be conceptualized as an amalgamation of confirmatory factor analysis (CFA) - the measurement model - and path analysis - the structural model (Iacobucci, 2009; Kline, 2010; Schreiber, Nora, Stage, Barlow, & King, 2006). A model, or series of models, is specified by the researcher to reflect hypothesized relationships among constructs based on robust theoretical reasoning. The proposed model is then assessed against existing data to ascertain how closely the hypothesized relationships mirror observed relationships. A narrow difference between the estimated and actual data suggests good model fit, whereas a large difference suggests the hypothesized model is not consistent with 'real world' relationships (Bryne, 2010; Hayduk, 1987; Kline, 2010). This traditional form of SEM, or 'covariance structure modelling', utilizes covariance matrices generated from real world data to imply a structure for covariance among variables (Hox & Bechger, 1998).

The most evident advantage to employing SEM methods is the ability to investigate latent constructs. Latent variables are those that the researcher has sound reason to believe exist in the real world but cannot be directly measured; these variables act like 'factors' in factor analysis. A latent variable (also referred in the literature as a 'common factor', 'latent factor' or 'construct') is customarily signified by a circle in graphical representations of structural equation models. Conversely, a manifest variable (also referred to as an 'observed variable' or 'indicator') is associated with some tangible form of measurement and typically represented by a square or rectangle. Variables in a traditional structural equation model can be either exogenous or endogenous. An exogenous variable is similar to the concept of an independent variable; it is thought to influence other variables but is not ‘caused by’ any other variable in the model. An endogenous variable is like a dependent variable in that is affected by other variables in the model, but can also influence other variables (Hayduk, 1987; Kline, 2010).

Aside from the inclusion of latent constructs, SEM surpasses more conventional techniques by testing several hypothesized paths simultaneously thereby resulting in more parsimonious, precise estimates and theoretically decreasing bias (Acock, 2013; Kline, 2010; Little, 2013; Wothke, 2010). SEM can also accommodate complexities such as non-recursive relationships and non-normal data that may prove problematic using standard techniques (Iacobucci, 2009). SEM permits testing coefficients across multiple groups and over time. The ability to deal with measurement error independently gives SEM a substantial advantage over traditional analytic methods. Inclusion of measurement error allows the researcher to parse out whether lack of fit is due to model misspecification or poor measurement (Dimitrov, 2006; Iacobucci, 2009; Kline, 2010; Sarkisian, 2007; Williams, Vandenberg, & Edwards, 2009).

The measurement model. Standard structural equation models can be broken down into two overlapping components: the measurement model and the structural model. The proposed relationships between latent constructs and manifest variables constitute a measurement model. Evaluation of the measurement model assesses how well a set of manifest variables represent a hypothesized latent factor; i.e., testing the significance of each factor loading as well as the overall model fit. The practical aim is to generate estimates for factor loadings, the degree of variance /covariance shared by indicators, and the residual variance unique to each indicator (i.e., measurement error) (Hoyle & Gregory, 1994). The concepts involved in specifying the measurement model are briefly introduced below using notation commonly employed in the extant SEM literature (Iacobucci, 2009; 2010; Jöreskog & Sörbom, 1996).

The lambda-y matrix ($y = \Lambda y\ \eta + \varepsilon$) specifies factor loadings for latent endogenous variables (Hayduk, 1987; Iacobucci, 2009). Figure 3-3 depicts a latent endogenous variable. In this example three indicators (y_1, y_2 and y_3) each with measurement error (ε_1, ε_2 and ε_3) are hypothesized to relate to the latent variable as noted by eta (η_1). Measurement error is occasionally referred to as a 'residual error term', 'unique factor' or as 'uniqueness'; the term 'disturbance' may also be used to describe error specific to endogenous indicators. In this example two parameters are free to vary ($\lambda_{1,1}$ and $\lambda_{2,1}$), while the remaining path is fixed at 1.0 to act as a scale for the free parameters. It is worth noting that a lambda parameter (λ) is also referred to as a 'factor loading', 'regression coefficient' or 'structural coefficient' when dealing with typical or covariance structure models; and as an 'estimate of the regression slope' or 'scale unit' when considering mean structure model analysis or growth curve analysis.

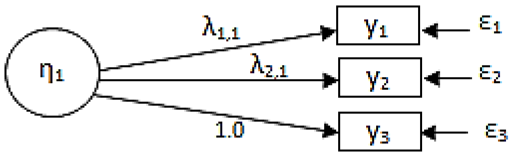

Figure 3-3. A latent endogenous variable

The lambda-x matrix ($x = \Lambda x\ \xi + \delta$) pictured in Figure 3-4 works in much the same fashion but specifies paths from the latent exogenous variables, noted by ksi (ξ), to their observed indicators (Hayduk, 1987; Iacobucci, 2009; Kline, 2010).

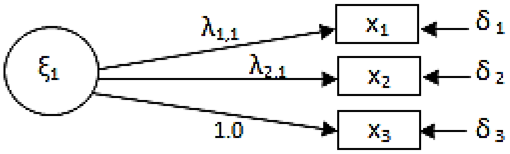

Figure 3-4. A latent exogenous variable

The error terms of the endogenous manifest variables (ε) are conferred by the theta sub epsilon matrix (Θε). Within a matrix containing all possible relationships between variables, each element is fixed to zero aside from those specified free to be estimated based on free lambda parameters (e.g., $\lambda_{2,1}$). Error variance suggests a percentage of real variance in the variable that should be counted as error. Similarly, the theta sub delta (Θδ) matrix deals with measurement error (δ) on the exogenous variable indicators. The researcher must be confident that the measurement model is valid (i.e., adequately fits the data) before moving on to the structural model.

The structural model. The structural model concerns the hypothesized paths between latent constructs; i.e., the relationships between exogenous and endogenous variables, or among endogenous variables (see Figure 3-5). The structural model can be defined using the following formula: $\eta = \beta\eta + \Gamma\ \xi + \zeta$ (Byrne, 1998; Hayduk, 1987; Iacobucci, 2009). Here beta (β) and gamma (Γ) are path coefficients (also referred to as ‘structural path parameters’). Betas represent the effects of eta (η) variables on themselves while gammas (γ) are the effects of ksi (ξ) variables on etas. The beta matrix (βη) corresponds to the hypothesized relationships between endogenous variables; while the gamma matrix (Γξ) represents relationships hypothesized between the exogenous and endogenous variables.

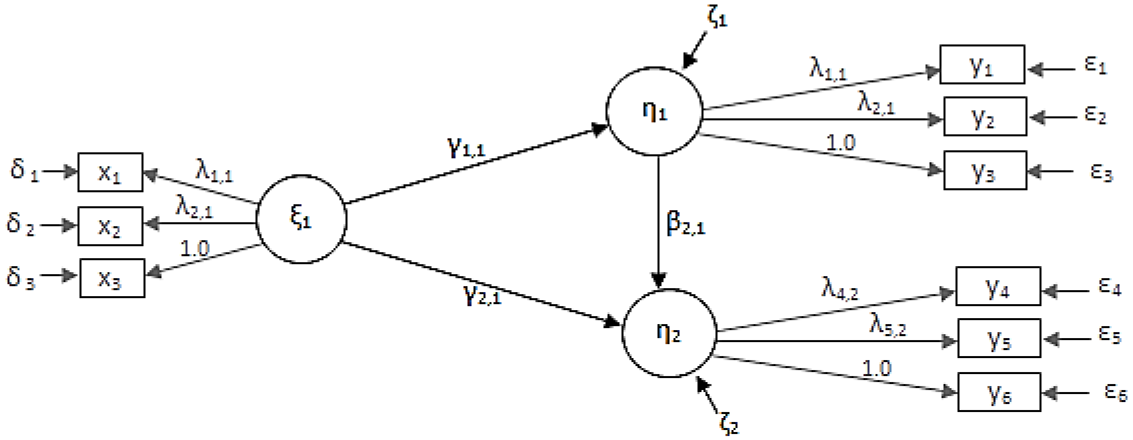

Figure 3-5. A structural path diagram

The psi matrix (Ψ) represents predicted error on the endogenous latent variables (ζ); i.e., something that influences more than one eta (η) variable that was not accounted for in the model. This differs from measurement error (ε) as it deals with unmeasured latent constructs. Rather, the error (ζ) is a structural disturbance term (also referred to a 'structural prediction error'). The phi (Φ) matrix is the variance / covariance between exogenous latent variables; i.e., inter-correlations among variables (φ).

Goodness-of-fit indices. Validation of both the measurement and structural models are typically based on an assortment of goodness-of-fit indices. The one universally reported goodness-of-fit (or rather poorness-of-fit) statistic is the chi-squared (χ^2) test. The χ^2 assesses model misspecification and therefore should be non-significant ($p > 0.05$) (Acock, 2013; Iacobucci, 2010; Kline, 2010; Wothke, 2010). While not a commonly asserted stance, some go so far as to suggest the χ^2 statistic is the only appropriate way to determine model fit (Hayduk, 1987). The primary drawback of the χ^2 statistic is that it is likely to be significant regardless of model fit if the sample is large (Bryne, 2010; Fan, Thompson, & Wang, 1999; Hox & Bechger, 1998; Iacobucci, 2010; Little, 2013; Schermelleh-Engel et al., 2003; Smith & McMillan, 2001).

Given the sensitivity of the χ^2 statistic to sample size, some analysts recommend reporting a 'normed chi-square' (NC or CMIN/DF) statistic: χ^2 divided by degrees of freedom (Bryne, 2010; Schermelleh-Engel et al., 2003). However, use of this adjusted fit statistic remains debated. Kline (2010) for example strongly discourages its use going so far as to state "because there is little statistical or logical foundation for NC it should have no role in model fit assessment" (p. 204). Among Kline's arguments against NC is that division of χ^2 by degrees of freedom (df) to correct for a large sample makes little sense given that df increases with greater model complexity not greater sample size.

In light of debate surrounding SEM's only inferential statistic, a compliment of well-validated descriptive fit-indices are commonly reported to judge the fit of a given model. Four of the most widely reported (and available using Stata software) are the comparative fit index (CFI, Bentler, 1990), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the root mean square error of approximation (RMSEA; Steiger, 1990) with 90 percent confidence interval, and the standardized root mean square residual (SRMR; Bentler, 1995). The CFI compares improvement of the fit of the hypothesized model to a restricted or 'null' model that specifies no relationships among variables (Weston & Gore, 2006). Scores on this incremental fit index range from 0 to 1.0. Generally a CFI > .95 indicates good model fit (Iacobucci, 2010; Schermelleh-Engel et al., 2003). The CFI is a sound choice for the current investigation as it is less sensitive to sample size (Bentler, 1990; Fan et al., 1999). The TLI also assesses how much of the variance in the covariance matrix is accounted for by a given model. A TLI > .95 is considered indicative of good model fit (Bryne, 2010; Hu & Bentler, 1999).

Unlike the previously detailed incremental fit indices, the RMSEA and the SRMR are based on the residuals matrix. The RMSEA estimates the amount of error of approximation per df accounting for sample size and, as such, is well suited for judging model fit with a large number of cases (Schermelleh-Engel et al., 2003). Essentially, the RMSEA assesses how well the model would fit the predicted population covariance matrix given unknown (but ideal) parameter values (Bryne, 2010). An RMSEA < .05 indicates close approximate fit, values between .05 and .08 suggest reasonable error of approximation, while an RMSEA > 0.1 indicates poor fit (Browne & Cudeck, 1992; Hox & Bechger, 1998; Smith & McMillan, 2001). The SRMR is the square root of the difference between the residuals of the sample covariance matrix and the predicted covariance model (Schermelleh-Engel et al., 2003). The SRMR has demonstrated greater sensitivity to model misspecification than to violations of distributional assumptions or sample size (Hu & Bentler, 1999; Iacobucci, 2010, p.96) making it a useful indicator in the current investigation. Good model fit is indicated by an SRMR < .05, values between .05 and .10 indicate acceptable model fit, and poor fit can be judged by an SRMR > 0.10 (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003).

Choosing a method of estimation. Stata software provides four options for model estimation: Asymptotically Distribution-Free (ADF), Maximum Likelihood (ML), Maximum Likelihood with missing values (MLMV), and Quasimaximum likelihood (QML). MLMV was discounted immediately as missing data are not a concern and this method assumes full joint normality of both observed and latent variables. ADF, a form of weighted least squares estimation, is generally considered the optimal choice when data are non-normal (Andreassen, Lorentzen, & Olsson, 2006; Finney & DiStefano, 2006; Schermelleh-Engel et al., 2003). That said sample weights cannot be applied using ADF estimation. Further, estimates generated through ADF have been found to be increasingly less reliable as model complexity increases (Acock, 2013; Muthen & Kaplan, 1992; StataCorp, 2013).

ML, the default estimation method in Stata, assumes full joint normality of all observed variables (Olsson, Foss, Troye, & Howell, 2000; Schermelleh-Engel et al., 2003; StataCorp, 2013). This method is not ideal given that much of the data does not meet the requirements of multi-variate normality. However, Satorra–Bentler adjustments may be paired with ML estimation to produce robust, corrected estimates including fit statistics, standard errors, p-values and confidence intervals (Acock, 2013; Bentler, 1990; Curran et al., 1996; Schermelleh-Engel et al., 2003; StataCorp, 2015). Similar to ADF estimation, Satorra–Bentler adjustments cannot be applied with normalized sample weights. QML uses ML estimation to fit model parameters but relaxes normality assumptions by adjusting standard errors (StataCorp, 2015). This method does allow data to be weighted thereby correcting (as much as possible) for attrition, the NLSCY's complex survey design, and unequal probabilities of selection. However, modification indices and most fit statistics cannot be generated when survey weights are applied.

Taking into account that none of the available estimation techniques allow for both the production and interpretation of relatively unbiased and accurate estimates, a combination of methods was selected. Hypothesized measurement and structural models were first explored using unweighted, raw data as input employing Maximum Likelihood with Satorra–Bentler corrected estimates. Estimates provided were then used to appropriately adjust parameter specification and interpret model fit. If the measurement model appeared sound, and the structural model fit the data well, the model was examined again using normalized survey weights using quasi-maximum likelihood (QML or vce, robust) estimation.

3.3.3 Data Analysis

The study hypotheses, specified below, were systematically tested in turn. Analysis was designed to make the most of the data taking into consideration data release restrictions put in place by Statistics Canada and the Research Data Centre (RDC). In following The Statistics Act[12] raw data deemed to contain potentially identifying information may only be viewed within an appointed Research Data Centre (RDC) by sanctioned personnel. Any results gleaned from RDC housed data, hand written hard copy or electronic, must be approved by a Statistics Canada representative prior to release. Data must be presented in a specific manner and meet requirements regarding sample size, weighting procedure, and case anonymity before it may be submitted to the Statistics Canada representative (see http://datalib.library.ualberta.ca/rdc/ for further details).

3.3.3.1 Study 1. A Profile of Canadian Adolescents with Disability

Study 1 is an exploratory, descriptive and correlational study designed to create a profile of the subjective well-being (SWB components) and life conditions of adolescent Canadians with disability. Raw, normalized data were prepared and analyzed with SPSS v. 22 software. First, a weighted zero-order correlation matrix was generated for the entire cross-sectional dataset. Variables were selected to augment existing measures of subjective well-being, socioeconomic status and social relationships. Variables were either kept in scale format or transformed into dichotomous measures. Full details are presented in Appendix A. Multivariate linear regression was used to investigate the 'effect' of disability on scale variables adjusting for two potentially confounding child characteristics (gender and aboriginal status). When dependent variables were dichotomous, logistic regression modelling was employed to calculate odds ratios (OR) for univariate and multivariate analyses. Standardized mean difference by way of Cohens *d* were

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[12] *Statistics Act*. 1970-71-72, c. 15, s. 1. This Act in its entirety may be found at http://www.statcan.gc.ca/about-apercu/act-loi-eng.htm

calculated to gauge the effect size of differences observed in scale variables; specifically $d < .20$ being a very small or insignificantly small effect, .20- .49 representing a small effect, .50- .79 medium, and $d > .80$ a large effect (Cohen, 1988; Dunst & Hamby, 2012; Durlak, 2009; Wilson, 2001). Effect size categories for odds ratios are reported following the recommendations of Olivier and Bell; small (OR < =0.82 or > =1.22), medium (OR < =0.54 or > =1.86), and large (OR < =0.33 or > =3.00) (Olivier & Bell, 2013).

3.3.3.2 Study 2. Disability-Based Differences - A Longitudinal Analysis

Study 2 primarily employed longitudinal structural equation modelling techniques by way of graphical chain models to investigate hypothesized pathways linking disability, socioeconomic status and social relationships at three points across childhood to subjective well-being in adolescence. Hypotheses were organized thematically; (1) exploring the relationship between disability and household socioeconomic status across childhood, (2) exploring the relationship between disability and social relationships across childhood, and (3) investigating the pathways between disability and adolescent subjective well-being by way of household socioeconomic status and social relationships.

First, a weighted zero-order correlation matrix was generated for the longitudinal dataset. Similar to the cross-sectional analysis, descriptive child and family characteristics were investigated followed by a number of univariate and multivariate comparisons on manifest indicators. If results of the initial evaluation supported the stated hypothesis more in-depth analysis was conducted with Stata v. 12. Hypothesized latent constructs (the measurement model) were tested by way of a confirmatory factor analysis (CFA) employing ML estimation with SB adjustments. The CFA was modified or trimmed based on modification indices. Constructs were modified only when changes were congruent with existing theory[13]. If acceptable fit was achieved, a structural model in line with the hypothesis was tested. With acceptable measurement fit established, structural models were analyzed using QML estimation and normalized sample weights. Output was cataloged in accordance to Statistics Canada guidelines and submitted for release.

In addition to the analysis described above, approach to analysis varies depending on what is required to test each hypothesis. For example, a growth curve analysis of household income is included as part of the investigation of the downward social mobility hypothesis (H1a, see below). Further methodological details, including variations in method of analysis, are described with the results. Specific hypotheses and associated structural equation models are delineated below.

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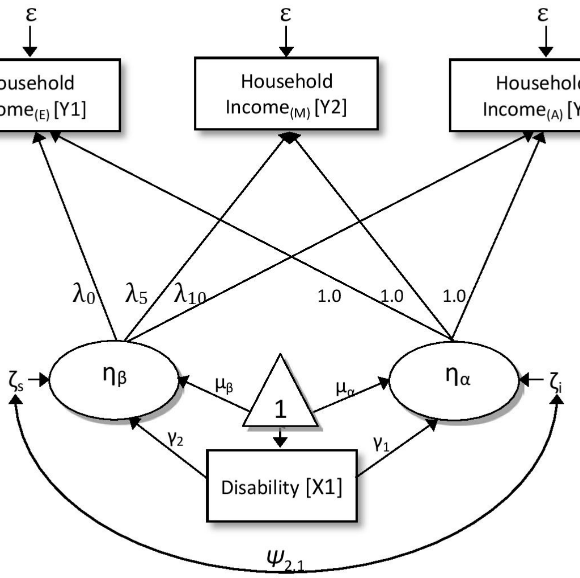
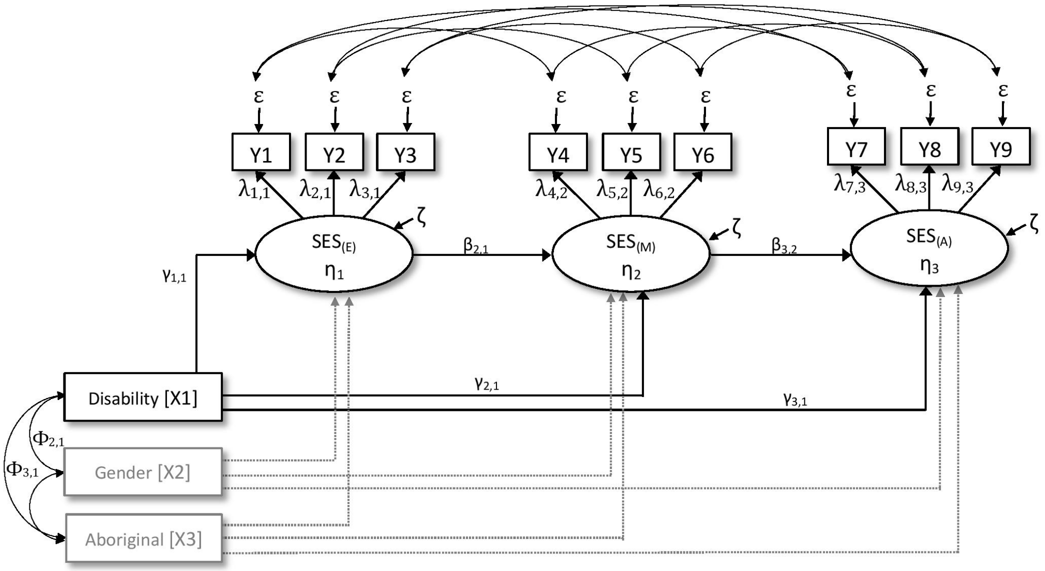
[13] For example, the error terms of positive and negative affect manifest variables could not be made to co-vary despite potential improvement to model fit as there is a general consensus in the literature that positive and negative affective components are two distinct constructs (Arthaud-day, Rode, Mooney, & Near, 2005, Campbell, 1976, Diener, 1984, Diener et al., 2010) .

3.3.4 Longitudinal Hypotheses with Graphic Representations

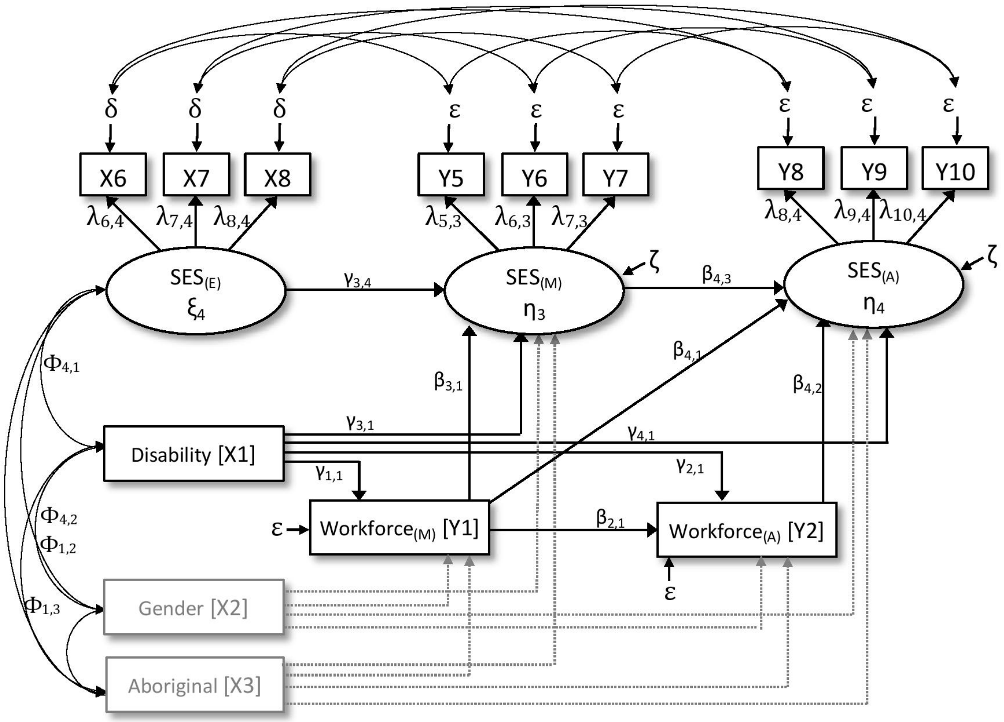
(1) Childhood disability and household socioeconomic status

Hypothesis 1a. From early childhood to adolescence, disability (identified in early childhood) is associated with increasingly greater socioeconomic inequality (i.e., the downward social mobility hypothesis).





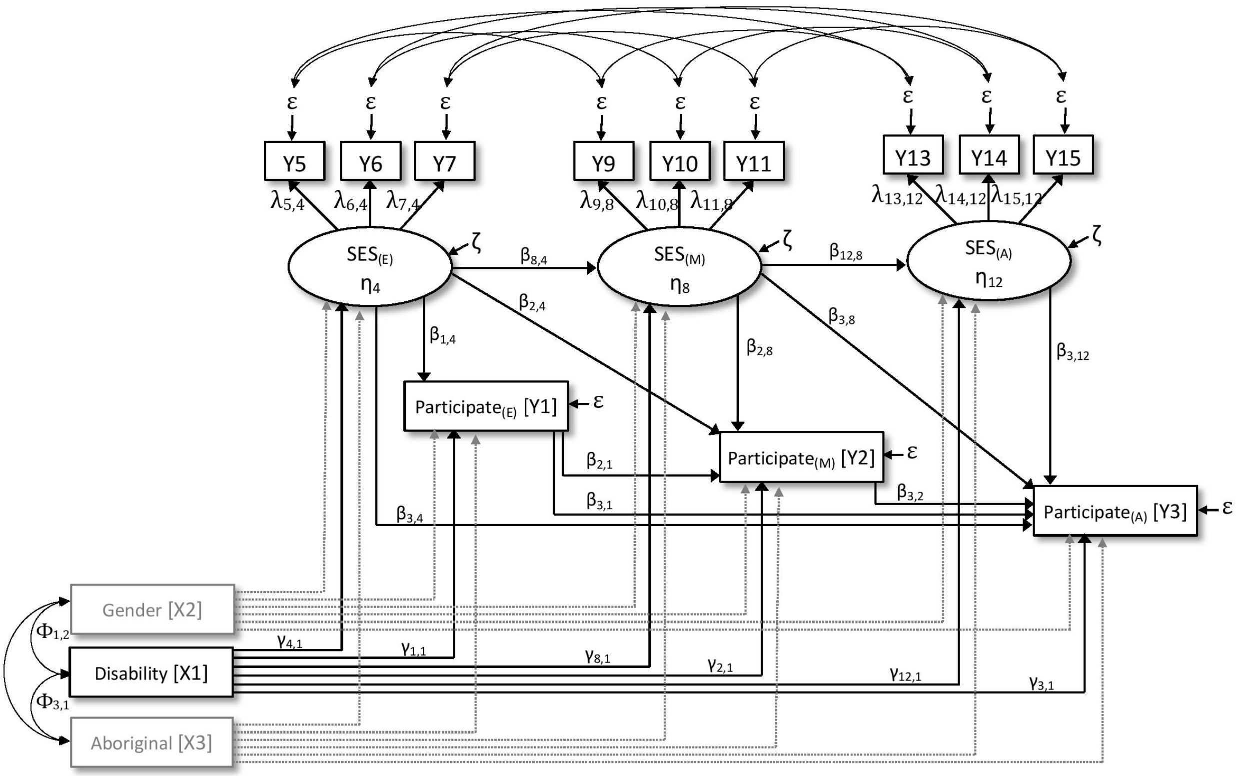
Hypothesis 1b. The relationship between disability (identified in early childhood) and household socioeconomic status (SES) in early childhood, middle childhood, and adolescence is at least partially mediated by a lower rate of paternal workforce participation.



(2) Childhood disability and social relationships

Hypothesis 2ai. Children with disability (identified in early childhood) participate in social leisure activities less frequently than same age peers in early childhood, middle childhood, and adolescence.

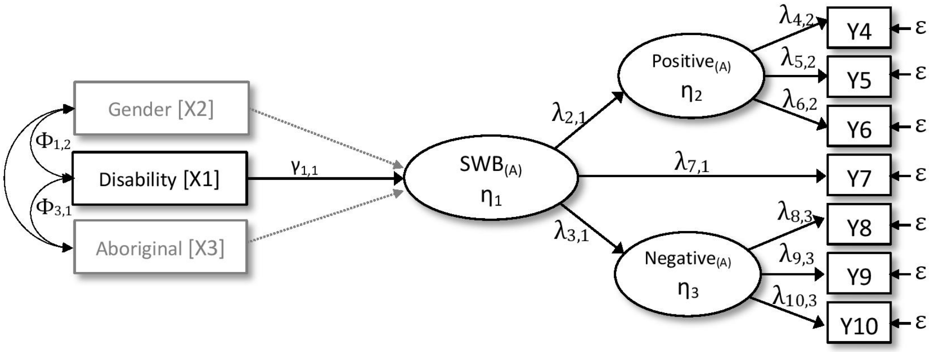
Hypothesis 2aii. The relationship between disability (identified in early childhood) and frequency of participation in social leisure activities is at least partially mediated by household socioeconomic status in early childhood, middle childhood, and adolescence.



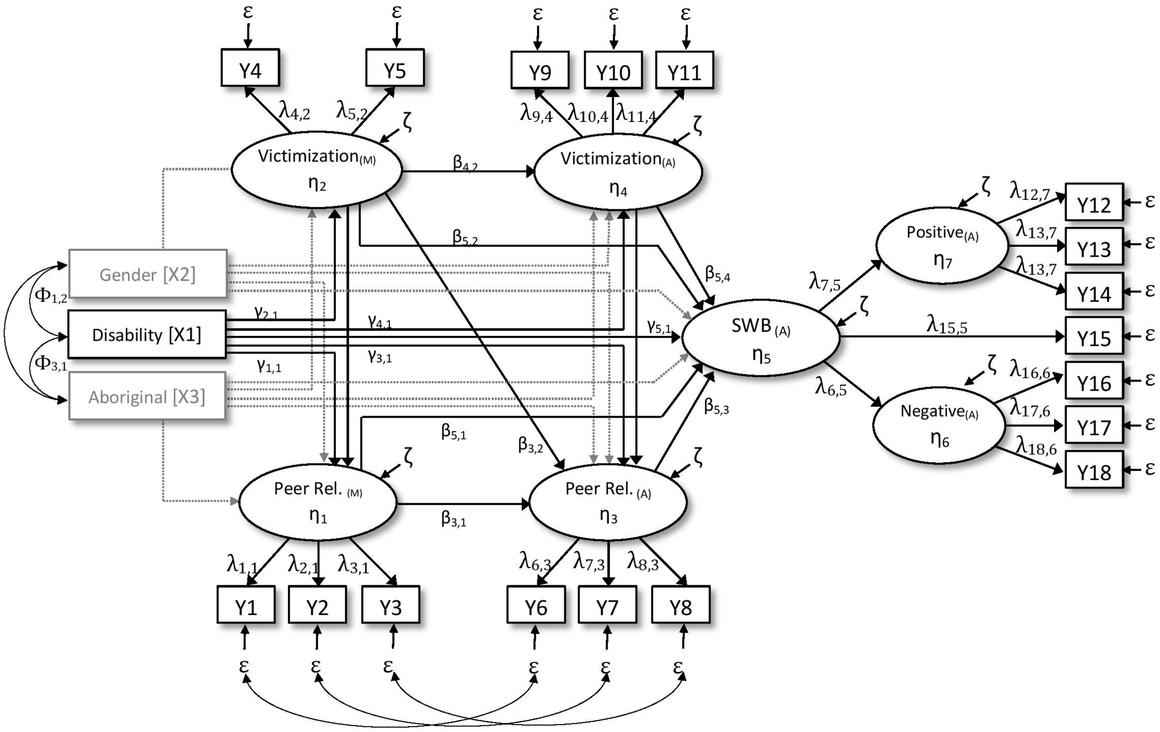
Hypothesis 2b. In middle childhood and adolescence, children with disability (identified in early childhood) report more impoverished peer friendships and greater exposure to peer victimisation than same age peers.

(3) Pathways to subjective well-being

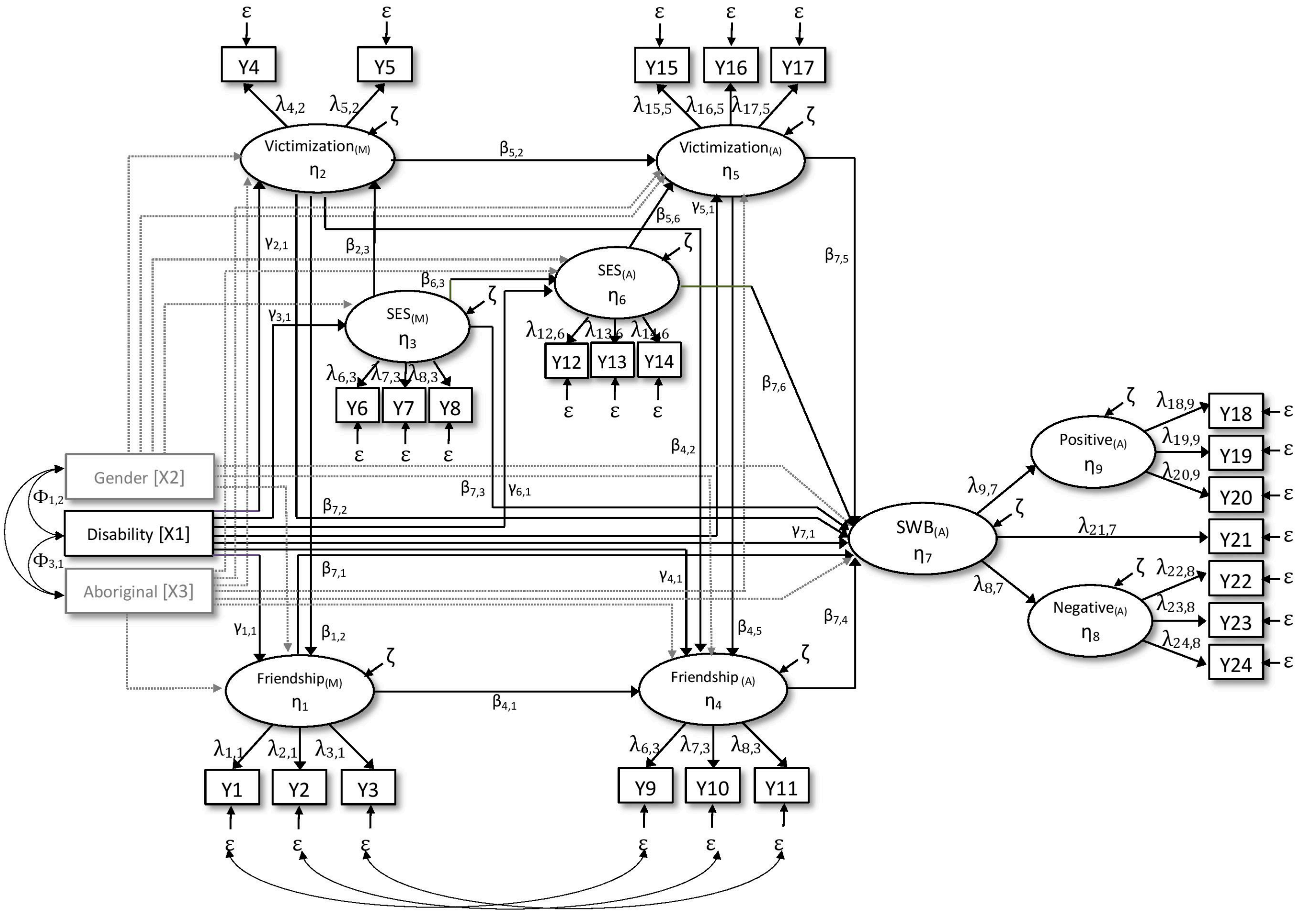
Hypothesis 3a. There is a negative association between disability (identified in early childhood) and adolescent subjective well-being (SWB).



Hypothesis 3b. The relationship between disability (identified in early childhood) and adolescent subjective well-being is at least partially mediated by peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.



Hypothesis 3c. The relationship between disability (identified in early childhood) and adolescent subjective well-being is mediated by household socioeconomic status, peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.



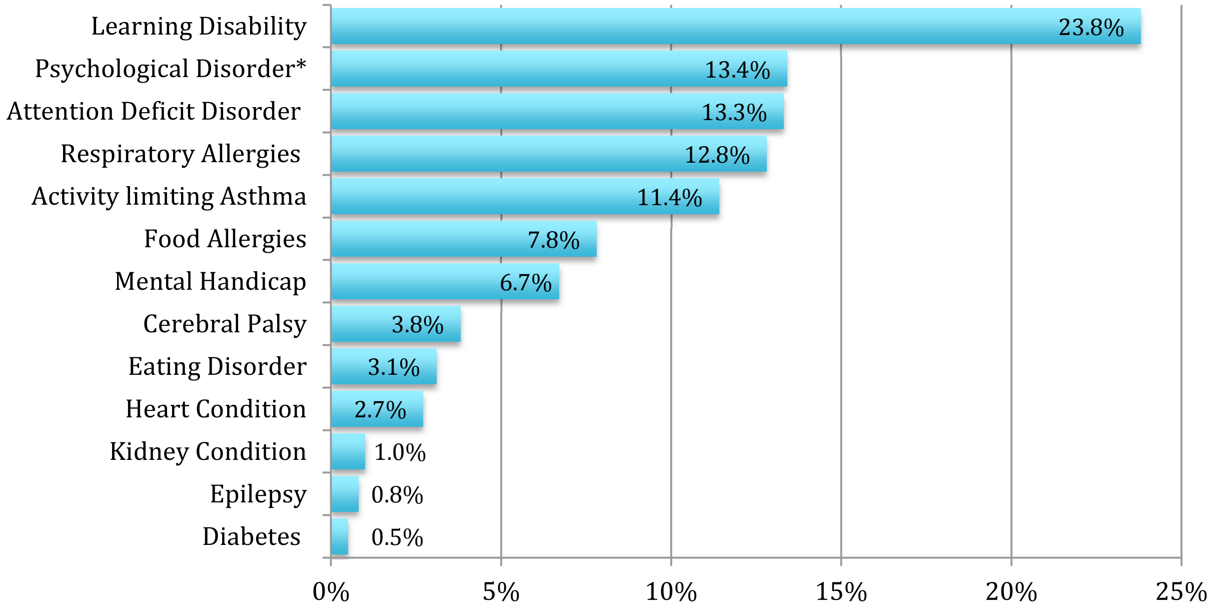
CHAPTER 4. RESULTS

The purpose of Study 1 was to generate a profile of the life conditions and components of subjective well-being of adolescent Canadians with disability relative to same age peers. The second study was designed to investigate the mediating role of socioeconomic status and social relationships in explaining the association between disability identified in early childhood and adolescent subjective well-being. The following section will detail the results of each study in succession.

4.1 Study 1. A Profile of Canadian Adolescents with Disability

The life conditions and SWB of adolescent Canadians were assessed by examining a cross-sectional sample drawn from the NLSCY; all youth age 14-15 years in either Cycle 7 or 8 regardless of participation in earlier cycles (N=4,415). This sample may be considered representative of Canadian youth born in the early 1990's, specifically 1991 to 1994 (Statistics Canada, 1996). Weighted child and family characteristics are listed in Table 4-1. The vast majority of PMK respondents, nearly 9 out of 10, were mothers. Based on PMK report, the total sample included 549 (12.5%) adolescents with disability. This is somewhat less than the estimated prevalence of disability among Canadians age 12 to 19 years (15.5%) provided by Statistics Canada during the same time period (Statistics Canada, 2010).

Adolescents with disability identified at Cycle 7-8 comprise a heterogeneous group with respect to diagnosed long-term conditions. The most commonly reported condition was diagnosed learning disability[14] (23.8%) followed by emotional, nervous and psychological disorders (13.4%). The proportion of adolescents with each 'type' of long-term condition is shown in Figure 4-1. It is important to note that not all adolescents with disability report being diagnosed with a listed chronic condition or health problem, and that the list of conditions provided by the NLSCY survey is in no way exhaustive. Rather, this figure shows the prevalence of some common conditions among adolescent Canadians with disability in the Cycle 7-8 NLSCY sample.



Note. Chronic Conditions are not mutually exclusive; *includes diagnosed emotional and nervous disorders

Figure 4-1. Chronic conditions diagnosed in adolescents with disability (n=549)

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[14] Given that the NLSCY is a Canadian survey, 'learning disability' refers to "a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information" and is "distinct from global intellectual deficiency" (Learning Disabilities Association of Canada, 2015).

Table 4-1.

Child and family characteristics of the cross-sectional adolescent sample (Cycle 7-8)

	Total Sample n=4415		**Peers n=3866**		**Adolescents with Disability n=549**	
	n (Mean)	% [SD]	n (Mean)	% [SD]	n (Mean)	% [SD]
PMK is Mother (bio, adopt or step)	3864	87.5	3368	87.1	497	90.4
PMK Martial Status						
PMK - Married	2914	66.0	2557	66.1	357	65.1
PMK - Common Law	492	11.2	428	11.1	65	11.8
PMK - Separated	321	7.3	275	7.1	46	8.4
PMK - Divorced/Widowed	449	10.2	401	10.4	47	8.5
PMK - Single, Never Married	238	5.4	204	5.3	34	6.2
Location of Residence						
Rural	750	17.0	654	16.9	96	17.5
Urban <30,000	429	9.7	376	9.7	53	9.6
Urban 30,000 - 99,999	451	10.2	399	10.3	53	9.6
Urban 100,000 - 499,999	820	18.6	703	18.2	118	21.4
Dense urban (500,000+)	1964	44.5	1734	44.9	230	41.8
Highest Household Education						
< High school	239	5.4	195	5.0	44	8.1
High school Grad	652	14.8	570	14.7	82	15.0
Some post-secondary	553	12.1	467	12.1	66	12.0
Diploma or Certificate	1513	34.3	1316	34.0	197	35.8
Bachelor's degree	1010	22.9	895	23.2	115	20.9
Graduate level degree	468	10.6	423	10.9	45	8.2
Rounded Household Income ($)	(95,400)	[70,300]	(95,800)	[70,000]	(92,700)	[72,500]
Household is below LICO	512	11.6	437	11.3	75	13.6
Number of children in household = 1	1,321	29.90	1,163	30.1	159	28.9
Number of children in household = 2	1,949	44.20	1,719	44.5	230	41.9
Number of children in household = 3+	1144	25.9	984	25.4	161	29.3
Child Characteristics						
Female	2159	48.9	1886	48.8	272	49.5
Aboriginal Status	159	3.6	135	3.5	23	4.2
Any Disability Reported	**549**	**12.4**				
Any Severe Disability Reported*	221	5.0				
Any Impairment (Chronic Condition)	1408	31.9				
Any impairment or disability	1591	36.0				

*parental report that disability impacts participation or function 'all of the time'
SD= Standard Deviation

4.1.2 Components of Subjective Well-Being

Subjective well-being in the strictest theoretical sense refers to the presence of positive emotional states or 'affect'; the relative absence of negative affect; and a positive global cognitive evaluation of life satisfaction (Andrews & Withey, 1976; Deci & Ryan, 2008; Diener, Suh, Lucas, & Smith, 1999; Feist, Bodner, Jacobs, Miles, & Tan, 1995; Keyes, Shmotkin, & Ryff, 2002; Marrero Quevedo & Carballeira Abella, 2011; McGillivray & Clarke, 2006; Scorsolini-Comin & Dos Santos, 2010). In Study 1, each of these components were examined separately. No statistically significant association was found between disability and the cognitive component of subjective well-being in this cohort. However, a statistically significant association was found between disability and both positive and negative affect. On average, adolescents with disability reported less positive affect ($\beta = -.034$, $p < .05$), and more negative affect ($\beta = .086$, $p < .01$). However, after controlling for youth gender and aboriginal status, the association between disability and positive affect was no longer statistically significant (see Table 4-2).

Disability-based differences on supplementary indicators of how the adolescents were faring suggest that those with disability were not faring as well as their peers. Adolescents with disability were, on average, more likely to report considering suicide (11.3% v. 7.1%) and attempting suicide (5.3% v. 3.4%). Of adolescents with disability who reported suicidal ideation, more than half also reported attempting suicide over the preceding year. In addition, fewer adolescents with disability rated their health as very good or excellent. Adolescents with disability were also more likely to have sustained serious injury over the past year. However, no statistically significant association was found between disability and health risk behaviors (i.e., drinking alcohol, smoking cigarettes or marijuana). See Appendix C for the weighted zero-order correlation matrix of items related to adolescent subjective well-being as well as all other cross-sectional items pulled from Cycles 7-8.

Table 4-2.

Cross-sectional indicators of adolescent subjective well-being

	Peers (n=3347)		**Disabled Youth** (n=438)		**Unadjusted**			**Adjusted for child gender and aboriginal status**		
	n	%	n	%	OR	[95%CI]		OR	[95%CI]	
Youth is happy with life (Strongly Agree)	1195	35.7	140	32.0	ns			ns		
Youth reports excellent or very good health	2654	79.3	278	63.4	0.45**	[0.37,0.56]		0.46**	[0.37,0.57]	
Smokes Cigarettes at least once a week	191	5.7	31	7.1	ns			ns		
Drinks alcohol at least once a month	778	23.3	101	23.0	ns			ns		
Smokes marijuana at least once a month	303	7.8	44	10.1	ns			ns		
Has considered suicide in past year	231	7.1	48	11.3	1.67**	[1.21,2.33]		1.64**	[1.17,2.29]	
Has attempted suicide in past year	112	3.4	29	5.3	2.11**	[1.39,3.21]		2.03**	[1.33,3.11]	
[a]Youth sustained serious injury in past year	565	14.7	126	22.9	1.73**	[1.39,2.15]		1.74**	[1.40,2.17]	
	Mean	[SD]	Mean	[SD]	B[SE] Cohens *d*	[95%CI] [95%CI]	St. B	B[SE]	[95%CI]	St. B
Positive Affect (Sum Score, 10) α=.786	7.8	[1.94]	7.59	[2.09]	-.21[.10] -.12	[-.40,-.01] [-.21,-.01]	-.034*	ns		
Negative Affect (Sum Score, 6) α=.738	2.1	[1.21]	2.42	[1.29]	.33[.06] .26	[.21,.45] [.16,.36]	.086**	.32[.06]	[.20,.44]	.083**

OR= Odds Ratio; SD= Standard Deviation; SE= Standard Error; CI= Confidence Interval, [a]PMK report item

Note. Weighted Data; *p<.05, **p<.01; Negative sum scale, categories 6+7 collapsed to smooth skewed distribution

4.1.3 Life conditions

Life conditions examined in Study 1 include household socioeconomic status, and supplementary indicators of socioeconomic exposure including parent perceived financial hardship, neighbourhood safety, whether a family was living below the ‘poverty line’, and housing tenure; and social relationships, including peer friendship and acceptance, peer victimisation and social participation, as well as supplementary indicators of social relationships, including time spent with friends, perceived exclusion and unfair treatment at school, adolescent employment, volunteer, and extracurricular activities, exposure to nurturing and rejecting parenting, and parent-child conflict.

4.1.3.1 Household Socioeconomic Status

Household socioeconomic status (SES) was found to be relatively similar between adolescents with disability and non-disabled peers in terms of traditional SES (i.e., household income, educational attainment and occupational status) (Bradley & Corwyn, 2002; Galobardes, Shaw, Lawlor, Lynch, & Davey Smith, 2006a; 2006b; Laaksonen, Rahkonen, Martikainen, & Lahelma, 2005). Families raising an adolescent with disability did not differ from comparison families in parental occupational status, or household income, though a statistically significant difference was found in parental educational attainment (see Table 4-3). Beyond household SES, no disability-based difference was found in parental perceptions of neighbourhood safety. In other words, parents raising a young person with disability were just as likely as other parents to report living in a neighbourhood where they felt safe being outside their home day or night.

Table 4-3.

Cross-sectional indicators of socioeconomic exposures

PMK Report	**Peers** (n=3866)		**Disabled Youth** (n=549)		**Unadjusted**			**Adjusted for child gender and aboriginal status**		
	n	%	n	%	OR	[95%CI]		OR	[95%CI]	
Living at or below the 'poverty line'	437	11.3	75	13.6	ns			ns		
Home is rental accommodation	627	16.5	99	18.3	ns			ns		
PMK worried about money (agree or strongly agree)	1739	44.9	278	50.6	1.26*	[1.05,1.50]		1.25*	[1.05,1.50]	
Financial situation is better than a year ago	925	23.9	108	19.7	0.78*	[0.63,0.97]		0.78*	[0.62,0.97]	
PMK Employed	3266	85.2	444	80.9	0.74*	[0.59,.093]		0.74*	[0.59,0.93]	
Single Parent household	892	23.1	127	23.2	ns			ns		
	Mean	[SD]	Mean	[SD]	B[SE] Cohens *d*	[95%CI] [95%CI]	St. B	B[SE]	[95%CI]	St. B
Categorized Household Income (22)	9.62	[5.01]	9.27	[5.12]	ns			ns		
Mean Highest Household Education (6)	3.91	[1.41]	3.74	[1.44]	-.17[.06] -.12	[-.30,-.05] [-.21,-.03]	-.041**	-.17[.06]	[-.30,-.04]	-.039**
Highest Household Occupational Status (9)	5.02	[2.55]	5.02	[2.56]	ns			ns		
Neighborhood Safety (Sum Score, 9) α=.740	6.66	[1.56]	6.56	[1.66]	ns			ns		

OR= Odds Ratio; SD= Standard Deviation; SE= Standard Error; CI= Confidence Interval
Note. Weighted Data; *p<.05, **p<.01

While mothers raising an adolescent with disability were less likely to be currently employed, families raising an adolescent with disability were no more likely than comparison families to be living below the poverty line. Despite similar income levels, parents raising an adolescent with disability were more likely to report being worried about the family's finances and less likely to report that their financial situation was better than the previous year. The effect of disability on all socioeconomic variables presented in Table 4-3 could be described as small and as such should be interpreted with caution (Olivier & Bell, 2013). However, it should be also noted that confidence intervals include larger effect sizes that are consistent with the data.

4.1.3.2 Social Relationships

Findings based on items pulled from the NLSCY signal a heightened risk of peer exclusion and victimisation toward adolescents with disability. Adolescents with disability were significantly more likely to report being teased, threatened and attacked (see Table 4-4). They were also significantly more likely to report feeling left out while at school. Adolescents with disability tended to rate their friendships and acceptance by peers as poorer then their same age counterparts; and, they were less likely to report spending time with friends outside of school. The parent-child relationship was measured in addition to social relationships with peers. Adolescents with disability did not report significantly less parental nurturance relative to same age peers but did report greater feelings of rejection by parents. In other words, while disabled adolescents were just as likely to report that their parents behaved in a nurturing manner (e.g., smiling, praising, listening, and engaging in problem solving), they were more likely than peers to report feelings of rejection (e.g., nagging, inconsistent rules, anger). Parent reports were consistent with adolescent assertions in that the PMK was significantly more likely to report greater parent-child conflict. Items in each scale may be found in Appendix A.

Table 4-4.

Cross-sectional indicators of family and social relationships

Youth Self-Report	**Peers** (n=3347)		**Disabled Youth** (n=438)		**Unadjusted**			**Adjusted for child gender and aboriginal status**		
	n	%	n	%	OR	[95%CI]		OR	[95%CI]	
Teased (made to feel uncomfortable) in past year	1852	55.3	268	61.3	1.28*	[1.04,1.57]		1.25*	[1.02,1.54]	
Threatened (threatening bodily harm) in past year	1123	33.6	183	41.8	1.42**	[1.16,1.74]		1.42*	[1.15,1.73]	
Attacked (physically assaulted) in past year	448	13.4	78	17.7	1.40*	[1.07,1.82]		1.40*	[1.07,1.82]	
Feels like an outsider (most or all of the time)	153	4.6	37	8.5	1.93**	[1.33,2.80]		1.92**	[1.32,2.79]	
Sees friends outside school at least once a week	2934	87.7	362	82.7	0.67**	[0.52,0.88]		0.67**	[0.51,0.88]	
	Mean	[SD]	Mean	[SD]	B[SE] Cohens *d*	[95%CI] [95%CI]	St. B	B[SE]	[95%CI]	St. B
Friends Score (Sum Score, 16) α=.908	12.89	[2.78]	12.26	[3.31]	-.63[.15] -.22	[-.91,-.34] [-.32,-.12]	-.070**	-.63[.14]	[-.90,-.34]	-.070**
Parental Nurturance (Sum Scale, 28) α=.918	20.34	[5.41]	19.98	[5.6]	ns			ns		
Parental Rejection (Sum Scale, 28) α=.761	11.15	[4.68]	11.70	[4.87]	.55[.24] .12	[.08,1.02] [.02, .02]	.037*	.55[.24]	[.08,1.02]	.037*
PMK Report	**Peers** (n=3866)		**Disabled Youth** (n=549)		**Unadjusted**			**Adjusted for child gender and aboriginal status**		
	Mean	[SD]	Mean	[SD]	B[SE] Cohens *d*	[95%CI] [95%CI]	St. B	B[SE]	[95%CI]	St. B
Parent/Child conflict (Sum Scale, 32) α=.755	5.70	[4.20]	6.79	[4.59]	1.10[.19] .26	[.72,1.48] [.16, .36]	.085**	1.08[.19]	[.71,1.46]	.084**

OR= Odds Ratio; SD= Standard Deviation; SE= Standard Error; CI= Confidence Interval

Note. Weighted Data; *p<.05, **p<.01

While the NLSCY allows for monitoring of actual participation (e.g., in education, leisure, or employment), valuation of these activities on the part of the individual is not reported for the majority of indicators. Understanding the value placed on participating in a given social pursuit gives an indication of equality vs. equity. For example, results show that adolescents with disability are significantly less likely to participate in organized sport (see Table 4-5); whether this is a result of differential desire to play sport, differential access, lack of appropriate accommodation, or some other reason cannot be determined given available data.

Notwithstanding this limitation, findings suggest that there is little difference between adolescents with disability and their age peers with respect to social participation. Controlling for potentially confounding individual level variables (i.e., gender and aboriginal status) adolescents with disability participate in arts based groups, community groups, volunteerism, and paid employment at the same level as their non-disabled counterparts. Personal valuation is measured for one item focused on participation in extracurricular activities at school. Findings suggest that teens with disability do not differ from their peers in desire to participate in extracurricular activities, or in actual self-reported participation. Notably while all adolescents in both groups attended formal education, those with disability were less likely to report that their teachers treated them fairly.

Table 4-5.

Cross-sectional indicators of social participation

Youth Self-Report	**Peers** (n=3347)		**Disabled Youth** (n=438)		**Unadjusted**		**Adjusted for gender and aboriginal status**	
	n	%	n	%	OR	[95%CI]	OR	[95%CI]
Organized Sport at least once a week	1845	55.1	212	48.4	0.76**	[0.63,0.93]	0.77*	[0.63,0.94]
Arts Group at least once a week	658	19.6	98	22.5	ns		ns	
Community group at least once a week	482	14.4	61	13.9	ns		ns	
Volunteered in the past year	2332	70.5	305	70.3	ns		ns	
Has a part time job	659	20.3	83	20.0	ns		ns	
Treated fairly by teachers most or all of the time	2905	86.8	362	82.7	0.72*	[0.56,0.95]	0.72*	[0.55,0.95]
Part. in extra activities at school is important	1985	59.3	252	57.7	ns		ns	
Part. in extra activities at least once a week	2107	63.0	267	61.0	ns		ns	

OR= Odds Ratio; SD= Standard Deviation; SE= Standard Error; CI= Confidence Interval
Note. Weighted Data; *p<.05, **p<.01

In summary, disability-based differences in the life conditions and components of SWB of Canadian adolescents were found, although on most indicators the differences were not large. The sharpest disparities were in items related to suicidal ideation. Despite similar socioeconomic status, parents raising an adolescent with disability were more likely to report being worried about the family's finances. Adolescents with disability also fared worse than their non-disabled counterparts on most measures of social relationships, including but not limited to exposure to victimisation and impoverished peer relationships. The greatest parity was found on indicators of social participation. One potentially concerning finding in this domain was youth self-report treatment by teachers, wherein adolescents with disability were significantly less likely to report being treated fairly.

4.2 Study 2. Disability-Based Differences - A Longitudinal Analysis

Study 2 examined the potential mediating role of life conditions, measured at three points across childhood, in explaining the hypothesized relationship between disability identified at age 4-5 years and adolescent subjective well-being. First, the relationship between disability and household socioeconomic status was explored. Second, the relationship between disability and social relationships was examined. Third, pathways between disability and adolescent subjective well-being by way of household socioeconomic status and youth social relationships were investigated. It is important to reiterate that youth with parent report disability identified in early childhood are not necessarily those identified by parents at adolescence. There are a number of reasons for this: Diagnosis of several conditions occurs after the child enters school (Howlin & Asgharian, 1999; Mandell, Listerud, Levy, & Pinto-Martin, 2002; Shalev, 2004); changes in available items also necessitated changing the operational definition of 'disability' at adolescence; ability to assess functional limitation was drastically reduced whereas measurement of activity restriction was expanded.

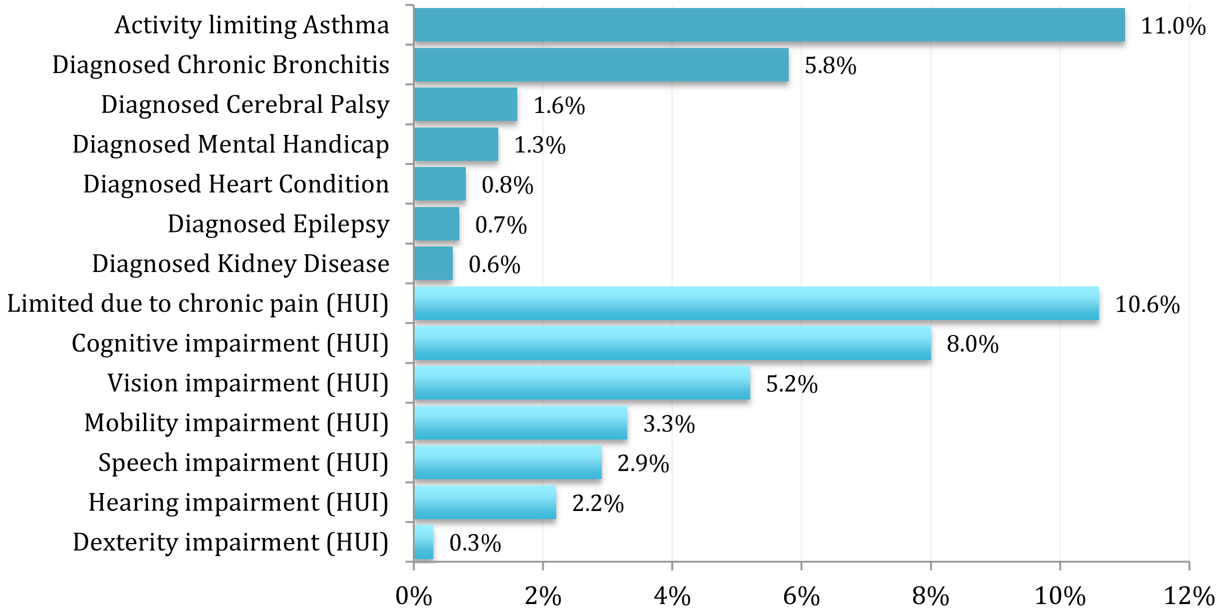
The final longitudinal sample consists of 3,199 children. Data were weighted utilizing normalized longitudinal sample weights. Table 4-6 describes general child and family characteristics of the sample in Cycle 2-3. Based on PMK report, there were 307 (9.6%) children with disability in the sample. The prevalence of all diagnoses and/or functional limitations, specified in the NLSCY survey, in this sample of disabled children may be found in Figure 4-2.

Table 4-6.

Child and family characteristics of the longitudinal sample at early childhood (Cycle 2-3)

	Total Sample n=3199		**Peers n=2891**		**Child with Disability n= 307**	
	n (Mean)	% [SD]	n (Mean)	% [SD]	n (Mean)	% [SD]
PMK is Mother (bio, adopt or step)	2932	91.7	2643	91.4	289	94.0
PMK Age	34.15	[5.29]	34.29	[5.26]	32.84	[5.43]
PMK Martial Status						
PMK - Married	2388	74.6	2200	76.1	188	61.1
PMK - Common Law	346	10.8	295	10.2	52	16.8
PMK - Separated/Divorced/Widowed	243	7.6	216	7.5	27	8.9
PMK - Single, Never Married	222	6.9	181	6.3	41	13.2
Location of residence						
Rural	397	12.5	356	12.4	41	13.5
Urban <30,000	427	13.5	395	13.8	32	10.4
Urban 30,000 - 99,999	256	8.1	217	7.6	39	12.7
Urban 100,000 - 499,999	601	19.0	540	18.9	60	19.7
Dense urban (500,000+)	1487	46.9	1352	47.3	134	43.7
Highest Household Education						
< High school	196	6.1	162	5.6	35	11.3
High school Grad	268	8.4	229	7.9	38	12.4
Some post-secondary	714	22.3	637	22.0	76	24.8
Diploma or Certificate	1012	31.6	925	32.0	87	28.3
Bachelor's degree	738	23.1	686	23.7	52	16.9
Graduate level degree	271	8.5	252	8.7	19	6.3
Rounded Household Income ($)	(59,500)	[44,600]	(60,300)	[45,200]	(51,600)	[45,100]
Household is below LICO	606	19.4	536	19.0	70	23.3
Single Parent Household	466	14.6	403	13.9	63	20.5
PMK Employed	2136	67.5	1,929	67.5	207	67.4
Number of children in household = 1	601	18.8	534	18.5	67	21.8
Number of children in household = 2	1487	46.5	1,340	46.3	146	47.6
Number of children in household = 3+	1112	34.7	1018	35.2	94	30.5
Child Characteristics						
Female	1614	50.5	1469	50.8	145	47.3
Aboriginal Status	108	3.4	94	3.2	below release guidelines	

Note: Normalized longitudinal weight at Cycle 2/3; LICO=Low Income Cut-Off; SD= Standard Deviation



Note. Impairments / Chronic conditions are not mutually exclusive.

Figure 4-2. Chronic conditions and functional limitations among children with disability (n=307)

4.2.1 Childhood Disability and Household Socioeconomic Status

A selection of indicators at three points across childhood were examined to assess the socioeconomic status of household with and without a child with disability. Multiple regression results displayed in Table 4-7 show that disability identified at age 4-5 years significantly predicts socioeconomic status across childhood holding child characteristics (i.e., gender and aboriginal status) constant. Although the observed effect sizes are arguably small, statistically significant disability-based differences were found in educational attainment, occupational status, and income across the 10 year period. Moreover, the confidence intervals show that larger effect sizes are also consistent with the data. Interestingly, no statistically significant association was found between disability and maternal employment any time point.

Table 4-7.

Socioeconomic status across childhood

		Youth with disability	Comparison Families	Adjusted for child gender and aboriginal status		
	Scale	Mean(SD)	Mean(SD)	B[SE] Cohens *d*^{a}	[95%CI] [95%CI]	St. B
Early Childhood						
Household Income	1-22	5.59(3.58)	6.49(3.62)	-.878[.216] -.25	[-1.302, -.454] [-.37, -.13]	-.071**
Highest Household Occupation	1-9	5.07(2.46)	5.88(2.44)	-.796[.146] -.33	[-1.083, -.508] [-.45, -.21]	-.095**
Highest Household Education	1-6	3.46(1.38)	3.86(1.27)	-.400[.076] -.31	[-.550, -.250] [-.43, -.19]	-.092**
PMK: Hours worked per week	1-7	3.64(1.99)	3.86(2.01)	-.208[.120] -.11	[-.444, .028] [-.23, .01]	-.031
Middle Childhood						
Household Income	1-22	7.03(4.10)	8.06(4.27)	-1.009[.256] -.24	[-1.510, -.508] [-.36, -.12]	-.069**
Highest Household Occupation	1-9	4.42(2.57)	5.00(2.59)	-.569[.156] -.22	[-.874, -.264] [-.34, -.12]	-.064**
Highest Household Education	1-6	3.39(1.42)	3.76(1.43)	-.363[.086] -.26	[-.531, -.195] [-.38, -.14]	-.074**
PMK: Hours worked per week	1-7	4.42(1.92)	4.41(1.84)	.010[.111] .01	[-.208, .228] [-.11, .12]	.002
Adolescence						
Household Income	1-22	9.10(4.66)	9.83(5.05)	-.714[.303] -.15	[-1.308, -.121] [-.26, -.03]	-.042*
Highest Household Occupation	1-9	4.54(2.51)	5.19(2.56)	-.631[.155] -.25	[-.934, -.328] [-.37, -.14]	-.072**
Highest Household Education	1-6	3.75(1.33)	3.97(1.34)	-.220[.081] -.16	[-.378, -.062] [-.28, -.05]	-.048**
PMK: Hours worked per week	1-7	4.67(1.76)	4.79(1.71)	-.109[.104] -.07	[-.312, .095] [-.19, .05]	-.018

SD= Standard Deviation; SE= Standard Error; CI= Confidence Interval

Note. Weighting appropriately calibrated for each time period; *p<.05, **p<.01; ^{a}Effect size corresponds to unadjusted between group difference.

> Hypothesis 1a. From early childhood to adolescence, disability (identified in early childhood) is associated with increasingly greater socioeconomic inequality (i.e., the downward social mobility hypothesis).

The income gap. Annual household income across childhood reveals an upward trend for both families raising a child with disability and comparison families. This gradual increase in household income is representative of a common financial trajectory among Canadian families beyond inflation; that is, as young families become more established their annual earnings are expected to increase. To illustrate, the average age of the PMK when her child was age 4-5 years (1996-1999) was 32.84 years (SD= 5.43) for those raising a child with disability and 34.29 years (SD= 5.26) in comparison families. Canadian women age 25 to 34 years were reported to have an average income of $27,900 during that time period, i.e., 1998 (Statistics Canada, 2011). Ten years later, in 2008, Canadian women age 35 to 44 years earned $38,200 on average. If we consider men's mean income a more dramatic increase can be observed; from an average of $41,700 annually for those age 25-34 in 1998, to $63,000 for men age 35-44 in 2008 (Statistics Canada, 2011).

While absolute income increases on average for all families over the ten-year study period, those raising a child with disability appear to consistently fall short. A growth curve model was tested to examine group based growth trajectories in household income; Specifically, does the income gap between groups widen over time as predicted by the downward social mobility hypothesis? In line with best practice, the latent slope parameters were constrained to mark the years between data collection; i.e., year zero = age 4-5, year five = age 10-11, and year ten = age 14-15 years of age (Acock, 2013; Kenny, 2011; Newsom, 2002). Child disability was included as a time-invariant covariate to allow calculation of whether the household income of families raising a child with disability changed at a different rate over time relative to comparison families (Acock, 2013; Kenny, 2011; Little, 2013). The model was initially tested with unweighted, raw data as input using Maximum Likelihood (ML) with Satorra–Bentler (SB) adjusted estimates. To reiterate, this process was chosen as the initial test for all models in this study as unweighted data allows fit statistics to be generated while Satorra–Bentler adjustments produce robust, corrective estimates without a multivariate normality requirement including fit statistics, standard errors, p-values and confidence intervals (Acock, 2013; Bentler, 1990; Curran, West, & Finch, 1996; Kline, 2010; Schermelleh-Engel et al., 2003; StataCorp, 2015). Supplementary fit statistics suggest the model provides an adequate description of the data[15] (X^2[SB]= 70.27(df 4) p<.001, RMSEA[SB]= .072, CFI[SB]=.979, TLI[SB]=.969, SRMR=.027) and was therefore reexamined with appropriate survey weights using quasi-maximum likelihood (QML or vce, robust) estimation (SRMR=.030). Results displayed in Table 4-8 suggest that families raising a child with disability are at a relative financial disadvantage when that child is entering school at age 4-5 years (4.50, z= -2.70, p=.007). This difference in income experienced by family is sustained over the following decade; the rate of positive change for this group was not significantly steeper than comparison families (.910, z=0.48 p=.630). This finding is

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[15] Sound model fit judged by supplementary indices is indicated by a CFI > .95 (Iacobucci, 2010; Schermelleh-Engel, Moosbrugger, & Müller, 2003), a TLI > .95 (Bryne, 2010; Hu & Bentler, 1999), an RMSEA ideally < .05 although .05 to .08 is considered acceptable (Browne & Cudeck, 1992; Hox & Bechger, 1998; Smith & McMillan, 2001), and an SRMR ideally < .05 although values between .05 and .10 indicate acceptable model fit (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003). See section 3.3.2 - Goodness-of-fit indices - for further details.

inconsistent with the downward social mobility hypothesis in that the initial income gap between families remains consistent across childhood.

Table 4-8.

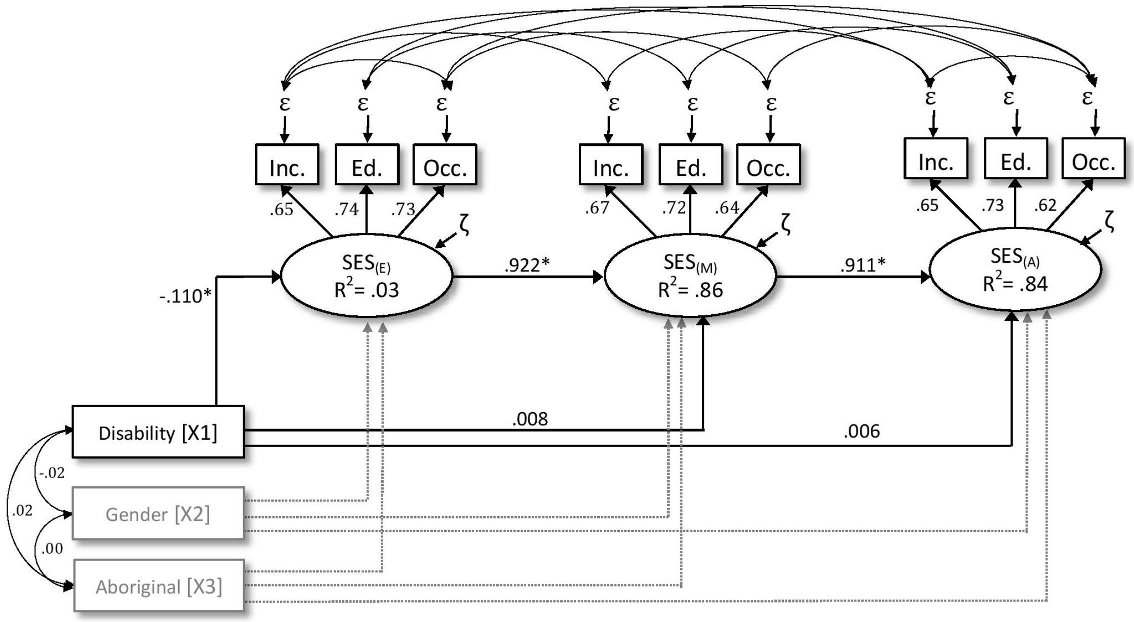
Structural coefficients: Intercept, slope and time-invariant covariate

	Coefficient [95%CI]	**SE(Robust)**	**Z(P)**
Intercept (constant)	5.51 [5.23, 5.80]	0.144	38.35(p<.001)
Disability	-1.01 [-1.74, -0.28]	0.374	-2.70(p=.007)
Slope (constant)	.864 [.791, .937]	0.037	23.25(p<.001)
Disability	.046 [-.140, .231]	0.095	0.48(p=.630)

Household socioeconomic status. With a greater understanding of relative income across childhood, analysis was expanded to consider the multifaceted construct of socioeconomic status (SES). Investigating the structure of the SES construct across childhood as depicted in the hypothesized models (i.e., as three matched chronological latent variables) requires verification of equivalence over time. To be considered fully comparable a latent construct must demonstrate factorial invariance by way of acceptable configural, metric, and scalar invariance (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012; van, Lugtig, & Hox, 2012; Widaman, Ferrer, & Conger, 2010). CFA measurement model analysis confirmed configural invariance in SES across all three time points. In other words, socioeconomic position is measured by the same set of variables (the same configuration of variables) and the model fit the data well both unweighted (X^2[SB]= 25.48(df 13) p<.020, RMSEA[SB]= .017, CFI[SB]=.999, TLI[SB]=.989, SRMR=.006) and weighted (SRMR=.012) (Kline, 2010; Vandenberg & Lance, 2000). Testing metric or ‘loading’ invariance involves constraining factor loadings at each time period to assess whether the indicators relate equally to the construct over time, or said another way, that the meaning ascribed to the construct is the same over time (Little, 2013; van et al., 2012). Given the large sample size, comparison of nested models is best assessed by the change in the Comparative Fit Index (CFI) criterion (Bryne, 2010; Kline, 2010; Meade, Johnson, & Braddy, 2008). The equal factor loadings hypothesis is rejected if ΔCFI > .01 (Cheung & Rensvold, 2002; Coertjens et al., 2012). Constraining factor loadings to be equal across time resulted in a model CFI[SB] of .988 (ΔCFI[SB] = .011) meaning that full metric invariance was not achieved. However, partial - nearly perfect - metric invariance is evident; income and education loadings held constant at all three time periods as well as occupation held at middle childhood and adolescence results in a model CFI[SB] of .994 (ΔCFI[SB] = .005). The only loading left ‘free to vary’ is household occupational status in early childhood. This finding is reasonable given that changes in NLSCY survey items required a different measure of occupational status in Cycles 2 and 3.

While requirements for configural and partial metric invariance were met, the latent SES construct did not demonstrate scalar or ‘intercept’ invariance. When the intercept of each observed variable is held constant over time the ΔCFI exceeds .01. This implies that while the meaning of the SES construct is consistent, the meaning of the levels of the observed indicators is not, therefore latent scores cannot be said to be directly comparable over time (Coertjens et al., 2012; van et al., 2012). In practice demonstrating both configural and metric invariance is generally considered sufficient for estimating relationships between latent factors and external variables over time (Dimitrov, 2010; Little, 2013; Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000).

With measurement invariance of the SES construct deemed acceptable, the hypothesized model designed to test the relationship between disability identified at early childhood and household socioeconomic position over time could be tested. If disability were to predict low SES at adolescence controlling for SES at early and middle childhood this would stand as evidence of downward social mobility employing a metric greater than income alone. The measurement and structural model were first explored using unweighted, raw data as input using ML with Satorra–Bentler (SB) corrected estimates. Given that the measurement model appeared sound, and the structural model fit the data well (X^2[SB]= 42.88(df 32) p=.095, RMSEA[SB]= .010, CFI[SB]=.999, TLI[SB]=.999, SRMR=.007) the model pictured in Figure 4-3 was examined with appropriate survey weights using QML estimation (SRMR .011). Parameters generated from the analysis of unweighted data parallel weighted data findings; while estimates vary slightly, direction and significance of relationships remain the same.



* p<.05

Figure 4-3. SEM analysis: Family socioeconomic status across childhood

Table 4-9.

Hypothesis 1a. Weighted direct, indirect and total effects with robust standard errors

Measures		**Effects decomposition**					
Predictor →	**Criterion**	**Direct**		**Indirect**		**Total**	
		Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.
Disability	SES (E)	-0.88(.28)	-.110**			-0.88(.28)	-.110**
	SES (M)	0.08(.22)	.008	-1.00(.33)	-.101**	-.924(.30)	-.093**
	SES (A)	0.06(.17)	.006	-0.96(.31)	-.085**	-0.89(33)	-.079**
SES (E)	SES (M)	1.14(.07)	.922**			1.14(.07)	.922**
	SES (A)			1.18(.07)	.840**	1.18(.07)	.840**
SES (M)	SES (A)	1.04(.04)	.911**			1.04(.04)	.911**
Gender (Female)	SES (E)	-0.07(.16)	-.016			-0.07(.16)	-.016
	SES (M)	-0.22(.13)	-.038	-0.08(.19)	-.015	-0.31(.20)	-.053
	SES (A)	0.09(.15)	.014	-0.32(.21)	-.048	-0.23(.22)	-.035
Aboriginal Status	SES (E)	-1.41(.27)	-.112**			-1.41(.27)	-.112**
	SES (M)	-0.37(.20)	-.024	-1.61(.31)	-.104**	1.98(.31)	-.127**
	SES (A)	-0.55(.29)	-.031	-2.05(.33)	-.116**	-2.60(.37)	-.147**

Note. E=Early childhood M=Middle childhood, A=Adolescence, *p < .05, **p < .01

Data presented in Table 4-9 do not support a disability-based trend of downward social mobility. Child disability is significantly related to household SES in early childhood and only related to later SES by way of early childhood. In other words, the relationship between childhood disability and family socioeconomic status over time is fully mediated by family SES in early childhood. Very strong associations between SES at each time point suggest that little variation exists in socioeconomic position between early childhood and adolescence for families in this sample. These findings are consistent with research suggesting that it is difficult for a family raising a child with disability to improve their socioeconomic standing over time (Emerson & Hatton, 2009; Emerson, Shahtahmasebi, Lancaster, & Berridge, 2010; Parish & Cloud, 2006a; Parish, Rose, Grinstein-Weiss, Richman, & Andrews, 2008; Shahtahmasebi, Emerson, Berridge, & Lancaster, 2011).

> Hypothesis 1b. The relationship between disability (identified in early childhood) and household socioeconomic status (SES) in early childhood, middle childhood, and adolescence is at least partially mediated by a lower rate of paternal workforce participation.

Research suggests that differential parental (maternal) employment may, in part, account for disability-based differences in income in the early years of childhood (Gordon, Rosenman, & Cuskelly, 2007; Parish & Cloud, 2006b). Regression analyses employing NLSCY longitudinal data suggest that, while families raising a child with disability fare worse on family level SES indicators relative to comparison families, PMK or maternal workforce participation does not differ significantly (see Table 4-7). Child disability did not significantly predict maternal workforce participation in early childhood ($\beta = -.036$, $p=.181$), middle childhood ($\beta = -.016$, $p=.567$), or adolescence ($\beta = -.018$, $p=.482$) controlling for child level variables[16]. These findings do not support investigation of the hypothesised mediating role of maternal employment in explaining the relationship between disability and household socioeconomic position.

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[16] Regression equation results: Early childhood (R2=.001, F(3,3195)=1.67, p=.17); Middle childhood (R2=.002, F(3,3195)=0.94, p=.42); Adolescence (R2=.001, F(3,3195)=1.80, p=.15).

4.2.2 Childhood Disability and Social Relationships

> Hypothesis 2ai. Children with disability (identified in early childhood) participate in social leisure activities less frequently than same age peers in early childhood, middle childhood, and adolescence.

Findings from the logistic regression analysis displayed in Figure 4-4 suggest that there are disability-based differences in some, but not all, indicators of leisure participation controlling for child level covariates (i.e., gender and aboriginal status). The most evident difference involved structured team sport; Young children with disability were significantly less likely to participate on a weekly basis than their non-disabled peers. A participation gap was maintained into the early teen years. This finding aligns with existing research suggesting that children with disability are less likely to participate in organized sport across childhood (Anderson, Wozencroft, & Bedini, 2008; Arim, Findlay, & Kohen, 2012; Bantjes, Swartz, Conchar, & Derman, 2015; Murphy, Carbone, & the Council on Children With Disabilities, 2008; Sit, Lindner, & Sherrill, 2002; Zwinkels et al., 2015).

While no other differences were found in early childhood, further differences emerged as the children grew into middle childhood and adolescence. Children with disability were found significantly more likely to participate in organized active groups (e.g., dance, gymnastics, or martial arts) at least once a week at age 10-11 years (49.4% v. 41.6% respectively). By adolescence, participation dropped drastically for all youth and the disability-based relationship flipped; teens with early identified disability were now less likely relative to their non-disabled peers to participate in active groups (20.4% v. 26.1% respectively).

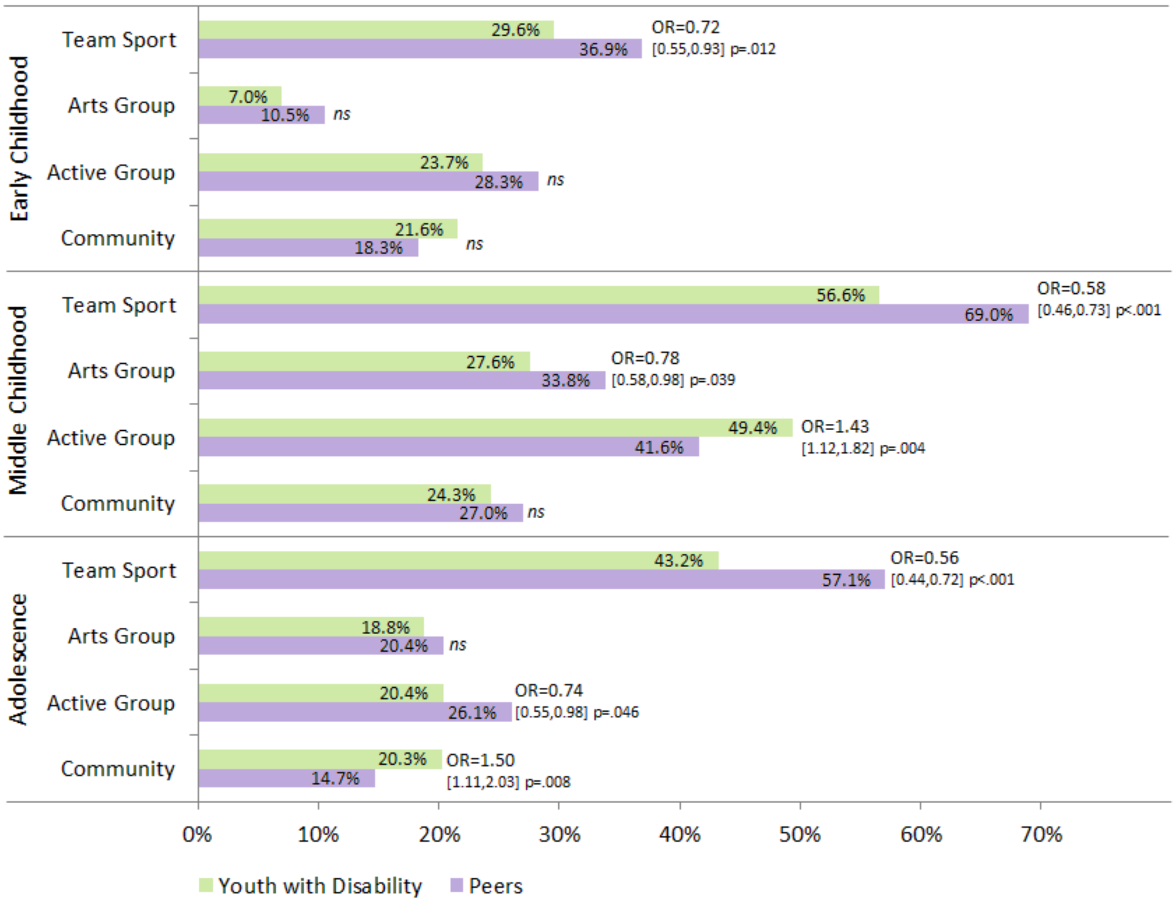

Figure 4-4. Leisure Participation at Least Once a Week: Proportions and Adjusted Odds Ratios

Preadolescents with disability (age 10-11 years) were found to be less likely to participate in arts activities (e.g., music, art, or drama clubs/groups), whereas the adjusted odds of weekly participation in a community group (e.g., church youth group, Scouts, or 4-H club) were 1.50 times higher for teens with disability. Observed effect sizes could be described as small (Olivier & Bell, 2013). However, larger effect sizes noted in the 95% confidence intervals are consistent with the data. Caution should be applied to interpretation of child leisure participation data; data on child preference is lacking, as is the ability to differentiate participation in ‘mainstream’ activities from therapeutic / prescribed activities specific to children with disability. Further, participation in early childhood is reported by the PMK, while middle childhood and adolescent participation is reported by the young person themselves.

Hypothesis 2aii. The relationship between disability (identified in early childhood) and frequency of participation in social leisure activities is at least partially mediated by household socioeconomic status in early childhood, middle childhood, and adolescence.

While the domain specific participation indicators outlined above provide a general understanding of leisure participation across childhood, they cannot be interpreted as manifest indicators of a greater latent participation construct to test the SES mediation hypothesis. A child may participate in a wide variety of social activities in equal amounts or, perhaps more common, participate in one or two activities to the exclusion of all other leisure domains. It follows that participation domain items do not correlate highly enough to support a latent indictor (see Appendix D for longitudinal variable correlations). Composite indicators were created denoting level of social leisure participation irrespective of domain at early childhood, middle childhood, and adolescence. The composite measures were obtained by calculating the mean of all participation raw item scores at each time point. A series of multiple regression analyses were run to test if childhood disability significantly predicted participation controlling for potential child level confounds (i.e., child gender and aboriginal status). Results indicated that child disability did not significantly predict mean leisure participation in early childhood ($\beta = -.041$, $p=.087$), middle childhood ($\beta = -.030$, $p=.191$), or adolescence ($\beta = -.047$, $p=.079$). In addition the variance explained by disability, gender, and aboriginal status was negligible in each regression equation[17]. These findings do not support further mediation analysis to explore the association between childhood disability and composite participation across childhood.

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[17] Regression equation results: Early childhood (R2=.013, F(3,3195)=5.78, p<.01); Middle childhood (R2=.019, F(3,3195)=9.23, p<.01); Adolescence (R2=.001, F(3,3195)=2.32, p=.07).

Hypothesis 2b. In middle childhood and adolescence, children with disability (identified in early childhood) report more impoverished peer friendships and greater exposure to peer victimisation than same age peers.

A trend of peer exclusion and victimisation was found for youth with disability (identified at age 4-5 years) relative to same age peers. Preadolescents 10-11 years of age with disability were significantly more likely than same age peers to report “other young people say mean things to me at school” all or most of the time (18.2% v. 9.8%; Adjusted OR= 2.01, 95%CI= 1.46, 2.76; p< .001), and “I am bullied in school” all or most of the time (8.4% v. 4.5%; Adjusted OR= 1.87, 95%CI= 1.20, 2.92; p= .006). This finding is consistent with existing research demonstrating that students with disability tend to face bullying at school more often than their non-disabled peers (Chan, Emery, & Ip, 2016; Cummings, Pepler, Mishna, & Craig, 2006; Flynt & Morton, 2004; Lindsay & McPherson, 2012; Rose, Monda-Amaya, & Espelage, 2011; Rose, Simpson, & Moss, 2015; Sentenac et al., 2011). Four years later this same group of young people with disability reported significantly more frequent verbal abuse and threats of physical violence relative to their non-disabled peers (see Table 4-10).

Results suggest that youth with disability may have increasingly impoverished friendships following the transition from preadolescent to adolescent. Children with disability at age 10-11 years report that ‘others my age want me to be their friend’ and that they ‘have many friends’ at par with other preteens. Four years later this group reports significantly less agreement with the same statements relative to same age peers. In addition, adolescents with disability were less likely than their non-disabled peers to agree with the statement ‘most others my age like me’. These results are congruent with previous studies suggesting that adolescents with disability are less positive about their friendships (Ecotiere, 2015; MacArthur, 2013; Matheson, Olsen, & Weisner, 2007; Zeedyk, Rodriguez, Tipton, Baker, & Blocher, 2014) and less likely to report having a cohesive network of friends (Gerhardt, McCallum, McDougall, Keenan, & Rigby, 2015; Tipton, Christensen, & Blacher, 2013; Zic Ralic & Ljubas, 2013).

Table 4-10.

Preadolescent and adolescent indictors of peer relationships

		Youth with disability	**Comparison Peers**	**Adjusted for child gender and aboriginal status**		
	Scale	Mean(SD)	Mean(SD)	B[SE] Cohens d^{a}	[95%CI] [95%CI]	St. B
Middle Childhood						
Peers say mean things	1-5	2.37(1.19)	2.12(1.02)	.237[.062] .24	[.115, .360] [.12, .36]	.067**
Bullied at school	1-5	1.70(1.06)	1.49(0.87)	.199[.053] .24	[.095, .303] [.12, .36]	.065**
Liked by peers	1-5	3.90(1.22)	4.07(1.01)	-.151[.061] -.17	[-.271, -.031] [-.28, -.05]	-.043*
Desired friend	1-5	3.80(1.09)	3.78(1.06)	.033[.064] .02	[-.092, .158] [-.10, .14]	.009
Many friends	1-5	4.53(0.85)	4.61(0.74)	-.073[.045] -.11	[-.161, .015] [-.22, .01]	-.029
Adolescence						
Teased in past year	1-5	1.99(1.01)	1.76(0.85)	.238[.052] .27	[.137, .339] [.15, .38]	.080**
Threatened in past year	1-5	1.67(0.90)	1.46(0.76)	.207[.047] .27	[.115, .299] [.15, .39]	.078**
Attacked in past year	1-5	1.24(0.59)	1.18(0.52)	.059[.032] .11	[-.004, .122] [-.00, .23]	.032
Feels like an outsider	1-5	3.85(0.94)	3.95(0.83)	-.106[.051] -.12	[-.205, -.006] [-.24, -.01]	-.037*
Liked by peers	1-5	4.03(1.00)	4.31(0.76)	-.278[.047] -.36	[-.371, -.185] [-.47, -.24]	-.103**
Desired friend	1-5	3.90(0.94)	4.07(0.84)	-.161[.051] -.20	[-.261, -.060] [-.32, -.08]	-.055**
Many friends	1-5	3.86(0.92)	4.01(0.81)	-.146[.050] -.18	[-.243, -.048] [-.30, -.06]	-.052**

Note. Weighting appropriately calibrated for each time period; *p<.05, **p<.01; ^{a}Effect size corresponds to unadjusted between group difference.

4.2.3 Pathways to Subjective Well-being

Hypothesis 3a. There is a negative association between disability (identified in early childhood) and adolescent subjective well-being (SWB).

A series of multiple regression equations were conducted to evaluate potential disability-based differences on items measuring the primary domains of SWB; life satisfaction, positive affect scale score (α=.796) and negative affect scale score (α=.734). The results displayed in Table 4-11 suggest that adolescents with disability report lower life satisfaction, lower positive affect, and higher negative affect compared to their non-disabled peers controlling for the potentially confounding effects of gender and aboriginal status.

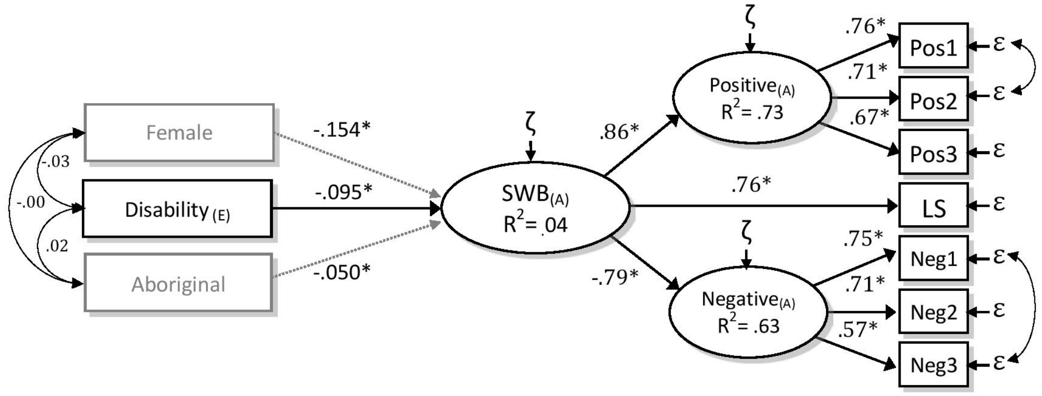
Table 4-11.

Adolescent report indicators of subjective well-being

		Youth with disability	**Comparison Peers**	**Adjusted for child gender and aboriginal status**		
	Scale	Mean(SD)	Mean(SD)	B[SE] Cohens *d*[a]	[95%CI] [95%CI]	St. B
Adolescence						
Life Satisfaction	1-4	3.10(.749)	3.24(.667)	-.151[.041] -.21	[-.232,-.071] [-.33 ,-.09]	-.065**
Positive Affect	1-10	7.23(2.16)	7.80(1.96)	-.576[.119] -.29	[-.809,-.344] [-.41 ,-.17]	-.085**
Negative Affect	1-6	2.40(1.44)	2.17(1.27)	.239[.078] .18	[.806, .391] [.06 ,.30]	.054**

Note. *p<.05, **p<.01; [a]Effect size corresponds to unadjusted between group difference.

Measurement and structural models designed to approximate the hypothesized structure of SWB were examined using maximum likelihood (ML) estimation with Satorra–Bentler (SB) adjustments using un-weighted raw data. The structural model demonstrated sound model fit as evidenced by supplementary fit indices (X^2[SB]= 113.54(df 28) p<.001, RMSEA[SB]= .031, CFI[SB]=.988, TLI[SB]=.982, SRMR=.017). The model, depicted in Figure 4-6, also appeared to describe weighted data well (SRMR=.021).



* p<.05

Figure 4-5. SEM analysis: Disability and adolescent subjective well-being

The effects decomposition listed in Table 4-12 shows small but statistically significant relationships between child disability and individual components of adolescent SWB as well as the overarching latent construct. This finding is in line with previous studies demonstrating a negative relationship between disability and components of subjective well-being among youth (Edwards, Patrick, & Topolski, 2003; Emerson, Honey, & Llewellyn, 2008; Emerson, Llewellyn, Honey, & Kariuki, 2012; Emerson, Honey, Madden, & Llewellyn, 2009; McNamara, Willoughby, Chalmers, & YLC-CURA, 2005; Neuner et al., 2011; Topolski et al., 2004; Uusitalo-Malmivaara et al., 2012). However, disability, aboriginal status and gender explain very little of the variance in youth SWB (R^2= .035).

Table 4-12.

Hypothesis 3a. Weighted direct, indirect and total effects with robust standard errors

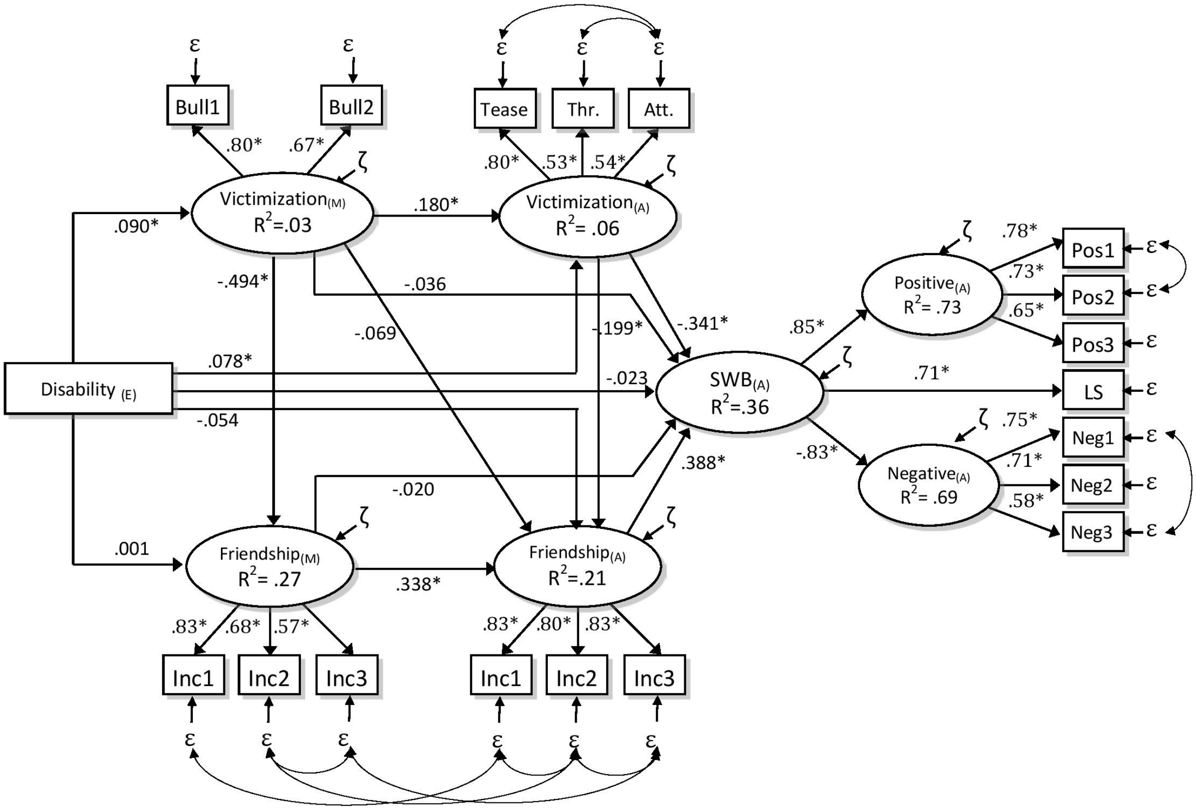
Measures		**Effects decomposition**					
Predictor →	**Criterion**	**Direct**		**Indirect**		**Total**	
		Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.
Disability (E)	SWB (A)	-.167(.07)	-.095*			-.167(.07)	-.095*
	Life Sat. (A)			-.167(.07)	-.072*	-.167(.07)	-.072*
	Pos. Affect (A)			-.180(.07)	-.081*	-.180(.07)	-.081*
	Neg. Affect (A)			.119(.05)	.075*	.119(.05)	.075*
Gender (Female)	SWB (A)	-.158(.03)	-.154**			-.158(.03)	-.154**
Aboriginal Status	SWB (A)	-.167(.07)	-.050*			-.167(.07)	-.050*

Note. E=Early childhood M=Middle childhood, A=Adolescence, *p < .05, **p < .01

> Hypothesis 3b. The relationship between disability (identified in early childhood) and adolescent subjective well-being is at least partially mediated by peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.

Prior to inclusion in a structural model, factorial invariance should be demonstrated by the ‘friendship’ construct (peer friendship and acceptance) to verify equivalence over time, and in doing so support correlating error terms over time (Little, 2013; Vandenberg & Lance, 2000). CFA measurement model analysis confirmed configural invariance in ‘friendship’ across both time points (Kline, 2010; Vandenberg & Lance, 2000). Next, metric invariance was tested to assess whether the indicators relate equally to the construct over time, i.e., the meaning ascribed to the construct remains consistent (Little, 2013; van et al., 2012). The equal factor loadings hypothesis was rejected (ΔCFI = .11); full metric invariance was not achieved (Cheung & Rensvold, 2002; Coertjens et al., 2012). However, partial metric invariance was evident; ΔCFI > .01 if two of the three indicators (Inc B and Inc C) were held constant.

The full model, pictured in Figure 4-7, suggests that interaction with peers plays a substantial role in adolescent SWB. The model fit the data well, both with un-weighted (X^2[SB]= 633.77(df 153) p<.001, RMSEA[SB]= .032, CFI[SB]=.983, TLI[SB]=.984, SRMR=.027) and weighted data (SRMR= 0.031). Indicators of peer friendship and victimisation from middle childhood to adolescence account for 37% of the variance in adolescent subjective well-being (R^2 = .365). The effects decomposition presented in Table 4-13 indicates that the impact of child disability on adolescent SWB is fully mediated by peer relationship variables. Two of the eleven potential mediation pathways running from early childhood disability to adolescent subjective well-being were found to account for a significant proportion of the standardized indirect effect: Disability_{EC} → $\text{Victimisation}_{MC}$ → Friendship_{MC} → Friendship_{AD} → SWB_{AD} (Coef.= -.006, SE= .002[-.011, -.001], p=.015), and Disability_{EC} → $\text{Victimisation}_{MC}$ → $\text{Victimisation}_{AD}$ → SWB_{AD} (Coef.= -.006, SE= .003[-.011, -.001], p=.045). These results should be interpreted with caution; indirect path coefficients are quite small as would be expected given the small standardized total effect (Coef.= -.094, p=.013). As a whole, these results suggest that disabled youth who are not subject to peer victimisation and who have positive peer friendships and acceptance of peers report well-being equivalent to their non-disabled counterparts.



Note: Aboriginal status and gender omitted from figure to increase readability; *p<.05

Figure 4-6. SEM analysis: Disability, peer relationships and adolescent subjective well-being

Table 4-13.

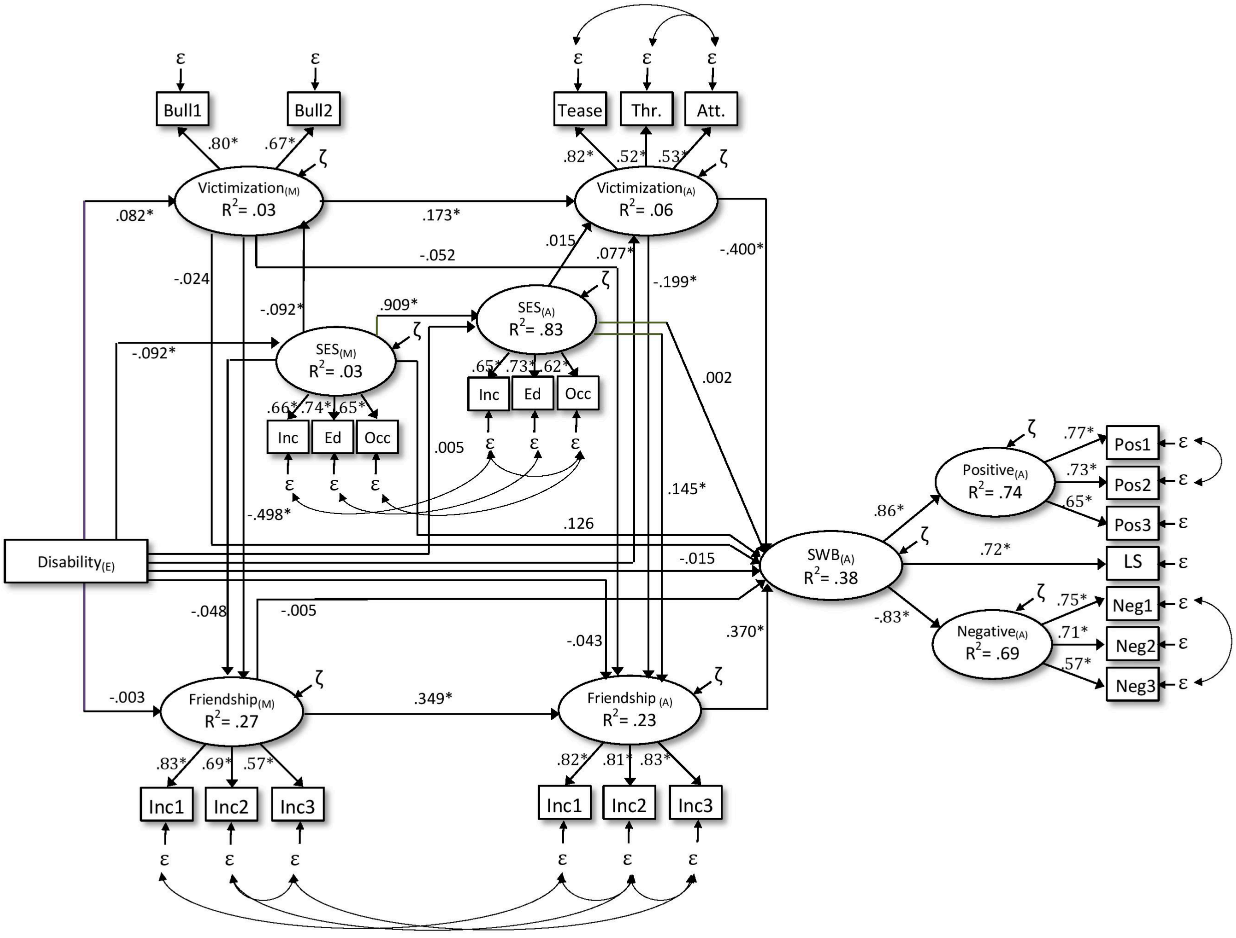
Hypothesis 3b. Weighted direct, indirect and total effects with robust standard errors

Measures		**Effects decomposition**					
Predictor →	**Criterion**	**Direct**		**Indirect**		**Total**	
		Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.
Disability (E)	Friendship (M)	.003(.09)	.001	-.130(.05)	-.045*	-.128(.10)	-.044
	Friendship (A)	-.121(.07)	-.054	-.088(.03)	-.040**	-.210(.08)	-.094**
	Victimisation (M)	.254(.10)	.090**			.254(.10)	.090**
	Victimisation (A)	.185(.09)	.078*	.039(.02)	.016*	.223(.09)	.093*
	SWB (A)	-.039(.06)	-.023	-.117(.04)	-.071**	-.156(.06)	-.094*
Friendship (M)	Friendship (A)	.258(.04)	.338**			.258(.04)	.338**
	SWB (A)	-.012(.03)	-.020	.074(.01)	.131**	.063(.03)	.112*
Friendship (A)	SWB (A)	.287(.03)	.388**			.287(.03)	.388**
Victimisation (M)	Friendship (M)	-.512(.05)	-.494**			-.512(.05)	-.494**
	Friendship (A)	-.055(.04)	-.069	-.161(.02)	-.203**	-.215(.04)	-.271**
	Victimisation (A)	.151(.04)	.180**			.151(.04)	.180**
	SWB (A)	-.021(.02)	-.036	-.092(.02)	-.157**	-.113(.02)	-.193**
Victimisation (A)	Friendship (A)	-.188(.04)	-.199**			-.188(.04)	-.199**
	SWB (A)	-.238(.04)	-.341**	-.054(.02)	-.077**	-.292(.05)	-.418**
Gender (Female)	Friendship (M)	.163(.05)	.096**	.104(.06)	.061**	.267(.06)	.157**
	Friendship (A)	.036(.04)	.027	.044(.02)	.034*	.080(.04)	.061*
	Victimisation (M)	-.203(.05)	-.123**			-.203(.05)	-.123**
	Victimisation (A)	.222(.07)	.160**	-.031(.01)	-.022**	.191(.07)	.138**
	SWB (A)	-.135(.03)	-.140**	-.021(.02)	-.022	-.157(.03)	-.162**
Aboriginal Status	Friendship (M)	-.003(.09)	-.001	-.120(.06)	-.026	-.122(.10)	-.027
	Friendship (A)	-.191(.07)	-.054**	-.082(.04)	-.023*	-.272(.08)	-.078**
	Victimisation (M)	.233(.12)	.053			.233(.12)	.053
	Victimisation (A)	.165(.10)	.044	.035(.02)	.009	.201(.10)	.054*
	SWB (A)	.002(.05)	.001	-1.30(.04)	-.050**	-.127(.05)	-.049*

Note. E=Early childhood M=Middle childhood, A=Adolescence, *p < .05, **p < .01

Hypothesis 3c. The relationship between disability (identified in early childhood) and adolescent subjective well-being is mediated by household socioeconomic status, peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.

To investigate the direct and indirect effects of disability, household socioeconomic position and peer relationships on adolescent subjective well-being the model displayed Figure 4-8 was examined. The model provided a good description of both the unweighted data (X^2[SB]= 806.18(df 271) $p<.001$, RMSEA[SB]= .025, CFI[SB]=.984, TLI[SB]=.979, SRMR=.026) and weighted data (SRMR=.029).



Note: Aboriginal status and gender omitted from figure to increase readability; *p<.05

Figure 4-7. SEM analysis: Disability, peer relationships, SES and adolescent SWB

Direct, indirect and total effects are presented in Table 4-14. The model accounted for a slightly greater proportion of the variance in SWB than previously tested models (R^2 = .376). The small but significant effect of child disability on adolescent SWB is fully mediated by social and economic factors. Of the twenty-eight potential mediation pathways running from early childhood disability to adolescent subjective well-being only two were found to account for a significant proportion of the standardized indirect effect. The first path may be termed the 'peer relationship pathway' and is also noted in the previous model: Disability_{EC} → $\text{Victimisation}_{MC}$ → Friendship_{MC} → Friendship_{AD} → SWB_{AD} (Coef.= -.005, SE= .002[-.010, -.001], p=.029). The second path may be termed the 'socioeconomic pathway' running: Disability_{EC} → SES_{MC} → SES_{AD} → Friendship_{AD} → SWB_{AD} (Coef.= -.005, SE= .002[-.008, -.001], p=.023). Again, these results should be interpreted with caution. Overall, the findings are consistent with the primary hypothesis; the relationship between disability (identified in early childhood) and adolescent subjective well-being is fully mediated by household socioeconomic status, peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.

Table 4-14.

Hypothesis 3c. Weighted direct, indirect and total effects with robust standard errors

Measures		**Effects decomposition**					
Predictor →	**Criterion**	**Direct**		**Indirect**		**Total**	
		Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.	Coef.(SE)	Std. Coef.
Disability	Friendship (M)	-.009(.10)	-.003	-.118(.06)	-.040*	-.126(.10)	-.043
	Friendship (A)	-.096(.07)	-.043	-.110(.03)	-.050**	-.206(.07)	-.093**
	Victimisation (M)	.023(.10)	.082*	.024(.01)	.008	.255(.09)	.090**
	Victimisation (A)	.189(.09)	.077*	.035(.02)	.014	.224(.09)	.092*
	SES (M)	-.893(.30)	-.092**			-.893(.30)	-.092**
	SES (A)	.055(.16)	.005	-.929(.31)	-.083**	-.874(.33)	-. 078**
	SWB (A)	-.025(.06)	-.015	-.131(.04)	-.0.79**	-.156(.06)	-.094*
Friendship (M)	Friendship (A)	.266(.04)	.349**			.266(.04)	.349**
	SWB (A)	-.003(.03)	-.005	.074(.01)	.129**	.071(.03)	.124**
Friendship (A)	SWB (A)	.276(.03)	.370**			.276(.03)	.370**
Victimisation (M)	Friendship (M)	-.513(.06)	-.498**			-.513(.06)	-.498**
	Friendship (A)	-.041(.04)	-.052	-.164(.02)	-.208**	-.205(.04)	-.260**
	Victimisation (A)	.150(.04)	.173**			.150(.04)	.173**
	SWB (A)	-.014(.02)	-.024	-.090(.02)	-.153**	-.104(.02)	-.177**
Victimisation (A)	Friendship (A)	-.181(.04)	-.199**			-.181(.04)	-.199**
	SWB (A)	-.231(.05)	-.339**	-.050(.01)	-.074**	-.281(.05)	-.413**
SES (M)	Friendship (M)	-.014(.01)	-.048	.014(.01)	.046*	-.001(.01)	-.002
	Friendship (A)			.031(.01)	.137**	.031(.01)	.137**
	Victimisation (M)	-.027(.01)	-.092*			-.027(.01)	-.092*
	Victimisation (A)			-.001(.00)	-.002	-.000(.01)	-.002
	SES (A)	1.04(.05)	.909**			1.04(.05)	.909**
	SWB (A)	.022(.02)	.126	.010(.01)	.056**	.031(.02)	.181

SES (A)	Friendship (A)	.029(.01)	.145**	-.001(.00)	-.003	.028(.01)	.142**
	Victimisation (A)	.003(.01)	.015			.003(.01)	.015
	SWB (A)	.001(.02)	.002	.007(.01)	.048*	.007(.02)	.050
Gender (Female)	Friendship (M)	.157(.05)	.093**	.108(.03)	.064**	.266(.06)	.156**
	Friendship (A)	.043(.04)	.033	.035(.02)	.027	.078(.04)	.060*
	Victimisation (M)	-.210(.06)	-.129**	.008(.01)	.005	-.203(.06)	-.123**
	Victimisation (A)	.240(.07)	.166**	-.031(.01)	-.022**	.205(.07)	.144**
	SES (M)	-.315(.20)	-.056			-.315(.20)	-.056
	SES (A)	.080(.14)	.012	-.328(.21)	-.050	-.247(.23)	-.038
	SWB (A)	-.126(.03)	-.130**	-.030(.02)	-.031	-.157(.03)	-.162**
Aboriginal Status	Friendship (M)	-.031(.10)	-.007	-.091(.07)	-.020	-122(.11)	-.027
	Friendship (A)	-.117(.08)	-.033	-.154(.04)	-.044**	-.271(.08)	-.078**
	Victimisation (M)	.180(.12)	.041	.053(.03)	.012*	.233(.12)	.053
	Victimisation (A)	.171(.10)	.045	.026(.03)	.007	.197(.09)	.051*
	SES (M)	-1.98(.30)	-.130**			-1.98(.30)	-.130**
	SES (A)	-.574(.29)	-.034*	-2.07(.32)	-.118**	-2.64(.37)	-.151**
	SWB (A)	.039(.05)	.015	-.167(.04)	-.064**	-.128(.06)	-.049*

Note. E=Early childhood M=Middle childhood, A=Adolescence, *p < .05, **p < .01

In summary, in investigating a nationally representative sample of Canadian children spanning a decade, this investigation found that families raising a child with disability identified at age 4-5 years appear to be at a persistent socioeconomic disadvantage relative to comparison families across the early life-course of the child. Preadolescents and adolescents with disability report more impoverished peer friendships and greater experience of victimisation than same age peers. In addition, small but statistically significant effects of child disability on individual components of adolescent SWB as well as the overarching latent construct were found.

Structural equation modelling analysis was employed to permit investigation of how exposures and experiences across childhood may impact later subjective well-being for adolescents with and without disability. Results suggest that adolescents with disability who are not exposed to peer victimisation, who have the friendship and acceptance of peers, and who live in families that are not subject to relative socioeconomic disadvantage, are not at greater risk of poor subjective well-being than their non-disabled peers. Such findings indicate that disability-based differences in adolescent subjective well-being are, at least in part, a result of differential exposure to disadvantage and adversity rather than a direct consequence of disability.

The following chapter will place the results of this investigation into the context of existing theoretical and empirical literature. This investigation provides evidence that parity in subjective well-being and life conditions has not yet been achieved for Canadian adolescents with disability. Further, results suggest that the relationship between early childhood identified disability and adolescent subjective well-being is fully mediated by household socioeconomic status, peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence. This study then provides evidence that disability-based differences in subjective well-being may be socially determined, and as such may be more accurately described as disability-based *disparities*. Implications of study findings including potential means of redressing disability-based disparities in adolescent subjective well-being, as well as recommendations for future research, will be discussed in the following chapter.

CHAPTER 5. DISCUSSION

This dissertation adds to a growing body of literature investigating disability-based inequalities in the well-being of youth. Building on earlier research, the purpose of this study was to investigate the relationship between disability, life conditions and adolescent subjective well-being (SWB) using a large population-based data set. One objective was to create a descriptive, cross-sectional profile of the life conditions and subjective well-being of Canadian adolescents with disability relative to their non-disabled peers. Another objective, and the primary focus of the investigation, was to determine whether or to what extent the hypothesized relationship between disability and adolescent subjective well-being is mediated by household socioeconomic status and social relationships including peer friendships and acceptance, and exposure to peer victimisation in middle childhood and adolescence.

5.1 Overview of Main Findings

There is mounting evidence of disability-based inequality in adolescent subjective well-being. This study adds to this evidence-base. Further, utilizing structural equation modelling, this study tested and found support for the hypothesis that life conditions mediate the relationship between early childhood disability and adolescent subjective well-being. More specifically, the results suggest that the comparatively poor subjective well-being of adolescents with early childhood disability can be explained by their exposure to less positive peer relationships including victimisation, in middle childhood and adolescence. On this basis, differences in adolescent subjective well-being associated with early childhood disability would seem to be socially determined and potentially preventable, and might therefore be more aptly described as disability-based *disparities*.

5.1.1 Disability-based differences in adolescent SWB

In theory, subjective well-being (SWB) consists of three components: life satisfaction (LS), positive affect (PA), and negative affect (NA) (Diener, 2000; 2009; Diener, Sapyta, & Suh, 1998; Pavot, Diener, Colvin, & Sandvik, 1991). Empirical research into the composition and nature of SWB further suggests that it is best conceptualized as a higher-order factor with three observed indicators (LS, PA, NA) (Arthaud-day, Rode, Mooney, & Near, 2005; Busseri, 2015; Busseri & Sadava, 2011; Eryılmaz, 2011). Modeled in Study 2, this conceptualization of subjective well-being fit the data well, thereby providing strong evidence of construct validity.

Statistically significant associations were found between disability and individual components of SWB, as well as the overarching latent construct. Adolescents with disability reported less positive and more negative affect (Study 1), and early childhood disability was linked to poorer subjective well-being in adolescence (Study 2). The total effect of early childhood disability on adolescent SWB may be described as 'small' (standardized path coefficient = -.095, $p< .05$). However, the observed effect of early childhood disability was similar in magnitude to the observed effect of aboriginal status (standardized path coefficient = -.050, $p< .05$) and female gender (standardized path coefficient = -.154, $p< .05$), which have previously been linked to poorer adolescent SWB in Canada (Burton, Daley, & Phipps, 2015; Michalos & Orlando, 2006; Sarriera, Bedin, Abs, Calza, & Casas, 2015; Tomyn, Norrish, & Cummins, 2013; Trull, 2003). Furthermore, the effect is not small by comparison with the effect sizes observed in other studies that have utilized NLSCY data and SEM methods to investigate predictors of child health and well-being related outcomes (e.g., King et al., 2005; Kohen, Leventhal, Dahinten, & McIntosh, 2008; Seifert & Schulz, 2007). For instance, King et al., (2005) report a small but significant cross-sectional 'effect' of child disability on participation in social leisure among 6-11 year old children in cycle 1 (standardized path coefficient = .026, $p < .01$; variables measured with an approach comparable to the current study).

The findings of studies 1 and 2 were not entirely consistent. A statistically significant association was found between disability identified at age 4-5 and adolescent life satisfaction (a component of SWB) in Study 2, but not between concurrently measured disability and adolescent life satisfaction in Study 1. In addition, adolescents with disability identified at age 14-15 years (Study 1) were not found to be living in a household with an income level significantly lower than their non-disabled peers, whereas children with disability identified at age 4-5 years (Study 2) were found to be at a persistent socioeconomic disadvantage relative to comparison families across the ten year study period. One possible reason for the discrepant findings is the difference in the way the samples for studies 1 and 2 were constructed. For the purposes of the cross-sectional analysis (Study 1), adolescents with disability were identified in Cycle 7-8. Although many of these adolescents were identified as children with disability in Cycle 2-3 (Study 2), many others were not. This is not surprising given that many 'conditions', including learning disabilities, are (usually) only diagnosed after a child starts school (Howlin & Asgharian, 1999; Mandell, Listerud, Levy, & Pinto-Martin, 2002; Shalev, 2004). Additionally, some of the children *with* disability identified in Cycle 2-3 became adolescents *without* disability in Cycle 7-8. This variation over time in disability status likely reflects, at least in part, the dynamic interaction between characteristics of individuals and their environments (Burton, Lethbridge, & Phipps, 2008; Lee, Mathiowetz, & Tourangeau, 2007). In addition, the items used to identify disability changed across the span of the NLSCY survey, and item wording and presentation have been shown to have a sizeable impact on disability identification (Emerson, 2012; Lee et al., 2007; Mathiowetz, 2000; McNeil, 1993; Todorov, 2000).

Convergent evidence: Self-report health and suicidality. In addition to measuring components of subjective well-being, supplementary indicators of how adolescents were faring were included in Study 1. Inclusion of supplementary indicators served, in part, to potentially strengthen study conclusions with converging evidence from multiple indicators. Cross-sectional results suggest that adolescents with disability are less likely to report excellent or very good health relative to same age non-disabled peers (unadjusted OR= 0.45, p< .01, 95%CI= 0.37, 0.56). This is perhaps unsurprising given that adolescents with disability were 'identified' on the basis of limitations in functioning and/or activity limitations associated with a long-term "physical condition or mental condition or health problem". Indeed, parents report a range of health conditions in this sample that may be associated with poorer self-report health including respiratory allergies, severe (activity limiting) asthma, and heart and kidney conditions.

Cross-sectional analysis also found that adolescents with disability were more likely to have sustained serious injury over the preceding year. While limited research has been conducted investigating injury incidence among disabled adolescents, evidence does suggest a higher than normal injury risk in children, adolescents and young adults with intellectual disability (Sherrard, Tonge, & Ozanne-Smith, 2001; 2002), ADHD (DiScala, Lescohier, Barthel, & Li, 1998), and developmental disability (Lee, Harrington, Chang, & Connors, 2008). Higher than average rates of smoking cigarettes, marijuana use, and alcohol consumption have also been reported in samples of adolescents with disability, particularly those with intellectual and/or learning disability (Blum, Kelly, & Ireland, 2001; Emerson & Turnbull, 2005; Jones & Lollar, 2008; McNamara & Willoughby, 2010). However, adolescents with disability in Study 1 reported none of these health-risk behaviours more frequently than non-disabled peers. One potential explanation for these discordant findings is the inability to disaggregate analyses by type of chronic condition or impairment associated with disability. While studies of adolescents with intellectual and/or learning disability tend to show higher rates of health-risk behaviours, there is some evidence that rates of health-risk behaviours are lower than average among adolescents with physical disability (Steele et al., 1996; Steele et al., 2004).

Finally, the odds of suicidal ideation in adolescents with disability were significantly greater than that of their non-disabled peers (adjusted OR=1.64, $p < .01$, 95%CI= 1.17, 2.29). Among those who had contemplated suicide, the odds of attempting suicide over the preceding year were more than two times higher for adolescents with disability (adjusted OR=2.03, $p < .01$, 95%CI= 1.33, 3.11). Confidence intervals suggest that even larger effect sizes are consistent with the data with odds of attempted suicide potentially more than three times greater for adolescents with disability. This finding is consistent with other studies reporting a higher risk of suicidality among adolescents with disability (Daviss & Diler, 2014; Epstein & Spirito, 2009; Huntington & Bender, 1993; Jones & Lollar, 2008; Ludi et al., 2012; Merrick, Merrick, Kandel, & Morad, 2005; Shtayermman, 2007).

One plausible explanation for the observed disability-based differences in adolescent SWB observed in this and earlier studies is differential exposure to adverse life conditions. Research into the SWB of adolescents *without* disability has found associations between lower levels of life satisfaction and/or happiness, and low household socioeconomic status (SES) (Orkibi & Dafner, 2016; Ozdemir, 2012; Proctor, Linley, & Maltby, 2009) as well as peer rejection and victimisation (Annerback, Sahlqvist, & Wingren, 2014; Goswami, 2012; Jankauskiene, Kardelis, Sukys, & Kardeliene, 2008; Lambert et al., 2014; Lemstra, Nielsen, Rogers, Thompson, & Moraros, 2012). In contrast, peer friendships (Raboteg-Saric & Sakic, 2014; van Workum, Scholte, Cillessen, Lodder, & Giletta, 2013), positive parent-child relationships (Gudmundsdottir et al., 2016; Yucel & Yuan, 2015), and participation in social activities (Gilman, 2001; Huebner, 1991; Lewis, Huebner, Malone, & Valois, 2011; Orkibi, Ronen, & Assoulin, 2014; Proctor et al., 2009) are correlated with higher adolescent report happiness and life satisfaction. Supplementary indicators of SWB have demonstrated similar sensitivity to adverse life conditions. Suicidality has been linked to adverse life conditions in samples of non-disabled adolescents, including socioeconomic disadvantage (Agerbo, Nordentoft, & Mortensen, 2002; Dupéré, Leventhal, & Lacourse, 2009; Fergusson, Woodward, & Horwood, 2000) and adverse family and social relationships (Bearman & Moody, 2004; Borowsky, Ireland, & Resnick, 2001; Kim & Leventhal, 2008; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Klomek et al., 2009).

5.1.2 Disability-based differences in child and adolescent life conditions

Accumulating research across high-income countries suggests that families raising a child with disability are more likely to be situated in households with low socioeconomic status (Emerson & Hatton, 2009; Emerson, 2009; Emerson, Shahtahmasebi, Lancaster, & Berridge, 2010; Fujiura & Yamaki, 2000; Parish & Cloud, 2006; Parish, Rose, Grinstein-Weiss, Richman, & Andrews, 2008; Shahtahmasebi, Emerson, Berridge, & Lancaster, 2011). In Study 1, adolescents with disability identified at age 14-15 years were not found to be living at an income level significantly lower than their non-disabled peers or more likely to be living below the low income cut-off or ‘poverty line’. However, parents raising these adolescents were more likely to report being worried about the family’s finances. The reasons for this discrepancy are unclear. It may be, as suggested by Heslop and Emerson (in press) that income-based measures underestimate the prevalence of poverty among persons with disability and their families by not taking into account the additional expenditure associated with disability. Thus the observed ‘disconnect’ between relative income and perception of financial hardship may reflect additional financial burdens placed on families directly related to the care of their disabled child (Baldwin, 2015; Blackburn, Spencer, & Read, 2010; Lukemeyer, Meyers, & Smeeding, 2000; Parish & Cloud, 2006; Reichman, Corman, & Noonan, 2008). In other words, perceived financial strain may be a result of having to ‘stretch each dollar further’ than comparison families. The additional stressors and uncertainties sometimes associated with raising an adolescent with disability, such as impending direct and indirect costs of youth transition into adulthood, may also contribute to differential perceptions of financial insecurity (Cadman et al., 2012; Mugno, Ruta, D'Arrigo, & Mazzone, 2007; Schneider, Wedgewood, Llewellyn, & McConnell, 2006; Stewart et al., 2010).

In contrast to Study 1, children with disability identified at age 4-5 years were found to be living at a lower socioeconomic status (SES) relative to comparison peers at early childhood, middle childhood and adolescence. Study 2 investigated the possibility that this socioeconomic disadvantage could be explained by the indirect costs of caring for a child with disability, specifically a lower level of parental workforce participation. However, no statistically significant association was found between child disability and parental workforce participation in early childhood, middle childhood or adolescence. Further, Study 2 tested the hypothesis that socioeconomic disadvantage would increase over time (i.e., the downward social mobility hypothesis). The results however do not support this hypothesis: The results suggest that the socioeconomic gap between families with and without children with disability does not widen across the course of childhood but remains stable. It is possible that evidence of downward social mobility may be found earlier in the lives of these families, prior to data collection, producing enduring long-term disadvantage (Baldwin, 2015; Blackburn et al., 2010; Lukemeyer et al., 2000; Parish & Cloud, 2006; Reichman et al., 2008). It is also possible that the families raising a child with disability were situated in relatively low socioeconomic positions prior to the birth of their child and that it was the poor living conditions often associated with low SES that led to the onset of child health conditions or impairments (Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 2000; Emerson et al., 2012; Emerson et al., 2015; Emerson, 2004; Shonkoff, et al., 2012). Alternatively, an unmeasured additional factor or factors may have independently impacted both the incidence of child disability and low SES (e.g., parental disability; IASSID Special Interest Research Group on Parents and Parenting with Intellectual Disabilities, 2008; National Council on Disability, 2012). It is probable, as suggested by Emerson and colleagues (Emerson & Hatton, 2009; Emerson et al., 2009) that none of these mechanisms can wholly account for the increased risk of exposure to socioeconomic disadvantage for families raising a child with disability and that a combination of processes are involved.

In the current investigation, social relationships pertain to the quality of childhood social relationships including peer friendship and acceptance, social participation, and exposure to peer victimisation. A number of indicators of social participation were assessed among adolescents with disability identified at Cycle 7-8 (Study 1). No difference was found between adolescents with disability and their non-disabled peers with regard to participation in paid employment, volunteerism, desire to engage in extracurricular activities at school and actual participation in extracurricular activities. This is an encouraging finding given evidence suggesting that adolescents with disability often face a number of barriers transitioning into the workforce (Blomquist, 2006; Lindsay, 2011; 2015; Lindsay, McDougall, Menna-Dack, Sanford, & Adams, 2015; White, 1997). Less encouraging are disability-based differences in adolescent report of treatment by teachers; adolescents with disability were less likely than their non-disabled peers to report fair treatment by teachers (OR= 0.72, $p < .05$, CI95%= 0.56, 0.95). This finding indicates that further research may be needed into the classroom experiences of Canadian adolescents with disability, including potential discrimination by people in positions of authority.

Indicators of leisure participation outside of school available for analysis were not ideal. No data were available on child or adolescent preference, nor was there any means to differentiate participation in 'mainstream' activities from therapeutic / prescribed activities specific to those with disability. Caveats aside, the data from both studies suggest that youth are not at a great disadvantage relative to same age peers with respect to participation in social leisure. The primary difference fell within the domain of organized sport. Consistent with existing research, youth with disability in both studies, those identified at age 4-5 years and at age 14-15 years, were less likely to participate in team sport across childhood (Anderson, Wozencroft, & Bedini, 2008; Arim, Findlay, & Kohen, 2012; Bantjes, Swartz, Conchar, & Derman, 2015; Murphy, Carbone, & the Council on Children With Disabilities, 2008; Sit, Lindner, & Sherrill, 2002; Zwinkels et al., 2015). Whether this finding signals differential access, lack of appropriate support, differential desire to play sport, or something else entirely cannot be determined given available data.

Across studies, adolescents (and pre-adolescents) with disability reported greater exposure to bullying and violence, and more impoverished friendships, relative to same age peers. These findings mirror the majority of research around the social lives of disabled youth. There is extensive evidence that youth with disability experience peer victimisation to a greater degree than their non-disabled counterparts (Chan, Emery, & Ip, 2016; Cummings, Pepler, Mishna, & Craig, 2006; Flynt & Morton, 2004; Humphrey & Hebron, 2015; Jones et al., 2012;

Lindsay & McPherson, 2012; Rose, Monda-Amaya, & Espelage, 2011; Rose, Simpson, & Moss, 2015; Sentenac et al., 2011). The extant research also suggests that youth with disability tend to be less positive about their friendships (Ecotiere, 2015; MacArthur, 2013; Matheson, Olsen, & Weisner, 2007; Zeedyk, Rodriguez, Tipton, Baker, & Blocher, 2014) and are less likely to report having a cohesive peer network (Gerhardt, McCallum, McDougall, Keenan, & Rigby, 2015; Tipton, Christensen, & Blacher, 2013; Zic Ralic & Ljubas, 2013). These findings strengthen the case, made by mounting research, for action to remedy the social marginalization and victimisation of children and adolescents with disability.

5.1.3 Disability-based disparities in adolescent subjective well-being

Few studies to date investigating the relationship between disability and components of SWB have properly controlled for differential exposure to adverse life conditions. The small number of studies that have done so have found that disability-based differences in SWB (or components thereof) are potentially attributable to adverse life conditions, rather than intrinsically founded in disability. Edwards, Patrick and Topolski (2003) for example, investigated composite quality of life (including each component of subjective well-being) among American high school students with and without self-reported disability and found that no statistically significance difference existed after controlling for measures of social adversity. Similarly, in Australia, Emerson and colleagues (2009; 2012) conducted secondary analyses of nationally representative data finding that the life satisfaction of adolescents and young adults with self-report disability is not significantly different from their non-disabled peers after controlling for differential exposure to financial hardship and low social support.

The longitudinal analysis conducted in Study 2 builds on this existing cross-sectional research by examining the relationship between disability and adolescent SWB while controlling for adverse life conditions measured across childhood. Consistent with earlier research, the findings suggest that the disability-based inequality in adolescent subjective well-being is likely the consequence of differential exposure to adverse life conditions rather than the presence of disability *per se*. Specifically, the results suggest that the relatively poor subjective well-being of adolescents identified as 'disabled' in early childhood can be explained by exposure to less positive relationships with peers including peer victimisation, in middle childhood and adolescence. This study then provides evidence that disability-based differences in subjective well-being may be socially determined and as such suggest more than inequality, but rather, may represent disability-based *disparities*.

5.1.4 Pathways to adolescent subjective well-being

Evidence of the long-term impact of life conditions on subjective well-being (SWB), or components thereof, is beginning to emerge (Bertoni, 2015; Louis & Zhao, 2002; Marion, Laursen, Zettergren, & Bergman, 2013; Sheikh, Abelsen, and Olsen, 2014; Van Workum, Scholte, Cillessen, Lodder & Giletta, 2013). Oshio, Umeda and Kawakami (2013) for example found that exposure to peer victimisation in childhood was a significant predictor of perceived happiness in adulthood. While existing research highlights a potential causal link between childhood life conditions and adult SWB, there is a paucity of research investigating childhood determinants of subjective well-being in adolescents with and without disability.

There are a variety of ways in which differential exposure to adverse life conditions across childhood may explain the relationship between disability and poor adolescent SWB. The association may be spurious: adverse life conditions may be a common cause of both disability and poor adolescent SWB. There may also be a number of pathways connecting disability, adverse life conditions and adolescent SBW, including non-recursive and or recursive paths. It is plausible, for instance, that disability indirectly mediates the link between adverse life conditions and poor adolescent SWB. Another plausible hypothesis is that life conditions mediate the relationship between disability and SWB.

However, most studies to date have been cross-sectional in design and as such are limited in the extent to which they could investigate potential mediation. Study 2 of the current investigation tested a series of nested hypotheses examining the role childhood life conditions play in influencing the SWB of adolescents with and without disability. Results suggest that socioeconomic status and social relationships in middle childhood and adolescence, mediate the relationship between disability identified at age 4-5 years and adolescent subjective well-being. In other words, the relatively poorer SWB of adolescents with disability may be explained by exposure to adverse life conditions rather than presence of disability *per se*.

5.2 Strengths and Limitations

A primary strength of this investigation was the utilization of a large nationally representative sample of Canadian children and adolescents permitting broad generalization of the findings. Another major strength was the utilization of longitudinal data in Study 2, which permitted the investigation of whether observed disability-based difference in adolescent subjective well-being (SWB) could plausibly be attributed to differential exposure to adverse life conditions *across* childhood. This is the first study, to my knowledge, that examines the impact of adverse life conditions across childhood on the hedonic SWB of adolescents with and without disability.

Another strength of this investigation was the examination of life satisfaction (LS), positive affect (PA), and negative affect (NA) as manifest indicators of higher-order latent SWB in Study 2. A growing body of evidence supports the conceptualization of SWB as a higher-order latent factor (Arthaud-day et al., 2005; Busseri & Sadava, 2013; Busseri & Sadava, 2011; Joshanloo & Bakhshi, 2015; Joshanloo, 2015; Metler & Busseri, 2015). While several studies have demonstrated a link between disability and components of subjective well-being among adolescents and young adults (e.g., Edwards et al., 2003; Emerson et al., 2008; 2009; 2012; McNamara, Willoughby, Chalmers, & YLC-CURA, 2005; Neuner et al., 2011; Topolski et al., 2004; Uusitalo-Malmivaara et al., 2012), none of the previous work in this area attempts to empirically test SWB as a higher-order latent construct.

Despite the rich data available for analysis, this dissertation has a number of limitations. One limitation of data collected by another researcher is a lack of control over what constructs are measured or how they are measured. In some instances, inconsistency in questioning and dropped items posed a challenge for analyses, i.e., some questions were asked in some cycles but not in others, item wording was not always consistent across cycles, and response categories for several items changed across cycles. These limitations were overcome, for the most part, with careful item selection and variable recoding. Operationalization of ‘disability’ across studies is one important exception. An array of items was compiled in each study to develop an adequate indicator of disability. Items that touched on the conceptualization of disability employed in this investigation changed dramatically from Cycle 2-3 to Cycle 7-8.

Further limitations specific to use of NLSCY data include the inability to corroborate parent report child/youth disability with any other source, and probable exclusion of youth with severe to profound intellectual or physical impairment. Youth who were unable to complete a pencil and paper questionnaire, or alternatively, respond to questions verbally with a researcher over the phone, are not represented in the data at all. Consequently, weighting the data to improve representation could not address this sampling bias. There is some research suggesting that the subjective well-being of youth with disability is significantly impacted by the degree or severity of impairment – directly or indirectly (Choi, 2015; Nadeau et al., 2015). Given that children and adolescents with more severe or profound disability are unlikely to be represented in the NLSCY cohort, the disability-based disparity in SWB found may be underestimated.

Finally, it is worth noting that subjective reports of well-being made by individuals prone to experience disadvantage may not accurately demonstrate the extent of the inequity they face in all cases. In circumstances of extraordinary disadvantage, youth subjective reports of well-being may in fact under-represent their disadvantaged life conditions. Amartya Sen (1999) suggests that self-reported satisfaction can be distorted through mental conditioning unconsciously employed to make life manageable in perpetually adverse circumstances (p.62). Further, an individual's perception of the disadvantage they are exposed to and the legitimacy attributed to it (i.e., whether inequality is seen as temporary or fair) may exert considerable impact on their perceived well-being (Alesina, Di Tella, & MacCulloch, 2004; Schneider, 2011). This is by no means to suggest that the subjective reports of disadvantaged groups should be discounted, but rather that self-report well-being needs to be considered within the social and cultural context of the individual.

5.3 Implications and Future Directions

Previous studies have found that persons with disability, including adolescents and young adults, tend to report poorer life satisfaction and less happiness than their non-disabled peers. However, this relationship remains poorly understood. The absence of research examining the causes of disability-based differences in SWB may be partly due to a particular expression of the stigma of disability described by Amundson (2005) as the 'standard view'; Specifically, that disability has an intrinsically detrimental effect on subjective well-being. The findings of this study support previous work dispelling this myth by providing robust evidence that disability-based differences or inequalities in adolescent SWB may be explained, in part, by differential exposure to socioeconomic disadvantage and adverse or impoverished social relationships. This emerging evidence suggests that the comparatively poor SWB of adolescents with disability may be socially determined and likely preventable. The question then becomes how to redress disability-based disparities in adolescent subjective well-being.

Current evidence presents a link between participation in organized social leisure and the self-reported well-being of youth with disability (Garrod & Oakes, 2014; Karademir, 2012; Maher, Toohey, & Ferguson, 2016; Poulsen, Ziviani, Johnson, & Cuskelly, 2008; Zwinkels et al., 2015). However, in this study child disability did not predict composite leisure participation in early childhood, middle childhood, or adolescence. These findings do not support the notion that participation in social leisure mediates the association between childhood disability and adolescent subjective well-being. In other words, increasing the participation of youth with disability in social leisure activities may not be the solution to closing the subjective well-being gap.

Findings from the longitudinal sample do however suggest that greater exposure to bullying and a lack of close peer bonds may explain disability-based disparities in youth SWB. One way to improve subjective well-being among youth with disability may be to create conditions or opportunities that are facilitative of positive peer relationships. Adolescents with disability in the cross-sectional sample assigned significantly lower ratings to the size and quality of their peer network, were significantly more likely to report feeling ‘like an outsider’, and significantly less likely to report spending time with friends outside of school. Results from the longitudinal sample speak to the continuity and potential impact of peer exclusion and victimisation as children transition into adolescence. Adolescents with disability identified in early childhood reported weaker peer relationships than same age peers throughout middle and later childhood.

These results indicate that social and educational policies may be needed to enhance the opportunities for children and adolescents with disability to form supportive peer networks. However, young people with disability will continue to be at a disadvantage unless the stigma and negative social reactions of peers are also addressed. Adolescents with disability in both studies reported a greater incidence of intimidation, bullying and exclusion. Longitudinal modelling additionally demonstrated that bullying is negatively linked to current and future peer relationships as well as adolescent subjective well-being. Research suggests that experience of peer exclusion and victimisation can have dramatic effects on the lives of youth with disability from poorer academic performance (Berg, Shiu, Msall, & Acharya, 2015a; Brooks, 2011; O'Brennan, Waasdorp, Pas, & Bradshaw, 2015), to poorer mental health (Berg, Shiu, Msall, & Acharya, 2015b; Weiss, Cappadocia, Tint, & Pepler, 2015; Zablotsky, Bradshaw, Anderson, & Law, 2013), lower subjective health (Sentenac et al., 2013) and, as evidenced by the current study, lower subjective well-being. Further, marginalization and victimisation at school compromise the right of youth with disability to feel safe and to fully participate in their community (MacArthur, 2013). Targeted school-based interventions including anti-stigma programs, social skills training, guided peer interaction, and providing specialized training for teachers and support staff, have demonstrated promise in the short term (e.g., Beaumont & Sofronoff, 2008; Brock, Biggs, Carter, Cattey, & Raley, 2016; Copeland et al., 2004; Humphrey, Lendrum, Barlow, Wigelsworth, & Squires, 2013; Humphrey & Hebron, 2015; Owen-

DeSchryver, Carr, Cale, & Blakeley-Smith, 2008; Raghavendra, Newman, Grace, & Wood, 2013; Raskauskas & Modell, 2011; Rose et al., 2015). Further research in this area is needed to find the most efficient and long-lasting means of countering the roots of exclusion and victimisation of children and adolescents with disability.

The current investigation also highlights gaps in existing longitudinal research. Study 2 of the current investigation utilizes a decade of data following a cohort of pre-schoolers into adolescence. Within the NLSCY dataset examination of SWB is only permitted at one time point at age 14 to 15 years. Any testing of malleability in SBW and / or the influence of change in social policy would require the ability to measure SWB at different points in time. Ideally this (or a comparable) cohort could be followed into young adulthood. With more extensive data research questions could be expanded to include examination of the hypothesized malleability of SWB among persons with disability. For example: 'Does the observed disability-based disparity in adolescent SWB increase as adolescents transition into adulthood? If so, is this increase attributable to socially patterned disadvantage? Under what conditions do adolescents with disability transition into adulthood with a level of SWB comparable to their non-disabled peers?' In addition, long-term impacts could be examined to investigate potential mechanisms or pathways linking early childhood experiences and exposures to relative adult health and subjective well-being for persons with disability. Access to maternal and family level data on this (or a comparable) cohort from infancy and perhaps in-utero would be useful in examining potential latency effects on young adult subjective well-being.

Finally, there is a need to address gaps in existing research into the subjective well-being of diverse populations of children and adolescents with disability. While understanding the causes of disability-based disparities in the SWB of adolescents broadly is a valuable addition to current knowledge, disability-based differences in the SWB of subgroups of adolescents potentially facing additional stigmatization due to, for example, sexual orientation or ethnicity, remain poorly understood. Research disaggregated by factors including but not limited to type of impairment or chronic condition, sexual orientation, and ethnicity, may be helpful in understanding the most effective means of redressing disability-based disparities in SWB among different populations of disabled children and adolescents. In addition, virtually everything we know about the SWB of adolescents with disability comes from studies of young people in high-income countries. Research is needed to investigate how adolescents with disability are faring in low- and middle-income countries with respect to their happiness and satisfaction with life.

In conclusion, this dissertation provides evidence that parity of well-being has not yet been achieved for Canadian youth with disability. Further, findings from analysis of a decade of data may offer some insight into how to redress disability-based disparities in adolescent subjective well-being. This investigation is, to my knowledge, the first to provide evidence from across childhood that disability-based differences in adolescent subjective well-being are potentially a consequence of differential exposure to adverse life conditions rather than an intrinsic consequence of disability. Facilitating strong peer networks for children and adolescents with disability, and developing ways to challenge stigma and deter victimisation, appear to be practical courses of action that could make a positive difference in the lives of adolescents with disability.

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Appendix A: Study 1 – Cross-sectional Variables

Subjective Well-being

Variable Details	Response Categories	Variable Recoded	NLSCY [Cycle] Item
In general, I am happy with how things are for me in my life now	1. Strongly disagree 2. Disagree 3. Agree 4. Strongly Agree	"Youth is happy with life (Strongly Agree)" Derived dichotomous variable: Yes = 4	Youth Report: [G/H]AMCBQ02
Pride: Overall I have a lot to be proud of. Esteem: A lot of things about me are good.	1. False 2. Mostly False 3. Sometimes true/false 4. Mostly true 5. True	"Positive Affect" Response categories 1 & 2 collapsed for 'Pride' and 'Esteem' to match 'Enjoyment'.	Youth Report: [G/H]AMCbQ02 [G/H]AMCQ01B
Enjoyment: I enjoy the things I do.	1. Rarely true of me 2. Sometimes true of me 3. Often true of me 4. Very often true of me	Scores summed (range= 3-12), minus two to set lower end of scale to one (range= 1-10). Scale α = .796	[G/H]AMCQ01C
Relative unhappiness: I am not as happy as other people my age. Sadness: I am unhappy or sad. Apathy: I have trouble enjoying myself.	1. Never or not true 2. Sometimes or somewhat true 3. Often or very true	"Negative Affect" Scores summed (range= 3-9), minus 2 to set lower end of scale to one (range= 1-7). Categories 6+7 collapsed to smooth skewed distribution (range= 1-6). Scale α = .738	Youth Report: [G/H]FBCQ01K [G/H]FBCQ01F [G/H]FBCQ1RR

Subjective Well-being: Supplementary indicators

Variable Details	Response Categories	Variable Recoded	NLSCY [Cycle] Item
In general, would you say your health is:	1. Excellent 2. Very good 3. Good 4. Fair 5. Poor	"Youth reports excellent or very good health" Derived dichotomous variable: Yes = 1-2	Youth Report: [G/H]HTCCQ03
In the past 12 months was this child injured seriously enough to require medical attention, by a doctor, nurse or dentist?	1. Yes 2. No	"Youth sustained serious injury in past year" Yes = 1	PMK Report: [G/H]HLCE37
In the past 12 months, did you seriously consider attempting suicide?	1. Yes 2. No	"Has considered suicide in past year" Derived dichotomous variable: Yes =1	Youth Report: [G/H]FBCCQ05

In the past 12 months, how many times did you attempt suicide?	1. Never/None 2. Once 3. More than once	"Has attempted suicide in past year" Derived dichotomous variable: Yes =2-3	Youth Report: [G/H]FBCCQ07
Which of the following best describes your experience with smoking cigarettes?	1. I have never smoked 2. I have only had a few puffs 3. I do not smoke anymore 4. A few times a year 5. Once or twice a month 6. About 1-2 days a week 7. About 3-5 days a week 8. About 6-7 days a week	"Smokes Cigarettes at least once a week" Derived dichotomous variable: Yes = 6-8	Youth Report: [G/H] DRCdQ01
Which of the following best describes your experience with drinking alcohol?	1. I have never had a drink of alcohol 2. Only had a few sips 3. I only tried once or twice (at least one drink) 4. I do not drink alcohol 5. A few times a year 6. Once or twice a month 7. About 1-2 days a week 8. About 3-5 days a week 9. About 6-7 days a week	"Drinks alcohol at least once a month" Derived dichotomous variable: Yes =6-9	Youth Report: [G/H]DRCDQ6A
Which of the following best describes your experience with using marijuana and cannabis products (also known as a joint, pot, grass or hash) in the past 12 months?	1. I have never done it 2. I have done it, but not during the past 12 months 3. A few times 4. Once or twice a month 5. About 1-2 days a week 6. About 3-5 days a week 7. About 6-7 days a week	"Smokes marijuana at least once a month" Derived dichotomous variable: Yes =4-7	Youth Report: [G/H]DRCDQ15

Life Conditions: Socioeconomic Status

Variable Details	Response Categories	Variable Recoded	NLSCY [Cycle] Item
Categorized Household Income (22)	Income categorized to correct dramatically skewed distribution. 1=< \$9,999; 2= \$10,000 - \$19,999; 3= \$20,000 - \$20,999; ... 20= \$190,000 - \$190,999; 21= \$200,000 - \$249,999; 22= \$250,000+		PMK Report: [G/H]INHGQ03
Highest Household Educational Attainment (6)	Highest level of education (PMK & Spouse) exported to new variable to indicate highest household education. Reduced to 7 ordered response categories. Low to high: 1=no schooling, 6=PhD or MD		PMK Report: [G/H]EDPgQ4B & [G/H]EDSgQ4B

Highest Household Occupational Status (9)	Occupational prestige rating system derived using NOC-S 2001 scores converted to NOC scores for rating*. Higher occupational level exported to new variable to indicate highest household occupational prestige. Final scores then reversed to rank low to high, and a new category introduced to denote dual unemployment. Ordinal categories reduced to 1-9 (collapsed by 3) to smooth out bimodal distribution.		PMK Report: [G/H]LFPfD6A and [G/H]LFSfD6A
PMK Working Status	1. Currently working 2. Not currently working but had at least one job in the past 12 months 3. Not currently working and did not work during past year	"PMK Employed" Derived dichotomous variable: Yes = 1	PMK Report: [G/H]LFPD25

Life Conditions: Social Relationships (peer friendship and acceptance, peer victimisation, social participation)

Variable Details	Response Categories	Variable Recoded	NLSCY [Cycle] Item
Friends Score (Sum Score, 16) α=.908	0-16 Sum Scale; high score indicates friendship and acceptance of peers		Youth Report: [G/H]FFCQ01-4
In the past 12 months, how many times did someone say something personal about you that made you feel extremely uncomfortable? A) At school B) Elsewhere	1. never 2. once or twice 3. 3 or 4 times 4. 5 times or more	"Teased" Derived dichotomous variable: Yes = 2- 4	Youth Report: Greater response to [G/H] AMCcQ8A or B.
In the past 12 months, how many times did someone threaten to hurt you but did not actually hurt you? A) At school B) Elsewhere	1. never 2. once or twice 3. 3 or 4 times 4. 5 times or more	"Threatened" Derived dichotomous variable: Yes = 2- 4	Youth Report: Greater response to [G/H] AMCcQ7A or B.
In the past 12 months, how many times did someone physically attack or assault you? A) At school B) Elsewhere	1. never 2. once or twice 3. 3 or 4 times 4. 5 times or more	"Attacked" Derived dichotomous variable: Yes = 2- 4	Youth Report: Greater response to [G/H] AMCcQ6A or B.
Outside of school, during the past 12 months, how often have you played sports with a coach or instructor ?	1. Never 2. Less than once a week 3. 1 to 3 times a week 4. 4 or more times a week	"Organized Sport at least once a week" Derived dichotomous variable: Yes = 3-4	Youth Report: [G/H]ATCC1BB
… how often have you taken part in art, drama or music groups, clubs or lessons?	1. Never 2. Less than once a week 3. 1 to 3 times a week 4. 4 or more times a week	"Arts Group at least once a week" Derived dichotomous variable: Yes = 3-4	Youth Report: [G/H]ATCC1DD

… how often have you taken part in clubs or groups such as Guides or Scouts, 4-H club, community, church or other religious groups?	1. Never 2. Less than once a week 3. 1 to 3 times a week 4. 4 or more times a week	"Community group at least once a week" Derived dichotomous variable: Yes = 3-4	Youth Report: [G/H]ATCC1EE

Life Conditions: Supplementary indicators

Variable Details	Response Categories	Variable Recoded	NLSCY [Cycle] Item
Statistics Canada derived ratio of the household low income cut-off (LICO)	LICO= the income threshold where a family is likely to spend 20% more of its income on basic necessities than the average family.	"Living at or below the 'poverty line'" Derived dichotomous variable: Yes = Ratio to the LICO < or = 1.0	PMK Report: [G/H]INHgD4A
Is this dwelling owned by a member of this household?	1. Yes 2. No	"Home is rental accommodation" Yes= 2	PMK Report: [G/H]HHHQ01
You worry about whether the money you have will be enough to support your family?	1. Strongly agree 2. Agree 3. Disagree 4 Strongly disagree	"PMK worried about money (agree or strongly agree)" Derived dichotomous variable: Yes = 1-2	PMK Report: [G/H]INHDQ05
Compared to your financial situation a year ago, are you and your family are...	1. Better off 2. Worse off 3. Just about the same	"Financial situation is better than a year ago" Derived dichotomous variable: Yes = 1	PMK Report: [G/H]INHDQ06
Neighbourhood Safety (Sum Score, 9) α=.740	0-9 Sum Scale; high score indicating a sense of high degree of PMK report parent/child conflict		PMK Report: [G/H]SFHhQ5A-C
Child lives with	1. Two parents 2. One parent only 3. Does not live with a parent	"Single Parent household" Derived dichotomous variable: Yes = 2	PMK Report: [G/H]DMCD04
How often do you feel like an outsider (or left out of things) at your school?	1. All of the time 2. Most of the time 3. Some of the time 4. Rarely 5. Never	"Feels like an outsider" Derived dichotomous variable: Yes = 1- 2	Youth Report: [G/H]SCCCQ10
About how many days a week do you do things with close friends outside of school hours?	1. never 2. < once a week 3. 1 day a week 4. 2-3 days a week 5. 4-5 days a week 6. 6-7 days a week	"Sees friends outside school at least once a week" Derived dichotomous variable: Yes = 3- 6	Youth Report: [G/H]FFCQ05

In the past 12 months, have you volunteered or helped without pay by A) doing activities at school, B) supporting a cause, C) fund raising, D) helping in your community, E) helping neighbours or relatives, F) doing another volunteer activity?	Six items (A-F) 1. Yes 2. No	"Volunteered in the past year" Yes= 1 on one or more items	Youth Report: [G/H]ATCDQ5A-F
Are you currently doing any work for pay for an employer?	1. Yes 2. No	"Has a part time job" Yes = 1	Youth Report: [G/H]WKCCQ4A
How important is it to you to do the following in school: Participate in extra-curricular activities?	1. Very important 2. Somewhat important 3. Not very important 4. Not important at all	"Part. in extra activities at school is important" Derived dichotomous variable: Yes = 1-2	Youth Report: [G/H]SCCCQ3B
Since the beginning of the school year, how often have you taken part in the following school based activities [outside of class/ gym class]: A) played sports without a coach, B) played sports with a coach, C) taken part in dance, gymnastics, karate or other groups or lessons, D) taken part in art, drama or music groups, clubs or lessons, E) taken part in a school club or group such as yearbook club, photography club or student council?	Five items (A-E) 1. Never 2. Less than once a week 3. 1 to 3 times a week 4. 4 or more times a week	"Part. in extra activities at least once a week" Yes= 3-4 on any item	Youth Report: [G/H]SCCC31A-E
In general, my teachers treat me fairly.	1. All of the time 2. Most of the time 3. Some of the time 4. Rarely 5. Never	"Treated fairly by teachers most or all of the time" Derived dichotomous variable: Yes = 1-2	Youth Report: [G/H]SCCQ12
Parental Nurturance (Sum Scale, 28) α=.918	0-28 Sum Scale; higher score indicates greater youth report parental nurturance		Youth Report: [G/H]PMCcS1
Parental Rejection (Sum Scale, 28) α=.761	0-28 Sum Scale; higher score indicates greater youth report parental rejection		Youth Report: [G/H]PMCbS2B
Parent/Child conflict (Sum Scale, 32) α=.755	0-32 Sum Scale; higher score indicates higher degree of PMK report parent/child conflict		PMK Report: [G/H]PRCb30A-H

*Rating system employed based on: Goyder, J. & Frank, K. (2007). A Scale of occupational prestige in Canada based on NOC Major Groups. The Canadian Journal of Sociology, 32(1), 63-83. See chart below for details.

NLSCY Scale Items (Cycles 7 and 8)

Friends Score (Sum Score, 16) α=.908

Items	NLSCY [Cycle] Items	Response Categories
I have many friends.	[G/H]FFCQ01	1. False
I get along easily with others my age.	[G/H]FFCQ02	2. Mostly False
Others my age want me to be their friend.	[G/H]FFCQ03	3. Sometimes true/ false
Most others my age like me.	[G/H]FFCQ04	4. Mostly true
		5. True

Neighbourhood Safety (Sum Score, 9) α=.740

Items	NLSCY [Cycle] Items	Response Categories
It is safe to walk alone in this neighbourhood after dark.	[G/H]SFHhQ5A	1. Strongly Disagree
It is safe for children to play outside during the day.	[G/H]SFHhQ5B	2. Disagree
There are safe parks, playgrounds and play spaces in this neighbourhood.	[G/H]SFHhQ5C	3. Agree
		4. Strongly Agree

Parental Nurturance (Sum Scale, 28) α=.918

Items	NLSCY [Cycle] Items	Response Categories
My parents (or step parents or foster parents or guardians)…		
… smile at me.	[G/H]PMCcQ1A	1. Never
… praise me (say nice things about me).	[G/H]PMCcQ1D	2. Rarely
… listen to my ideas and opinions.	[G/H]PMCcQ1H	3. Sometimes
… and I solve a problem together whenever we disagree.	[G/H]PMCcQ1I	4. Often
… make sure I know I am appreciated.	[G/H]PMCcQ1K	5. Always
… speak of the good things I do.	[G/H]PMCcQ1M	
… seem proud of things I do.	[G/H]PMCcQ1Q	

Parental Rejection (Sum Scale, 28) α=.761

Items	NLSCY [Cycle] Items	Response Categories
My parents (or step parents or foster parents or guardians)…		
… soon forget a rule that they have made.	[G/H]PMCcQ1C	1. Never
… nag me about little things.	[G/H]PMCcQ1G	2. Rarely
… only keep rules when it suits them.	[G/H]PMCcQ1J	3. Sometimes
… threaten punishment more often than they use it.	[G/H]PMCcQ1L	4. Often
… enforce a rule or do not / depending upon their mood.	[G/H]PMCcQ1O	5. Always
… hit me or threaten to do so.	[G/H]PMCcQ1P	
… get angry and yell at me.	[G/H]PMCcQ1R	

Parent/Child conflict (Sum Scale, 32) α=.755

Items	NLSCY [Cycle] Items	Response Categories
We make up easily when we have a fight.	[G/H]PRCb30A [R]	1. Not at all
We disagree and fight.	[G/H]PRCb30B	2. A little
We bug each other or get on each other's nerves.	[G/H]PRCb30C	3. Sometimes
We yell at each other.	[G/H]PRCb30D	4. Pretty often
When we argue we stay angry for a very long time.	[G/H]PRCb30E	5. Almost all of the time
When we disagree, I refuse to talk to this child.	[G/H]PRCb30F	
When we disagree, this child stomps out of the room…	[G/H]PRCb30G	
When we disagree about something, we solve the problem together.	[G/H]PRCb30H [R]	

Note. [R]= reverse scored

Noc Major Group Scale of occupational prestige

Rank	Noc 2001	Noc-S / Soc 91	Occupational Group Title
1	31	D0	Professional Occupations in Health
2	32	D1	Technical and Skilled Occupations in Health
3	41	E0	Professional Occs in Social Science, Education, Government and Religion
4	00	A0	Senior Management Occupations
5	21	C0	Professional Occupations in Natural and Applied Sciences
6	22	C1	Technical Occupations Related to Natural and Applied Sciences
7	34	D2,D3	Assisting Occupations in Support of Health Services
8	11	B0	Professional Occupations in Business and Finance
9	42	E1,E2	Paraprofessional Occs in Law, Social Services, Education and Religion
10	51	F0	Professional Occupations in Art and Culture
11	12	B1	Skilled Administrative and Business Occupations
12	82	I0	Skilled Occupations in Primary Industry
13	52	F1	Technical and Skilled Occupations in Art, Culture, Recreation and Sport
14	01–09	A1,A2,A3	Middle and Other Management Occupations
15	72–73	H0	Trades and Skilled Transport and Equipment Operators
16	92	J0	Processing, Manufacturing and Utilities Supervisors and Skilled Operators
17	74	H1	Intermediate Occupations in Transport, Equipment Operators
18	62	G0	Skilled Sales and Service Occupations
19	76	H2 - H8	Trades Helpers, Construction Labourers and Related Occupations
20	64	G1	Intermediate Sales and Service Occupations
21	94–95	J1	Processing and Manufacturing Machine Operators and Assemblers
22	14	B2,B3,B4,B5	Clerical Occupations
23	84	I1	Intermediate Occupations in Primary Industry
24	96	J2,J3	Labourers in Processing, Manufacturing and Utilities
25	86	I2	Labourers in Primary Industry
26	66	G2 - G9	Elemental Sales and Service Occupations

Sources: (Goyder & Frank, 2007, p.69; Statistics Canada, 1993; 2007; 2013a)

Appendix B: Study 2 - Manifest Variables

Subjective Well-being

Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **LS** In general, I am happy with how things are for me in my life now	1. Strongly disagree 2. Disagree 3. Agree 4. Strongly Agree	Youth Report (AD): [G/H]AMCBQ02
Indicator Label: **Pos1** Overall I have a lot to be proud of.	1. False/Mostly False 2. Sometimes true, Sometimes false 3. Mostly true 4. True	Youth Report (AD): [G/H]AMCbQ02 False/ Mostly False collapsed
Indicator Label: **Pos2** A lot of things about me are good.	1. False/Mostly False 2. Sometimes true, Sometimes false 3. Mostly true 4. True	Youth Report (AD): [G/H]AMCQ01B False/ Mostly False collapsed
Indicator Label: **Pos3** I enjoy the things I do.	1. Rarely true of me 2. Sometimes true of me 3. Often true of me 4. Very often true of me	Youth Report (AD): [G/H]AMCQ01C
Indicator Label: **Neg1** I am not as happy as other people my age.	1. Never or not true 2. Sometimes or somewhat true 3. Often or very true	Youth Report (AD): [G/H]AMCbQ02
Indicator Label: **Neg2** I am unhappy or sad.	1. Never or not true 2. Sometimes or somewhat true 3. Often or very true	Youth Report (AD): [G/H]AMCQ01B
Indicator Label: **Neg3** I have trouble enjoying myself.	1. Never or not true 2. Sometimes or somewhat true 3. Often or very true	Youth Report (AD): [G/H]AMCQ01C

Socioeconomic Status

Early childhood: Household Income

Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **Inc** Categorized Household Income (22)	Annual income calculated at EC: Household specific Low Income Cut Off (LICO) x Ratio to the LICO Recoded to be consistent over time (see MC/AD below)	PMK Report (EC): [B/C]INHD03A & 04A

Middle childhood/Adolescence: Household Income

Variable Details	Response Categories		NLSCY [Cycle] Item
Indicator Label: **Inc** Categorized Household Income (22)	1. < $9,999 2. $10,000 - $19,999 3 $20,000 - $20,999 4. $30,000 - $30,999 5. $40,000 - $40,999	12. $110,000 - $110,999 13. $120,000 - $120,999 14. $130,000 - $130,999 15. $140,000 - $140,999 16. $150,000 - $150,999	PMK Report (MC): [E/F]INHGQ03 PMK Report (AD): [G/H]INHGQ03

	6. $50,000 - $50,999 7. $60,000 - $60,999 8. $70,000 - $70,999 9. $80,000 - $80,999 10. $90,000 - $90,999 11. $100,000 - $100,999	17. $160,000 - $160,999 18. $170,000 - $170,999 19. $180,000 - $180,999 20. $190,000 - $190,999 21. $200,000 - $249,999 22. $250,000 +	

Early childhood: Educational Attainment

Variable Details	Response Categories		NLSCY [Cycle] Item
Indicator Label: **Ed**	Original	Recoded	PMK Report (EC):
Highest Household Educational Attainment	1. No schooling 2. Elementary school 3. Some secondary school 4. Secondary school grad 5. Beyond high school 6. Some trade school 7. Some college 8. Some university 9. Diploma/Cert. trade 10. Diploma/Cert. college 11. Bachelor degree 12. Graduate degree +	1. < high school diploma 1= 1, 2, 3 2. high school graduate 2= 4 3. some post-secondary 3= 5, 6, 7, 8 4. diploma or certificate 4= 9, 10 5. undergraduate degree 5= 11 6. graduate degree + 6= 12	[B/C] EDPD01 PMK [B/C]EDSD01 Spouse

Middle childhood: Educational Attainment

Variable Details	Response Categories		NLSCY [Cycle] Item
Indicator Label: **Ed**	Original	Recoded	PMK Report (MC):
Highest Household Educational Attainment	1. No schooling 2. Some elementary 3. Completed elementary 4. Some secondary 5. Completed secondary 6. Some post-secondary 7. Diploma/Certificate 8. Bachelor degree 9. Master's degree 10. PhD or MD 11. Other education	1. < high school diploma 1= 1, 2, 3, 4 2. high school graduate 2= 5 3. some post-secondary 3= 6, 11 4. diploma or certificate 4= 7 5. undergraduate degree 5= 8 6. graduate degree + 6= 9, 10, 11	[E/F]EDPEQ4B PMK [E/F]EDSEQ4B Spouse

Adolescence: Educational Attainment

Variable Details	Response Categories		NLSCY [Cycle] Item
Indicator Label: **Ed**	Original	Recoded	PMK Report (AD):
Highest Household Educational Attainment	1. No schooling 2. Some elementary 3. Some high school 4. High school graduate 5. Some trade school 6. Some college 7. Some university 8. Some post-secondary	1. < high school diploma 1= 1, 2, 3 2. high school graduate 2= 4 3. some post-secondary 3= 5, 6, 7, 8, 16 4. diploma or certificate 4= 9, 10, 11	[G/H]EDPgQ4B PMK [G/H]EDSgQ4B Spouse

	9. Diploma/Cert. trade 10. Diploma/Cert. college 11. Finish post-secondary 12. Bachelor degree 13. Master's degree 14. MD,DDS, DMD, etc. 15. Earned doctorate 16. Other education	5. undergraduate degree 5= 12 6. graduate degree + 6= 13, 14, 15	

Early childhood: Occupational Status			
Variable Details	Response Categories		NLSCY [Cycle] Item
Indicator Label: **Occ** Highest Household Occupational Status Items reversed then collapsed by 2 to create 9 point scale with reasonably normal distribution: low-high occupational 'prestige'	Original 1. Self -employed profess. 2. Employed professional 3. High -level management 4. Semi -professional 5. Technician 6. Middle manager 7. Supervisor 8. Foreman/forewoman 9. Skilled clerical/ service 10. Skilled crafts and trade 11. Farmer 12. Semi -skilled cler./sales 13. Semi -skilled manual 14. Unskilled clerical/ serv. 15. Unskilled manual 16. Farm labourer '17'. unemployed (added)	Recoded 1= 17 (unemployed) 2= 15, 16 3= 13, 14 4= 11, 12 5= 9, 10 6= 7, 8 7= 5, 6 8= 3, 4 9= 1, 2 (professional)	PMK Report (EC): Occupation [B/C]LFPD09 PMK [B/C]LFSD09 Spouse (Un)employed [B/C]LFPD25 PMK [B /C]LFSD25 Spouse

Middle childhood/Adolescence: Occupational Status			
Variable Details	Response Categories		NLSCY [Cycle] Item
Indicator Label: **Occ** Highest Household Occupational Status Items reversed then collapsed by 3 to create 9 point scale with reasonably normal distribution: low-high	Original See Noc major group scale of occupational prestige in Appendix A	Recoded 1= 25, 26, 27 2= 22, 23, 34 3= 19, 20, 21 4= 16, 17, 18 5= 13, 14, 15 6= 10, 11, 12 7= 7, 8, 9 8= 4, 5, 6 9= 1, 2, 3	PMK Report (MC): [E/F]LFPcD6A PMK [E/F]LFScD6A Spouse [E/F]LFPD25 PMK [E/F]LFSD25Spouse PMK Report (AD): [G/H]LFPfD6A PMK [G/H]LFSfD6A Spouse [G/H]LFPD25 PMK [G/H]LFSD25 Spouse

Primary Caregiver Employment

Variable Details	Response Categories: Original	Recoded	NLSCY [Cycle] Item
Indicator Label: **Workforce** Primary caregiver (maternal) employment	1. < 10 hours/week 2. 10-19 hours 3. 20-29 hours 4. 30-39 hours 5. 40-49 hours 6. 50 hours +	1. unemployed 2. < 10 hours/week 3. 10-19 hours 4. 20-29 hours 5. 30-39 hours 6. 40-49 hours 7. 50 hours +	PMK Report (EC): [B/C]LFPbQ04 [B/C]LFPD25 PMK Report (MC): [E/F]LFPbQ04 [E/F]LFPD25 PMK Report (AD): [G/H]LFPbQ04 [G/H]LFPD25

Social Relationships: Peer friendship and acceptance

Middle childhood/Adolescence: Friendship

Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **IncA** Most others my age like me.	1. False 2. Mostly False 3. Sometimes true/ Sometimes false 4. Mostly true 5. True	Youth Report (MC): [E/F]FFCQ04 Youth Report (AD): [G/H]FFCQ04
Indicator Label: **IncB** Others my age want me to be their friend.	1. False 2. Mostly False 3. Sometimes true/ Sometimes false 4. Mostly true 5. True	Youth Report (MC): [E/F]FFCQ03 Youth Report (AD): [G/H]FFCQ03
Indicator Label: **IncC** I have many friends.	1. False 2. Mostly False 3. Sometimes true/ Sometimes false 4. Mostly true 5. True	Youth Report (MC): [E/F]FFCQ01 Youth Report (AD): [G/H]FFCQ01

Social Relationships: Peer victimisation

Middle childhood: Victimisation

Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **BulA** Other young people say mean things to me at school.	1. All of the time 2. Most of the time 3. Some of the time 4. Rarely 5. Never	Youth Report (MC): [E/F]SCCcQ07 Item reverse scored
Indicator Label: **BulB** I am bullied in school.	1. All of the time 2. Most of the time 3. Some of the time 4. Rarely 5. Never	Youth Report (MC): [E/F]SCCQ08 Item reverse scored

Adolescence: Victimisation

Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **Int.** In the past 12 months, how many times did someone say something personal about you that made you feel extremely uncomfortable? A)At school B) Elsewhere	1. never 2. once or twice 3. 3 or 4 times 4. 5 times or more	Youth Report (AD): Greater response to [G/H]AMCcQ8A or B.
Indicator Label: **Thr.** In the past 12 months, how many times did someone threaten to hurt you but did not actually hurt you? A)At school B) Elsewhere	1. never 2. once or twice 3. 3 or 4 times 4. 5 times or more	Youth Report (AD): Greater response to [G/H]AMCcQ7A or B.
Indicator Label: **Att.** In the past 12 months, how many times did someone physically attack or assault you? A)At school B) Elsewhere	1. never 2. once or twice 3. 3 or 4 times 4. 5 times or more	Youth Report (AD): Greater response to [G/H]AMCcQ6A or B.

Social Relationships: Social Participation

Early childhood: Leisure Participation

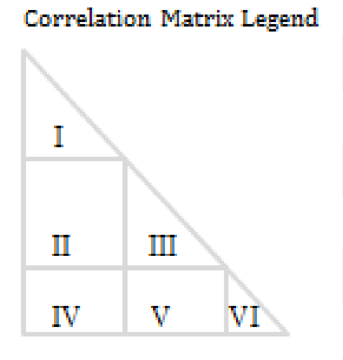
Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **Participation** Outside of school, during the past 12 months, how often has this child taken part in: A) sports; AA) dance, gymnastics, martial arts or other groups or lessons; C) music or art groups or lessons; D) clubs or groups such as Beavers, Sparks or church groups?	Composite (mean) score 1. Most days 2. A few times a week 3. About once a week 4. About once a month 5. Almost never	PMK Report (EC): [B/C]ACCQ3A,AA,C, D Items reverse scored

Middle childhood/Adolescence: Leisure Participation

Variable Details	Response Categories	NLSCY [Cycle] Item
Indicator Label: **Participation** Outside of school, during the past 12 months, how often have you: B) played sports; taken part in C) dance, gymnastics, karate or other groups or lessons; D) drama or music groups, clubs or lessons; E) clubs or groups such as Guides or Scouts, 4-H club, community, church or other religious groups?	Composite (mean) score 1. Never 2. Less than once a week 3. 1 to 3 times a week 4. 4 or more times a week	Youth Report (MC): [E/F]ATCbQ1B - E Youth Report (AD): [G/H]ATCc1BB - EE

Appendix C: Study 1 - Cross-sectional Weighted Zero-order Correlation Matrix

I	Disability at Adolescence	Aboriginal Status	Youth Gender (Female)	Teased	Threated	Attacked	Outsider	Friends are important	Friendship Scale	See friends in community	Community Cohesiveness	Participate in sport	Participate in arts groups	Participate in community	Volunteer	Work for pay	Treated fairly by teachers	Extra act. are important	Extra act. participation
Disability at Adolescence	1																		
Aboriginal Status	.013	1																	
Youth Gender (Female)	.005	-.013	1																
Teased	.038*	.031	.160*	1															
Threated	.055*	.060*	-.019	.319*	1														
Attacked	.040*	.051*	-.036*	.199*	.408*	1													
Outsider	.057*	.048*	-.013	.053*	.100*	.098*	1												
Friends are important	.015	-.038*	.089*	-.026	-.030	-.074*	-.181*	1											
Friendship Scale	-.070*	-.086*	.072*	-.126*	-.137*	-.126*	-.320*	.243*	1										
See friends in community	-.047*	.001	.029	.005	-.008	.019	-.169*	.129*	.254*	1									
Community Cohesiveness	.007	-.031*	-.007	.003	.019	.021	-.029	-.001	.080*	.002	1								
Participate in sport	-.043*	-.016	-.070*	.022	.007	-.033*	-.098*	.090*	.206*	.124*	.138*	1							
Participate in arts groups	.023	-.024	.094*	.083*	.004	.008	-.002	.021	.018	.032*	.047*	.057*	1						
Participate in community	-.005	-.043*	.019	.079*	.085*	.039*	.022	-.029	-.045*	-.045*	.032*	.052*	.230*	1					
Volunteer	-.002	-.042*	.145*	.108*	-.006	-.004	-.072*	.077*	.087*	.039*	.050*	.112*	.087*	.128*	1				
Work for pay	-.003	-.016	.042*	.033*	.018	.003	-.012	.034*	.081*	.001	.023	.080*	-.006	-.001	.042*	1			
Treated fairly by teachers	-.038*	-.029	.051*	-.104*	-.200*	-.202*	-.047*	.065*	.060*	-.010	.032	.043*	-.017	.031	.072*	.007	1		



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II	Disability at Adolescence	Aboriginal Status	Youth Gender (Female)	Teased	Threated	Attacked	Outsider	Friends are important	Friendship Scale	See friends in community	Community Cohesiveness	Participate in sport	Participate in arts groups	Participate in community	Volunteer	Work for pay	Treated fairly by teachers	Extra act. are important	Extra act. participation
Extra act. are important	-.011	-.012	.011	-.024	-.038*	-.014	-.047*	.129*	.165*	.078*	.089*	.320*	.110*	.120*	.189*	.047*	.062*	1	
Extra act. participation	-.013	-.023	.015	.041*	.000	.030	-.061*	.107*	.160*	.112*	.091*	.425*	.269*	.107*	.177*	.041*	-.012	.399*	1
Life Satisfaction	-.025	-.045*	-.067*	-.170*	-.165*	-.126*	-.088*	.012	.263*	.069*	.069*	.104*	.045*	.023	.014	.073*	.104*	.134*	.067*
Positive Affect	-.034*	-.051*	-.130*	-.209*	-.168*	-.156*	-.197*	.104*	.381*	.103*	.092*	.228*	.052*	.023	.089*	.040*	.175*	.252*	.158*
Negative Affect	.086*	.031	.109*	.273*	.199*	.204*	.247*	-.114*	-.321*	-.103*	-.039*	-.076*	.025	.037*	-.008	-.013	-.169*	-.077*	-.036*
Self-report health	-.122*	-.075*	-.146*	-.139*	-.125*	-.137*	-.137*	.094*	.203*	.032*	.044*	.210*	.001	.035*	.078*	.004	.179*	.164*	.139*
Cigarettes	.020	.046*	.039*	.072*	.084*	.134*	.030	-.009	-.031	.072*	-.026	-.101*	-.016	-.022	-.091*	.045*	-.095*	-.141*	-.103*
Alcohol	-.002	.009	.061*	.125*	.091*	.142*	-.038*	.028	.081*	.142*	.008	.025	-.002	-.071*	-.014	.124*	-.169*	-.076*	-.031
Marijuana	.012	.060*	.005	.079*	.078*	.086*	.022	-.025	-.015	.078*	-.071*	-.071*	-.006	-.053*	-.081*	-.026	-.143*	-.186*	-.123*
Considered Suicide	.051*	.010	.144*	.180*	.175*	.235*	.147*	-.111*	-.134*	-.043*	.004	-.083*	.022	.070*	.003	-.025	-.107*	-.081*	-.034*
Attempted Suicide	.058*	.041*	.127*	.124*	.146*	.182*	.112*	-.117*	-.095*	-.025	-.013	-.073*	.020	.047*	.013	-.045*	-.082*	-.076*	-.046*
Injuries	.075*	.016	-.091*	.036*	.070*	.044*	-.022	-.003	.058*	.061*	.041*	.129*	-.020	.012	.003	.029	-.042*	.075*	.103*
Poverty Line	.024	.070*	-.002	-.043*	.000	.001	.023	-.015	-.024	-.076*	-.121*	-.144*	-.026	-.018	-.064*	-.058*	.006	-.005	-.060*
Household Income	-.023	-.101*	.003	.028	-.003	-.045*	-.051*	.087*	.119*	.060*	.143*	.184*	.056*	.000	.125*	.060*	.041*	.061*	.121*
Household Education	-.041*	-.098*	-.036*	.031	-.039*	-.022	-.035*	.034*	.078*	.011	.136*	.165*	.083*	.016	.122*	.000	.039*	.080*	.197*
Household Occ. Status	.001	-.076*	.015	.013	-.051*	-.043*	-.036*	.022	.098*	-.023	.108*	.129*	.048*	-.012	.089*	.000	.020	.062*	.126*
Rented Home	.016	.106*	-.016	-.022	.047*	.087*	.091*	-.055*	-.090*	-.018	-.199*	-.173*	-.070*	-.023	-.077*	-.054*	-.069*	-.045*	-.097*
PMK Worried about money	.038*	.066*	-.004	.011	.026	.046*	.047*	-.055*	-.092*	-.010	-.102*	-.043*	-.014	.025	-.029	-.025	-.034*	.064*	.007

continued…

III	Life Satisfaction	Positive Affect	Negative Affect	Self-report health	Cigarettes	Alcohol	Marijuana	Considered Suicide	Attempted Suicide	Injuries	Poverty Line	Household Income	Household Education	Household Occ. Status	Rented Home	PMK Worried about money	Finances comparison	Neighborhood Safety	Single Parent Household
Life Satisfaction	1																		
Positive Affect	.458*	1																	
Negative Affect	-.402*	-.472*	1																
Self-report health	.232*	.342*	-.296*	1															
Cigarettes	-.072*	-.159*	.131*	-.204*	1														
Alcohol	-.012	-.098*	.063*	-.105*	.330*	1													
Marijuana	-.078*	-.175*	.134*	-.184*	.461*	.393*	1												
Considered Suicide	-.162*	-.252*	.329*	-.169*	.180*	.122*	.178*	1											
Attempted Suicide	-.109*	-.205*	.236*	-.152*	.114*	.125*	.136*	.700*	1										
Injuries	.020	.066*	-.005	.022	-.010	.032*	.035*	.007	.025	1									
Poverty Line	-.074*	-.017	-.026	-.051*	.049*	-.058*	-.037*	-.038*	-.015	-.015	1								
Household Income	.102*	.106*	-.039*	.127*	-.080*	.024	.019	-.024	-.058*	.036*	-.468*	1							
Household Education	.048*	.098*	-.022	.131*	-.133*	-.036*	-.024	-.031	-.054*	.016	-.278*	.460*	1						
Household Occ. Status	.083*	.096*	-.002	.107*	-.087*	-.022	-.049*	-.004	-.015	.026	-.301*	.417*	.480*	1					
Rented Home	-.093*	-.072*	.018	-.098*	.095*	-.019	.037*	.018	.042*	-.023	.384*	-.378*	-.264*	-.262*	1				
PMK Worried about money	-.067*	-.011	.057*	-.077*	.020	-.028	-.063*	.000	.031	.009	.192*	-.313*	-.200*	-.194*	.205*	1			

continued…

IV	Disability at Adolescence	Aboriginal Status	Youth Gender (Female)	Teased	Threated	Attacked	Outsider	Friends are important	Friendship Scale	See friends in community	Community Cohesiveness	Participate in sport	Participate in arts groups	Participate in community	Volunteer	Work for pay	Treated fairly by teachers	Extra act. are important	Extra act. participation
Finances comparison	-.033*	.021	.004	.022	.041*	.053*	.039*	-.009	-.019	-.003	.069*	-.023	.016	.014	.038*	.004	-.020	.022	-.004
Neighborhood Safety	-.022	-.034*	-.068*	.044*	.006	-.010	-.035*	.035*	.085*	.055*	.493*	.091*	.027	-.018	-.025	.017	.007	.000	.040*
Single Parent Household	.001	.090*	.004	.020	.039*	.044*	.008	-.037*	-.031	-.006	-.073*	-.112*	-.025	-.005	-.111*	-.047*	-.027	-.070*	-.065*
Parental Nurture	-.026	-.026	-.037*	-.181*	-.219*	-.214*	-.133*	.084*	.231*	.054*	.095*	.159*	.071*	.046*	.079*	-.012	.257*	.175*	.122*
Parental Rejection	.037*	.024	-.019	.180*	.220*	.199*	.047*	-.007	-.073*	.050*	-.038*	-.043*	.001	.001	-.034*	.022	-.196*	-.054*	-.036*
Parental Conflict	.085*	.044*	.107*	.080*	.126*	.179*	.040*	.003	-.070*	.027	-.056*	-.039*	-.035*	-.018	-.038*	.050*	-.099*	-.044*	-.047*
Mean	0.12	0.04	0.49	0.56	0.35	0.14	0.05	0.94	12.82	0.87	10.81	0.54	0.20	0.14	0.70	0.20	0.86	0.59	0.63
Std. Dev	0.33	0.19	0.50	0.50	0.48	0.35	0.22	0.23	2.85	0.34	2.37	0.50	0.40	0.35	0.46	0.40	0.34	0.49	0.48

* p<0.05 (2-tailed)

continued...

V	Life Satisfaction	Positive Affect	Negative Affect	Self-report health	Cigarettes	Alcohol	Marijuana	Considered Suicide	Attempted Suicide	Injuries	Poverty Line	Household Income	Household Education	Household Occ. Status	Rented Home	PMK Worried about money	Finances comparison	Neighborhood Safety	Single Parent Household
Finances comparison	-.030	-.016	.029	-.051*	.005	-.012	.015	.041*	.011	.016	-.113*	.140*	.055*	.069*	.037*	-.158*	1		
Neighborhood Safety	.078*	.054*	-.021	.019	.004	.039*	.023	-.002	-.024	.046*	-.120*	.169*	.160*	.116*	-.159*	-.105*	.048*	1	
Single Parent Household	-.099*	-.068*	.035*	-.073*	.139*	.038*	.060*	.031	.080*	-.004	.350*	-.441*	-.259*	-.227*	.371*	.191*	-.051*	-.011	1
Parental Nurture	.349*	.439*	-.362*	.276*	-.119*	-.142*	-.150*	-.238*	-.175*	.031	.000	.042*	.113*	.108*	-.083*	-.037*	-.055*	.104*	-.008
Parental Rejection	-.165*	-.172*	.253*	-.142*	.073*	.159*	.104*	.152*	.105*	.052*	.027	.010	-.046*	-.092*	.059*	.068*	-.007	-.071*	.021
Parental Conflict	-.126*	-.134*	.124*	-.159*	.107*	.121*	.098*	.094*	.083*	.087*	.002	-.083*	-.073*	-.047*	.075*	.130*	-.003	-.079*	.074*
Mean	0.35	7.77	2.13	0.77	0.06	0.23	0.09	0.08	0.04	0.16	0.12	9.58	3.89	5.03	0.17	0.46	0.23	6.65	0.23
Std. Dev	0.48	1.96	1.22	0.42	0.23	0.42	0.29	0.26	0.19	0.36	0.32	5.10	1.41	2.55	0.37	0.50	0.42	1.57	0.42

* p<0.05 (2-tailed)

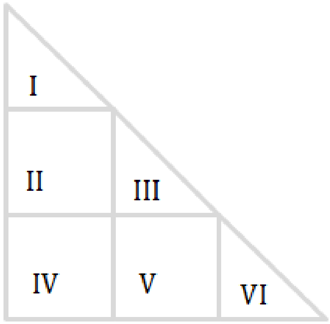
VI	Parental Nurture	Parental Rejection	Parental Conflict
Parental Nurture	1		
Parental Rejection	-.387*	1	
Parental Conflict	-.246*	.280*	1
Mean	20.29	11.21	5.83
Std. Dev	5.43	4.71	4.26

* p<0.05 (2-tailed)

Appendix D: Study 2 - Longitudinal Weighted Zero-order Correlation Matrix

I	Child Disability	Aboriginal Status	Youth Gender (Female)	Household Occ. Status(E)	Household Education(E)	Household Income(E)	PMK Workforce(E)	Sport Participate(E)	Active Group Participate(E)	Arts Participate(E)	Community Participate(E)	Mean Participate(E)	Household Occ Status(M)	Household Education(M)	Household Income(M)	PMK Workforce(M)	Sport Participate(M)	Active Group Participate(M)	Arts Participate(M)
Child Disability	1																		
Aboriginal Status	.020	1																	
Youth Gender (Female)	-.025	-.003	1																
Household Occ. Status(E)	-.088*	-.069*	.008	1															
Household Education(E)	-.072*	-.089*	-.026	.537*	1														
Household Income(E)	-.074*	-.089*	-.015	.512*	.478*	1													
PMK Workforce(E)	-.038*	-.004	.048*	.271*	.126*	.207*	1												
Sport Participate(E)	-.056*	.025	-.042*	.242*	.236*	.305*	.082*	1											
Active Group Participate(E)	-.023	-.051*	.165*	.177*	.194*	.210*	.071*	.209*	1										
Arts Participate(E)	-.026	.006	.075*	.089*	.127*	.124*	.019	.108*	.130*	1									
Community Participate(E)	.013	-.019	.069*	.080*	.051*	.083*	-.031	.091*	.073*	.094*	1								
Mean Participate(E)	-.044*	-.016	.104*	.268*	.274*	.328*	.070*	.693*	.638*	.468*	.500*	1							
Household Occ Status(M)	-.067*	-.088*	-.019	.518*	.433*	.393*	.111*	.181*	.155*	.073*	.039*	.205*	1						
Household Education(M)	-.060*	-.091*	-.044*	.477*	.727*	.432*	.092*	.195*	.177*	.135*	.080*	.258*	.464*	1					
Household Income(M)	-.065*	-.095*	-.048*	.454*	.480*	.658*	.143*	.265*	.186*	.080*	.066*	.276*	.421*	.504*	1				
PMK Workforce(M)	-.017	-.033	-.003	.143*	.085*	.115*	.417*	.071*	.038*	.017	-.021	.052*	.154*	.074*	.167*	1			
Sport Participate(M)	-.082*	-.012	-.061*	.154*	.165*	.192*	.017	.250*	.133*	.059*	.068*	.237*	.138*	.166*	.229*	.055*	1		

Correlation Matrix Legend



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II	Child Disability	Aboriginal Status	Youth Gender (Female)	Household Occ. Status(E)	Household Education(E)	Household Income(E)	PMK Workforce(E)	Sport Participate(E)	Active Group Participate(E)	Arts Participate(E)	Community Participate(E)	Mean Participate(E)	Household Occ Status(M)	Household Education(M)	Household Income(M)	PMK Workforce(M)	Sport Participate(M)	Active Group Participate(M)	Arts Participate(M)
Active Group Participate(M)	.017	-.032	.173*	.104*	.140*	.143*	.028	.116*	.137*	.066*	.061*	.168*	.106*	.135*	.157*	.012	.289*	1	
Arts Participate(M)	-.011	-.035	.125*	.027	.059*	.084*	.027	.031	.051*	.069*	.168*	.126*	.044*	.080*	.066*	-.028	.172*	.237*	1
Community Participate(M)	-.009	.001	.086*	.096*	.077*	.066*	-.016	.051*	.018	.028	.233*	.135*	.075*	.092*	.060*	.002	.146*	.117*	.184*
Mean Participate(M)	-.034	-.032	.129*	.152*	.177*	.195*	.024	.180*	.138*	.089*	.206*	.267*	.145*	.190*	.206*	.016	.648*	.672*	.635*
Peer Inclusion IncC (M)	-.036*	-.030	.058*	.019	-.033	.031	-.008	.023	.040*	.010	-.024	.024	-.007	-.042*	.058*	.067*	.121*	.118*	.043
Peer Inclusion IncB (M)	-.001	-.010	.104*	.010	-.069*	-.014	-.014	.002	.012	.049*	.008	.025	-.009	-.040*	.021	.020	.097*	.122*	.081*
Peer Inclusion IncA (M)	-.050*	-.023	.141*	-.001	-.020	.036*	-.041*	.032	.072*	.042*	.004	.065*	-.021	-.001	.045*	.016	.152*	.124*	.083*
Bullying BulA (M)	.072*	.037*	-.077*	-.059*	-.083*	-.088*	.011	-.072*	-.091*	-.053*	.002	-.096*	-.050*	-.060*	-.044*	-.027	-.081*	-.019	-.009
Bullying BulB (M)	.070*	.051*	-.130*	-.045*	-.053*	-.078*	-.019	-.037*	-.068*	-.028	.037*	-.045*	-.039*	-.036*	-.049*	-.014	-.030	-.034	.014
Household Occ Status(A)	-.074*	-.087*	.009	.448*	.398*	.328*	.076*	.150*	.121*	.057*	.041*	.169*	.695*	.421*	.340*	.111*	.112*	.086*	.058*
Household Education(A)	-.049*	-.111*	-.039*	.462*	.684*	.375*	.068*	.190*	.151*	.112*	.090*	.240*	.442*	.842*	.436*	.048*	.170*	.123*	.097*
Household Income(A)	-.043*	-.100*	-.028	.427*	.390*	.532*	.162*	.217*	.157*	.109*	.081*	.252*	.410*	.429*	.668*	.158*	.192*	.080*	.063*
PMK Workforce(A)	-.019	-.051*	-.003	.091*	.035*	.032	.299*	.043*	.017	.016	-.088*	.002	.101*	.021	.038*	.499*	.025	-.001	-.014
Sport Participate(A)	-.085*	-.015	-.094*	.175*	.170*	.203*	.019	.167*	.115*	.038*	.036*	.167*	.163*	.154*	.239*	.024	.325*	.169*	.047*
Active Group Participate(A)	-.039*	-.001	.118*	.166*	.138*	.174*	.040*	.104*	.125*	.042*	-.020	.117*	.097*	.143*	.158*	.032	.154*	.212*	.100*
Arts Participate(A)	-.020	-.002	.087*	.107*	.075*	.060*	.025	.028	.044*	.063*	.091*	.090*	.040*	.059*	.040*	-.050*	.016	.088*	.179*
Community Participate(A)	.052*	-.038*	.041*	.004	.022	.023	-.053*	-.010	.062*	.027	.226*	.119*	-.016	.060*	.026	-.084*	.026	.051*	.104*
Mean Participate(A)	-.048*	-.021	.048*	.197*	.176*	.202*	.018	.132*	.145*	.069*	.118*	.204*	.130*	.177*	.206*	-.021	.238*	.220*	.166*

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III	Community Participate(M)	Mean Participate(M)	Peer Inclusion IncC (M)	Peer Inclusion IncB (M)	Peer Inclusion IncA (M)	Bullying BulA (M)	Bullying BulB (M)	Household Occ. Status(A)	Household Education(A)	Household Income(A)	PMK Workforce(A)	Sport Participate(A)	Active Group Participate(A)	Arts Participate(A)	Community Participate(A)	Mean Participate(A)	Bullying Int. (A)	Bullying Thr. (A)	Bullying Att. (A)
Active Group Participate(M)																			
Arts Participate(M)																			
Community Participate(M)	1																		
Mean Participate(M)	.552*	1																	
Peer Inclusion IncC (M)	-.019	.108*	1																
Peer Inclusion IncB (M)	-.008	.120*	.397*	1															
Peer Inclusion IncA (M)	.009	.150*	.468*	.569*	1														
Bullying BulA (M)	.017	-.038*	-.236*	-.243*	-.360*	1													
Bullying BulB (M)	.065*	.003	-.230*	-.207*	-.271*	.538*	1												
Household Occ Status(A)	.054*	.124*	-.014	-.008	-.020	-.094*	-.046*	1											
Household Education(A)	.047*	.176*	-.041*	-.035*	-.024	-.050*	-.006	.473*	1										
Household Income(A)	.024	.145*	.036*	-.007	.029	-.078*	-.007	.416*	.454*	1									
PMK Workforce(A)	-.058*	-.017	.039*	.014	.000	-.020	-.052*	.170*	.064*	.129*	1								
Sport Participate(A)	.070*	.247*	.133*	.103*	.120*	-.084*	-.044*	.159*	.161*	.214*	.028	1							
Active Group Participate(A)	.033	.203*	.115*	.079*	.102*	-.035*	-.073*	.067*	.114*	.087*	-.029	.263*	1						
Arts Participate(A)	.095*	.150*	.012	.004	.009	.000	.001	.033	.059*	.045*	-.087*	.046*	.268*	1					
Community Participate(A)	.207*	.150*	-.029	-.004	-.033	.005	.069*	-.033	.028	.003	-.107*	.054*	.148*	.293*	1				
Mean Participate(A)	.152*	.311*	.108*	.084*	.093*	-.054*	-.029	.108*	.157*	.160*	-.066*	.637*	.690*	.606*	.527*	1			

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IV	Child Disability	Aboriginal Status	Youth Gender (Female)	Household Occ. Status(E)	Household Education(E)	Household Income(E)	PMK Workforce(E)	Sport Participate(E)	Active Group Participate(E)	Arts Participate(E)	Community Participate(E)	Mean Participate(E)	Household Occ Status(M)	Household Education(M)	Household Income(M)	PMK Workforce(M)	Sport Participate(M)	Active Group Participate(M)	Arts Participate(M)
Bullying Int. (A)	.077*	.035*	.174*	-.008	.044*	.016	.021	-.003	.054*	.037*	.064*	.059*	-.006	.041*	.036*	-.001	.015	.096*	.004
Bullying Thr. (A)	.080*	.058*	-.041*	-.038*	-.028	-.034	-.009	.005	.022	-.001	.079*	.043*	-.059*	-.044*	-.024	-.003	.030	.002	.007
Bullying Att. (A)	.034	.042*	-.036*	-.039*	-.038*	-.065*	.040*	-.027	-.032	-.002	.024	-.020	-.024	-.026	-.027	.040*	-.010	-.017	-.022
Peer Inclusion IncC (A)	-.054*	-.065*	.030	.073*	.039*	.095*	-.010	.049*	.066*	.024	-.025	.054*	.104*	.062*	.080*	.005	.104*	.033	.032
Peer Inclusion IncB (A)	-.057*	-.059*	.039*	.065*	.047*	.094*	.003	.037*	.071*	.042*	-.027	.055*	.089*	.056*	.074*	.013	.118*	.042*	.043*
Peer Inclusion IncA (A)	-.106*	-.066*	.074*	.071*	.030	.090*	-.028	.032	.075*	.035*	.031	.074*	.092*	.048*	.080*	-.038*	.056*	.020	.066*
SWB Life Sat(A)	-.064*	-.035*	-.073*	.115*	.077*	.092*	.011	.051*	.014	.052*	.007	.052*	.111*	.077*	.084*	-.017	.076*	-.016	.037*
SWB Pos1 (A)	-.053*	-.037*	-.162*	.111*	.079*	.128*	.009	.068*	.030	.031	.012	.064*	.081*	.102*	.122*	-.009	.121*	.011	.047*
SWB Pos2 (A)	-.061*	-.064*	-.119*	.055*	.061*	.091*	-.036*	.074*	.066*	.054*	.000	.087*	.095*	.097*	.096*	-.050*	.095*	.005	.028
SWB Pos3 (A)	-.100*	-.033	-.055*	.096*	.091*	.114*	.026	.066*	.037*	.061*	.035*	.085*	.121*	.097*	.119*	-.018	.096*	-.011	.077*
SWB Neg1 (A)	.036*	.014	.065*	-.044*	-.030	-.066*	.006	-.049*	-.049*	-.003	-.016	-.055*	-.055*	-.060*	-.026	.019	-.035	.041*	-.012
SWB Neg2(A)	.041*	.025	.184*	-.063*	-.056*	-.099*	-.027	-.039*	-.013	.033	-.006	-.018	-.061*	-.054*	-.066*	-.034	-.046*	.045*	.016
SWB Neg3 (A)	.053*	.005	.048*	-.042*	-.025	-.040*	-.020	-.013	-.041*	.018	.064*	.005	-.033	-.039*	-.009	.016	-.006	.024	-.008
Mean	0.09	0.04	0.51	5.68	3.76	6.29	3.78	1.85	1.62	1.23	1.40	1.52	4.94	3.73	8.02	4.41	2.68	2.11	1.91
Std. Dev	0.29	0.19	0.50	2.45	1.27	3.59	2.02	1.14	0.99	0.68	0.84	0.54	2.58	1.42	4.28	1.84	1.01	1.04	1.00

* p<0.05 (2-tailed)

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V	Community Participate(M)	Mean Participate(M)	Peer Inclusion IncC (M)	Peer Inclusion IncB (M)	Peer Inclusion IncA (M)	Bullying BulA (M)	Bullying BulB (M)	Household Occ. Status(A)	Household Education(A)	Household Income(A)	PMK Workforce(A)	Sport Participate(A)	Active Group Participate(A)	Arts Participate(A)	Community Participate(A)	Mean Participate(A)	Bullying Int. (A)	Bullying Thr. (A)	Bullying Att. (A)
Bullying Int. (A)	.051*	.067*	-.022	-.025	.015	.078*	.040*	-.040*	.011	.009	-.023	-.040*	.053*	.083*	.110*	.069*	1		
Bullying Thr. (A)	.084*	.047*	-.075*	-.082*	-.044*	.111*	.112*	-.073*	-.048*	-.037*	.003	-.029	.006	.024	.075*	.022	.425*	1	
Bullying Att. (A)	.009	-.017	-.055*	-.066*	-.071*	.138*	.159*	-.034	-.040*	-.037*	.038*	-.030	-.004	.052*	.048*	.019	.261*	.490*	1
Peer Inclusion IncC (A)	-.043*	.053*	.231*	.253*	.254*	-.199*	-.151*	.108*	.082*	.121*	.049*	.196*	.058*	.004	-.030	.112*	-.153*	-.152*	-.114*
Peer Inclusion IncB (A)	-.041*	.067*	.234*	.262*	.261*	-.195*	-.152*	.086*	.074*	.112*	.048*	.187*	.071*	.010	-.047*	.110*	-.130*	-.131*	-.101*
Peer Inclusion IncA (A)	.005	.059*	.189*	.227*	.231*	-.189*	-.149*	.093*	.053*	.094*	-.018	.197*	.053*	.033	-.019	.126*	-.137*	-.114*	-.124*
SWB Life Sat(A)	-.026	.029	.071*	.045*	.028	-.100*	-.083*	.118*	.090*	.120*	.001	.161*	.078*	.051*	.029	.141*	-.208*	-.167*	-.180*
SWB Pos1 (A)	-.025	.063*	.148*	.126*	.133*	-.097*	-.047*	.089*	.095*	.122*	.008	.241*	.077*	.034	.038*	.176*	-.242*	-.154*	-.140*
SWB Pos2 (A)	-.022	.043*	.101*	.117*	.113*	-.120*	-.103*	.098*	.092*	.080*	-.013	.214*	.047*	.039*	.034	.151*	-.185*	-.134*	-.131*
SWB Pos3 (A)	.043*	.081*	.071*	.050*	.058*	-.110*	-.028	.107*	.105*	.124*	-.034	.216*	.074*	.105*	.052*	.194*	-.126*	-.074*	-.099*
SWB Neg1 (A)	.044*	.014	-.071*	-.082*	-.075*	.100*	.067*	-.031	-.053*	-.030	.054*	-.089*	-.006	.019	.013	-.035	.296*	.211*	.194*
SWB Neg2(A)	.047*	.024	-.068*	-.047*	-.033	.069*	.068*	-.017	-.057*	-.078*	.027	-.122*	-.025	.025	.040*	-.048*	.314*	.201*	.208*
SWB Neg3 (A)	.042*	.020	-.030	-.052*	-.037*	.066*	.074*	-.004	-.038*	-.004	.010	-.073*	-.004	.007	.068*	-.012	.209*	.148*	.172*
Mean	1.75	2.11	4.61	3.78	4.06	2.14	1.50	5.13	3.95	9.76	4.78	2.47	1.70	1.57	1.42	1.79	1.78	1.48	1.18
Std. Dev	0.93	0.63	0.74	1.06	1.03	1.02	0.90	2.56	1.34	5.01	1.71	1.18	0.98	0.90	0.78	0.60	0.87	0.77	0.53

* p<0.05 (2-tailed)

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VI	Peer Inclusion IncC (A)	Peer Inclusion IncB (A)	Peer Inclusion IncA (A)	SWB Life Sat(A)	SWB Pos1 (A)	SWB Pos2 (A)	SWB Pos3 (A)	SWB Neg1 (A)	SWB Neg2 (A)	SWB Neg3 (A)
Peer Inclusion IncC (A)	1									
Peer Inclusion IncB (A)	.956*	1								
Peer Inclusion IncA (A)	.682*	.680*	1							
SWB Life Sat(A)	.215*	.209*	.232*	1						
SWB Pos1 (A)	.296*	.282*	.284*	.494*	1					
SWB Pos2 (A)	.306*	.295*	.337*	.441*	.708*	1				
SWB Pos3 (A)	.218*	.209*	.233*	.450*	.503*	.478*	1			
SWB Neg1 (A)	-.264*	-.240*	-.240*	-.452*	-.385*	-.377*	-.329*	1		
SWB Neg2(A)	-.195*	-.178*	-.189*	-.437*	-.363*	-.348*	-.274*	.540*	1	
SWB Neg3 (A)	-.220*	-.189*	-.201*	-.351*	-.292*	-.305*	-.271*	.503*	.400*	1
Mean	4.00	4.05	4.29	3.23	3.16	3.22	3.37	1.42	1.53	1.30
Std. dev.	0.82	0.85	0.79	0.68	0.85	0.79	0.71	0.61	0.61	0.51