ABSTRACT

Aim: The goal of this study was to test the applicability of Harter’s (1990) model of adolescent self-perception to global self-worth among youth with chronic illness.

Method: Fifty-three adolescents with asthma, arthritis or diabetes completed an online survey. Factors that have been previously shown to predict higher global self-worth among typically developing adolescents (i.e., male gender, older age, higher parent support, fewer depressive symptoms) were examined. In addition, the possible role of physical health-related quality of life was examined. Adolescents’ reports of discounting and autonomy were evaluated as potential moderators of the relationship between physical health-related quality of life and global self-worth. Results: The results indicated that overall the youth with chronic illness reported a moderate level of global self-worth and this level was comparable to that of typically developing youth. Consistent with Harter’s model, the discrepancy domains of competence, as a group, predicted global self-worth, with romantic appeal emerging as a significant unique predictor. Consistent with expectations, male gender, a lower level of depressive symptoms, a higher physical health-related quality of life, discounting more domains and a higher level of autonomy were associated with higher global self-worth. Unexpectedly, however, age and parent support were not related to global self-worth. Examination of the hypothesized predictor variables as a group revealed that level of depressive symptoms was the only unique individual predictor of global self-worth. Moreover, contrary to the expectations, neither discounting nor autonomy were found to be significant moderators. Conclusions: It appears from this study that having a chronic illness does not invariably place a youth at risk for lower global self-worth. Rather, universal factors, such as male gender, a higher
level of autonomy, and a lower level of depressive symptoms are the most salient factors that promote global self-worth. In addition, higher physical health-related quality of life, especially less pain, may be associated with higher global self-worth due to fewer depressive symptoms. Overall, the results suggest that using Harter's model is relevant and appropriate for youth with chronic illness. Future research using normative models for assessment and intervention of self-esteem problems in youth with chronic illness is recommended.
DEDICATION

This dissertation is dedicated to my dad, for the love and support during my formative years, and to my mom and Michelle, whose ongoing support has been immeasurable.
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1.0 INTRODUCTION

1.1 Overview

Researchers have debated whether youth with chronic illness are more likely than youth without chronic illness to experience lower self-worth as a result of living with their disease. Whereas some evidence supports that having a chronic illness is a risk factor for lower self-worth, negative outcomes are not universal (Miller, 1993). Indeed, for many youth, overcoming adversity due to chronic illness may lead to a stronger sense of self and greater resilience to psychosocial problems (Sherrill, 1997). Few explanations have been offered, however, to account for the variations observed in the level of self-worth reported by youth with a chronic illness.

Pioneers of research involving typical adolescents (i.e., those with no chronic illness) have established that several tasks (such as identity/self-concept and autonomy formation) are imperative for successful adolescent development (Lerner & Steinberg, 2004). The focus of the current study was on the development of self-concept. Although self-concept and self-worth were initially considered unidimensional constructs, Harter (1990) proposed that self-competence for adolescents was better understood in terms of various role relationships, including youth’s identities as students, athletes, and friends. She developed a multidimensional model that measured different domains of competence, in addition to an overall measure of self-worth. Most importantly, she incorporated ideas first proposed by James in 1890, whereby the relationship between each domain and overall global self-worth is determined by the importance given to that domain by the adolescent. In other words, only domains considered important to an adolescent have an impact on global self-worth. This implies that domains in which...
competence ratings are low and importance ratings are high (i.e., high discrepancy scores) lead to low global self-worth. In contrast, domains rated low in competence and low in importance are “discounted” and thus do not lower global self-worth. Furthermore, Harter (2012a) has consistently found that physical appearance is perceived as the most important domain for adolescents, and is especially salient for girls in determining their global self-worth.

Several factors have been found to predict global self-worth. Using various measures, it has been consistently shown that girls have lower global self-worth than boys (Harper & Marshall, 1991; Knox, Funk, Elliott, & Bush, 2000) indicating gender is a salient factor. Second, whereas researchers of self-worth development across the lifespan have determined that self-worth declines from childhood to adolescence (Robins & Trzesniewski, 2005), evidence from developmental studies during adolescence alone reveals that global self-worth improves in late adolescence (Harter, 1999). Thus, age may predict global self-worth, such that older adolescents will have higher self-worth than younger adolescents.

As emphasized in Harter’s model, approval from significant others also affects adolescents’ global self-worth. She suggested that domain competence and importance are influenced by social support factors, especially the perceived support of parents (Harter, 1999). In both research with typically developing youth and research with youth with chronic illness, it has been established that adolescents’ self-concepts are influenced by the views of parents as norms and values become internalized (Kyngas, 2004; LaGreca, Auslander, & Greca, 1995). Therefore, it follows that perceptions of parent
support are associated with global self-worth (Bosacki, Dane, & Marini, 2007; Laible & Carlo, 2004; Robinson, 1995).

In the general literature on depression, as well as research on self-esteem, researchers consistently find a strong correlation between depressive symptoms and self-concept (e.g., Abramson, Seligman, & Teasdale, 1978; Beck, 1967; Nolen-Hoeksema, 1990). Although the causal direction has been debatable, the overwhelming evidence indicates youth who demonstrate depressed affect also report low self-worth (Harter, 2012a). This finding has been replicated in studies of youth with chronic illness (e.g., Lavigne & Faier-Routman, 1992; Miller, 1993); however, the focus of these studies has been to address the question of whether youth with chronic illness are more likely to become depressed. Given the importance of self-concept in relation to depression, it is possible that depression may be a reliable predictor of global self-worth regardless of illness status.

Although adolescents with chronic illness are susceptible to low self-worth for the same reasons as typically developing youth, they may be at increased risk due to factors related to their illness. Eccleston, Wastell, Crombez, and Jordan (2008), for example, found that some illness-related factors are associated with poor social development in youth with chronic illness compared with healthy peers. Petersen, Schmidt, and Bullinger (2006) concluded that, in general, factors related to health-related quality of life affect ability to cope with illness-related challenges. Therefore, it is likely that illness-related factors as measured by health-related quality of life are directly related to global self-worth over and above predictors relevant for typically developing youth.
Although some attempts have been made to elucidate models of identity formation for people with chronic illness (e.g., Rosenberg & Kaplan, 1982; Sherrill, 1997), these theories are more descriptive than predictive and utilize constructs that are similar to general theories of adolescent development. In this study, Harter's (1990) model of perceived competence was applied to youth with chronic illness to explain the inconsistent literature regarding self-worth for these youth. It was hypothesized that youth with chronic illness who are not able to discount the domains negatively affected by their illness develop low self-worth, whereas those youth who are able to discount their perceived incompetence maintain high self-worth. Thus, discounting may moderate the relationship between health-related quality of life and global self-worth. Furthermore, using discounting as a cognitive resiliency factor might be more important for girls than boys as girls are at a higher risk of developing low self-worth.

The development of autonomy in youth with chronic illness has not been researched directly to date; however, the issue has been alluded to in several studies that highlighted concerns about independence (e.g., Dashiff, Vance, Abdullatif, & Wallander, 2009; Sällfors, Fasth, & Hallberg, 2002) and parental over-protectiveness (e.g., Barlow, Wright, Shaw, Luqmani, & Wyness, 2002). Collins and Laursen (2004) suggested that autonomy formation is related to competence, in that adolescents who become individuated are more likely to establish healthy self-worth. Thus, it was hypothesized that autonomy would moderate the relationship between health-related quality of life and global self-worth. Much like with discounting, it is likely that higher autonomy will be a more salient resiliency factor for girls than for boys given their higher risk for low self-worth.
The overall goal of this study was to test the applicability of Harter's (1990) model of adolescent self-perception to global self-worth among youth with chronic illness. Gender, age, parent support, depressive symptoms and health-related quality of life were also examined as predictors of global self-worth. In addition, adolescents’ reports of discounting and autonomy were evaluated as potential moderators of the relationship between health-related quality of life and global self-worth. It was predicted that consistent with Harter’s formulation, the relationship between health-related quality of life and global self-worth would be weaker for youth who discount. Similarly, it was predicted that the relationship between health-related quality of life and global self-worth would be weaker for youth who have higher levels of autonomy. In this way, discounting and autonomy serve as potential resiliency factors to protect against lower global self-worth for youth with chronic illness in general, and for girls with chronic illness in particular.

To provide a basis for the applicability of Harter’s model to youth with chronic illness, a review of relevant literature on various aspects of adolescent development was completed. This review was divided into four main sections: (1) identity formation during adolescence and predictors of self-worth; (2) chronic illness among adolescents and predictors of self-worth; (3) proposed moderators of the relationships between illness factors and self-worth, specifically discounting and autonomy; and (4) specific research questions and hypotheses.

1.2 Typical Adolescent Development

Since the beginning of the twentieth century, psychologists have recognized that adolescence marks a distinct period in the developmental lifespan. Erik Erikson's (1950)
psychosocial theory of development prompted researchers to consider that each person must confront and resolve a unique developmental task during each of eight stages of development. He posited that ‘Identity versus Role Confusion’ is the task through which adolescents must establish a sense of personal identity. He suggested that at this stage, youth are “primarily concerned with what they appear to be in the eyes of others as compared with what they feel they are” (Erikson, 1950, p. 261). Robert Havinghurst (1972) followed with a developmental theory focused on the specific tasks of adolescence that combined consideration of individuals’ needs with societal demands. These tasks included the skills, knowledge, functions, and attitudes that individuals have to acquire at certain points in their lives through physical maturation, social expectations, and personal effort. Much like Erikson, Havinghurst (1972) believed that mastery of the tasks at each stage of development results in adjustment and preparation for the harder tasks ahead, whereas failure to master the tasks results in anxiety, social disapproval, and an inability to function as a mature person.

Whereas several tasks are considered important in the “typical” developmental process, less is understood about the development of youth with chronic illness. Thus, in the present research, the focus was on investigating the application of existing theories to youth with chronic illness, as issues of identity and autonomy were hypothesized to be especially relevant for these youth (Blum, 1992; Morad, Kandel, Hyam, & Merrick, 2004). Research on the formation of identity within typically developing youth has been extensive and includes theories related to cognitive development, self-concept, and self-esteem.
1.3 Identity Formation during Adolescence

Identity formation occurs concurrently with cognitive development, such that adolescents develop the cognitive capacity to structure their sense of self (Byrne & Shavelson, 1996). It is during adolescence that youth are first able to think abstractly (Case, 1992) and attempt to form a coherent ‘theory of self’ (Harter, 1999). They are able to conceive of various aspects of their personality, including those characteristics that appear to be inconsistent (Harter & Monsour, 1992), and their sense of self becomes increasingly differentiated and varies as a function of the social context (Harter, 1998). Older adolescents are able to recognize the discrepancies in their sense of self and reorganize their personality depending on the context, often applying higher-order generalizations to make a unified self-representation (Harter, 1999). Markus and Nurius (1986) introduced the idea of “possible selves”, which refers to the alternative identities that adolescents use as a reference point to evaluate their self-impressions (Knox et al., 2000). Markus and Nurius (1986) posited that individuals consider their varying ‘possible selves’ in terms of ideas of what they expect to become, as the ‘ideal’ selves they hope to become, and as the ‘feared’ selves they are afraid of becoming. In forming their self-concepts, individuals must negotiate among their ‘possible selves’, and evaluate their standing given social and contextual information. Researchers have focused on two major areas involved in identity formation in adolescence: changes in self-concept and the role of global self-worth.

Self-Concept

As previously indicated, self-conceptions change in structure and in content during adolescence. Structurally, self-conceptions become more differentiated and better
organized (Byrne & Shavelson, 1996). In addition to considering their self-concept in different situations, adolescents are also able to take the perspectives of others and to hypothesize about what others think of them (Harter & Monsour, 1992). For example, a youth might describe him or herself by saying, “People think I’m very outgoing, but I’m actually very shy”, thus recognizing that the self he or she projects to others may differ from his or her self-concept. Whereas this integration becomes synthesized for late adolescents, Harter (1990) found that for early or middle adolescents, such discrepancies and contradictions might cause identity conflict. Adolescents may experience this identity conflict as a result of a perceived contradiction in their role-related self-concepts, as a discrepancy between their perceived actual and ideal self-concepts, or as a discrepancy between their self-concept and how they believe others perceive them. Researchers find, however, that most adolescents are later able to understand and reconcile the inconsistencies or contradictions in themselves (Byrne & Shavelson, 1996; Harter & Monsour, 1992), and this reconciliation forms the basis of their more complex self-conceptions.

Although the recognition that one’s self is multifaceted may initially cause some distress, some researchers have suggested that the development of a more complicated view of the self is one way individuals cope with the recognition of their faults and weaknesses (Harter & Whitesell, 1996; Lerner & Steinberg, 2004). Consistent with this idea, Evans (1993; as cited by Lerner & Steinberg, 2004) found that adolescents who have more complex self-conceptions are less likely to be depressed. In addition, having a more differentiated self-concept means the adolescent is now able to distinguish among his or her actual self, ideal self, and feared self (Lerner & Steinberg, 2004). This supports
earlier research by Markus and Nurius (1986), who argued that being able to make these distinctions serves as motivation for the adolescent to improve by aligning the actual with the ideal self and avoiding the feared self. Thus, changing self-conceptions during adolescence can help explain why issues of identity take on so much importance at this time of the lifespan. As individuals become better able to see themselves in psychological terms, they are likely to become more self-reflective. They begin to structure and describe not only their self-concepts, but also to evaluate them, leading to the development of self-worth (Rice & Dolgin, 2005).

Self Worth

Self-worth or self-esteem\(^1\) may be defined as “an overall judgment made by the self on how well the self is doing” (Fox, 1997, p. 115). With the onset of puberty, most young people make a thorough assessment of themselves, comparing various aspects of themselves with their peers or significant others (Harter, Bresnick, Bouchey, & Whitesell, 1997). They may become preoccupied with attempting to reconcile their actual selves, as they perceive them, with their ideal selves (Markus & Nurius, 1986). The amount of discrepancy between their actual and ideal selves, and the perceived relative importance of that discrepancy, is thought to represent their overall self-worth (Harter, 1999; Shapka & Keating, 2005).

Harter (1999) credits William James for introducing the concept of discrepancy and perceived relative importance in his ‘theory of self’ first published in 1890. In his

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\(^1\) It should be noted that the terms “self-esteem”, “self-worth” and “self-competence” are often used interchangeably, and will be used here as they are used in the studies cited.
seminal textbook entitled *Principles of Psychology*, James discussed his concepts of “A) the self as known, or the *me*, the ‘empirical ego’ as it is sometimes called; and that of B) the self as knower, or the *I*, the ‘pure ego’ of certain authors” (James, reprinted 1984, p. 159). James elaborated upon several components of the “me” self, which include the material self, the social self, and the spiritual self, and are structured with the material self as a lower-order self, followed by the social self, and then the spiritual self at the highest tier. Harter (1999) recognized that James paved the way for future models in which the self is viewed as multidimensional and hierarchical. In addition, James discussed the idea that different aspects of oneself are not given equal weight in establishing an overall sense of self-worth. Harter highlighted this important theme when she wrote that “critical to this formulation is the assumption that lack of success in an area in which one does not have pretensions will not erode self-esteem, since it can be discounted” (Harter, 1999, p.16).

For almost a century after James’ postulations about the self and self-esteem, researchers in this area focused on the individual’s overall sense of worth as a person or global self-esteem. Harter et al. (1997) challenged this approach on the grounds that adolescents tend to make important evaluative distinctions about different domains in their lives. She posited that multidimensional models of the self far more adequately describe the phenomenology of self-evaluations than do unidimensional global models. As previously discussed, researchers (e.g., Byrne & Shavelson, 1996; Case, 1992) found support that the self becomes increasingly differentiated in adolescence and that the proliferation of selves tends to vary as a function of social context. Thus, Harter et al.
(1997) suggested that a critical developmental task in adolescence is the construction of multiple selves in different roles and relationships.

Because adolescents are able to perceive themselves differently in different relational contexts, the possibility of conflicting aspects of the self is introduced. In investigating the intrapsychic conflict experienced by adolescents at different developmental stages, Harter et al. (1997) found that as adolescents age, they become more comfortable with apparent contradictions in their sense of self and even perceive these contradictions as desirable. However, Harter et al. (1997) also showed adolescents need to remain consistent with their self-attributes within roles. That is, they tend to experience intrapsychic conflict when they identify contradictions within a role. Further investigation into this observation revealed that discomfort was most likely the result of the difference between the way a youth described him or herself within a role, and the way he or she desired to be (Harter et al., 1997). In other words, the conflict arose as a result of the discrepancy between an actual self and an ideal self in each relational context or domain.

In an attempt to measure the construct of self-esteem through a multidimensional framework, Harter (1982) conceived of 'perceived competence' as a relevant dimension of self-evaluation. She hypothesized that children do not feel equally competent in every skill domain and developed the *Perceived Competence Scale for Children* to assess self-competence in multiple skill domains, including: (a) cognitive competence, with an emphasis on academic performance; (b) social competence, with a focus on being liked by one’s peers; and (c) physical competence, with a focus on sports and outdoor games. Consistent with her theory that judgments concerning one’s overall self-worth (i.e.,
global self-esteem) are not inferred from the summation of the responses to other domains, she also included a fourth subscale, which assessed general self-worth. Items on this subscale referred to being sure of oneself and thinking one is a good person overall.

In 1988, Harter developed the *Self Perception Profile for Adolescents*, expanding the initial scale to include an additional four subscales she determined were relevant to the self-perceptions of youth aged 13 to 18. Specifically, physical appearance, close friendships, job competence, and romantic relationships were added to delineate important aspects of the self for this older group. These domains were meant to represent the proliferation of selves that vary as a function of youths' social contexts and to include the role-related identities associated with being a best friend, employee, or romantic partner (Harter, 1988).

Subsequently, researchers investigating self-worth revealed that in addition to being multidimensional, self-concepts are also hierarchical, with general self-concept at the apex and the various domains, or subcategories of domains, constituting the lower branches (Marsh & Hattie, 1996; Shapka & Keating, 2005). Shavelson, Hubner, and Stanton (1976) initially identified two broad classes in their model: academic and nonacademic self-concepts, nested under general self-concept at the apex. The nonacademic self-concept was subdivided into social, emotional and physical domains, with the physical self-concept further differentiated into physical ability and physical appearance. The academic self-concept was subdivided into particular school subjects. Self-perceptions at lower levels were hypothesized to affect those at the next levels; for example, perceptions of math competence "cause" perceptions of overall academic achievement, which in turn have an impact on general self-concept (Byrne & Shavelson,
1996). Marsh, Byrne, and Shavelson (1992) conducted extensive research on this model, employing hierarchical and confirmatory factor analyses that supported the validity of the theoretical structure. Other researchers have proposed similar models with increasingly differentiated self-concepts and further categorical divisions (e.g., L'Écuyer, 1992; Marsh & Shavelson, 1985; Song & Hattie, 1984).

Within these multi-dimensional and hierarchical models of self-concept, the domains are assumed to predict global self-worth in universal ways. Harter (1999) has concluded, however, that whereas hierarchical models have considerable appeal in their organized representation of domain-specific evaluations that combine to predict self-worth, the general frameworks may not be applicable to the structure of self-representations for given individuals or particular subgroups of people. For example, Linville (1987) found clear individual differences in the complexity of the self-structure when participants are asked to form their own hierarchies. Similarly, Harter and Monsour (1992) asked participants to sort various self-attributes and found that the valence of the attributes (i.e., whether participants rated themselves positively or negatively) was a more salient predictor of global self-worth than the domain content: attributes for which adolescents perceived themselves positively were considered central to self-concept, whereas negatively self-perceived attributes were relegated to the periphery. Thus, the relation between global and domain-specific ratings of self-worth is a function of the importance an individual places on each domain. In other words, global self-worth can differ for two individuals who have similar profiles of competence ratings because of the distinct valences and importance placed on each domain. In effect, individuals with the
lowest self-worth are those who rate themselves poorly in domains on which they place high importance (Harter et al., 1997).

Reviving James’ idea of “discounting”, Harter and Whitesell (2001) reintroduced the concept as a means of explaining why many individuals who rate themselves as incompetent in some domains fail to show an overall reduction in global self-worth. She suggested that youth with high self-worth may have domains in which they feel inadequate; however, they tend to discount the importance of these domains. In contrast, individuals with low self-worth may be unable to discount areas of perceived inadequacy. She also posited that the importance the adolescent places on each of these domains is influenced by his or her social context. Specifically, if parents place a high value on achieving good grades in school, then the youth is more likely to place higher importance on his or her scholastic competence, and would have more difficulty discounting a discrepancy between his or her actual and ideal scholastic competence.

1.4 Predictors of Global Self-Worth among Adolescents

Gender

There is a large literature on gender differences in self-esteem or self-worth during adolescence. Overall, the findings are quite consistent: upon entering adolescence, girls experience significant disruption in self-esteem and self-concept (Daniels & Leaper, 2006; Harper & Marshall, 1991; Heaven & Ciarrochi, 2008). This finding appears to hold both within and across individuals. Robins, Trzesniewski, Tracy, Potter, and Gosling, (2002), for example, found that although boys and girls had similar self-esteem levels in childhood, by adolescence the gender gap emerged for all of their participants. Baldwin & Hoffmann (2002) found similar results across genders and expanded their
methodology to include a growth-curve analysis of intraindividual changes. Their results indicated that fluctuations in self-esteem were significantly more dramatic among girls than among boys and that girls’ self-esteem decreased substantially from age 12 to about 17. However, in both the Robins et al. (2002) and Baldwin and Hoffmann (2002) studies, developing low self-esteem was not universal for all girls as some did maintain high self-esteem throughout adolescence.

In explaining the differential effects of gender on self-esteem, Robins et al. (2002) suggested the maturational and socioemotional changes associated with puberty may lower the self-esteem of both boys and girls, but the physical changes that occur during puberty may have a more profound effect on girls. Consistent with this theory, adolescent girls report more unfavourable perceptions of their appearance and their athletic competence, the two dimensions that define the physical self (Harter, 1999). Harter recently elaborated on this finding by dedicating an entire book chapter to “The Inextricable Link between Perceived Physical Appearance and Self-Esteem” (Harter, 2012) in which she explained that whereas physical appearance is consistently the strongest predictor of self-worth for boys and girls (with an average correlation across studies of .64), the effect size for girls is much larger. She notes that although perceptions of athletic competence are also lower for girls compared to boys, girls do not consider athletic competence important to their global self-worth. Furthermore, although some studies have found gender differences among other domains of competence, only physical appearance emerges reliably across studies. This difference has been found to be highly robust across different countries, with differences between boys and girls similar in magnitude and highly significant (Harter, 2012).
Using a similar rationale, Clay, Vignoles, and Dittmar (2005) suggested poor body image might explain the decline in self-esteem from childhood to adolescence for boys and girls as body image becomes a core component of self-definition. In addition, the authors surmised girls are socialized in a way that attaches great importance to a particular body shape and size and that this affects girls’ self-esteem more strongly than boys. Results from a study by Harter (2000) are consistent with this view. She found there was a subgroup of adolescent girls who reported their appearance determined their self-worth as a person. This group tended to feel worse about their appearance, had lower self-esteem, and reported feeling more depressed compared to girls for whom self-worth preceded judgments of appearance. Thus, adolescent girls who place high importance on physical appearance are more at risk for low self-worth and associated maladaptive outcomes. Although the same mechanism would be expected for boys, it appears the impact of perceived physical appearance on global self-worth is stronger for girls.

Despite similar findings across countries, many researchers argue that differences in self-worth as determined by body image are primarily a cultural phenomena influenced by the western media (e.g., Biro, Striegel-Moore, Franko, Padgett, & Bean, 2006; Brown et al., 1998; Greene & Way, 2005; Moneta, Schneider, & Csikszentmihalyi, 2001). They argue western media depictions of women underscore virtually unattainable standards of appearance to which American women must aspire. In support of this, Savacool (2009) recently investigated the historical and cultural shifts of contemporary beauty ideals among Japanese, Jamaican, South African, Afghan, and Chinese women and found cultural differences about ideal body size and shape lead to differing perceptions of body image.
dissatisfaction. Invariably, those countries most influenced by the American media produced women whose body size and shape affected their self-esteem.

Therefore, considering the literature on gender differences in self-worth overall, as well as the cultural emphasis on physical appearance for girls, it is likely that boys will have higher global self-worth than girls and physical attractiveness will be a significant predictor of global self-worth for both girls and boys, but will be stronger for girls as compared to boys.

Age

Research on changes in self-worth throughout the lifespan has been equivocal due to various measurement instruments, small sample sizes, and restricted age range. However, Robins et al. (2002) sought to elucidate the trajectory of self-esteem across the life span. Using cross-sectional data on a large sample of participants ranging in age from 9 to 90 years, the researchers found self-esteem levels were high in childhood, dropped during adolescence, rose gradually throughout adulthood, and declined sharply in old age. Robins et al. (2002) offered Harter’s (1998) explanation to account for the decline in self-esteem from childhood to adolescence. They suggested children have artificially inflated self-esteem due to parental praise and lack of cognitive skills to evaluate the self critically. The subsequent decline reflects an increasing reliance on more realistic information (e.g., school performance, feedback from multiple social groups such as teachers, coaches, and peers) about the self. As previously discussed, adolescents’ cognitive development allows them to base their evaluations of self-worth on external feedback and social comparisons, which may produce more accurate judgments of where they stand in relation to others. Eccles, Lord, Roeser, Barber, and Jozefowicz (1997) also
found that, in comparison to children, adolescents experience more negative feedback from teachers, parents, and peers, and thus their self-evaluations correspondingly become more negative when they make the transition from elementary school to high school.

Whereas Robins et al. (2002) used a cross-sectional approach across the lifespan, other researchers have yielded different results conducting longitudinal studies specifically with adolescents. Hirsch and DuBois (1991) focused on a two-year period with early adolescents (grades six through eight) and identified four divergent trajectories of self-esteem. They discovered that 35% of their sample had a profile of consistently high global self-esteem, 13% fell into the chronically low self-esteem group, 31% showed a small increase in self-esteem over the two-year period, and the final 21% displayed a steeply declining self-esteem trajectory. The authors also found that increased levels of school adjustment and peer social support were associated with positive self-esteem trajectories. These results were replicated by Zimmerman, Copeland, Shope, and Dielman (1997) with adolescents over a four-year period from sixth to tenth grades. In addition to the four divergent trajectories of global self-esteem, these authors found more girls reported decreasing self-esteem trajectories than boys.

Considering the aggregated data, which shows self-worth drops from childhood to adolescence, most adolescents experience a gradual increase in self-worth as they age (Zimmerman et al., 1997). Therefore, it is expected that increasing age will be related to higher global self-worth.

**Parent Support**

In addition to individual characteristics that relate to global self-worth, it is apparent that social support also contributes to how youth perceive their sense of self.
Messages of approval or disapproval from parents strongly influence self-perceptions. There is considerable evidence from different theoretical perspectives that the quality of caregiving, beginning with the role of parents, has a tremendous impact on the self-system, as well as on how features of the self are organized (Harter, 1999).

Researchers have repeatedly shown social support has both indirect and direct benefits for mental health outcomes, such as leading to mutual assistance, feelings of self-worth and self-efficacy, and stimulating cognitive development (Colarossi & Eccles, 2003). Evidence from both attachment and family systems’ perspectives shows the quality of family relationships affects children’s development (Cowan & Cowan, 2003). Whereas researchers in this area have historically concentrated on parenting styles and adjustment in youth (e.g., Maccoby & Martin, 1983), more recently the focus has turned to research on specific parenting practices such as support and control, which are two dimensions presumed to underlie parenting styles. Laible, Carlo, and Raffaelli (2000) found support and warmth from parents play an important role in fostering healthy socioemotional development across adolescence, even when the support of peers becomes increasingly important. Specifically, these authors suggested support and warmth from parents enhances social, emotional, and moral competence and leads to high levels of self-esteem and prosocial behaviour and low levels of aggression, anxiety and depression. Similarly, Supple and Small (2006) compared perceptions of parent support among adolescents of different cultural backgrounds and found parent support, knowledge, and an authoritative decision-making style were positively related to adolescent outcomes such as self-esteem and school performance, and were also protective against risk-related behaviours.
Parental approval is more predictive of self-worth than approval from peers among younger children (Harter, 1999). In addition, Oosterwegel and Oppenheimer (1993) found that although the correlation between peer approval and self-worth increased with development, the correlation between parental approval and self-worth did not decline through adolescence. Thus, whereas parents’ roles may be transformed when youth reach adolescence, parents continue to remain central. In particular, parents appear to exert the greatest influence over the domains of scholastic competence and behavioural conduct, reflecting the values many parents transmit at home (Harter, 1999).

Other researchers have focused on the gender dyads between parents and children in terms of social support. Colarossi and Eccles (2003) examined the differential effects of social support from mothers and fathers for boys and girls. They found boys perceived significantly more support from fathers than girls, whereas support from mothers was related to self-esteem and depression for both boys and girls. Overall, the authors noted that fathers were not very influential sources of support for adolescents based on adolescent perceptions and poor correlations with psychosocial outcomes. Similar findings were reported by Laible and Carlo (2004) who found that although maternal and paternal support were highly correlated, perceived support versus rigid control from mothers was a more consistent predictor of adolescents’ reports of social competence and self-worth than support from fathers. Finally, in examining the gender differences for the recipients of social support, it appears that although social support from family members has important effects on both adolescent boys’ and girls’ mental health, the effect sizes are larger for girls than for boys (Colarossi & Eccles, 2003).
As youth develop from childhood through adolescence, they begin to rely increasingly on peers for social support (Kuttler, La Greca, & Prinstein, 1999). In summarizing the literature, however, Laursen and Collins (2009; p. 18) stated, “relationships with parents remain the most influential of all adolescent relationships and shape most of the important decisions confronting children, even as parents’ relative authority over mundane details of adolescents’ lives wanes.” This is consistent with Oosterwegel and Oppenheimer’s (1993) finding that although the correlation between peer approval and self-worth increases with development, the correlation between parental approval and self-worth does not decline through adolescence.

**Depressive Symptoms**

Many theories postulate that low self-esteem is a defining feature of depression (e.g., Abramson et al., 1978; Beck, 1967; Nolen-Hoeksema, 1990). In both clinical populations and normative samples, there is a strong correlation between self-esteem and depressed affect, which has been estimated to range from .72 to .80 (Harter & Whitesell, 1996). Harter has repeatedly found that in normative samples of older children and adolescents, youth who report low self-worth also report depressed affect (Harter, 1990; Harter & Jackson, 1993; Renouf & Harter, 1990). Similarly, Harter, Marold, and Whitesell (1992) found 80% of adolescents in an inpatient sample of youth with a psychiatric diagnosis of depression also reported low self-worth.

Whereas the correlation between self-worth and depression has been reliably demonstrated, the causal direction of this relation has been subject to debate. In his cognitive model, Beck (1967) hypothesized that low self-esteem is a risk factor for depression, especially in the face of life stressors. His cognitive theory of depression
included 'negative beliefs about the self' as one of the three central components of depressive disorders that play a causal role in the etiology of depression.

Harter’s research has yielded mixed results with respect to the causal direction of self-worth and depressive symptoms (Harter, 1999). Whereas her initial model of the relation between various competencies and depression proposed self-evaluative components precede one’s affective responses, she later changed her formulation and argued that low self-worth followed depressive symptoms. This was as a result of research utilizing structural equation modeling in which she found the latter direction was better supported (Harter & Whitesell, 1996). Harter (1999) concluded that, much like the multiple profiles that differ for individuals in terms of competencies and global self-worth, individuals vary in terms of the causal link between self-worth and depression and that given the strong correlation between depression and self-esteem, the pathway is likely bi-directional.

1.5 Summary of Typical Adolescent Development

Models of self-concept and self-worth have evolved from unidimensional theories to multidimensional and hierarchical formulations, which recognize the various ‘selves’ that reflect social roles for youth. Harter’s (1997) theory of perceived competence suggests global self-worth represents one’s overall evaluation of oneself. Global self-worth is situated at the apex of her model of self-competence, with varying domains of competence constituting the lower branches and contributing to the overall evaluation. In her model, she suggests the relation between global self-worth and the domain-specific ratings of self-competence is a function of the importance an individual places on each domain. Furthermore, domains for which an individual does not perceive him or herself
competent can be discounted if the domains are considered unimportant. Therefore, only competence ratings on domains of importance are considered related to global self-worth.

In addition to the contributions made by domain-specific ratings to global self-worth, several predictors of global self-worth have also been identified. First, gender and age have been consistently related to global self-worth. Specifically, adolescent girls report lower self-worth than adolescent boys (Anderson & Hope, 2008; Robins et al., 2002), and older adolescents tend to have higher global self-worth than younger adolescents (Robins et al., 2002). Second, social support is linked to how youth perceive their sense of self. In particular, parent support has been found to foster social competence and self-worth (Laible & Carlo, 2004). Finally, depressive symptoms have been consistently correlated with self-worth (Harter, 1990; Harter & Jackson, 1993; Renouf & Harter, 1990), although the causal direction of this relationship is equivocal.

Considering the literature on typical adolescent development, it is clear changes in identity, at least in terms of perceived competence, are essential for adequate psychosocial development. Much less is known, however, about adolescent developmental processes for youth from unique populations. It is possible that the processes and outcomes are different for youth who struggle with additional challenges, such as those with chronic illness.

1.6 Chronic Illness among Adolescents

Definition and Prevalence of Chronic Illness

A chronic illness is a “medically diagnosed ailment with a duration of six months or longer which shows little change or slow progression” (Williams, 1997, p. 312). A disability, on the other hand, is defined as, “a state of decreased functioning associated
with disease, disorder, injury, or other health conditions, which in the context of one’s environment is experienced as an impairment, activity limitation, or participation restriction” (Leonardi, Bickenbach, Ustun, Kostanjsek, & Chatterji, 2006, p. 1220). Thus, whether a chronic illness is considered a disability depends on the relative severity of the illness in the context of the individual’s environmental demands. For example, a youth with asthma who takes the bus to school may not be perceived as disabled, whereas a youth who is required to walk to school but cannot due to his or her asthma may be perceived as having a disability.

Overall, it is estimated that approximately 46% of youth under the age of 20 have a disability or chronic condition that limits or prevents participation in school or play (Barlow & Ellard, 2006). According to the researchers interpreting data from the U.S. National Health Interview Survey on Child Health (as cited in Morad et al., 2004), the top five childhood chronic conditions are asthma (15 per 1000 children), congenital heart disease (10 per 1000 children), seizure disorders (3 per 1000 children), juvenile arthritis (JA) (3 per 1000 children) and juvenile diabetes (JD) (1.4 per 1000 children). Canadian statistics are comparable, with 17 out of 1000 adolescents aged 12 to 19 years diagnosed with asthma, approximately 3 out of 1000 diagnosed with JD, and 4 out of every 1000 youth under the age of 16 years diagnosed with JA (Juvenile Diabetes Research Foundation, 2009; Public Health Agency of Canada [PHAC], 2008a; The Arthritis Society, 2009). Because this study focused on youth with asthma, JA, and JD, only those chronic conditions will be described further.

It is clear that asthma is the most prevalent childhood/adolescent chronic illness in Canada, with 20% of boys and 15% of girls ages 8 to 11, and 12% of boys and 12% of
girls ages 12 to 19 diagnosed with this condition. There has been a fourfold increase in the rates of asthma among children in the past 20 years, which is hypothesized to be due to increased exposure to environmental and air pollutants (PHAC, 2008a). Asthma is defined as “a chronic inflammatory disease of the airway” that causes shortness of breath, tightness of the chest, coughing and wheezing (PHAC, 2008a). The severity of symptoms range from mild discomfort to death. Although there is no cure for asthma, management of the illness involves medication and behavioural monitoring, which includes avoiding the personal “triggers” of asthma (e.g., allergens, cold air, or chemical fumes) (PHAC, 2008a).

Juvenile Arthritis (JA) is an autoimmune disease that occurs in children under the age of 16. It is characterized by pain, stiffness, and swelling in one or more of the joints and is defined as continuous inflammation of one or more joints lasting at least six weeks for which no other cause can be found. In Canada, it affects as many as 1 in 250 children under the age of 16, and affects about four times as many girls as boys (The Arthritis Society, 2009). There are several different types of JA, which are classified according to the number of joints involved within the first six months of disease onset (Horvat, Eichstaedt, Kalakian, & Croce, 2004). The course of the illness is very unpredictable in that inflammation can occur at various times to different levels of severity. The causes of JA are unknown and there is currently no cure. Treatment usually consists of medication to reduce the inflammation in combination with exercise programs to help prevent loss of joint movement and to encourage normal joint and bone development.

Finally, JD is an autoimmune disorder in which the body has difficulty regulating its blood glucose levels (PHAC, 2008b). Because the body’s immune system attacks and
destroys certain cells in the pancreas, an individual with diabetes is unable to produce his or her own insulin. The prevalence of JD is approximately equal for boys and girls throughout adolescence. Treatment for diabetes requires daily insulin injections, as well as behavioural management with diet and exercise. Much like JA, the precise cause of diabetes is not entirely understood and there is currently no cure.

**Impact on Adolescent Psychosocial Functioning**

Several researchers have suggested that chronic diseases of childhood and adolescence have implications for the psychosocial well-being of children and their families (e.g., Barlow & Ellard, 2006; Gortmaker, Perrin, Weitzman, & Homer, 1993; Miller, 1993; Morad et al., 2004). The physical symptoms of illness, such as pain and fatigue, combined with the corresponding need for disease management are likely to interfere with daily life. For example, according to the Canadian Council on Social Development (Hanvey, 2001), adolescents with chronic illnesses or disabilities were more likely to miss school compared to their healthy counterparts either because of their health problems (8% versus 1%) or because they chose to “skip” school (42% versus 31%). Thus, disruptions in education, peer interactions, and feelings of being different may arise for these youth.

Many researchers have examined both internalizing and externalizing problems in youth with chronic illness. In the CCSD (2001) study, Hanvey found that compared to youth without a chronic illness, adolescents with chronic illnesses were more likely to have considered and planned suicide (24% versus 9%), use alcohol (75% versus 60%), and smoke cigarettes regularly (34% versus 21%). Gortmaker, Walker, Weitzman, and Sobol (1990) also found a higher risk of behavioural problems and greater drug and...
alcohol use among youth with chronic illness. Overall, however, researchers find youth with a chronic medical problem are more vulnerable to internalizing problems, such as low self-esteem and depression, than to externalizing problems (Lavigne & Faier-Routman, 1992). For example, Olson et al. (1988) and Nelms (1989) found that among hospitalized pediatric patients, suspected depression or suicidal ideation constituted the single most common reason for a mental health referral from a child's physician.

It is not surprising that the majority of the research on psychosocial outcomes of youth with chronic illness has focused on the occurrence of depressive symptoms. Among particular diseases, Nelms (1989) and Seigel, Golden, Gough, Lashley, and Sacker (1990) found children with asthma reported more symptoms of depression than children without asthma. Similarly, Sullivan (1978), Seigel et al. (1990), and Nelms (1989) found children with diabetes reported more symptoms of depression than a healthy control group, and clarified that this difference was primarily related to the psychological rather than the somatic symptoms of depression. Finally, in a longitudinal study investigating the long-term psychosocial effects of persistent chronic illness, Huurre and Aro (2002) found that, by the age of 32, adults who had experienced chronic illness as adolescents showed higher depressive symptom scores, higher prevalence of diagnosed depression, and lower self-esteem than individuals without a chronic illness.

Lavigne and Faier-Routman (1992) conducted a meta-analysis of studies with children with chronic illness and found these youth were at increased risk of overall adjustment problems, internalizing symptoms, and externalizing symptoms when compared to those without a chronic disease. Likewise, LeBovidge, Lavigne, Donenberg, and Miller (2003) conducted a meta-analysis and found evidence of overall adjustment
problems and internalizing symptoms when children or adolescents with JA were compared to those without JA, although there was no effect on externalizing symptoms.

Not all investigators, however, have found differences in rates of depression between youth with and without chronic illness. Bender, Lerner, Ikle, Comer, and Szefler (1991), as well as Brown, Kaslow, Sansbury, Meacham, and Culler (1991) and Kovacs et al. (1990), found no differences between youth with and without chronic diseases on symptoms of depression. Following a review of the literature, Miller (1993) summarized that, in general, children with rheumatic diseases do not show evidence of psychological or social dysfunction, and that differences between children with and without JA reported previously were found in studies that used small sample sizes or samples of psychiatric patients (e.g., King & Hanson, 1986; Varni & Jay, 1984). He concluded that among both youth with and without JA, there are children who do well and children who do not, and the focus of subsequent research should be to identify common factors that predict psychosocial outcomes (Miller, 1993).

Bennett (1994) also conducted a review of the experience of depressive symptoms among children and adolescents with chronic medical problems. Although he concluded children with a chronic illness are at a slightly elevated risk of depressive symptoms, he noted most are not clinically depressed. In addition, there was great variability across children with the same disorder, suggesting depression was not a universal experience for these youth. Interestingly, the severity of the disease was inconsistently related to depressive symptoms. He also noted that overall illness factors, such as type of disorder, disorder severity, and duration of disorder, are generally poor predictors of depressive symptoms in this group of youth.
Lavigne and Faier-Routman (1993) drew similar conclusions to Bennett (1994). They found that, after comparing studies of children with various chronic illnesses, overall disease/disability parameters were poorer predictors of psychosocial problems than were family or individual child measures (such as coping strategy). They argued that this is evidence for a "noncategorical approach" to studying chronic illness (whereby the effects of certain common disease characteristics can be generalized across different illnesses). In terms of "individual child measures", they also suggested the child’s self-concept is the critical variable for psychological adjustment given their finding that coping with a chronic illness was highly correlated with a child’s self-concept (Lavigne & Faier-Routman, 1993). Thus, it appears that although youth with chronic illness may be at a marginally higher risk of developing psychosocial problems, especially depression, it is possible that understanding the development of their self-concept is of primary importance.

1.7 Development of Self-Worth among Adolescents with Chronic Illness

As discussed previously, assimilation of a sense of self is a critical developmental task for adolescents. Youth with chronic illness have an additional aspect to their identity development, which involves incorporating their illness into their self-concept. The extent to which they do this likely has consequences for their psychosocial functioning. Vitulano (2003) proposed the self-esteem of chronically ill youth may be hampered by physical and psychological stresses. He suggested discomfort and pain may cause these youth to feel psychologically different and separate from others. This feeling, along with constraints of the illness, might limit interactions with the social environment that normally contribute to a child’s growth, development, and self-esteem. In support of this
argument, Erickson, Patterson, Wall, and Neumark-Sztainer (2005) found in their study of over 4,700 adolescents in grades seven through twelve that those with chronic health conditions reported significantly lower levels of self-esteem than their healthy peers. This result held after the researchers adjusted for gender, race, grade level and socioeconomic status. Finally, in a longitudinal study of the psychosocial effects of persistent chronic illness, Huurre and Aro (2002) followed individuals from age 16 to age 32 and found adults who had a chronic illness that limited daily life activities reported lower self-esteem than healthy participants. This pattern suggests that having a chronic illness as a youth continues to contribute to one’s self-concept in adulthood.

Other studies of adjustment, however, do not report lower self-esteem among adolescents with chronic illness. Miller (1993) reviewed the literature on psychosocial factors related to rheumatic diseases in youth. He found that studies that measured self-image showed no differences between youth with rheumatic diseases and healthy youth, and measures of “self-confidence” showed the same pattern of results. In their longitudinal study of youth with chronic health conditions from ages 12 to 21, Gortmaker et al. (1993) also found no overall differences in self-esteem between those with or without a chronic condition. More recently, LeBovidge et al. (2003) found no differences on self-concept between youth with arthritis and those without arthritis, and Erkolahti and Ilonen (2005) reported no differences between youth with diabetes or arthritis and healthy youth on measures of self-image. Finally, Barlow and Ellard (2006) concluded from their meta-analysis that there was no difference in self-concept among adolescents with and without arthritis, although there was evidence of overall adjustment problems and internalizing symptoms among adolescents with arthritis.
As is evident from this review, the literature on self-concept among youth with chronic illness is both limited and contradictory. Using meta-analysis, Lavigne and Faier-Routman (1992) concluded that across studies, the self-concept of youth with physical disorders appears significantly lower than that of healthy youth, but these differences are not significant in studies that have used careful matching or made comparisons with norms. Similarly, in a recent meta-analysis, Ferro and Boyle (2013) found that on average, youth with a chronic illness had compromised self-concept. They also found, however, that the type of control group used in the studies exerted a moderating influence, such that studies using normative data for the comparison reported higher self-concept in youth with chronic illness whereas studies in which a healthy control group was recruited for comparison reported lower self-concept in youth with chronic illness. Thus, it is unclear whether youth with chronic illness have lower self-worth as a result of their disease. It is noteworthy, however, that in all of these studies, unidimensional measures of self-esteem were used. For example, Erickson et al. (2005) measured self-esteem using a 6-item scale adapted from Rosenberg’s (1965) Self-Esteem Questionnaire. All of the studies examined by Lavigne and Faier-Routman (1992) in their meta-analysis used global scores of either self-esteem or competence. Further, most of these studies of self-concept relied upon the Piers-Harris Self Concept Inventory, a measure that is now considered dated in light of the availability of more psychometrically sound instruments (Lavigne & Faier-Routman, 1992).

Although some researchers who have examined self-concept have used Harter’s (1982) multidimensional Perceived Competence Scale for Children (which provides normative data), they usually focus only on the global self-worth subscale. Therefore,
regardless of whether studies found lower self-esteem or no difference between adolescents with and without chronic illness, individual domains of competence and the relative importance of each of the domains for these youth have not been examined. Thus, it is possible that previous researchers overlooked important aspects of self-worth by neglecting to examine the contributions that specific domain competencies make to global self-worth in this population. Further, examining the discrepancies between actual and ideal self-perceptions to illuminate potential resiliency factors that protect against low self-worth has not been investigated.

One exception to this criticism is a study in which the self-concept of adolescents with spina bifida was examined. In this study, Appleton, Minchom, Ellis, and Elliott (1994) used Harter’s Self-Perception Profile for Learning Disabled Students (which is based on the Self-Perception Profile for Children) to assess various domains of competence as well as global self-worth. Although Appleton et al. (1994) found no group differences on global self-worth between youth with and without spina bifida, there were differences found on certain domains of competence. This pattern was attributed to the majority of youth with spina bifida comparing themselves unfavourably with able-bodied peers across many domains. The authors found youth with spina bifida reported considerably larger discrepancies between their perceived domain competence and the degree of importance they placed on the corresponding domains than did the typically developing youth. Specifically, some youth with spina bifida perceived themselves as less competent on general intellectual ability, social acceptance, and athletic competence and perceived these domains as being more important than youth without spina bifida (i.e., they did not discount); however, this pattern was not universal. The authors
suggested that an over-emphasis on between-group differences might fail to identify individual trajectories of self-worth. In other words, it may not be as useful to establish whether there are differences between groups, but rather to understand what factors within both groups promote or impede the development of optimal self-worth. As previously noted by Miller (1993), youth with and without chronic illness have varying levels of global self-worth, and researchers should focus on understanding the processes that lead to specific outcomes. Further, it is also possible that intelligence was a confound in this study, as there was a significant difference on this variable between the youth with spina bifida and those without spina bifida that was not controlled. Given cognitive development is a precursor to the development of self-concept (Byrne & Shavelson, 1996), it is possible youth with lower intelligence are not able to report their self-perceptions as accurately as youth with average intelligence. Finally, it is also possible perceptions of dependency might account for the differences on individual measures between the groups (such as parent support), but not for differences on global self-worth. Because parent support was found to be more important for the youth with spina bifida compared to their healthy peers, balancing independence with the need for assistance might be an important issue related to global self-worth.

In her book *The Construction of the Self*, Harter (1999) discussed an unpublished study in which she used a similar methodology to that presented in Appleton et al.’s (1994) work. In this study, she examined the self-perceptions of children who were hospitalized as part of an inpatient treatment program for chronic asthma. Although she reported no differences on mean scores compared to established norms for the various domains of self-perception, she did not look at discrepancy and importance data to
understand the mechanisms through which discounting may predict psychosocial outcomes. It is possible that some youth with chronic illness do not incorporate their illness into their self-concepts whereas others do, leading to different psychosocial outcomes. In other words, it may be that youth who are able to discount negative competencies that arise as a result of their chronic illness have higher global self-worth, whereas those who emphasize the importance of low competence domains develop lower global self-worth.

Theories of Self-Worth for Youth with Chronic Illness

A number of theorists have endeavored to explain the development of self-worth in youth with disabilities (e.g., Rosenberg & Kaplan, 1982; Weinberg, 1988; Wright, 1983). Rosenberg and Kaplan (1982) described the self-esteem processes for people with disabilities as guided by four principles: 1) reflected appraisal; 2) social comparison; 3) self-attribution; and 4) psychological centrality. Applied to individuals with chronic illness, reflected appraisal is experienced within the context of ambiguous social attitudes and behaviours that involve discrimination and marginalization for people with illness. In other words, it involves both subtle and blatant experiences of discrimination for individuals with illness and how they cope with these messages. Thus, the influence of these experiences on self-esteem is partly dependent on the internalization of negative messages. Social comparison is more complex for individuals with a chronic illness than for non-chronically ill people in that self-judgments may be based on comparison with peers with or without chronic illnesses, and may vary according to the environment (i.e., how integrated the individual is with his or her peers). Thus, those who make self-comparisons with healthy peers may have lower self-worth than those who compare
themselves to other disabled peers, particularly those who are more severely ill/disabled. Self-attribution is defined by Rosenberg and Kaplan as the cognitive appraisal of self on the basis of past successes and failures. This may include internal/stable versus external/unstable attributions of success and failure. Thus, those who attribute successes to external and unstable factors and failures to internal and stable factors are likely to have poor self-esteem. Finally, psychological centrality refers to the hierarchical ordering of the many domains of self-concept, and varies according to individual preferences of which aspects define one’s sense of self (Rosenberg & Kaplan, 1982). In other words, some people may choose to define themselves by their relationships to others, whereas others may focus on selective skills or occupations. Self-esteem would then depend on how successful one evaluated him or herself to be on domains of ‘centrality’.

According to the above principles, it seems plausible that many individuals with a chronic illness would experience lower self-esteem to the extent that they receive negative societal messages, conduct downward self-comparisons, make attributions of failure, and have a number of domains affected by their disability. As previously discussed, however, the research is equivocal with regard to whether lower self-esteem occurs among this population when they are compared to their typically developing peers. In one poignant study, adult participants were asked directly, “If you were given one wish, would you wish that you are no longer disabled?” Results indicated approximately 50% of respondents said yes, which suggests that for the other 50%, being disabled is not necessarily the major determinant of their self-worth (Weinberg, 1988).

Sherrill (1997) expanded on Rosenberg and Kaplan’s theory and proposed a fifth principle of self-concept formation to account for the healthy self-worth experienced by
many individuals with disabilities. She proposed that *mastery challenge* emphasizes the importance of developing strategies that (a) empower individuals to master challenges they perceive as being hard, unpleasant, dangerous, or likely to result in failure; and (b) provide added support and empathy for persons who fail frequently and/or face unusual barriers or constraints. According to Sherrill, mastery challenge relates equally to perceived competence and the specific domains that lead to global self-worth, as well as the “I am” or social identity descriptors that also form a component of one’s self-concept. Related to the concept of mastery challenge is the observation that adversity seems to promote growth in some persons who draw on internal adaptive resources and coping mechanisms to develop strong integrated identities (Petersen et al., 2006; Sherrill, 1997). It is thought that strength gained through coping with adversity, such as a chronic illness, generalizes to other aspects of life, increases internal locus of control and confidence, and helps explain the variation in the literature regarding self-worth.

Whereas Rosenberg and Kaplan’s (1982) theory and Sherrill’s (1997) amendments to this theory are the only known attempts to devise a specific model for the development of self-concept for people with a disability/chronic illness, it appears many aspects of the model mirror the concepts explained in Harter’s (1990) general model of self-perception. For example, the construct of ‘reflected appraisal’ or the internalization of negative messages is similar to the idea that messages from society have an impact on one’s “ideal” self. Similarly, the construct of ‘social comparison’ is reflected in Harter’s model, as she explains that youth develop the ability to make social comparisons to evaluate their self-concepts (Harter, 1999). The ideas of ‘self-attribution’ and ‘psychological centrality’ also reflect the evaluations of competence (considered internal
and stable) as well as the relative importance that individuals place on specific domains of self-concept (reflecting their ‘centrality’ to the self). Finally, ‘mastery challenge’ may reflect one’s ability to discount aspects of the self that are undesirable while simultaneously placing greater importance on domains that reflect pride in overcoming adversity. Therefore, it appears that consistent with researchers’ demands to investigate youth with chronic illness from the perspective of normative development (e.g., Bennett, 1994; Gortmaker et al., 1993; Miller, 1993), it is relevant and appropriate to apply Harter’s general model of self-perception to youth with a chronic illness. Thus, the primary goal of the proposed research was to test the applicability of Harter’s model of adolescent self-perception to global self-worth in adolescents with chronic illness.

Overall, it appears the literature is inconclusive with respect to the prevalence or severity of self-esteem problems among children or adolescents with chronic diseases. It also appears that general models of adolescent identity formation are applicable to youth with chronic illness and may predict whether youth form a positive or negative self-concept. In addition to the individual and social support factors related to global self-worth among typically developing adolescents, it is possible that specific illness factors predict self-worth for youth with chronic illness.

1.8 Predictors of Global Self-Worth among Youth with Chronic Illness

Gender

As previously stated, gender is a reliable predictor of global self-worth for typically developing adolescents (Daniels & Leaper, 2006; Harper & Marshall, 1991; Heaven & Ciarrochi, 2008). When considering youth with chronic illness, gender may in fact be more important given the effect their illness may have on certain domains of
perceived competence. Specifically, societal messages regarding gender and illness likely
differ for boys and girls. In a study that addressed gender matters in transition to
adulthood among adolescents with disabilities including those with chronic illness,
Powers, Hogansen, Geenen, Powers, and Gil-Kashiwabara (2008) found adolescent girls
and adolescent boys perceived that societal expectations affected their opportunities
differently. Specifically, girls with chronic illness perceived their parents were more
likely to limit their activities due to safety and to convey messages to marry and have
children at an earlier age. Conversely, young men with chronic illness perceived they
were expected to live on their own eventually and get a job. Overall, the adolescent girls
were more likely than the adolescent boys to indicate people expect less of them because
of their disability, and both adolescent girls and parents of daughters reported diminished
expectations because of gender. However, girls also reported receiving greater support
from both family members and other caregivers than boys (Powers et al., 2008).

Relating the above finding to measures of competence, it is possible that the
parental expectation for girls to marry might manifest in perceptions of physical
attractiveness. Given the robust gender difference found on physical appearance among
typically developing adolescents, Harter (2012a) addressed perceptions of appearance
and related self-esteem among children and adolescents who have medical conditions and
physical disabilities. Although she had hypothesized that study participants would report
low levels of perceived appearance, athletic competence, peer likability, and global self­
esteem, she found, in contrast, that there were no significant differences between the
severely asthmatic children and adolescents and her normative samples. Furthermore,
both appearance and global self-esteem scores were equivalent to those recorded in the
normative samples. Also comparable was the pattern of gender differences whereby girls reported lower global self-worth and lower perceived physical attractiveness than boys. Thus, although gender differences based on societal/parental expectations may be perceived as being more salient to youth with chronic illness, it appears the pattern of gender differences is the same for youth with and without chronic illness. Specifically, boys are more likely to have higher global self-worth than girls, and physical appearance is likely a stronger predictor of global self-worth for girls than boys.

Age

As previously discussed, typically developing adolescents tend to experience a gradual increase in self-esteem as they age (Zimmerman et al., 1997). In their meta-analysis of correlates of psychological adjustment to pediatric physical disorders, Lavigne and Faier-Routman (1993) found a similar trend: Age was a significant predictor of adjustment, with older youth demonstrating higher self-concept. Similarly, Blum (1992; p. 366) reported, “It is the early adolescent going through puberty who appears to be most vulnerable.” He posited this might be because at that age differences from peers are the most extreme and the psychological costs are greatest. Finally, Gortmaker et al. (1993) found the great majority of youth with chronic conditions appear to be remarkably successful in their transition to adulthood, suggesting that self-worth increases throughout adolescence. Although there are few studies among youth with chronic illness that have evaluated age directly as a predictive variable, these studies, as well as the literature on typically developing adolescents, indicate that global self-worth increases as adolescents get older.
Parent Support

Consistent with research on typical adolescent development, LaGreca et al. (1995) showed that family variables, such as a positive family climate and open relationships between family members, provide valuable support for adolescents with chronic illness. More recently, Cuneo and Schiaffino (2002) examined the influence of family support on self-perceptions of youth with JA. They found family functioning was significantly associated with adolescent adjustment: specifically, family support and cohesion were related to higher global self-worth and fewer symptoms of depression whereas conflict was related to lower global self-worth and more symptoms of depression. In a qualitative study examining the support network and experiences of adolescents with a chronic disease, Kyngäs (2004) interviewed youth between 13 and 17 years with asthma, epilepsy, JA, and JD. During the interviews, the adolescents talked most about their parents. The authors found support from parents was oriented to all aspects of the adolescents’ everyday life and the youth felt most supported when they were able to share almost all issues and emotions with their parents. In contrast, other youth reported not feeling very supported by their parents when the focus of their discussions centered on their disease and its treatment. These adolescents felt their parents were not interested in them as their children, and by asking about the illness, parents were trying to convince themselves they were involved in their child’s life. The author concluded that for these youth, being accepted and supported with their chronic disease was vital for their self-esteem. Therefore, there appears to be a direct link between parent support and higher global self-worth for youth with chronic illness.
Depressive Symptoms

In general, individuals who internalize favourable views of themselves are highly likely to be cheerful. Conversely, the most common affective correlate of negative self-perception is depression (Abramson et al., 1978; Beck, 1967; Nolen-Hoeksema, 1990). As previously discussed, correlates of depression with self-esteem among typically developing youth have been estimated to range from .72 to .80 (Harter & Whitesell, 1996). Harter describes depression as a “normative liability” during adolescence due to the need to forge new social and romantic relationships and feelings of rejection that may accompany these tasks. ‘Fear of failure’ might also constitute another determinant, as a risk to one’s sense of self may lead to depression. However, the causal direction of the self-worth/depression correlation is highly debatable with some researchers arguing that low self-worth leads to depression (Beck, 1976; Nolen-Hoeksema, 1996) whereas others have found evidence that depression leads to low self-worth (Renouf & Harter, 1990).

As discussed previously (see section on Impact on Psychosocial Functioning), research among youth with chronic illness has focused predominantly on the presence or absence of depression as a consequence of the illness. The results are equivocal, with some studies demonstrating youth with chronic illness are at higher risk of developing depression and other studies finding depression rates are no different when they are compared to those of youth without illness. With respect to the relationship between depression and global self-worth, the same pattern of results emerges as is found among typically developing adolescents: depressive symptoms and lower self-worth are strongly intercorrelated (Lavigne & Faier-Routman, 1992). Therefore, it is not the presence or absence of illness that leads to depression, but that adolescents who have depressive
symptoms (for various reasons) also have low self-worth. Thus, it was expected that for youth with chronic illness in this study, fewer depressive symptoms would predict higher global self-worth.

**Health-Related Quality of Life**

Health-Related Quality of Life refers to a specific impact of an illness or injury, medical treatment, or health care policy on an individual’s quality of life (Petersen et al., 2006). Health-related quality of life is defined as the physical, emotional, and social aspects of an individual’s disease and/or its treatment and consists of four domains: disease state, functional status, psychological functioning, and social functioning (Spieth & Harris, 1996). Functional status is characterized as the ability to perform a variety of age-appropriate daily activities, including self-care, mobility, physical activity, and leisure activities, and is considered the objective degree of impairment caused by an illness (Spieth & Harris, 1996). Assessment of health-related quality of life also includes the subjective evaluation of the impairment (Spieth & Harris, 1996). This is an important distinction as researchers have found mixed results in terms of whether objective measures of illness and functional severity predict psychological distress. Specifically, Lavigne and Faier-Routman (1993) found disease severity was associated with increased risk in their meta-analysis, whereas Bennett (1994) reported that severity was inconsistently related to poor psychological outcomes in his review. However, with the exception of general psychological outcomes such as depression, no researchers have focused on the specific relation between health-related quality of life and global self-worth.
Health-related quality of life also measures subjective experiences of pain. Eccleston et al. (2008) evaluated the effect of chronic pain on adolescent social development. The authors concluded chronic pain appears to have direct effects on reducing opportunities for social exposure and normative developmental experience such as school and peer group involvement, but also increases exposure to dependent relationships in the home setting. Therefore, the experience of pain appears to be a salient factor influencing adolescent identity formation. Overall, it is the individual’s perception of his or her quality of life – including pain - that is more important than objective physical measures. Therefore, it was expected that their subjective experiences of health-related quality of life would predict the global self-worth of youth with chronic illness over and above the predictors common to all youth (i.e., gender, age, parent support and depressive symptoms).

1.9 Summary of Development in Youth with Chronic Illness

Chronic illness affects a significant number of children and adolescents in Canada. Nevertheless, there has been scant research on the psychosocial development of these youth. Reports in the literature have been inconsistent with regard to the degree of psychosocial problems experienced by adolescents with chronic illness: some researchers report these youth have a higher risk of internalizing problems, particularly depression and low self-esteem (e.g., Lavigne & Faier-Routman, 1992; Seigel et al., 1990), whereas other researchers report no differences between youth with and without chronic illness (e.g., Bennett, 1994; Miller, 1993). Most importantly, no comprehensive theory has been offered to explain these discrepant findings. Although 21 years ago Lavigne and Faier-Routman (1993) suggested the focus of research on adolescents with chronic illness
should be on self-concept, only a few studies (i.e., Appleton et al., 1994; Harter, 1999) have addressed self-concept exclusively in youth with chronic illness. These studies were limited by their emphasis on between-group differences as opposed to within group differences, a specific chronic illness sample with intelligence as a possible confound, and methodological problems in defining and measuring the concept of “discounting.”

Rosenberg and Kaplan (1982) and Sherrill (1997) have proposed disability-specific theories of identity development. These theories, however, are more descriptive than predictive and fail to explain why some youth with chronic illness develop poor self-concept whereas others do not. Further examination of the constructs in their theory reveals that many of the ‘principles’ mirror similar concepts outlined in Harter’s (1990) general model of adolescent self-perception. Following Bennett’s (1994) and Miller’s (1993) suggestions that models of normative development be applied to account for the contradictions in the literature, it was proposed that Harter’s model be used to explain this variance.

Similar to typical adolescent development, development of global self-worth among youth with chronic illness is influenced by a number of variables including gender, age, parent support and depressive symptoms. Specifically, gender affects self-worth for these youth as society places different values on abilities for boys and girls, making it more difficult for youth to discount limitations that are consistent with gender expectations. In particular, boys are more likely to have higher global self-worth than girls (Daniels & Leaper, 2006; Harper & Marshall, 1991; Heaven & Ciarrochi, 2008). Furthermore, because of the emphasis on physical appearance for girls in our society, perception of physical appearance is likely to be a stronger predictor of global self-worth
for girls than for boys (Harter, 2012a). With respect to age, both the literature on typically
developing adolescents and research among youth with chronic illness indicate that older
adolescents are more likely to have higher global self-worth than younger adolescents
(Robins et al., 2002). Also consistent with research with typically developing
adolescents, parent support is predictive of positive self-worth in youth with chronic
illness, as these youth need to feel valued by their parents (Cuneo & Schiaffino, 2002;
LaGreca et al., 1995). Depressive symptoms are highly correlated with global self-worth
for both typically developing youth and for youth with chronic illness (Harter, 2012a).
Finally, in addition to factors that are relevant for all adolescents, perceived health-related
quality of life may be a significant predictor of self-worth for youth with a chronic illness
whereas objective measures of an illness or disability are not (Petersen et al., 2006).

1.10 Moderators of Global Self-Worth

Discounting

As previously discussed, a key component of Harter’s (1990) model of self-
perception is the concept of discounting. According to Harter, only domains of
competence that individuals perceive as being high in importance have an impact on their
global self-worth. In contrast, competence domains perceived as being low in importance
are “discounted” and therefore do not affect global self-worth. In describing her
methodology for calculating discrepancies between competence and importance, Harter
includes only the competence data for domains rated as “important” (scored 3.0 or higher
on her 4-point scale) in her predictions of global self-worth (Harter, 1998). All of her
studies follow this method (e.g., Harter, 1990; Harter et al., 1997; Harter & Whitesell,
2001). The only study to include discrepancy data in relation to global self-worth for
youth with chronic illness (i.e., Appleton et al., 1994) also utilized Harter’s method. In Appleton et al.’s study, discounting was defined as the difference between groups on importance ratings in certain domains (academic, physical appearance, and athletic). It was hypothesized that youth with spina bifida would rate these domains as less important overall. By operationalizing discounting in this way, however, Appleton and colleagues could not detect within-group differences. There were likely some youth who discounted the importance of these domains whereas others failed to discount, leading to different results for global self-worth.

When considering the four possible combinations of competence/importance discrepancy data (see Figure 1), it becomes apparent that Harter’s method only measures two combinations in relation to global self-worth. First, youth who perceive themselves as having high competence on domains considered highly important are thought to have high global self-worth. Second, youth who perceive themselves as having low competence on domains considered highly important (i.e., fail to discount) are thought to have low self-worth. Although she does not evaluate the impact of the remaining two competence/important combinations, it is plausible they also influence global self-worth. First, youth who rate their competence high on domains they consider of low importance may also have low global self-worth. For example, individuals with depression often minimize their accomplishments by downplaying the importance of their successes (Beck, 1967; Whitton, Larson, & Hauser, 2008). Leahy and Holland (2000, p. 299) describe ‘discounting positives’ under their category of ‘distorted automatic thoughts of
Competence

High

Importance

High  ↓ Gs-w  ↓ Gs-w

Low  ↓ Gs-w  ↑ Gs-w

Fail to Discount

Discount

Figure 1. Four possible combinations of competence/importance discrepancy data and hypothesized relation to global self-worth (Gs-w).
depressed individuals’ by giving the example “You claim that the positive things you or
others do are trivial; those successes were easy so they don’t matter”. Finally, the last
combination – youth who rate their competence low on domains considered unimportant
– are thought to “discount” such incompetence. According to Harter’s theory, this
concept would be unrelated to global self-worth as the domains are not perceived as
important by the youth. It was hypothesized here, however, that discounting would be
associated with higher global self-worth because it serves as a cognitive resiliency factor
for youth who, by virtue of illness or disability, are not competent in domains that are
generally considered important. These resilient youth might base their self-concept on
perceived strengths while discounting possible weaknesses, leading to a healthy self-
concept.

As previously discussed, the available evidence supports the relation between
higher perceived health-related quality of life and higher global self-worth (Eccleston et
al., 2008; Guite, Logan, Sherry, & Rose, 2007; Petersen et al., 2006). Furthermore,
health-related quality of life is thought to influence global self-worth by interfering with
opportunities to develop competence in various domains (e.g., physical and social
competence, Vitulano, 2003; academic competence, Appleton et al., 1994). It was
proposed in this study, however, that discounting would moderate the relationship
between health-related quality of life and global self-worth by serving as a cognitive
resiliency factor. Thus, the potential effects of having a chronic illness on global self-
worth would be attenuated for youth who discount. In other words, health-related quality
of life would interact with discounting to predict global self-worth, such that the strength
of the relationship between health-related quality of life and global self-worth was
expected to vary depending on whether youth with chronic illness discount or fail to
discount. Specifically, higher health-related quality of life was expected to predict higher
global self-worth for youth who fail to discount. For youth who are able to discount,
however, the relationship between this variable and global self-worth would be
significantly weaker.

As previously discussed, boys and girls receive different messages about the
importance of various domains of competence, which likely has implications for the
formation of self-concept and self-worth. It appears girls are expected to be physically
attractive whereas boys are expected to overcome physical limitations to be self-
sufficient (Powers et al., 2008). Whether adolescents’ perceptions of competence match
areas deemed important likely has implications for psychosocial outcomes. For example,
girls who do not perceive themselves as physically attractive and do not discount this
shortcoming given the importance society places on this domain may have low self-worth
regardless of health-related quality of life. Likewise, boys who perceive themselves as
incompetent in the physical domain may be more likely to have low self-worth if they are
unable to discount their physical limitations. It is possible that psychosocial outcomes are
determined by one’s ability to discount domains of importance, with certain domains
given higher societal weight depending on gender. Thus, it was hypothesized there would
be a three-way interaction between health-related quality of life, discounting and gender
in the prediction of global self-worth; although the direction would be the same for girls
and boys, the strength of the relationship would be weaker for girls. Specifically, the
relationship between health-related quality of life and global self-worth would be weaker
for girls who discount than boys who discount. This interaction was anticipated on the
assumption that girls are generally at a higher risk for developing lower global self-worth. Hence, the ability to discount perceived incompetence would serve as a stronger protective factor for them compared to their male counterparts.

**Autonomy**

Although establishing one’s autonomy is viewed as a key developmental task of adolescence and is often recognized as a prerequisite to healthy psychosocial functioning in adulthood (Noom, Dekovic, & Meeus, 2001), the precise meaning of the term has largely depended on the theoretical orientation of the researcher. According to the psychoanalytic view, autonomy refers to separation from parents, and strongly emphasizes the interpersonal distance between an adolescent and his or her parents (Beyers, Goossens, Vansant, & Moors, 2003). Other theoreticians have defined autonomy as resistance to peer or parent pressure (e.g., Berndt, 1979), a subjective sense of independence (e.g., Elder, 1963; Kandel & Lesser, 1972), confidence in decision-making and self-governance (e.g., Greenberger, 1984), and the use of moral or principled reasoning in problem-solving (e.g., Kohlberg & Gilligan, 1972). Steinberg and Silverberg (1986) suggested that similar to multidimensional frameworks for identity, autonomy is more appropriately conceptualized as a “variety of putatively related phenomena” (p. 841).

In analyzing various definitions and theoretical approaches to conceptualizing autonomy, Noom et al. (2001) distinguished among three types of autonomy. First, emphasizing the cognitive component of this construct, the authors defined *attitudinal autonomy* as “the ability to specify several options, to make a decision, and to define a goal” (p. 578). Second, they discerned an *emotional autonomy* dimension involving the
perception of emotional independence from parents and peers as “a feeling of confidence in one’s own choices and goals” (p. 581). Finally, the authors considered a regulatory dimension that refers to different approaches to achieve one’s goal and the corresponding assumption of responsibility. Hence functional autonomy was defined as “the ability to develop a strategy to achieve one’s goal” (p. 578). Whereas it appears that different types of autonomy emerge in adolescence, autonomy of all kinds develops in the context of parent and peer relationships (Allen, Hauser, Bell, & O’Connor, 1994; Allen, Moore, Kuperminc, & Bell, 1998; Engels, Dekovic, & Meeus, 2002; Steinberg & Silverberg, 1986).

Although it is clear that a balance needs to be struck in terms of the level of individuation versus attachment with parents, Allen et al. (1994) showed that adolescents whose parents are emotionally close to the point of being intrusive or overprotective may have difficulty individuating from them, which may lead to depression, anxiety, and diminished social competence. Such overprotectiveness may be especially harmful for adolescents who are already less competent. The influence of parental psychological control is even more harmful when it is accompanied by negative self-evaluations by the adolescent (Allen et al., 1994). In other words, adolescents who are vulnerable to depression and who have very intrusive/unsupportive parents (compromising autonomy development) likely develop low global self-worth (Pomerantz, 2001). In general, adolescents’ mental health is optimal when their capacity and desire for autonomy matches their expectations for what their parents are willing to grant (Juang, Lerner, McKinney, & von Eye, 1999). For most adolescents, conformity to both parents and peers begins to decline during middle and late adolescence as youth develop their own
sense of self (Steinberg & Silverberg, 1986). Furthermore, this balanced level of individuation is associated with higher self-esteem and fewer behaviour problems (Allen et al., 1994; Bynum & Kotchick, 2006; Owens, Mortimer, & Finch, 1996).

Autonomy in Youth with Chronic Illness. Although the development of autonomy in youth with chronic disease or disability has not been studied directly, a number of researchers have alluded to this issue through their work on general psychosocial development. For example, Timko, Stovel, Baumgartner, and Moos (1995) reported that during the developmental process of negotiating new levels of independence, chronically ill adolescents and their parents and siblings had greater difficulty maintaining mutually supportive relationships due to the family’s concerns about managing the illness. Similarly, Sandstrom and Schanberg (2004) found peer rejection, or the inability of some youth with chronic illness to establish supports outside of the home, was related to self-reported depressive symptoms. Finally, in their investigation of maternal stressors for parents of children with chronic illness, Barlow et al. (2002) found mothers expressed concerns about being too overprotective of their children, as they were worried they were compromising their child’s autonomy.

The issue of autonomy from a youth’s perspective was highlighted in a qualitative study by Sällfors et al. (2002) in which the authors conducted interviews to examine the life situation and psychosocial processes of living with chronic pain in youth 6-17 years with JA. In addition to issues related to pain and pain management, a theme of ‘dependency’ emerged. The participants related that both the pain and the disability associated with the disease resulted in deep dependency on others. Dependency on parents for help with their chronic illness can have consequences for youth in terms of
their relationships with peers and with other adults. Specifically, the youth expressed ambivalence towards their parents as they sometimes wanted and needed help and at other times resented their dependency, leading to strain in the parent-adolescent relationship. With regard to peers, the adolescents expressed feeling “deviant from the norm” and perceived their pain interfered with their participation in “normal” social activities. The authors concluded that, for these individuals, a lack of autonomy was likely to impede self-worth because the youth’s pain and disability made activities less enjoyable and blocked their ability to achieve important developmental goals.

Taken together, it is clear that the development of autonomy is important for self-competence (Collins & Laursen, 2004b) and global self-worth (Bynum & Kotchick, 2006; Soenens et al., 2007), and that youth with chronic illness are at risk for compromised autonomy due to aspects of their illness that might lead to dependency on parents and alienation from peers (Barlow et al., 2002; Sällfors et al., 2002). In contrast, it is possible that youth with chronic illness who develop higher autonomy and perceived independence are able to maintain high global self-worth, thus attenuating the impact that specific illness factors have on global self-worth. As previously discussed, higher perceived health-related quality of life relates to higher global self-worth (Eccleston et al., 2008; Guite et al., 2007; Petersen et al., 2006). Given that a chronic illness is often associated with increased dependency on parents (Sällfors et al., 2002; Sandstrom & Schanberg, 2004), it is probable that the relationship between health-related quality of life and global self-worth will differ for youth who are better able to individuate from their parents. Thus, it was hypothesized in this study that autonomy would moderate the relationship between health-related quality of life and global self-worth. That is, health-
related quality of life was expected to interact with autonomy to predict global self-worth, such that the strength of the relationship between health-related quality of life and global self-worth would vary depending on the level of autonomy reported by the youth. For those youth who have a lower level of autonomy, higher health-related quality of life was expected to be a significant predictor of high global self-worth. For youth with a higher level of autonomy, however, health-related quality of life was expected to have a significantly weaker relationship to global self-worth. Thus, the strength of the relationship between having a chronic illness and global self-worth would be attenuated for youth who develop higher autonomy.

It is also likely that variation in the relationship between health-related quality of life and global self-worth as a function of autonomy would be somewhat different for girls and boys. Society places greater importance on independence for boys, and parents of girls with chronic illness are more likely to limit their child’s activities due to safety concerns (Powers et al., 2008). Thus, it was hypothesized there would be a three-way interaction between health-related quality of life, autonomy, and gender in the prediction of global self-worth. The relation between health-related quality of life and global self-worth would be weaker for girls with a higher level of autonomy than for boys with higher autonomy. This expected interaction was based on the assumption that girls are generally at a higher risk for developing lower global self-worth. Hence, the ability to achieve a higher level of autonomy would serve as a stronger protective factor for them compared to their male counterparts.
1.11 Summary of the Predictive Variables

Several variables have been shown to predict global self-worth. In the literature on both typically developing youth and adolescents with chronic illness, researchers have shown gender to be a reliable factor related to self-worth. Powers et al. (2008) found societal messages regarding disability differ for girls and boys, with physical attraction emphasized for girls and physical abilities emphasized for boys. Harter (1999) consistently reports that although physical attraction is considered important for both genders, the discrepancy for girls is greater leading to lower overall self-worth. Developmental theorists also posit that age is related to global self-worth, as older adolescents tend to have a more integrated self-concept and higher global self-worth than younger adolescents (Robins et al., 2002). Thus, variables such as gender and age likely predict global self-worth for youth with chronic illness.

It is also clear that parent support factors are important for typically developing adolescents (Beyers et al., 2003; Engels et al., 2002) and may be especially important for youth with chronic illness due to increased dependency on parents because of physical limitations (Cuneo & Schiaffino, 2002; LaGreca et al., 1995; Sandstrom & Schanberg, 2004). It is thought that support and acceptance from parents encourage youth with chronic illness (as well as all youth) to accept themselves for who they are, making it easier to discount perceived incompetence and embrace personal strengths. Thus, higher levels of parent support likely predict higher global self-worth.

Depressive symptoms have been intricately linked with perceptions of self-esteem throughout the literature for youth with and without a chronic illness (Harter, 2012a;
Lavigne & Faier-Routman, 1992). Although the direction of causality remains debatable, it is clear that fewer symptoms of depression predict higher global self-worth.

Although illness-related factors associated with self-perceptions for youth with chronic illness have not been studied directly, with the exception of Appleton et al. (1994) who investigated the self-concept of young people with spina bifida, Petersen et al. (2006) found illness factors related to health-related quality of life, such as pain and functional status, limit youth’s access to peer group activities that otherwise foster social competence, physical competence and overall self-esteem. Thus, higher health-related quality of life likely predicts higher global self-worth over and above predictors of global self-worth that are common to all youth.

In her model of adolescent self-perception, Harter (1990) posits that for all youth, global self-worth is determined by the discrepancy between self-perceptions of competence on various domains and self-perceptions of the importance of these domains. As the discrepancy increases between competence and importance, global self-worth decreases. Although Harter has only evaluated the impact of domains considered important, it is also likely that discounting (i.e., low competence and low importance) could serve a protective function leading to high global-self worth. It is possible that some youth with chronic illness are not able to discount the domains affected by their illness and develop low self-worth, whereas other youth are able to discount their perceived incompetence and maintain high self-worth. Thus, it was proposed that discounting would moderate the relationship between health-related quality of life and global self-worth such that the strength of the relationship between health-related quality of life and global self-worth would vary depending on whether youth with chronic illness...
discount or fail to discount. Specifically, higher health-related quality of life would predict higher global self-worth for youth who fail to discount. For youth who are able to discount, the impact of this variable on global self-worth would be significantly weaker. Finally, given the different societal messages transmitted to boys and girls, it is also likely that global self-worth as a function of discounting would be stronger for girls than boys. Specifically, the relationship between health-related quality of life and global self-worth would be weaker for girls who discount than boys who discount.

Autonomy development also has been intricately linked with the development of self-concept (Collins & Laursen, 2004b), and self-esteem (Bynum & Kotchick, 2006; Owens et al., 1996; Soenens et al., 2007). In addition, Sällfors et al. (2002) found that among youth with chronic illness, concerns related to a lack of autonomy were common and likely influenced their psychosocial development. It is probable the relationship between health-related quality of life and global self-worth will differ for youth who are better able to individuate from their parents. Thus, it was proposed that autonomy moderates the relationship between health-related quality of life and global self-worth. For those youth who have lower levels of autonomy, higher health-related quality of life would predict higher global self-worth. For youth with higher levels of autonomy, health-related quality of life was expected to have a significantly weaker impact on global self-worth. In this way, autonomous adolescents are resilient to this risk factor for low global self-worth and instead develop healthy self-concepts. Finally, given the different messages regarding autonomy for girls and boys, it is likely that the relationship between health-related quality of life and global self-worth as a function of autonomy would be weaker for girls than for boys. Specifically, for girls with a higher level of autonomy, the
impact of health-related quality of life on global self-worth would be weaker than for boys.

1.12 Purpose

The purpose of this study was to evaluate the applicability of Harter’s model of self-perception to adolescents with chronic illness. A noncategorical approach to chronic illness was employed because researchers have shown that general health, individual, and social support variables are stronger predictors of psychosocial development than are specific disease-related factors (Gortmaker et al., 1993; Lavigne & Faier-Routman, 1992). Given the prevalence of chronic illness among youth, it is important to understand the mechanisms that lead some to develop lower self-worth while appreciating factors that lead to higher self-worth in others.

Research Questions and Hypotheses

Research Question 1. What is the overall level of global self-worth for youth with chronic illness? How does it compare with that found in normative samples and does it vary by gender and age?

Hypothesis 1a. Overall, youth with chronic illness were expected to report a moderate level of global self-worth and this moderate level was expected to be comparable to that found in normative samples.

Hypothesis 1b. Within this sample of youth with chronic illness, boys were expected to have higher global self-worth than girls.

Hypothesis 1c. Within this sample of youth with chronic illness, increasing age was expected to be associated with higher global self-worth.
Research Question 2. Based on Harter’s multidimensional model of self-perception, which domain discrepancies predict global self-worth in this population? Does this vary by gender?

Hypothesis 2a. All domain discrepancy ratings together were expected to predict global self-worth. The physical appearance discrepancy was expected to be the domain that was the strongest predictor of global self-worth for both girls and boys.

Hypothesis 2b. The physical appearance discrepancy was expected to be a stronger predictor for girls compared to boys.

Research Question 3. Are gender, age, parent support and depressive symptoms predictive of global self-worth in youth with chronic illness as they are in typically developing youth? Does health-related quality of life add to the prediction of global self-worth for youth with chronic illness?

Hypothesis 3a. Male gender b. older age c. higher parent support, and d. fewer depressive symptoms were expected to predict higher global self-worth.

Hypothesis 3e. Health-related quality of life was expected to predict global self-worth over and above these general factors.

Research Question 4. Does discounting moderate the relationship between health-related quality of life and global self-worth? Does this relationship vary by gender?

Hypothesis 4a. The relationship between health-related quality of life and global self-worth was expected to be weaker for youth who discount more domains of competence.

Hypothesis 4b. The strength of the relationship between health-related quality of life and global self-worth was expected to be weaker for girls who discount than for boys who discount.
Research Question 5. Does autonomy moderate the relationship between health-related quality of life and global self-worth? Does this relationship vary by gender?

Hypothesis 5a. The strength of the relationship between health-related quality of life and global self-worth was expected to be weaker for youth with higher autonomy.

Hypothesis 5b. The strength of the relationship between health-related quality of life and global self-worth was expected to be weaker for girls with higher autonomy than for boys with higher autonomy.
2.0 METHOD

2.1 Participants

Adolescents in grades nine through twelve who had been diagnosed with asthma, arthritis or diabetes were recruited for the study. The sample consisted of 54 adolescents from across Canada (81% from Atlantic Canada).\(^2\) Fifty-four percent were girls and 46% were boys. Their ages ranged from 13 years to 18 years \([M(SD) = 15.42(1.28)]\). Eighty-one percent identified as Caucasian, 7.5% identified as Native Canadian and the remainder identified as various ethnicities. Forty-three percent had asthma, 37% had diabetes, 13% had arthritis and 7% reported having one of these three diagnoses plus one "other" chronic illness. The "other" illnesses were comorbid diagnoses; two participants with diabetes also reported having celiac disease \((n = 1)\) or deafness \((n = 1)\), and two participants with asthma also reported having celiac disease \((n = 1)\) or ADHD \((n = 1)\). Two one-way ANOVAs were conducted to evaluate whether there were age or gender differences among the four diagnostic groups. Results showed there were no differences among diagnostic groups on age, \(F(3, 50) = .451, p = .861\) or gender, \(F(3, 50) = .256, p = .856\). Therefore, it was considered appropriate to combine the groups for subsequent analyses.

Participants also reported the level of education and employment status of their parents. Six percent of fathers had not completed high school, 17% of mothers and 32% of fathers had completed high school only, 28% of mothers and 32% of fathers had

\(^2\) Sixty adolescents completed the questionnaire, however, 6 participants were excluded because they did not report having a diagnosis of asthma, arthritis or diabetes.
completed community college or technical school, and 51% of mothers and 24% of fathers had completed university. Four percent of participants did not know their mothers' level of education and 6% did not know their fathers' level of education. According to the participants, 46% of mothers and 78% of fathers were employed full-time while 22% of mothers and 6% of fathers were employed part-time.

2.2 Measures

Demographic Information

Demographic information, including the youth’s gender, age, height, weight, ethnicity, parents’ employment status and type of chronic illness was collected using a series of items developed by the researcher (see Appendix A). Height and weight data were used to calculate the youth’s body mass index (BMI), an indicator of obesity.

Global Self-Worth

Adolescent global self-worth was measured using the Self-Perception Profile for Adolescents (SPPA; Harter, 1988; see Appendix B). This 45-item scale measures youth’s perceptions of competence in eight domains (see Table 1 for a complete description of each domain) and of global self-worth, for adolescents from grades 9 through 12. This scale uses a “structured alternative format” for responses in which the adolescent is first asked to decide which of two item descriptions is “most like” him or her, and then is asked whether this is only “sort of true” or “really true” for him or her. Each scale item is then scored from 1 to 4. Each of the nine subscales contains five items. Scores are summed for each domain and range from 5-20 on each subscale, with higher scores denoting greater perceptions of competence and higher Global Self-Worth.
Table 1

*Domain Descriptions of Harter’s Self-Perception Profile for Adolescents*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholastic Competence</td>
<td>The adolescent’s perception of how well he/she is doing in school and how intelligent he/she feels.</td>
</tr>
<tr>
<td>Social Acceptance</td>
<td>The degree to which the adolescent feels accepted by peers, has a lot of friends, and feels he/she is easy to like.</td>
</tr>
<tr>
<td>Athletic Competence</td>
<td>The adolescent’s perceptions of his/her athletic ability and competence at sports.</td>
</tr>
<tr>
<td>Physical Appearance</td>
<td>The degree to which the adolescent is happy with the way he/she looks, likes his/her body, and feels he/she is good looking.</td>
</tr>
<tr>
<td>Job Competence</td>
<td>The extent to which the adolescent feels he/she has job skills, is ready to do well at part-time jobs, and feels he/she is doing well at the job he/she has.</td>
</tr>
<tr>
<td>Romantic Appeal</td>
<td>The teenager’s perceptions that he/she is romantically attractive to those...</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Behavioural Conduct</td>
<td>The degree to which he/she likes the way he/she behaves, does the right thing, and avoids getting into trouble.</td>
</tr>
<tr>
<td>Close Friendship</td>
<td>His/her ability to make close friends he/she can trust with personal thoughts and feelings.</td>
</tr>
<tr>
<td>Global Self-Worth</td>
<td>The extent to which the adolescent likes himself/herself as a person, is happy with the way he/she is leading his/her life, and is generally happy with the way he/she is.</td>
</tr>
</tbody>
</table>
The SPPA also contains a 16-item (two items per domain) measure of the youth’s perception of the importance of each domain (see Appendix B). This scale uses the same alternative question format, requiring youth to choose between two alternative statements and then indicate whether the statement is “really true” or “sort of true” for him or her. Items are scored from 1 to 4, with higher scores denoting more importance. A mean importance score is calculated for each domain.

The SPPA also includes a single question to assess the adolescent’s peer comparison group by asking, “What group of teenagers were you thinking about when you answered these questions?” Whereas the responses on the original scale were open-ended for this item, in this case adolescents were required to check a box indicating either “other teenagers in my class” or “other teenagers with my illness”.

The SPPA has been used widely for decades to measure adolescent self-perceptions, self-esteem and its correlates (Harter, 1999) and has been translated into several languages (Wichstrøm, 1995). Internal consistency reliabilities for each of the subscales range from $\alpha = .77$ to $.93$ with most falling in the $\alpha = .80$ range. Factor analyses have supported the eight factor structure according to Harter’s own research (1988; 2012b), work done by Trent, Russell, and Cooney (1994) with Australian youth, and researchers examining the factor structure with African American adolescents (Thomson & Zand, 2002).

In addition to the analysis of the factor structure, Wichstrøm (1995) examined the convergent and discriminant validity of the SPPA and found the relevant domains were correlated with measures of school performance, questions related to close friendships, a measure of loneliness, athletic involvement, and body satisfaction. However, the SPPA
was not correlated with a measure of social desirability, supporting Harter’s contention that the question format guarded against a social desirability bias. Although Wichström cautioned against the use of Harter’s question format due to its “time-consuming and cumbersome” nature (p. 100), his study compared two question formats and found that the SPPA was adequate in terms of omitted items and response time. Similar support for adequate convergent and divergent validity was found by Thomson and Zand (2002) and Hagborg (1993) when they examined the global self-worth subscale with other measures of self-esteem.

Although no psychometric data have been reported for the SPPA among chronically ill populations, the measure has been used with a number of samples of persons with chronic illness including adolescents with JA (Aasland & Diseth, 1999), youth with chronic musculoskeletal pain (Guite et al., 2007), and young people with spina bifida (Appleton et al., 1994). In the current sample, the internal consistencies for the domains ranged from $a = .53$ to $a = .84$. Specifically, the reliability coefficients for each scale were: Scholastic Importance $a = .70$; Social Acceptance $a = .68$; Athletic Competence $a = .84$; Physical Appearance $a = .82$; Job Competence $a = .72$; Romantic Appeal $a = .77$; Behavioral Conduct $a = .61$; Close Friendship $a = .77$; and Global Self-Worth $a = .53$. The internal consistency for Global Self-Worth was noted to be lower than has been found in previous studies. An examination of the inter-item correlations indicated that four of the five item-total correlations were low, suggesting that participants did not respond to any one item more inconsistently than the other items. Because eliminating any items reduced the overall reliability of the scale, the scale was retained in its current form.
Parent Support

The Parent Support subscale of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987; see Appendix C) was used to measure adolescents’ perceptions of parent support. It assesses the positive and negative affective and cognitive dimensions of adolescents’ relationships with their parents for youth aged 16 to 20 years. For each of the 28 items assessing parent attachment, respondents are required to rate the degree to which each item is true for them on a 5-point scale ranging from ‘Almost always or always true’ to ‘Almost never or never true’. A principal components analysis conducted by the authors showed the items in each of the two subscales (parent and peer) clustered into three factors (trust; communication; anger and alienation). Total scores are calculated by summing the responses for each item, with higher scores indicating greater parent attachment/support.

Armsden and Greenberg (1987) reported good internal consistency for the IPPA with Cronbach’s alpha coefficients ranging from .72 to .91 for the subscales across the parent and peer scales. Good test-retest reliability over a three-week period was also reported with correlation coefficients ranging from \( r = .86 \) for peer attachment and \( r = .93 \) for parent attachment. The authors also demonstrated convergent validity (Armsden & Greenberg, 1987). Although norms for the scale were originally generated on the basis of samples of middle and late adolescents (aged 16 to 20), Duchesne and Larose (2007) found it was an appropriate instrument for their sample of early adolescents (grade 7 students, 13 years old). In the current study, the internal consistency of the parent subscale was \( \alpha = .49 \), which was substantially lower than has been reported in other studies. An analysis of the reliability statistics revealed that removing four items with the
lowest inter-item total correlations improved the overall reliability to $\alpha = .70$. These items were: "I don't get much attention at home"; "My parents have their own problems so I don't bother them with mine"; "I don't know who I can depend on"; and "My parents don't understand my problems." Therefore, these items were removed and the 24-item scale was used in all analyses.

**Depressive Symptoms**

Symptoms of depression were measured using the depression subscale of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983; see Appendix D). This measure was initially developed for use with general hospital outpatients and has been adjusted for overlapping somatic symptoms, which tend to inflate depression scores (Zigmond & Snaith, 1983). The scale contains 14 items and yields separate scores for depression and anxiety. Participants respond to each item by choosing one of the four responses most representative of their feelings in the past week. Items are scored from 0 to 3 and are summed for each subscale, yielding a total Depression score ranging from 0 to 21, with a higher score representing more problems. Although the scale was initially developed with adult samples, White, Leach, Sims, Atkinson, and Cottrell (1999) used this scale with both ‘typical’ (i.e., school-based) and inpatient adolescents aged 12 to 16 years and found it had adequate test-retest reliability (ranging from $r = .62$ to $r = .74$). White et al. (1999) also investigated the factor structure using hierarchical cluster analysis and confirmed the presence of two distinct factors representing anxiety and depression. Finally, predictive validity was supported as the scale was found to adequately discriminate between adolescents diagnosed with depressive or anxiety disorders and those without these diagnoses (White et al., 1999). In the current study, the
internal consistency for the depression subscale was $\alpha = .78$, which was consistent with previous studies.

**Health-Related Quality of Life**

Health-Related Quality of Life (HRQOL) was measured using the Pediatric Quality of Life Inventory – Version 4.0 (PedsQL) (Varni, Seid, & Kurtin, 2001). The PedsQL Teen Report (see Appendix E) is a measure of health-related quality of life in both healthy children and those with chronic health conditions between the ages of 13 and 18. It consists of 23 items contained in the Generic Core Scales that are designed to measure the core dimensions of health (physical, emotional and social) as well as role (school) functioning. Youth are asked to indicate how often each particular item has been a problem for them in the past month using a 5-point Likert scale. Each item is scored from 0 to 4 (“never a problem” to “almost always a problem”), with higher ratings indicating poorer functioning. Items are then reverse-scored and linearly transformed (i.e., $0=100, 1=75, 2=50, 3=25, 4=0$) to form a range between 0-100, with higher scores indicating higher health-related quality of life. Scale scores are then computed as the sum of the items divided by the number of items answered.

Degotardi (2003) investigated the psychometric properties of the PedsQL among youth with arthritis. She found the Generic Core Scales had strong psychometric properties, including high internal consistencies (ranging from $\alpha = .93$ for the parent report to $\alpha = .86$ for the child self-report), as well as acceptable content validity and construct validity. Factor analysis resulted in a 5-factor solution for self-report and parent-report versions consistent with the core subscales. Degotardi (2003) concluded this measure reliably discriminated between healthy children and those with a chronic
health condition. Subsequently, the PedsQL has shown good reliability and validity as a school population health measure for both children and adolescents (Varni, Burwinkle, & Seid, 2006), as a measure of long-term adjustment for children after a major trauma (Janssens, Gorter, Ketelaar, Kramer, & Holtslag, 2008), and as an assessment measure for depressive symptoms with young adolescents (Reinfjell, Hjemdal, Aune, Vikan, & Diseth, 2008). In the current study, the internal consistency of the PedsQL was excellent ($\alpha = .94$). The reliability coefficients of each of the subscales were also very good: Physical ($\alpha = .91$), Emotional ($\alpha = .90$), Social ($\alpha = .78$), and School ($\alpha = .83$).

**Discounting**

Using Harter’s method, discrepancy scores (i.e., the difference between importance and competence) are calculated only for those domains rated as “sort of important” to “very important” (mean of 3.0 to 4.0) by subtracting the importance rating from their respective competence scores for each domain. If the importance rating is greater than the competence score, the discrepancy score will be negative (indicating the youth failed to discount that domain). If the importance rating is smaller than the competence score, then the discrepancy score will be positive. A total discrepancy score is calculated by adding the discrepancy scores, taking their sign into account. The larger the total discrepancy score with a negative sign, the more the youth’s importance ratings exceed his or her competence ratings (i.e., the less the youth discounted). A mean discrepancy score is calculated by dividing the total discrepancy score by the number of domains rated as important.

Although Harter’s method of calculating discrepancies has been used to operationalize discounting, as previously discussed, this method only measures “failure to
discount" given that only domains rated highly important are considered. Therefore, in this study, "discounting" was defined as occurring when the importance value was reported to be less than the competence value regardless of the domain's rated level of importance. In this way, domains that are rated low in competence but also low in importance are included as predictors of global self-worth as a measure of potential cognitive resiliency. A total discounting score was calculated for each participant by summing the number of domains discounted. As a result, each participant's total discounting score could range from 0-8, with higher scores indicating more domains were discounted.

**Autonomy**

The Adolescent Autonomy Questionnaire (AAQ; Noom, 1999; see Appendix F) was used to assess autonomy development. This 18-item scale consists of three 6-item subscales measuring Attitudinal Autonomy, Emotional Autonomy, and Functional Autonomy, and also yields an overall score. Youth are asked to respond to items using a 5-point Likert scale ranging from “Not at all descriptive of me” to “Very descriptive of me." Scores are summed and range from 0 to 30 on each subscale or 0 to 90 on the total scale, with higher scores indicating higher autonomy. Noom et al. (2001) conducted a conceptual and factor analysis using the instrument with 400 youth between 12 and 18 years of age. They found it produced adequate psychometric properties, yielding internal consistency coefficients of $\alpha = .71$ for attitudinal autonomy, $\alpha = .60$ for emotional autonomy and $\alpha = .64$ for functional autonomy. In addition, results of structural equation modeling supported the 3-factor model and there was evidence of convergent and divergent validity. In the current study, the three subscales showed good internal
consistency: $\alpha = .84$ for the attitudinal autonomy subscale, $\alpha = .70$ for emotional autonomy and $\alpha = .84$ for functional autonomy. The overall internal consistency was excellent at $\alpha = .93$. It was notable that the internal consistency in this sample was higher than reported by Noom et al. (2001), suggesting the scale is appropriate for use with this population of adolescents.

**Potential Covariates**

Researchers have shown that general health, individual, and social support variables are more predictive of psychosocial development than are specific diagnostic factors (Gortmaker et al., 1993; Lavigne & Faier-Routman, 1992). Although a noncategorical approach to chronic illness was employed in this study, diagnosis (asthma, diabetes, arthritis or other) was considered a potential covariate to evaluate this assumption with respect to the dependent, predictor and moderator variables.

Researchers have found high BMI is associated with depressive symptoms and low self-esteem among typically developing adolescents (Al Mamun et al., 2007; Marcotte, Fortin, Potvin, & Papillon, 2002; Rawana & Morgan, 2014). Although investigating the effects of BMI was not a focus of the current study, BMI was considered a potential covariate with respect to the dependent, predictor and moderator variables.

**2.3 Procedure**

After receiving approval from the University of New Brunswick Research Ethics Board, the investigator contacted the Asthma Society of Canada, the Canadian Arthritis Society, and the Juvenile Diabetes Research Foundation. Once permission from each agency was obtained, members of the associations were asked to participate in a study
about self-concept in youth with chronic illness through an email invitation distributed to members in Atlantic Canada via the organizations’ listservs. This email invited adolescents to complete an online survey. Parents were asked to complete the online consent form with instructions for the youth to complete the remaining questionnaires. The online survey package was assembled using the secure software package “Checkbox” which allowed respondents to choose responses from drop-down menus or checkboxes via the Internet. The survey took 45-60 minutes to complete. All participants were thanked for their contribution and were provided with a debriefing form and an invitation to receive the results of the study. Although compensation was not given to each participant, participants had a chance to win one of 10 $25 VISA gift cards and one chance to win an iPod Touch as a small incentive to participate.

Unfortunately, this strategy proved ineffective in recruiting a sufficiently large sample; therefore, several other health-related organizations were contacted (see Appendix G for a detailed description of the data recruitment efforts). Following an amendment to the ethics procedure, Phase II of data recruitment was initiated. The investigator printed and distributed posters in hospitals, walk-in clinics and physicians’ offices in Fredericton, New Brunswick. Thirty-two school boards in Atlantic Canada and large city centres across Canada were contacted and ethics proposals were completed for each. Following ethics approval from each school board, school principals were contacted and requested to distribute the email invitation to students via school email, website, or personal communication with eligible students. However, this strategy also proved to be ineffective, as only 11 participants had completed the online survey after several months of active recruitment.
In Phase III of data recruitment, the investigator applied to the IWK Health Centre Ethics Board to recruit participants from the IWK Diabetes, Asthma and Rheumatology Clinics. Posters and “Permission to Contact” forms were put up in the various clinics. Patients who completed the “Permission to Contact” forms at the registration desks were personally contacted via email by the researcher and sent a link to the online study. Reminder emails were periodically sent out. In addition, posters were distributed in hospitals, walk-in clinics and physicians’ offices throughout Halifax, NS.

Response rates were difficult to calculate given the electronic nature of the study. Over a two-year period, an average of 2.5 participants completed the survey per month, for a total of 60 completed surveys. The majority of completed surveys \([n = 33]\) appeared to result from the IWK recruitment. Given the difficulties with recruitment it was determined that the study would proceed utilizing the eligible responses from 54 youths, although a power analysis using the software G*power (with 8 total predictors, assuming a .30 effect size, 80% power, and setting alpha to .05) indicated a sample size of 59 was required for each of the proposed regression analyses. All analyses were completed using SPSS Statistics Software Version 22 ("IBM Statistics for MacIntosh," 2013).
3.0 RESULTS

3.1 Data Conditioning

Missing Data

Prior to conducting the analyses, the dependent variables (global self-worth, domains of self-perception), predictor variables (gender, age, parent support, depressive symptoms, health-related quality of life), moderator variables (discounting, autonomy), and potential covariates (BMI, diagnosis) were examined for accuracy of data entry by evaluating plausible scores and ranges of values. No errors were found. The data were reviewed for missing data points. The total amount of missing data was calculated at 3%. Results of the Missing Values Analysis revealed these missing data points were randomly distributed and therefore mean substitution was used to estimate missing values (Tabachnick & Fidell, 2001). Because subsequent analyses involve gender as a predictor variable, mean values were calculated for each gender and missing items were replaced with the gender relevant value. Specifically, data points were estimated for the following variables: scholastic competence (one), social acceptance (two), athletic competence (three), physical appearance (one), job competence (five), romantic appeal (six), behavioral conduct (two), close friendship (three), parent support (five), depressive symptoms (two), health-related quality of life (three), autonomy (three) and BMI (two). No data points were estimated for gender, age, diagnosis, or global self-worth. Because one participant was missing a score for global self-worth, that participant was eliminated from the sample, resulting in a final sample of 53 participants.
Normality, Linearity and Homoscedasticity

The variables were screened for normality by examining the frequency histograms. The variables global self-worth, depressive symptoms, health-related quality of life, autonomy, and BMI appeared to be skewed and therefore normality was further evaluated by examining the Shapiro-Wilk statistic. Using $p < .001$ (as recommended by Tabachnick & Fidell, 2001), only the distribution of BMI was found to be significantly different from normal ($Shapiro-Wilk = .859; p < .001$). However, a decision to transform this variable was not made until the univariate and multivariate outliers were examined in case the distribution could be corrected by eliminating outliers. A review of scatterplots of the standardized residuals in the regression analyses showed that the variables had acceptable linearity and homoscedasticity.

Univariate and Multivariate Outliers

The data were screened for univariate outliers on the aforementioned variables. An examination of the $z$-scores indicated only one score on the BMI was discontinuous and greater than 3.29 standard deviations from the mean for that variable. Further, this extreme score contributed to the positive skew in the distribution of this variable. Because deleting this outlier did not correct the lack of normality of the distribution, a log transformation was applied to BMI. The transformed BMI variable had an acceptable normal distribution; examination of the transformed $z$-scores also indicated that the univariate outlier was now within the acceptable range. Mahalanobis distances were examined for multivariate outliers among the variables to be used in each regression analysis using $\chi^2$ at $p < .001$ (Tabachnick & Fidell, 2001). One multivariate outlier was identified; however, because its value of Cook’s distance was acceptable, it was
determined the case did not heavily influence the overall model and was retained for future analyses.

**Multicollinearity and Singularity**

Zero-order correlations among the variables were examined for multicollinearity and singularity by considering correlations above .70 (Tabachnick & Fidell, 2001). In addition, collinearity statistics including the variance inflation factor and tolerance were examined. It was found that the variables measuring depressive symptoms and health-related quality of life were highly negatively correlated ($r = -.78$). An analysis of the individual items of the measure used for health-related quality of life (PedsQL) revealed that many items were "mood" related and were likely redundant with the measure of depressive symptoms. To reduce multicollinearity, the Physical subscale of the PedsQL, which was found to be less redundant with depression ($r = -.63$), was used in all analyses involving health-related quality of life. The eight items related to physical health included ones that addressed pain and functional limitations.

In order to minimize issues of multicollinearity in the regression analyses that involved interaction terms, all predictor variables in these analyses were centred around the mean (Aiken & West, 1991). Predictor variables remained in their original form when they were entered into regression analyses that did not include interaction terms.

### 3.2 Descriptive Statistics

**Dependent Variable (Global Self-Worth)**

The descriptive statistics for global self-worth for the total sample and subdivided by gender are presented in Table 2. Mean scores for global self-worth were above the midpoint, indicating that, on average, youth with chronic illness in this sample were
Table 2

Descriptive Statistics for the Global Self-Worth and Competence Domains

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Boys</th>
<th>Girls</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent Variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Self-Worth</td>
<td>2.88 (.62)</td>
<td>3.10 (.42)</td>
<td>2.68 (.70)</td>
<td>7.04</td>
<td>.01*</td>
</tr>
<tr>
<td>Domainsa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholastic Competence</td>
<td>2.81 (.70)</td>
<td>2.86 (.74)</td>
<td>2.78 (.68)</td>
<td>.16</td>
<td>.69</td>
</tr>
<tr>
<td>Social Acceptance</td>
<td>2.91 (.67)</td>
<td>3.07 (.66)</td>
<td>2.78 (.66)</td>
<td>2.52</td>
<td>.12</td>
</tr>
<tr>
<td>Athletic Competence</td>
<td>2.40 (.85)</td>
<td>2.56 (.80)</td>
<td>2.25 (.88)</td>
<td>1.74</td>
<td>.19</td>
</tr>
<tr>
<td>Physical Appearance</td>
<td>2.38 (.85)</td>
<td>2.65 (.84)</td>
<td>2.14 (.80)</td>
<td>5.09</td>
<td>.03</td>
</tr>
<tr>
<td>Job Competence</td>
<td>2.98 (.64)</td>
<td>3.14 (.60)</td>
<td>2.84 (.66)</td>
<td>3.00</td>
<td>.09</td>
</tr>
<tr>
<td>Romantic Appeal</td>
<td>2.54 (.77)</td>
<td>2.67 (.75)</td>
<td>2.43 (.77)</td>
<td>1.26</td>
<td>.27</td>
</tr>
<tr>
<td>Behavioural Conduct</td>
<td>2.95 (.63)</td>
<td>2.88 (.53)</td>
<td>3.01 (.72)</td>
<td>.64</td>
<td>.43</td>
</tr>
<tr>
<td>Close Friendship</td>
<td>2.91 (.71)</td>
<td>2.95 (.74)</td>
<td>2.87 (.69)</td>
<td>.17</td>
<td>.68</td>
</tr>
</tbody>
</table>

Note. Higher scores indicate higher perceived competence.

Possible range of the means for all variables = 1-4.

a The multivariate analysis indicated that the competence domains, as a group, did not
differ significantly by gender.

*p ≤ .01.
generally happy with themselves as people. Although the mean score for girls was also above the midpoint, results of an ANOVA found boys reported significantly higher global self-worth than girls.

**Competence Domains, Importance Domains and Domain Discrepancies**

The descriptive statistics for the competence domains for the total sample and subdivided by gender are presented in Table 2. The mean scores for the competence domains were also all above the midpoint, indicating this sample of youth with chronic illness, on average, saw themselves as more competent than not in all areas. They perceived themselves as most competent in the areas of job competence, behavioural conduct, social acceptance and close friendship, respectively. Results of a MANOVA using Pillai's trace indicated that, as a group, the competence domains did not differ significantly by gender, $V = .19, F(8, 44) = 1.28; p = .28$. As a result, the univariate test for each domain was not evaluated.

The descriptive statistics for the importance domains for the total sample and subdivided by gender are presented in Table 3. All scores were above the midpoint of the measure, indicating that the total sample perceived each domain as being more important than not. The domains most important to them were close friendship and job competence. Results of a MANOVA using Pillai's trace indicated there was no significant gender difference on the importance domains as a group, $V = .11, F(8, 44) = .68; p = .71$, suggesting that both boys and girls perceived the domains as being important to them. As a result, the univariate test for each domain was not evaluated.

The descriptive statistics for the domain discrepancies between competence and importance for the total sample and subdivided by gender are presented in Table 4. All of
Table 3

*Descriptive Statistics for the Importance Domains*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Boys</th>
<th>Girls</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N= 53)</td>
<td></td>
<td>(n = 25)</td>
<td>(n = 28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domains*</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholastic Importance</td>
<td>3.14 (.65)</td>
<td>3.18 (.51)</td>
<td>3.11 (.76)</td>
<td>.17</td>
<td>.68</td>
</tr>
<tr>
<td>Social Importance</td>
<td>2.52 (.90)</td>
<td>2.71 (.87)</td>
<td>2.36 (.91)</td>
<td>2.06</td>
<td>.16</td>
</tr>
<tr>
<td>Athletic Importance</td>
<td>2.53 (.63)</td>
<td>2.62 (.89)</td>
<td>2.45 (.98)</td>
<td>.48</td>
<td>.49</td>
</tr>
<tr>
<td>Physical Importance</td>
<td>3.09 (.76)</td>
<td>3.04 (.78)</td>
<td>3.13 (.77)</td>
<td>.16</td>
<td>.70</td>
</tr>
<tr>
<td>Job Importance</td>
<td>3.35 (.52)</td>
<td>3.38 (.46)</td>
<td>3.33 (.58)</td>
<td>.13</td>
<td>.72</td>
</tr>
<tr>
<td>Romantic Importance</td>
<td>3.20 (.54)</td>
<td>3.14 (.58)</td>
<td>3.25 (.50)</td>
<td>.53</td>
<td>.47</td>
</tr>
<tr>
<td>Behavioural Importance</td>
<td>3.23 (.60)</td>
<td>3.23 (.47)</td>
<td>3.24 (.70)</td>
<td>.01</td>
<td>.94</td>
</tr>
<tr>
<td>Friendship Importance</td>
<td>3.39 (.54)</td>
<td>3.29 (.63)</td>
<td>3.48 (.44)</td>
<td>1.66</td>
<td>.20</td>
</tr>
</tbody>
</table>

*Note.* Higher scores indicate higher perceived importance.

The multivariate analysis indicated that the importance domains, as a group, did not differ significantly by gender.

Possible range of the means for all variables = 1-4.
Table 4

**Descriptive Statistics for the Domain Discrepancies**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N= 53)</th>
<th>Boys (n = 25)</th>
<th>Girls (n = 28)</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Discrepancy</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-.32 (.47)</td>
<td>-.23 (.46)</td>
<td>-.40 (.46)</td>
<td>1.84</td>
<td>.18</td>
</tr>
<tr>
<td>Domains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholastic</td>
<td>-.33 (.76)</td>
<td>-.33 (.81)</td>
<td>-.33 (.72)</td>
<td>.00</td>
<td>.99</td>
</tr>
<tr>
<td>Social</td>
<td>.39 (.98)</td>
<td>.36 (.95)</td>
<td>.42 (1.02)</td>
<td>.05</td>
<td>.82</td>
</tr>
<tr>
<td>Athletic</td>
<td>-.13 (.76)</td>
<td>-.07 (.61)</td>
<td>-.19 (.89)</td>
<td>.36</td>
<td>.55</td>
</tr>
<tr>
<td>Physical</td>
<td>-.70 (1.19)</td>
<td>-.39 (1.26)</td>
<td>-.98 (1.07)</td>
<td>3.39</td>
<td>.07</td>
</tr>
<tr>
<td>Job</td>
<td>-.37 (.83)</td>
<td>-.24 (.81)</td>
<td>-.49 (.84)</td>
<td>1.19</td>
<td>.28</td>
</tr>
<tr>
<td>Romantic</td>
<td>-.65 (.93)</td>
<td>-.47 (.92)</td>
<td>-.82 (.94)</td>
<td>1.82</td>
<td>.18</td>
</tr>
<tr>
<td>Behavioural</td>
<td>-.29 (.64)</td>
<td>-.35 (.71)</td>
<td>-.23 (.58)</td>
<td>.50</td>
<td>.48</td>
</tr>
<tr>
<td>Close Friendship</td>
<td>-.49 (.82)</td>
<td>-.34 (.82)</td>
<td>-.62 (.82)</td>
<td>1.45</td>
<td>.23</td>
</tr>
</tbody>
</table>

*Note.* Negative scores indicate perceptions of competence lower than perceptions of importance.

*The multivariate analysis indicated that the domain discrepancies, as a group, did not differ significantly by gender.*
the values were negative except for the social domain, indicating that, overall, youth perceived their level of competence as being lower than the importance of each domain. The largest discrepancies were found for the domains of physical appearance and romantic appeal whereas the smallest discrepancies were noted in the domains of athletic competence and behavioural conduct. Results of a MANOVA using Pillai's trace indicated that there was no significant gender difference on the discrepancy domains as a group, $V = .18, F (8, 44) = 1.21; p = .32$. As a result, the univariate test for each domain discrepancy was not evaluated.

Youth were asked to indicate to whom they compared themselves when responding to the competence and the importance items. Results indicated that 77% of participants compared themselves to classmates, 4% compared themselves to other youth with chronic illness, and 19% compared themselves to "other" groups, including family members and peers outside of school. This suggests the majority of youth with chronic illness in this sample perceived themselves as "regular teenagers" in that the illness was not necessarily a central feature of their self-identity.

**Predictor Variables (Gender, Age, Parent Support, Depressive Symptoms, and Physical Health-Related Quality of Life)**

Descriptive statistics for the predictor variables for the total sample and subdivided by gender are presented in Table 5. ANOVA results comparing boys and girls on these variables are also presented in Table 5. A Bonferroni adjustment was made to account for multiple analyses (.05/4 = .01; therefore alpha was set at .01). On the measure of parent support, participants reported a mean score higher than the midpoint of the scale, indicating the youth in this sample perceived their parents as moderately
Table 5

Descriptive Statistics for the Predictor and Moderator Variables

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>Possible Range</th>
<th>Total $M (SD)$</th>
<th>Boys $M (SD)$</th>
<th>Girls $M (SD)$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>15.42 (1.28)</td>
<td>15.36 (1.29)</td>
<td>15.46 (1.29)</td>
<td>.09</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>Parent Support</td>
<td>24-120</td>
<td>59.78 (8.06)</td>
<td>60.51 (7.14)</td>
<td>59.13 (8.88)</td>
<td>.38</td>
<td>.54</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>0-13</td>
<td>4.35 (3.62)</td>
<td>3.22 (3.49)</td>
<td>5.29 (3.52)</td>
<td>4.79</td>
<td>.03</td>
</tr>
<tr>
<td>Physical Health-Related</td>
<td>0-100</td>
<td>71.57 (23.09)</td>
<td>80.16 (16.23)</td>
<td>64.51 (25.66)</td>
<td>6.43</td>
<td>.01**</td>
</tr>
<tr>
<td>Quality of Life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderator Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discounting</td>
<td>0-8</td>
<td>2.83 (1.77)</td>
<td>3.28 (1.93)</td>
<td>2.43 (1.55)</td>
<td>3.17</td>
<td>.08</td>
</tr>
<tr>
<td>Autonomy</td>
<td>0-90</td>
<td>62.85 (12.77)</td>
<td>67.16 (12.78)</td>
<td>59.0 (11.68)</td>
<td>5.90</td>
<td>.02*</td>
</tr>
</tbody>
</table>

Note. Higher scores indicate higher perceptions of each variable.

**$p < .01$. *$p < .03$.**
supportive. For depressive symptoms, participants reported a mean score lower than the midpoint of the scale, indicating most youth in this sample reported a low frequency of depressive symptoms. Finally, the mean score on the physical health subscale of health-related quality of life was above the midpoint. This suggests that, on average, the youth in this sample experienced a somewhat high physical health-related quality of life. With respect to gender differences, boys and girls did not differ significantly on age, parent support, or depressive symptoms. There was, however, a significant gender difference in level of physical health-related quality of life: Boys reported a significantly higher level of physical health-related quality of life compared to girls.

**Moderator Variables (Discounting and Autonomy)**

As previously described, discounting was defined as a positive discrepancy between the competence and importance rating on each domain. In other words, when participants rated the importance of a domain lower than their competence on that domain, the relevance of that domain to their self-concept was considered to be “discounted”. The number of domains discounted for each participant was summed, resulting in a possible range from 0-8. As indicated in Table 5, on average, participants discounted only a few of the total number of domains. Results of an ANOVA comparing the boys and girls indicated there was no significant gender difference in the number of domains discounted (applying the Bonferroni correction .05/2 = .025).

Participants’ mean score for autonomy was above the midpoint of the scale, indicating most of the youth perceived they have moderately high autonomy. An ANOVA comparing girls' and boys' average score showed that boys reported significantly higher autonomy than girls.
Pearson Correlations

Pearson correlations for the global self-worth and competence domains are presented in Table 6. Global self-worth was significantly positively correlated with four of the eight competence domains. Specifically, global self-worth was strongly correlated with physical appearance and romantic appeal, and moderately correlated with social acceptance and close friendship. Among the competence domains, scholastic competence was moderately positively correlated with social acceptance, behavioural conduct, and close friendship. Social acceptance was strongly positively correlated with close friendship and was moderately positively correlated with all of the remaining domains. Athletic competence was moderately positively correlated with physical appearance, job competence, and romantic appeal. Physical appearance and romantic appeal were strongly positively correlated. Finally, close friendship had moderate positive correlations with job competence, romantic appeal, and behavioural conduct.

Pearson correlations among the dependent, predictor and moderator variables are presented in Table 7. As illustrated, global self-worth was strongly negatively correlated with depressive symptoms and was strongly positively correlated with autonomy. Global self-worth was moderately positively correlated with physical health-related quality of life and discounting, was moderately negatively correlated with gender, but was not related to age or parent support. Depressive symptoms was strongly negatively correlated with physical health-related quality of life and autonomy, were moderately positively correlated with gender, and were moderately negatively correlated with discounting.
Table 6

*Pearson Correlations among Global Self-Worth and the Competence Domains*

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Global Self-Worth</td>
<td>.23</td>
<td>.33*</td>
<td>.26</td>
<td>.57**</td>
<td>.24</td>
<td>.55**</td>
<td>.19</td>
<td>.31*</td>
</tr>
<tr>
<td>2. Scholastic Competence</td>
<td>---</td>
<td>.47**</td>
<td>.24</td>
<td>.16</td>
<td>.20</td>
<td>.20</td>
<td>.39**</td>
<td>.39**</td>
</tr>
<tr>
<td>3. Social Acceptance</td>
<td>---</td>
<td>.43**</td>
<td>.35*</td>
<td>.48**</td>
<td>.49**</td>
<td>.41**</td>
<td>.64**</td>
<td></td>
</tr>
<tr>
<td>4. Athletic Competence</td>
<td>---</td>
<td>.43**</td>
<td>.28*</td>
<td>.48**</td>
<td>.09</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Physical Appearance</td>
<td>---</td>
<td>.25</td>
<td>.55**</td>
<td>.28*</td>
<td>.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Job Competence</td>
<td>---</td>
<td>.25</td>
<td>.04</td>
<td>.28*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Romantic Appeal</td>
<td>---</td>
<td>.27</td>
<td>.30*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Behavioral Conduct</td>
<td>---</td>
<td>.33*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Close Friendship</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. **p < .01. *p < .05*
Table 7

Pearson Correlations among Global Self-Worth and the Predictor and Moderator Variables

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Global Self-Worth</td>
<td>-.35*</td>
<td>-.04</td>
<td>.22</td>
<td>-.69**</td>
<td>.42**</td>
<td>.32*</td>
<td>.59**</td>
</tr>
<tr>
<td>2. Gender</td>
<td>---</td>
<td>.04</td>
<td>-.09</td>
<td>.29*</td>
<td>-.34*</td>
<td>-.24</td>
<td>-.32*</td>
</tr>
<tr>
<td>3. Age</td>
<td>---</td>
<td>-.01</td>
<td>-.05</td>
<td>-.01</td>
<td>-.05</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>4. Parent Support</td>
<td>---</td>
<td>-.11</td>
<td>.18</td>
<td>-.04</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Depressive Symptoms</td>
<td>---</td>
<td>-.63**</td>
<td>-.39**</td>
<td>-.58**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Physical Health-Related Quality of Life</td>
<td>---</td>
<td>.27</td>
<td>.39**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Discounting</td>
<td>---</td>
<td></td>
<td>.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Autonomy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. **p < .01. *p < .05.
Physical health-related quality of life was moderately positively correlated with autonomy and moderately negatively correlated with gender. Autonomy was also moderately negatively correlated with gender. Age and parent support were not correlated with any of the predictor or moderator variables.

**Analyses of Potential Covariates**

Results of a chi-square analysis indicated there were no gender differences among the diagnostic groups, \( \chi^2 (3) = .78, p = .85 \). Five one-way ANOVAs were conducted to evaluate whether the dependent and predictor variables were related to diagnosis (applying the Bonferroni correction .05/5 = .01, therefore alpha = .01; see Table 8). Results showed there were no differences among the diagnostic groups on these measures, with the exception of physical health-related quality of life. Tukey post-hoc analyses revealed youth who reported having asthma and diabetes had significantly higher health-related quality of life scores than youth with arthritis and those who reported having a comorbid diagnoses (i.e., celiac disease, deafness, and ADHD). Therefore, diagnosis was used as a covariate in analyses evaluating physical health-related quality of life.

To evaluate whether the moderator variables were related to diagnosis, two one-way ANOVAs were conducted (applying the Bonferroni correction .05/2 = .025). Results showed there were no differences among diagnostic groups on discounting or autonomy (see Table 9). Pearson correlations were examined between the dependent, predictor and
Table 8

ANOVA Results for Potential Covariate 'Diagnosis' on Global Self-Worth and the Predictor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Self-Worth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>3.02 (.54)</td>
<td>3, 49</td>
<td>.99</td>
<td>.41</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2.84 (.66)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td>2.76 (.61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2.57 (.74)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>15.48 (1.31)</td>
<td>3, 49</td>
<td>.49</td>
<td>.69</td>
</tr>
<tr>
<td>Diabetes</td>
<td>15.16 (1.30)</td>
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<td></td>
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</tr>
<tr>
<td>Arthritis</td>
<td>15.80 (1.10)</td>
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</tr>
<tr>
<td>Other</td>
<td>15.67 (1.37)</td>
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<tr>
<td>Parent Support</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>60.25 (9.01)</td>
<td>3, 49</td>
<td>1.39</td>
<td>.26</td>
</tr>
<tr>
<td>Diabetes</td>
<td>58.75 (5.90)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td>55.53 (12.40)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Other</td>
<td>64.78 (4.14)</td>
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<tr>
<td>Depressive Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>3.61 (3.49)</td>
<td>3, 49</td>
<td>2.71</td>
<td>.06</td>
</tr>
<tr>
<td>Diabetes</td>
<td>3.71 (2.86)</td>
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</tr>
<tr>
<td>Arthritis</td>
<td>6.00 (4.00)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>7.50 (4.14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Health-Related</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>72.83 (22.37)</td>
<td>3, 49</td>
<td>5.46</td>
<td>.00**</td>
</tr>
<tr>
<td>Diabetes</td>
<td>83.09 (14.83)</td>
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</tr>
<tr>
<td>Arthritis</td>
<td>51.88 (26.94)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>50.52 (21.69)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. **p < .01.
Table 9

ANOVA Results for Potential Covariate 'Diagnosis' on the Moderator Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Asthma</th>
<th>Diabetes</th>
<th>Arthritis</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discounting</td>
<td>2.87 (1.63)</td>
<td>3.32 (1.86)</td>
<td>2.20 (1.64)</td>
<td>1.67 (1.86)</td>
</tr>
<tr>
<td>Autonomy</td>
<td>66.0 (15.2)</td>
<td>61.42 (8.40)</td>
<td>61.60 (9.71)</td>
<td>56.33 (15.64)</td>
</tr>
</tbody>
</table>
moderator variables and BMI (applying the Bonferroni correction .05/8 = .01, therefore alpha = .01; see Table 10). Results showed that BMI was not related to any of the variables and was not included as a covariate in any of the analyses.

3.3 Hypothesis Testing

Hypotheses 1a-1c

According to Hypothesis 1a, it was expected that youth with chronic illness would report a moderate level of global self-worth and that this moderate level of self-worth would be comparable to the level of self-worth found in normative samples. The sample mean was higher than the midpoint of the scale, indicating that consistent with the hypothesis, youth with chronic illness had a moderate level of global self-worth and were generally happy with themselves as people. In order to evaluate Hypothesis 1a, a t-test was conducted to compare the mean sample score for global self-worth \([M(SD) = 2.88 (.62)]\) with Harter’s (2012b) published norms for global self-worth \([M(SD) = 2.99 (.63)]\). The result was non significant \((t = -1.22, p = .22)\), indicating that as expected, adolescents with chronic illness did not differ from typically developing youth on perceptions of overall self-worth. In Hypothesis 1b, it was predicted that boys would have higher global self-worth than girls. To test this hypothesis, a one-way ANOVA was conducted to examine whether there was a gender difference in global self-worth (see Table 2). Consistent with Hypothesis 1b, boys reported significantly higher global self-worth than girls. Finally, it was predicted in Hypothesis 1c that increasing age would be associated

\[3\] Analyses were performed using both the transformed and untransformed variable. As the results were the same, only the results of the untransformed variable will be reported as per Tabachnick & Fidell (2001).
Table 10

*Pearson Correlation Results for Potential Covariate 'BMI'*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$r$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.21</td>
<td>.13</td>
</tr>
<tr>
<td>Age</td>
<td>.28</td>
<td>.04</td>
</tr>
<tr>
<td>Parent Support</td>
<td>-.02</td>
<td>.88</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>.11</td>
<td>.43</td>
</tr>
<tr>
<td>Physical Health-Related Quality of Life</td>
<td>-.18</td>
<td>.21</td>
</tr>
<tr>
<td>Discounting</td>
<td>.14</td>
<td>.34</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-.04</td>
<td>.78</td>
</tr>
<tr>
<td>Global Self-Worth</td>
<td>-.23</td>
<td>.10</td>
</tr>
</tbody>
</table>
with higher global self-worth. In contrast to expectations, age was not significantly correlated with global self-worth ($r = -.04; p = .76$).

**Hypotheses 2a-2b**

According to Hypothesis 2a, all of the domain discrepancy ratings were expected to predict global self-worth, and the physical appearance discrepancy was expected to be the strongest predictor. To examine Hypothesis 2a, a multiple regression was conducted in which each of the eight discrepancy domain ratings was entered together on one step as predictors of global self-worth. In support of Hypothesis 2a, the overall model was significant, $F (8, 44) = 2.26; p = .04$. As a group, the eight discrepancy domains accounted for 29% of the total variance in global self-worth. Contrary to Hypothesis 2a, the physical appearance discrepancy variable was not the strongest individual predictor of global self-worth for all youth. Instead, the romantic appeal discrepancy variable emerged as the only significant unique predictor, accounting for 12% ($\sigma r^2$) of the variance (see Table 11).

It was predicted in Hypothesis 2b that the physical appearance discrepancy would be a stronger predictor of global self-worth for girls compared to boys. To evaluate Hypothesis 2b, a hierarchical multiple regression in which the physical appearance discrepancy variable and gender were entered on Step 1 and the physical appearance discrepancy by gender interaction was entered on Step 2 was conducted (see Table 12). The overall model was significant, $F (3, 49) = 4.42, p = .01$, accounting for 21% of the variance in global self-worth. Step 1, with both the physical appearance discrepancy and gender in the equation, was significant. An examination of the individual predictors revealed the physical appearance discrepancy variable was a significant unique predictor,
Table 11

*Multiple Regression Results for Competence Discrepancy Domains as Predictors of Global Self-Worth*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Global Self-Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
</tr>
<tr>
<td>Scholastic Discrepancy</td>
<td>-.07</td>
</tr>
<tr>
<td>Social Discrepancy</td>
<td>.09</td>
</tr>
<tr>
<td>Athletic Discrepancy</td>
<td>.03</td>
</tr>
<tr>
<td>Physical Discrepancy</td>
<td>.10</td>
</tr>
<tr>
<td>Job Discrepancy</td>
<td>-.03</td>
</tr>
<tr>
<td>Romantic Appeal Discrepancy</td>
<td>.27</td>
</tr>
<tr>
<td>Behavioral Conduct Discrepancy</td>
<td>-.09</td>
</tr>
<tr>
<td>Close Friendship Discrepancy</td>
<td>.06</td>
</tr>
</tbody>
</table>

*Note. **$p < .01.$*
Table 12

Hierarchical Multiple Regression Results for the Physical Appearance Discrepancy and Gender as Predictors of Global Self-Worth

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Global Self-Worth</th>
<th>( \beta )</th>
<th>sr</th>
<th>( \Delta R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Appearance Discrepancy</td>
<td></td>
<td>.31</td>
<td>.30*</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>-.27</td>
<td>-.26*</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td>.004</td>
</tr>
<tr>
<td>Physical Appearance Discrepancy</td>
<td></td>
<td>.22</td>
<td>.51</td>
<td></td>
</tr>
<tr>
<td>BY Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final ( R^2 )</td>
<td></td>
<td></td>
<td></td>
<td>.21</td>
</tr>
</tbody>
</table>

Note. *\( p < .05 \). **\( p < .01 \).
accounting for 9% ($r^2$) of the variance in global self-worth, as was gender, accounting for 7% ($r^2$) of the variance in global self-worth. The addition of the interaction term for the physical appearance discrepancy and gender on Step 2 did not improve the prediction of global self-worth. Therefore, Hypothesis 2b, that physical appearance was a stronger predictor of global self-worth for girls compared to boys was not supported.

Hypotheses 3a-3e

According to Hypothesis 3, a) male gender, b) older age, c) higher parent support, and d) fewer depressive symptoms were expected to predict higher global self-worth. Hypothesis 3e stated health-related quality of life was expected to predict global self-worth over and above these general factors. To evaluate Hypotheses 3a-3e, a hierarchical multiple regression was conducted. Diagnosis was entered on Step 1 to control for its potential effect on global self-worth. Gender, age, parent support and depressive symptoms were entered on Step 2 and physical health-related quality of life was entered on Step 3 to determine whether it added anything to the prediction of global self-worth over and above the variables entered on the first two steps (see Table 13).

Results of the overall model were significant, $F (6, 44) = 7.22, p < .01$. As a group, all of the predictors accounted for 50% of the total variance in global self-worth. Step 1, with diagnosis entered as a covariate, was not significant, indicating that it did not uniquely predict global self-worth. Step 2, with gender, age, parent support and depressive symptoms added to the equation, was significant, indicating the addition of these variables significantly improved the prediction of global self-worth. Only depressive symptoms, however, was a significant unique contributor, accounting for 33%
Table 13

Hierarchical Multiple Regression Results for the Covariate and Main Predictors of Global Self-Worth

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Global Self-Worth</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>sr</td>
<td>ΔR²</td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td>-.23</td>
<td>-.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.44**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.14</td>
<td>-.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.07</td>
<td>-.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Support</td>
<td>.01</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>-.66</td>
<td>-.58**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Health-Related</td>
<td>-.06</td>
<td>-.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of Life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final R²</td>
<td>.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. **p < .01.*
(sr²) of the variance in global self-worth. As expected, fewer depressive symptoms predicted higher global self-worth. Step 3, with physical health-related quality of life added to the equation, was not significant. Physical health-related quality of life did not improve the prediction of global self-worth. Thus, only partial support was found for Hypotheses 3a-3e (i.e., Hypothesis 3d).

**Hypotheses 4a-4b**

According to Hypothesis 4a, the relationship between health-related quality of life and global self-worth was expected to be weaker for youth who discount more domains of competence. Hypothesis 4b posited that the strength of the relationship between health-related quality of life and global self-worth would be weaker for girls who discount than for boys who discount. To evaluate Hypotheses 4a and 4b, a hierarchical multiple regression was conducted entering the covariate ‘diagnosis’ on Step 1, gender, physical health-related quality of life, and discounting on Step 2, the two-way physical health-related quality of life by discounting interaction on Step 3, the two-way gender by physical health-related quality of life, and gender by discounting interactions on Step 4, and the three-way gender by physical health-related quality of life by discounting interaction on Step 5 (see Table 14). Results of the overall model were not significant, \( F(8, 44) = 2.05, p = .06 \). Step 1, with the covariate diagnosis in the equation, was not significant, indicating diagnosis did not significantly predict global self-worth. Step 2, with gender, physical health-related quality of life, and discounting added to the equation, was significant, indicating the addition of these variables significantly improved the prediction of global self-worth. Only physical health-related quality of life, however, was
Table 14

Hierarchical Multiple Regression Results for Discounting as a Moderator between Health-Related Quality of Life and Global Self-Worth

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>sr</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td>-.23</td>
<td>-.23</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.20</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>Physical Health-Related Quality of Life</td>
<td>.28</td>
<td>.25*</td>
<td></td>
</tr>
<tr>
<td>Discounting</td>
<td>.18</td>
<td>.17</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Health-Related Quality of Life BY Discounting</td>
<td>.04</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender BY Physical Health-Related Quality of Life</td>
<td>.07</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Gender BY Discounting</td>
<td>.03</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Step 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender BY Physical Health-Related Quality of Life BY Discounting</td>
<td>.09</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>Final R²</td>
<td></td>
<td></td>
<td>.27</td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .01.
a significant unique contributor, accounting for 6% ($r^2$) of the variance in global self-worth. Neither Step 3 nor Step 4, with the two-way interaction terms added to the equation, was significant. Step 5, with the three-way interaction term added to the equation was not significant. Therefore, Hypotheses 4a and 4b were not supported.

**Hypotheses 5a-5b**

According to Hypothesis 5a, the relationship between health-related quality of life and global self-worth was expected to be weaker for youth with higher autonomy. Hypothesis 5b posited that the strength of the relationship between health-related quality of life and global self-worth would be weaker for girls with higher autonomy than for boys with higher autonomy. To evaluate Hypotheses 5a and 5b, a hierarchical multiple regression was conducted entering the covariate ‘diagnosis’ on Step 1, gender, physical health-related quality of life, and autonomy on Step 2, the two-way physical health-related quality of life by autonomy interaction on Step 3, the two-way gender by physical health-related quality of life, and gender by autonomy interactions on Step 4, and the three-way gender by physical health-related quality of life by autonomy interaction on Step 5 (see Table 15). Results of the overall model were significant $F(8, 44) = 4.50, p < .01$, with the predictors accounting for 45% of the total variance in global self-worth. Step 1 was not significant, indicating that diagnosis did not predict global self-worth. Step 2, with gender, physical health-related quality of life, and autonomy added to the equation, was significant, indicating the addition of these variables significantly improved the prediction of global self-worth. An examination of the individual predictors in Step 2 showed autonomy was the only significant unique predictor, accounting for 17% ($r^2$) of the variance in global self-worth. Neither Step 3 nor Step 4, with the
Table 15

*Hierarchical Multiple Regression Results for Autonomy as a Moderator between Health-Related Quality of Life and Global Self-Worth*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Global Self-Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td>-.23</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.13</td>
</tr>
<tr>
<td>Physical Health-Related Quality of Life</td>
<td>.18</td>
</tr>
<tr>
<td>Autonomy</td>
<td>.47</td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
</tr>
<tr>
<td>Physical Health-Related Quality of Life BY</td>
<td>-.10</td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td></td>
</tr>
<tr>
<td>Gender BY Physical Health-Related Quality of Life</td>
<td>.14</td>
</tr>
<tr>
<td>Gender BY Autonomy</td>
<td>.17</td>
</tr>
<tr>
<td>Step 5</td>
<td></td>
</tr>
<tr>
<td>Gender BY Physical Health-Related Quality of Life BY</td>
<td>-.10</td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
</tr>
<tr>
<td>Final R²</td>
<td></td>
</tr>
</tbody>
</table>

*Note.** p < .01.*
two-way interaction terms added to the equation, was significant. Step 5, with the three-way interaction term added to the equation was not significant. Therefore, Hypotheses 5a and 5b were not supported.

3.4 Post-Hoc Analyses

Post-Hoc Regression Analysis

Hypothesis 2a predicted that the physical appearance discrepancy would emerge as the most salient domain in the prediction of global self-worth, and hypothesis 2b predicted that the physical appearance discrepancy would be a stronger predictor for girls compared to boys. However, contrary to expectation, the romantic appeal discrepancy emerged as the only unique predictor of global self-worth. Therefore, a post-hoc regression analysis was conducted to examine whether the romantic appeal discrepancy was more important for the self-worth of girls or boys. To evaluate this, a hierarchical multiple regression in which the romantic appeal discrepancy variable and gender were entered on Step 1 and the romantic appeal discrepancy by gender interaction was entered on Step 2 was conducted (see Table 16). The overall model was significant, $F (3, 49) = 7.37, p = .01$, accounting for 31% of the variance in global self-worth. Step 1, with both the romantic appeal discrepancy and gender in the equation, was significant. An examination of the individual predictors revealed the romantic appeal discrepancy was a significant unique predictor, accounting for 17% ($sr^2$) of the variance in global self-worth, as was gender, accounting for 8% ($sr^2$) of the variance in global self-worth. The addition of the interaction term for the romantic appeal discrepancy and gender on Step 2 did not improve the prediction of global self-worth. Therefore, similar to the finding that the physical appearance discrepancy was not a stronger predictor of global self-worth for
Table 16

*Post-Hoc Hierarchical Multiple Regression Results for the Romantic Appeal Discrepancy and Gender as Predictors of Global Self-Worth*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Global Self-Worth</th>
<th>( \beta )</th>
<th>( sr )</th>
<th>( \Delta R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romantic Appeal Discrepancy</td>
<td></td>
<td>.42</td>
<td>.41**</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>-.27</td>
<td>-.27*</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td>.02</td>
</tr>
<tr>
<td>Romantic Appeal Discrepancy</td>
<td></td>
<td>.54</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>BY Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final ( R^2 )</td>
<td></td>
<td></td>
<td></td>
<td>.31</td>
</tr>
</tbody>
</table>

*Note. *\( p < .05. **p < .01.\)*
girls compared to boys, the romantic appeal discrepancy predicted global self-worth equally for girls and boys.

**Post-Hoc Mediation Analysis A**

In Hypotheses 3a-3e, the variables gender, age, parent support, depressive symptoms and physical health-related quality of life were evaluated in the prediction of global self-worth. The results showed support for Hypothesis 3d in that depressive symptoms emerged as the only significant predictor. It was also found that depressive symptoms and physical health-related quality of life were strongly negatively correlated ($r = -.63, p < .01$).

As previously noted, the direct relationship between physical health-related quality of life and global self-worth has not been well established among youth with chronic illness, although some support has been found for the effect of pain on self-esteem and other developmental factors (e.g., Eccleston et al., 2008). In considering the direction of the relationship between physical health-related quality of life and depressive symptoms, several researchers have posited that pain, which is regarded as the most salient factor involved in perceptions of quality of life, leads to depression (Egger, Angold, & Costello, 1998; Larsson & Sund, 2007; Lewandowski Holley et al., 2013; Mulvaney, Lambert, Garber, & Walker, 2006). Finally, the relationship between depressive symptoms and global self-worth has been well established in the literature, with some researchers arguing that depressive symptoms lead to global self-worth (Renouf & Harter, 1990). Although the nature of the relationship among all three variables is unclear, it appears that pain leads to depressive symptoms and depressive symptoms lead to low global self-worth. Thus, it is reasonable to postulate that among
youth with chronic illness, the effect of higher physical quality of life on global self-worth may be mediated by fewer depressive symptoms.

In order to test this relationship, a mediation analysis was conducted according to the method outlined by Preacher and Hayes (2004) using the macro "Indirect." Five thousand samples were used to generate the mean path coefficients, standard error, and 95% bias corrected and accelerated confidence interval (CI) to test the indirect effect. When zero is not included in the 95% CI, the indirect effect is deemed significantly different from zero at \( p < .05 \). Whether a significant indirect effect also indicates full or partial mediation is determined by examining it in relation to the total effect (i.e., the direct effect of the independent variable on the dependent variable) and the direct effect (i.e., the direct effect of the independent variable on the dependent variable after controlling for the proposed mediator) (Mathieu & Taylor, 2006; Preacher & Hayes, 2004). The results indicated that there was a significant total effect of physical health-related quality of life on global self-worth, \( b = .01, p < .01 \). There also was a significant effect of physical health-related quality of life on depressive symptoms, \( b = -.10, p < .01 \). Further, there was a significant effect of depressive symptoms on global self-worth, controlling for physical health-related quality of life, \( b = -.12, p < .01 \). There was no direct effect of physical health-related quality of life on global self-worth, controlling for depressive symptoms, \( b = -.00, p = .88 \). Finally, the test of the indirect effect of physical health-related quality of life on global self-worth through depressive symptoms was significant (95% CI = .0070-.0196; \( p < .05 \)). This pattern of a significant indirect effect along with a significant total effect and a nonsignificant direct effect suggests that depressive symptoms fully mediate the relation between physical health-related quality of
life and global self-worth in this sample of adolescents with chronic illness (see Figure 2).

Post-Hoc Mediation Analysis B

In order to test whether the romantic appeal discrepancy mediated the relationship between the physical appearance discrepancy and global self-worth, a post-hoc mediation analysis was conducted according to the method outlined by Preacher and Hayes (2004) using the macro "Indirect". Five thousand samples were used to generate the mean path coefficients, standard error, and 95% bias corrected and accelerated confidence interval (CI) to test the indirect effect. The results indicated that there was a significant total effect of the physical appearance discrepancy on global self-worth, $b = .19, p < .01$. There also was a significant effect of the physical appearance discrepancy on the romantic appeal discrepancy, $b = .30, p < .01$. Further, there was a significant effect of the romantic appeal discrepancy on global self-worth, controlling for the physical appearance discrepancy, $b = .25, p < .01$. There was no direct effect of the physical appearance discrepancy on global self-worth, controlling for the romantic appeal discrepancy, $b = .12, p = .09$. Finally, the test of the indirect effect of the physical appearance discrepancy on global self-worth through the romantic appeal discrepancy was significant (95% CI = .0135-.1729; $p < .05$). This pattern of a significant indirect effect along with a significant total effect and a nonsignificant direct effect suggests that the romantic appeal discrepancy fully mediates the relation between the physical appearance discrepancy and global self-worth in this sample of adolescents with chronic illness (see Figure 3).
Figure 2. Mediation pattern among physical health-related quality of life, depressive symptoms, and global self-worth. Values are unstandardized coefficients (b-values) and their corresponding standard error. Total $R^2 = .47$.

*a b-value for the independent variable after controlling for the mediating variable.

**p < .01.
Physical Appearance Discrepancy

Romantic Appeal Discrepancy

Global Self-Worth

Figure 3. Mediation pattern among the physical appearance discrepancy, romantic appeal discrepancy, and global self-worth. Values are unstandardized coefficients (b-values) and their corresponding standard error. Total $R^2 = .26$.

* $b$-value for the independent variable after controlling for the mediating variable.

** $p < .01$. 
Post-Hoc Mediation Analysis C

In order to test whether depressive symptoms mediated the relationship between discounting and global self-worth, a post-hoc mediation analysis was conducted according to the method outlined by Preacher and Hayes (2004) using the macro "Indirect". Five thousand samples were used to generate the mean path coefficients, standard error, and 95% bias corrected and accelerated confidence interval (CI) to test the indirect effect. The results indicated that there was a significant total effect of discounting on global self-worth, $b = .11, p = .02$. There also was a significant effect of discounting on depressive symptoms, $b = -.79, p < .01$. Further, there was a significant effect of depressive symptoms on global self-worth, controlling for discounting, $b = -.11, p < .01$. There was no direct effect of discounting on global self-worth, controlling for depressive symptoms, $b = .02, p = .62$. Finally, the test of the indirect effect of discounting on global self-worth through depressive symptoms was significant (95% CI = .0374-.1707; $p < .05$). This pattern of a significant indirect effect along with a significant total effect and a nonsignificant direct effect suggests that depressive symptoms fully mediates the relation between discounting and global self-worth in this sample of adolescents with chronic illness (see Figure 4).
Figure 4. Mediation pattern among discounting, depressive symptoms, and global self-worth. Values are unstandardized coefficients ($b$-values) and their corresponding standard error. Total $R^2 = .47$.

* $b$-value for the independent variable after controlling for the mediating variable.

** $p < .01$.

* $p < .05$. 

Discounting \arrow Depressive Symptoms \arrow Global Self-Worth

-.79 (.26)**

-.11 (.02)**

.11 (.04)*

.02 (.04)*
4.0 DISCUSSION

The current study aimed to evaluate the applicability of Harter’s model of self-perception to adolescents with chronic illness, to describe the level of global self-worth and domain competence perceived by youth with chronic illness, and to identify factors that predict global self-worth in youth with chronic illness. Furthermore, the study goals included evaluating specific moderators of the relationship between health-related quality of life and global self-worth. A discussion of the results for each of these aims is presented. Next, the implications of these findings for youth with chronic illness with respect to Harter’s model of self-perception are discussed. Finally, limitations of this study and directions for future research are presented.

4.1 Global Self-Worth and Competence Domains in Youth with Chronic Illness

This sample of youth with chronic illness reported a moderate level of global self-worth suggesting that overall they are happy with themselves as people. Their mean score of 2.88 was not statistically different from the norm of 2.99 reported by Harter (2012b) for typically developing adolescents. This result is consistent with the expectation outlined in Hypothesis 1a and with existing literature (Barlow & Ellard, 2006; Erkolahti & Ilonen, 2005; Gortmaker et al., 1993; LeBovidge et al., 2003; Miller, 1993) and provides additional support for the conclusion that overall the level of global self-worth reported by youth with chronic illness is similar to that reported by typically developing adolescents. Thus, the accumulating evidence suggests there are likely no group differences, at least in comparison to available norms, and investigators should focus on factors within both groups that promote or impede the development of optimal self-worth.
With respect to the youth's perceived level of competence on the domains that make up global self-worth, these youth perceived themselves as more competent than not in all areas. They perceived themselves as most competent in the areas of job competence, behavioural conduct, social acceptance, and close friendship, respectively. This pattern is similar to Harter's (2012b) normative data which shows that close friendship followed by job competence were consistently rated the highest by youths. The youth in the current study reported their lowest competence in physical appearance followed by athletic competence. In contrast, Harter (2012b) found that romantic appeal followed by physical appearance were consistently rated the lowest. It is likely that the lower perceived athletic competence reported by the youth with chronic illness in this sample (2.40, as compared to 2.71) was due to illness-related factors limiting physical activity. In general, with the exception of athletic competence, the youth with chronic illness in this study reported similar levels of competence in all of the domains as compared to reported norms.

With respect to the domains of perceived importance, these youth perceived that close friendship and job competence were the most important domains, although all domains were considered important. The least important ratings were given to the domains of social acceptance and athletic competence. Although Harter (2012b) does not provide normative data for the domains of importance, it is interesting to note that the youth in this study reported their highest importance ratings on the two domains that typical adolescents rate highest in competence, suggesting that peer comparison likely influences importance ratings.
Considering the discrepancy between competence and importance, all of the domains were rated with a negative discrepancy except the social acceptance domain, indicating that youth perceived the importance of all these domains to be greater than their competence. The largest discrepancies were found for the domains of physical appearance and romantic appeal, and the smallest discrepancies were noted in the domains of athletic competence and behavioural conduct. Harter (2012b) does not provide normative data for discrepancy scores; however, it is notable that the domains with the largest discrepancy in this study correspond with the domains generally found to contribute the most to global self-worth (Harter, 2012a). Also noteworthy is that the smallest discrepancy score was found in the domain of athletic competence, which was also found to have the lowest competence rating. Therefore it appears that youth with chronic illness in this sample "discounted" athletic competence in that they rated both their competence and the importance of this domain relatively low.

Altogether, the eight discrepancy domains of Harter's model significantly predicted global self-worth, accounting for 29% of the total variance in global self-worth, supporting Hypothesis 2a. With respect to the individual discrepancy domains, only the romantic appeal discrepancy emerged as a significant unique predictor of global self-worth, contrary to the expectation that physical appearance discrepancy would be the most significant domain. This suggests that for this sample of youth with chronic illness, their perceived competence about how appealing they are to prospective romantic partners was lower than the importance placed on this domain, and this was negatively associated with their overall self-worth more than any other domain.
Harter's (1990) and Harter and Jackson's (1993) work with typically developing early adolescents found physical appearance and social acceptance were the two domains most critical to global self-worth. They evaluated this by examining individual correlations (not a regression analysis, which considers shared variance) between domain discrepancies and global self-worth. When individual correlations were examined in the current study, both the physical appearance discrepancy ($r = .37; p < .01$) and the romantic appeal discrepancy ($r = .47; p < .01$) were significantly correlated with global self-worth. They were also significantly correlated with each other ($r = .38, p < .01$).

Thus, consistent with the research by Harter and colleagues, it appears that for this group of youth, the discrepancy between the importance of being attractive and their evaluation of their physical appearance is a major concern in determining how appealing they are to romantic partners, which in turn is a key determinant of their overall feelings of self-worth. Indeed, Post-hoc Meditational Analysis B revealed this to be true suggesting that for youth with chronic illness, romantic appeal might be the more critical domain because although physical attractiveness is an important part of their self-evaluation, they might also consider how their illness could affect a potential partner. For the majority of these youth, having asthma, arthritis or diabetes is "invisible" and does not affect physical appearance. In contrast, perhaps the behaviours necessary for disease management, such as using an inhaler, administering insulin injections, or abstaining from physically demanding leisure activities such as group sports, are perceived as "unattractive" by the youth and/or his or her potential romantic partner and become a barrier to romantic relationships. This finding points to the importance of research examining romantic relationships among youth with chronic illness, as there is currently no information
available pertaining to how a chronic illness might impact the initiation or development of such relationships.

In discussing the robust relationship between physical appearance and global self-worth across the lifespan, Harter (1990; 2012a) raises the possibility that physical appearance represents the manifestation of the outer self, whereas self-worth represents the inner self. As such, she proposes appearance is qualitatively different from the other competence/adequacy domains in that it is not merely one discrete, relatively situation-specific area of performance in which one manifests the appropriate behaviour, but an omnipresent feature of the self that is always on display. An implication of this is that the outer self develops prior to, and therefore has an impact on, the inner self. For example, adolescents must psychologically respond to bodily changes that emerge during puberty and their positive or negative evaluation of puberty has an impact on their inner self. This relationship may be bi-directional, however, in that it is also possible that one's perceived self-worth may affect one's views about one's appearance. For example, children who have depression and corresponding low self-worth report lower perceived physical attractiveness than children without depression (Bang et al., 2012).

Moreover, in their subsequent research examining similarities and differences in domain-specific and global self-evaluations among adolescents with learning disabilities, behavioural disorders, and normally-achieving adolescents, Harter, Whitesell, and Junkin (1998) found perceptions of physical appearance, romantic attractiveness, and peer likeability were the strongest predictors of global self-worth for youths in all three groups. These researchers surmised that the emphasis on physical attractiveness for youth in our culture contributes to the consistent finding that it is the most salient contributor to
self-worth, irrespective of group status. Thus, the results of the present study add to the growing body of literature showing physical appearance and its relation to romantic appeal are paramount to perceptions of global self-worth regardless of the presence of physical or cognitive disabilities.

4.2 Predictors of Global Self-Worth in Youth with Chronic Illness

Gender

Consistent with Hypothesis 1b, boys reported significantly higher global self-worth than girls. This finding is concordant with the extensive literature indicating girls report lower self-esteem than boys across cultures and age groups (Harper & Marshall, 1991; Knox et al., 2000; Moksnes & Espnes, 2012). Explanations for this result vary according to theoretical orientation, and include a combination of affective (emotional reactivity), biological (genetic vulnerability, pubertal timing and development) and cognitive factors (cognitive style, objectified body consciousness, rumination), in interaction with gender role intensification and stress exposure during adolescence (Essau, Lewinsohn, Seeley, & Sasagawa, 2010; Graber & Sontag, 2009; Hyde, Mezulis, & Abramson, 2008). Other researchers posit that girls are more oriented to group/social views of the self whereas boys are more orientated to individual views of the self, leading to inflated self-perceptions for boys (Gilligan, 1982).

In considering gender differences for the domains, there were no gender differences overall among the perceptions of competence for specific domains, perceptions of importance for specific domains, or domain discrepancies. This pattern of results indicates that in this sample both boys and girls see themselves similarly on these domains and regard these domains as important to the same extent. Other researchers
have also found that both boys and girls consider physical appearance to be equally important. For example, Hagborg (1993) examined gender differences on Harter's Self-Perception Profile for Adolescents and found that, although boys rated themselves higher on physical appearance than girls, this domain contributed to global self-worth equally for both genders and played a central role in overall self-worth. It was not surprising then that the physical appearance discrepancy was not a stronger predictor of global self-worth for girls than boys, although it was contrary to Hypothesis 2b. That is, the interaction between the physical appearance discrepancy variable and gender was not significant. Similarly, the post-hoc regression analysis examining the romantic appeal discrepancy found similar results whereby the interaction between the romantic appeal discrepancy and gender was not significant. It is possible that because both girls and boys place equal emphasis on the importance of physical appearance and romantic appeal, these domains contribute to overall global self-worth, regardless of the degree of discrepancy. In other words, neither boys nor girls discount the importance of physical appearance or romantic appeal in assessing their overall sense of worth. Using the definition of "discounting" operationalized for this study, an examination of the frequency data for the physical appearance domain revealed that 66% of the overall sample "Failed to discount" this domain. Divided by gender, 56% of boys "failed to discount" this domain, whereas 75% of girls "failed to discount" physical appearance. Thus it appears that for the majority of these youth with chronic illness, the importance of physical appearance to overall self-worth is paramount for both boys and girls.
Age

Examination of the bivariate correlations and the regression analyses showed that in contrast to Hypothesis 1c, age was not related to global self-worth. This result was unexpected given most researchers studying typically developing youth (e.g., Harter, 1999; Moksnes & Espnes, 2012; Robins et al., 2002) and youth with chronic illness (e.g., Gortmaker et al., 1993; Lavigne & Faier-Routman, 1993) have found global self-worth generally improves as adolescents get older. However, Baldwin and Hoffmann (2002) found age had a curvilinear relationship with self-esteem, indicating self-esteem is highly variable during the adolescent years. Similarly, Hirsch and DuBois (1991) and Zimmerman et al. (1997) found variability among their sample of early adolescents and identified four divergent trajectories of self-esteem, suggesting that age might not be as important as other factors that affect self-concept. It is possible that for youth with chronic illness, this variability is amplified as some youth may experience lower self-worth as they age and perceive that their illness negatively affects more aspects of their life, whereas others may follow the typical trajectory and incorporate their illness into a positive overall self-concept.

Parent Support

In examining both the bivariate correlations and regression analyses, parent support was not significantly related to global self-worth. This was unexpected and counter to Hypothesis 3c. Previous research has consistently found that parent support is positively correlated with global self-worth in both typically developing adolescents (Bosacki et al., 2007; Laible & Carlo, 2004; Robinson, 1995), as well as those with chronic illness (Cuneo & Schiaffino, 2002; Kyngäs, 2004).
Kyngä (2004) found that youth with chronic illness felt most supported when they were able to share almost all issues and emotions with their parents without the focus of their discussions centering on the disease and its treatment. Although the majority of youth in this sample reported they felt moderately supported by their parents, perhaps they experience ambivalence in how they relate to their parents (i.e., by simultaneously endorsing that their parents "respect my feelings" but "don't understand what I'm going through these days"), demonstrating the complexity of the parent-adolescent relationship in the context of a chronic illness. It is notable that the measure of parent support used in this study (i.e., the Parent Support subscale of the Inventory of Parent and Peer Support) had to be modified due to problematic internal consistency. It may be that a measure of parent support for youth with chronic illness that specifically taps the extent to which the youth feel supported in both their illness and non-illness related needs would be a more accurate reflection of perceived parental support and may thus be a better predictor of global self-worth.

It is also possible that the youth with chronic illness in this sample rely more on their peers for emotional support and place less emphasis on their parents in determining their overall self-worth. As previously described, both boys and girls reported social acceptance and close friendship as two of their top four most competent domains. Close friendship was rated as the most important domain overall, and the discrepancy on the social acceptance domain was the only positive discrepancy, indicating that youth perceived their competence even higher than the importance of this domain. Although these variables did not uniquely predict global self-worth in the presence of the more salient domains, both social acceptance and close friendship were significantly positively

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correlated with global self-worth. Therefore, it is possible that peer support may take on a more dominant role compared with parent support in determining global self-worth for adolescents with chronic illness.

**Depressive Symptoms**

An examination of the bivariate correlations found that level of depressive symptoms was strongly negatively correlated with global self-worth. Thus having fewer depressive symptoms was related to higher global self-worth. In the regression analysis used to evaluate Hypotheses 3a-e, the group of variables significantly predicted global self-worth; however, only level of depressive symptoms emerged as a significant unique predictor, accounting for 33% of the variance in global self-worth. This finding was expected given the overwhelming evidence on the intricate link between depression and self-esteem (Abramson et al., 1978; Harter, 2012a; Harter & Whitesell, 1996; Nolen-Hoeksema, 1990).

As previously described in the Introduction, there is considerable debate about the causal direction of this observed relationship between depression and self-worth. The vulnerability model states low self-esteem is a causal risk factor for the development of depression (Beck, 1967). Alternatively, the scar model proposes low self-esteem is a consequence, rather than a cause of depression, because experiences of depression may leave permanent 'scars' in the self-concept of the individual (Shahar & Davidson, 2003). Orth, Robins, Widaman, and Conger (2014) point out that the two models are not mutually exclusive because both processes (i.e., low self-esteem contributing to depression and depression contributing to low self-esteem) likely operate simultaneously. In their longitudinal study investigating the relationship between depression and self-
esteem in Mexican American youth, Orth et al. (2014) found that the vulnerability effect of low self-esteem was largely driven by general evaluations of the self (i.e., global self-esteem), but not domain-specific evaluations. Similarly, in the present study for youth with chronic illness, level of depressive symptoms was related to global self-worth whereas the youth’s competence ratings on the individual domains were not related to depression. This was the case for both boys and girls as the level of depressive symptoms overpowered the effect of gender in predicting global self-worth. Although the data in this study did not address the causal direction of the relationship, it is clear that for both typically developing youth and youth with chronic illness, there is an intricate link between depression and global self-worth.

Physical Health-related Quality of Life

An examination of the bivariate correlations showed that physical health-related quality of life was significantly positively correlated with global self-worth. In the regression analysis performed to evaluate Hypotheses 3a-e however, it was found that physical health-related quality of life did not significantly add to the prediction of global self-worth over and above the other variables. It was also observed that level of depressive symptoms was highly negatively correlated with physical health-related quality of life. Thus, a post-hoc mediation analysis was conducted to further examine the relationship among physical health-related quality of life, depressive symptoms, and global self-worth. Although physical health-related quality of life predicted global self-worth directly, physical health-related quality of life was not a significant predictor of global self-worth once level of depressive symptoms was taken into account. Thus,
depressive symptoms fully mediated the relationship between physical health-related quality of life and global self-worth.

The strong correlation between physical health, particularly the severity of pain, and depression has been documented in several studies of adolescents with chronic illness (Egger et al., 1998; Larsson & Sund, 2007; Mulvaney et al., 2006; Stanford, Chambers, Biesanz, & Chen, 2008). Recently, Lewandowski et al. (2013) investigated the reciprocal longitudinal associations between pain and depressive symptoms in adolescents. They found that pain and depressive symptoms were significantly associated over time and that this relationship was bi-directional. That is, Lewandowski and colleagues found changes in pain were associated with subsequent changes in levels of depressive symptoms, suggesting increasing pain intensity contributed to increasing levels of depression. Conversely, they also found changes in level of depressive symptoms predicted subsequent pain, but with a weaker association.

In the current study, significant differences in physical health-related quality of life were observed among the diagnostic groups (see Table 8). Specifically, youth with asthma and diabetes reported significantly higher physical health-related quality of life than youth with arthritis and comorbid illnesses. In a similar fashion, differences among diagnostic groups approached significance on depressive symptoms, with youth with asthma and diabetes tending to report lower levels of depressive symptoms compared to those with arthritis. Considering the three conditions, the possibility of experiencing pain appears to be the factor that most likely sets youth with arthritis apart from youth with diabetes and asthma. Given the bi-directional relationship between pain and depression described by Lewandowski et al. (2013), it is likely that the relationship observed
between physical health-related quality of life and depressive symptoms is also bidirectional. Nevertheless, Lewandowski et al. (2013) also found that pain is a stronger contributor to depression than vice versa. As there was a trend towards the youth with arthritis having a higher level of depressive symptoms, it is also likely the direction of causality between physical health-related quality of life and depression is similar in this sample. In other words, physical health-related quality of life more strongly contributes to depressive symptoms than vice versa. Thus, it is reasonable to postulate that among youth with chronic illness, particularly when that illness is accompanied by pain, higher physical health-related quality of life could attenuate the development of depressive symptoms. Given there is also a strong association between depressive symptoms and global self-worth, lower levels of depressive symptoms are a possible mechanism accounting for the direct relationship between higher physical health-related quality of life and higher global self-worth.

### 4.3 Moderators of Global Self-Worth

**Discounting**

Discounting was investigated as a potential moderator of the relationship between physical health-related quality of life and global self-worth (Hypothesis 4a). The overall regression model evaluating Hypothesis 4a was not significant, however, indicating discounting did not moderate the relationship between physical health-related quality of life and global self-worth. Thus, it may be that discounting is better conceptualized in terms of its direct effect on evaluations of the domains and on global self-worth as opposed to moderating other variables. Indeed, an examination of the bivariate correlations showed that discounting was significantly positively correlated with global self-worth.
self-worth, indicating that discounting more domains was directly associated with higher global self-worth. Moreover, as illustrated in Table 9, there was considerable variability across diagnostic groups in the extent to which they discounted. Although this variability did not reach statistical levels of significance, it is possible that collapsing across diagnostic groups reduced the likelihood of finding significant moderation. As discussed previously, level of depressive symptoms was found to be the dominant factor predicting global self-worth in this study, overshadowing the impact of physical health-related quality of life. Given discounting, like physical health-related quality of life, was significantly correlated with depressive symptoms ($r = -.39$), it is possible that discounting is related to global self-worth through its impact on depressive symptoms. Indeed, a post-hoc mediation analysis found that depressive symptoms fully mediated the relationship between discounting and global self-worth, suggesting that discounting domains impacts symptoms of depression, which in turn affects global self-worth. Further research investigating the direct/indirect effects of discounting might help elucidate the role of this variable.

Hypothesis 4b was also not supported as the strength of the relationship between physical health-related quality of life and global self-worth was not weaker for girls who discounted more domains than for boys. Although gender differences in discounting approached significance such that boys tended to discount more domains than did girls, gender did not interact with discounting in the prediction of global self-worth. It is possible that a lack of statistical power failed to detect unique gender differences in discounting over and above the variance accounted for by the other variables. Another interpretation of these results is that the effect of certain domains on global self-worth is
so salient that youth cannot discount them. Specifically, the results of this study and previous research point to the importance of physical appearance and romantic appeal in determining global self-worth (Harter, 2012a). As previously reported, 56% of boys and 75% of girls in this study failed to discount the importance of physical appearance. Although domains such as scholastic or athletic competence might be easily discounted for youth who do not feel these domains are important to their overall self-concept, youth are inundated with messages that perceptions of physical appearance and the implications for romantic prospects are paramount. Therefore it may not be the number of domains that are discounted that matter, but rather the salience of the domains that cannot be discounted. For some boys and girls with chronic illness, it is possible that physical illness affects perceptions of physical attractiveness and romantic appeal that are too difficult to discount, leading to low global self-worth. Furthermore, it is possible there is great variability among individual profiles such that after considering physical appearance, different domains exert varying influences on global self-worth depending on individual interests, personality characteristics, and social influences (Harter, 2012a). For each person, it may not be the number of domains that are discounted that is associated with global self-worth, but perhaps whether that individual is able to discount the ones most important to him or her. Future research using profile analyses might be able to address this consideration.

**Autonomy**

Autonomy was also investigated as a potential moderator of the relationship between physical health-related quality of life and global self-worth (Hypothesis 5a). The overall regression model evaluating Hypothesis 5a was significant, but only autonomy
emerged as a significant unique predictor, accounting for 17% of the variance in global self-worth. Autonomy did not emerge as a moderating variable between physical health-related quality of life and global self-worth. Therefore, it appears that autonomy exerts a direct impact on global self-worth, rather than attenuating the impact of physical health-related quality of life.

Hypothesis 5b was also not supported as the strength of the relationship between health-related quality of life and global self-worth was not weaker for girls with higher autonomy than for boys with higher autonomy. This indicates that autonomy affects girls and boys equally in the relationship between physical health and global self-worth.

Although the role of autonomy as a moderator was not supported, the results of the current study suggest there is a direct relation between autonomy and global self-worth, such that youth with higher autonomy have higher self-worth regardless of physical health-related quality of life. As previously discussed in the Introduction, to date researchers have not studied autonomy and global self-worth directly among youth with chronic illness. The qualitative study by Sällfors et al. (2002) highlighted the importance adolescents with arthritis place on the concept when they concluded that, for these individuals, a lack of autonomy was likely to impede self-worth. They explained that because the youth’s pain and disability made activities less enjoyable, they might withdraw from participating in social or physical activities that generally help build skills towards independence, such as going on field or sport trips away from home. The resulting lack of autonomy was hypothesized by Sällfors and colleagues to lead to lower competence in important domains and thus to lower global self-worth. Similarly, Sandstrom and Schanberg (2004) found the inability of some youth with chronic illness

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to establish supports outside of the home was related to depressive symptoms (which in turn relates to lower self-worth).

Similarly, research with typically developing adolescents finds a balance needs to be struck in terms of level of individuation versus attachment with parents (Allen et al., 1994). Pomerantz (2001) found that adolescents who were vulnerable to depression and who had very intrusive/unsupportive parents, which may compromise autonomy development, developed low global self-worth. In general, adolescents' mental health is optimal when their capacity and desire for autonomy matches their expectations for what their parents are willing to grant (Juang, Lerner, McKinney, & von Eye, 1999). Given their concerns about their child's health, parents of youth with chronic illness may have greater difficulty establishing reasonable boundaries between monitoring their child's health and facilitating individuation. Thus, the concordance between the level of autonomy desired and level of autonomy granted by their parents might be especially important in predicting the global self-worth of youth with chronic illness. Overall, it appears for both girls and boys with and without chronic illness, becoming emotionally, attitudinally, and functionally autonomous is a key developmental task related to overall self-worth.

4.4 Relevance of Harter's Model for Youth with Chronic Illness

The main purpose of this study was to evaluate the applicability of Harter's model of self-perception to adolescents with chronic illness in order to understand correlates of lower and higher self-concept in youth. Overall, the results suggest using Harter's model is relevant and appropriate for this population as youth with chronic illness reported a level of global self-worth comparable to typically developing adolescents along with the
expected gender difference that boys reported higher global self-worth than girls. Global self-worth was predicted by assessing domain discrepancies between perceptions of competence and importance. Consistent with research among typically developing adolescents, physical appearance and romantic appeal emerged as the most salient domains leading to evaluations of overall self-worth. Furthermore, physical health-related quality of life and autonomy were positively related to global self-worth. Nevertheless, consistent with research findings in populations of typically developing adolescents (Harter & Whitesell, 1996), depressive symptoms emerged as the most significant predictor of global self-worth. Thus it may be concluded from this study that it is not the presence or absence of a chronic illness that invariably predicts global self-worth among youth. Rather, similar to their peers without chronic illness, universal factors such as male gender, fewer depressive symptoms and higher levels of autonomy are salient factors that promote global self-worth. In addition, for youth with chronic illness, better physical health-related quality of life, especially less pain, may be an added factor associated with high global self-worth through its impact on reducing depressive symptoms.

Although researchers in the past have focused on whether youth with chronic illness are more likely to present with psychosocial difficulties (Lavigne & Faier-Routman, 1992; LeBovidge et al., 2003; Miller, 1993), the results of this study suggest that many of the same correlates that are related to overall self-evaluation among typically developing youth also affect youth with chronic illness. Therefore, the emphasis should not be on examining group differences between youth with and without chronic
illness, but rather on examining individual differences that promote or impede identity development.

An implication of this study is that utilizing normative models, including Harter's model of self-competence, is relevant and applicable to understanding the specific factors that predict overall global self-worth among youth with chronic illness. For example, attribution theory might be applied to examine whether youth with chronic illness make internal or external attributions about their illness and whether this is associated with positive or negative psychosocial outcomes. Similarly, investigating a range of normative coping styles (e.g., use of active coping, use of distraction) might also highlight specific cognitive factors to explain different outcomes for youth with chronic illness.

4.5 Clinical Implications

This study demonstrated that as in research with typically developing youth, physical appearance and romantic appeal are central to an adolescent's self-concept and are important to both boys and girls with chronic illness. The importance of physical appearance and romantic appeal for boys is likely to be overlooked based on the assumption that these issues matter only to girls, thus, clinicians and other health-care workers should be particularly vigilant about evaluating these potential concerns for both boys and girls. When assessing issues related to self-worth or self-esteem, an astute clinician might ask youth with chronic illness about how physically attractive they see themselves (relative to their ideal self) and if they perceive their illness affects their romantic status.

The results of this study also suggest that the presence of a chronic illness in and of itself does not necessarily indicate that a youth has low global self-worth. Instead,
better physical health-related quality of life, especially the reduction of pain, may contribute to fewer depressive symptoms, which may then lead to higher global self-worth. Thus, among youth with chronic illness, it will be important for clinicians to evaluate physical health-related quality of life and the presence or absence of depressive symptoms in order to determine a youth's risk for developing lower global self-worth. Furthermore, focusing on the reduction of pain and improving symptoms related to depression are viable directions for treating problems related to self-worth.

Taken altogether, this study suggests the assessment and treatment of self-esteem problems for youth with chronic illness should utilize existing empirically supported models of therapy valid for all adolescents. Rather than assuming the presence or absence of an illness leads to psychosocial problems, it should be recognized that depressive symptoms play a significant role in predicting overall self-worth. Assessment tools that screen for depression, and treatment that focuses on the cognitive and behavioural factors associated with depression, are especially relevant for all youth (Spirito, Esposito-Smythers, Wolff, & Uhl, 2011). In particular, girls are especially at risk for depression and low global self-worth. Although both boys and girls seem to place an equal emphasis on the role of physical appearance and romantic appeal, treatment that addresses the cognitive factors associated with poor body image might be especially beneficial for youth with chronic illness who attribute great importance to their physical appearance.

4.6 Study Limitations

The results of this study must be considered in light of its limitations. The first limitation concerns the characteristics of the study sample. The study participants were mostly Caucasian and had parents who were highly educated and employed full-time,
reducing the generalizability of the findings to all youth with chronic illness. Perhaps a more systematic procedure should have been utilized, whereby samples were recruited from fewer geographical sites, but where the researchers could ensure more demographic inclusivity. Furthermore, the participants were generally healthy (i.e., reported moderately high physical health-related quality of life) despite having a chronic illness. Therefore it appears the youth in this sample were managing their illnesses well and is possible the illness was not a salient factor in their self-perceptions.

A second limitation of the study concerns methodological issues related to participant recruitment. The study was initially designed as an online study due to the expectation that this would increase sample size and speed data collection given the study could be completed by participants from across Canada. Unfortunately, although recruitment continued for a period of two years the original plan for recruitment (e.g., advertisements on illness listervs and through schools) failed to produce a sufficiently large sample. Thus, alterations to the recruitment procedures had to take place in order to increase sample size. Specifically, recruitment changed from online solicitation to direct solicitation through relevant hospital clinics. Although the majority of participants were recruited from hospital clinics it is possible the varied sampling procedure introduced a number of participant biases. For example, the online recruitment emails generally went out to parents whereas adolescents who presented to the clinics were approached about the study directly, suggesting that the participants from the hospital clinics might have been more internally motivated to participate than the online participants (who were likely told about the study by their parents). Finally, although the asthma and diabetes clinics actively promoted the study to their patients, the rheumatology clinic (for arthritis)
only agreed to passive recruitment via poster. This likely led to the unequal groups in the overall sample as well as possible differences in motivation for participation (i.e., it takes greater motivation to initiate a response to a poster versus consenting to participate when asked).

Given the difficulty recruiting participants overall, there was likely sampling bias related to both parents and adolescents who volunteered to participate in this study compared to those who declined. For example, factors such as conscientiousness, altruism, or personal investment in the study topic may have been higher among the study participants (and may also be factors relevant to overall physical and mental health) compared to those who declined to participate.

A third limitation pertains to the use of an online survey to collect the data. This restricted the sample to youth who had access to a computer. More importantly, use of an online survey also means the youth were not supervised during their completion of the survey and the researcher was not available to answer any questions if they arose. Although youth were asked to have their parents provide consent, the extent to which this procedure was followed is unknown. The extent to which parents may have helped or supervised the survey completion is also unknown. Overall, having the youth complete the survey independently, without the supervision by the researcher, may have led to procedural inconsistencies across participants. In hindsight, a more appropriate method of data collection would have been to have youth complete the online survey in specific locations that provided access to both computers and a supervisor (i.e., researcher or research assistant).
A fourth limitation of this study was related to the measures used. The central measure of global-self worth showed poor internal reliability within this sample, limiting the strength of any conclusions. It is unclear why this measure was not internally consistent, especially given most of the other measures showed good reliability. The paper-and-pencil version of Harter's SPPA has been used in countless studies to date, with both large and small samples. As this is the first time (to the author's knowledge) that the measure has been administered using an electronic format; perhaps presenting the items using this medium led to less attention to detail and more errors in individual responding. Also, whereas the other measures were administered on one page electronically, the items of the SPPA were presented one at a time on the screen, possibly leading to "impatient" and inconsistent responses. However, it remains unclear why the items of global self-worth appeared to be inconsistent while the other domain subscales had acceptable internal consistency. Perhaps researchers could investigate and compare the internal consistencies of measures administered in an electronic format, especially given the increasing popularity of online surveys.

Finally, the small sample size and corresponding lack of statistical power greatly affected the ability to draw definitive conclusions from the data. As described in the Method section, the planned sample size for this study was approximately four times greater than the final obtained sample size. This was due to difficulties related to participant recruitment. The a priori power analysis indicated that a sample size of 59 was required in analyses using eight predictors (assuming a .30 effect size and .80 power). However, only 53 participants were included in all analyses. Although significant bivariate relationships among the predictors, moderators, and global self-worth were
often found in the expected directions, the full factorial regression equations used to examine overall relationships between these variables and global self-worth were under-powered. Therefore it was difficult to determine whether these relationships did exist but were too weak to be detected in the regression equations (a Type II error), or whether examination of the numerous bivariate statistics led to significant results by chance (i.e., Type I error). As a result, all conclusions drawn from the results of this study must be tentative and require replication.

4.7 Future Directions

The results of this study highlight several research areas worthy of future study. First, as described above, this sample of youth with chronic illness was relatively healthy. Future research should investigate whether similar findings would be obtained among youth whose illnesses were more severe and thus had a more significant impact on physical health-related quality of life. Moreover, given the relationship between pain and depression established by Lewandowski et al. (2013), the specific effect pain exerts on global self-worth should be examined. Finally, given Ferro and Boyle's (2013) meta-analysis findings, matching participants with healthy controls might better control for between-group variance while continuing to investigate within-group factors related to self-concept. Recruiting all study participants through hospital clinics utilizing a systematic supervised procedure might better ensure a more uniform sample. In addition, considering the inclusion of other chronic illnesses (such as Crohn's disease, colitis, or chronic pain) might increase the severity of the illness of the sample and permit further investigation of the role of pain in the development of global self-worth.
Second, the poor internal consistency of the global self-worth measure raises questions about the nature of using online surveys versus traditional paper-and-pencil measures. Future research should investigate the psychometric properties of measures adapted for online administration. Several issues such as completion time, rates of completed versus incomplete surveys, and adherence to questionnaire instructions may be relevant topics worthy of investigation.

Third, discounting was operationalized in this study as the number of domains that yielded a positive discrepancy between domain competence and importance. However, it is possible that discounting more domains of competence is not as relevant to global self-worth as the degree of discrepancy and individual importance of certain domains. Although physical appearance and romantic appeal appear to be (almost) universally important for youth, the other domains that contribute to global self-worth might be individually relevant depending on personality, family emphasis or peer influence. Therefore future research should examine individual profiles in order to yield a more informative picture of the role of discounting.

Fourth, the role of autonomy was examined in this study as a moderator to self-worth, and played a very minor role given the overall focus of the study. However, autonomy emerged as a potentially important individual variable directly predicting global self-worth. Given its observed contribution to global self-worth, it is recommended that future research evaluate autonomy as an outcome variable in order to determine what factors best predict autonomy achievement in adolescents with chronic illness. Questions of interest include: Does parent anxiety about the youth’s illness and thus potential over-involvement lead to lower autonomy for youth with chronic illness?
Similar to the findings of Juang et al. (1999) does optimal autonomy among youth with chronic illness require a match between support offered and support needed? Do levels of autonomy vary over time in concert with fluctuation in the youth’s health status?

Finally, the small sample size reduced the number of variables that could be included in this study. Future research could investigate other potential correlates of global self-worth, including factors that might compromise (e.g., pain levels, drug use, scholastic achievement) or promote (e.g., peer support, leisure activities) self-worth. It would be interesting to investigate whether these factors alter perceptions of physical appearance and/or romantic appeal as well as overall global self-worth. Furthermore, given the importance of romantic appeal in predicting global self-worth, future research should investigate how chronic illness impacts interest in, initiation of, and development of romantic relationships.

4.8 Conclusion and Study Contributions

The goal of this study was to test the applicability of Harter’s (1990) model of adolescent self-perception to global self-worth among youth with chronic illness. The results revealed that having a chronic illness does not invariably place a youth at risk for lower global self-worth. The overall level of global self-worth reported by this sample of youth with chronic illness was similar to that reported by Harter (2012b) for typically developing youth. Moreover, many of the same factors found to predict global self-worth in typically developing youth were also found to predict global self-worth in youth with chronic illness. Specifically, universal factors, such as male gender, a lower level of depressive symptoms, and a higher level of autonomy were related to higher self-worth in this sample. Higher physical health-related quality of life was also associated with higher
global self-worth. Further exploration of physical health status (e.g., examination of specific variables such as pain level) may further delineate the unique role chronic illness plays in perceptions of global self-worth.

Although previous researchers have focused on between group differences, a strength of this research was the emphasis on evaluating within-group factors. In addition, this study uniquely introduced the idea of using discounting to explain why some youth with chronic illness have problems with lower global self-worth whereas most do not. Finally, investigating the role of autonomy in relation to global self-worth among youth with chronic illness presented new findings about the importance of this variable among this population.
REFERENCES


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APPENDIX A: Demographic Questionnaire

1. I am:
   ○ Male
   ○ Female

2. My age is: (age in drop down menus)

3. I am in grade: (grades in drop down menus)

4. I am in a different school this year than I was last year:
   ○ Yes  ○ No

5. I currently live in: (all provinces listed in drop-down menus)

6. My ethnicity is:
   ○ Caucasian
   ○ Native Canadian
   ○ African Canadian
   ○ Asian Canadian
   ○ Other: ________

7. The highest education my mother or father completed was:
   ○ Elementary School
   ○ High School
   ○ Community college/technical school
   ○ University

8. My mother or father’s employment status is:
   ○ Employed full-time outside of the home
   ○ Employed part-time outside of the home
   ○ Not currently employed outside of the home

9. My height is: (height in drop down menus – imperial and metric)

10. My weight is: (weight in drop down menus – imperial and metric)

11. I have been diagnosed with:
   ○ No major physical illness
   ○ Asthma
   ○ Diabetes
   ○ Arthritis
   ○ Other: _____

12. My illness began when I was: (ages in drop-down menus).
APPENDIX B: Self-Perception Profile for Adolescents (SPPA)

Harter (1988)

Instructions: We have some sentences here and, as you can see from the top of the page where it says, “What I am Like” we are interested in what you are like, what kind of person you are like. This is a survey, not a test. There are no right or wrong answers. Since teenagers are very different from one another, everyone will be putting down something different.

Here is how these questions work. Each question talks about two different kinds of teenagers, and we want to know which teenagers are most like you.

1) What you decide first is whether you are more like the teenager on the left side or whether you are more like the teenager on the right side. So first decide which kind of teenager is most like you, and go to that side of the sentence.

2) Now that you have decided which kind of teenagers are most like you, you are to decide whether that is only sort of true for you, or really true for you. If it's only sort of true, then mark the box under “sort of true”; if it’s really true for you, then mark the box under “really true”.

3) For each sentence you only check one box. Sometimes it will be on one side of the page, another time it will be on the other side of the page, but you can only check one box for each sentence. You don’t check both sides, just the side most like you.

What I Am Like

Sample Sentence (for response validity check)

<table>
<thead>
<tr>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
<th>BUT</th>
<th>Really True for Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some teenagers like to go to movies in their spare time</td>
<td>Other teenagers would rather go to sports events.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
<th>BUT</th>
<th>Really True for Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some teenagers feel that they are just as smart as</td>
<td>Other teenagers aren’t so sure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparisons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others their age and wonder if they are as smart.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers find it hard to make friends but for other teenagers it's pretty easy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers do very well at all kinds of sports but other teenagers don't feel that they are very good when it comes to sports.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers are NOT happy with the way they look but other teenagers are happy with the way they look.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers feel that they are ready to do well at a part-time job but other teenagers feel that they are not quite ready to handle a part-time job.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers feel that if they are romantically interested in someone, that person will like them back but other teenagers worry that when they like someone romantically, that person won’t like them back.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers usually do the right thing but other teenagers often don’t do what they know is right.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers are able to make really close friends but other teenagers find it hard to make really close friends.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers are often disappointed but other teenagers are pretty pleased.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with themselves</td>
<td>with themselves.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers are pretty slow in finishing their school work</td>
<td>BUT</td>
<td>Other teenagers can do their school work more quickly.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers have a lot of friends</td>
<td>BUT</td>
<td>Other teenagers don’t have very many friends.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers think they could do well at just about any new athletic activity</td>
<td>BUT</td>
<td>Other teenagers are afraid they might not do well at a new athletic activity.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers wish their body was different</td>
<td>BUT</td>
<td>Other teenagers like their body the way it is.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers feel that they don’t have enough skills to do well at a job</td>
<td>BUT</td>
<td>Other teenagers feel that they do have enough skills to do well at a job.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers are not dating the people they are really attracted to</td>
<td>BUT</td>
<td>Other teenagers are dating those people they are attracted to.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers often get in trouble for the things they do</td>
<td>BUT</td>
<td>Other teenagers usually don’t do things that get them in trouble.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers do have a close friend they can share secrets</td>
<td>BUT</td>
<td>Other teenagers do not have a really close...</td>
<td></td>
</tr>
<tr>
<td>Some teenagers:</td>
<td>BUT</td>
<td>Other teenagers:</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>-----</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>don't like the way they are leading their life</td>
<td></td>
<td>do like the way they are leading their life.</td>
<td></td>
</tr>
<tr>
<td>do very well at their classwork</td>
<td></td>
<td>don't do very well at their classwork.</td>
<td></td>
</tr>
<tr>
<td>are very hard to like</td>
<td></td>
<td>are really easy to like.</td>
<td></td>
</tr>
<tr>
<td>feel that they are better than others their age at sports</td>
<td></td>
<td>don't feel they can play as well.</td>
<td></td>
</tr>
<tr>
<td>wish their physical appearance was different</td>
<td></td>
<td>like their physical appearance the way it is.</td>
<td></td>
</tr>
<tr>
<td>feel they are old enough to get and keep a paying job</td>
<td></td>
<td>do not feel they are old enough, yet, to really handle a job well.</td>
<td></td>
</tr>
<tr>
<td>feel that people their age will be romantically attracted to them</td>
<td></td>
<td>worry about whether people their age will be attracted to them.</td>
<td></td>
</tr>
<tr>
<td>feel really good</td>
<td></td>
<td>teenagers</td>
<td></td>
</tr>
<tr>
<td>Some teenagers</td>
<td>BUT</td>
<td>Other teenagers</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----</td>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>about the way they act</td>
<td>don’t feel that good about the way they often act.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers wish they had a really close friend to share things with</td>
<td></td>
<td>Other teenagers do have a close friend to share things with.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers are happy with themselves most of the time</td>
<td>BUT</td>
<td>Other teenagers are often not happy with themselves.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers have trouble figuring out the answers in school</td>
<td>BUT</td>
<td>Other teenagers almost always can figure out the answers.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers are popular with others their age</td>
<td>BUT</td>
<td>Other teenagers are not very popular.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers don’t do well at new outdoor games</td>
<td>BUT</td>
<td>Other teenagers are good at new games right away.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers think that they are good looking</td>
<td>BUT</td>
<td>Other teenagers think that they are not very good looking.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers feel like they could do better at work they do for pay</td>
<td>BUT</td>
<td>Other teenagers feel that they are doing really well at work they do for pay.</td>
<td></td>
</tr>
<tr>
<td>Some teenagers feel that they are fun and interesting on a date</td>
<td>BUT</td>
<td>Other teenagers wonder about how fun and interesting</td>
<td></td>
</tr>
</tbody>
</table>

160
<table>
<thead>
<tr>
<th>Some teenagers</th>
<th>BUT</th>
<th>Other teenagers</th>
</tr>
</thead>
<tbody>
<tr>
<td>do things they know they shouldn’t do</td>
<td></td>
<td>hardly ever do things they know they shouldn’t do.</td>
</tr>
<tr>
<td>Some teenagers find it hard to make friends they can really trust</td>
<td>BUT</td>
<td>Other teenagers are able to make close friends they can really trust.</td>
</tr>
<tr>
<td>Some teenagers like the kind of person they are</td>
<td>BUT</td>
<td>Other teenagers often wish they were someone else.</td>
</tr>
<tr>
<td>Some teenagers feel that they are pretty intelligent</td>
<td>BUT</td>
<td>Other teenagers question whether they are intelligent.</td>
</tr>
<tr>
<td>Some teenagers feel that they are socially accepted</td>
<td>BUT</td>
<td>Other teenagers wished that more people their age accepted them.</td>
</tr>
<tr>
<td>Some teenagers do not feel that they are very athletic</td>
<td>BUT</td>
<td>Other teenagers feel that they are very athletic.</td>
</tr>
<tr>
<td>Some teenagers really like their looks</td>
<td>BUT</td>
<td>Other teenagers wish they looked different.</td>
</tr>
<tr>
<td>Some teenagers feel that they are really able to handle the work on a paying job</td>
<td>BUT</td>
<td>Other teenagers wonder if they are really doing as good a job at work as they should.</td>
</tr>
</tbody>
</table>
| Some teenagers | BUT | Other teenagers
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>usually <em>don't</em> go out with the people they would really like to date</td>
<td></td>
<td><em>do</em> go out with the people they really want to date.</td>
</tr>
<tr>
<td>Some teenagers usually act the way they know they are supposed to</td>
<td>BUT</td>
<td>Other teenagers often don’t act the way they are supposed to.</td>
</tr>
<tr>
<td>Some teenagers don’t have a friend that is close enough to share really personal thoughts with</td>
<td>BUT</td>
<td>Other teenagers do have a close friend that they can share personal thoughts and feelings with.</td>
</tr>
<tr>
<td>Some teenagers are very happy being the way they are</td>
<td>BUT</td>
<td>Other teenagers wish they were different.</td>
</tr>
</tbody>
</table>

What group of teenagers were you comparing yourself to when you were thinking about what you were like in the above questions?

- Other teenagers in my class at school
- Other teenagers who have chronic illnesses
- Other: _____
How Important Are Each of These Things to You?

<table>
<thead>
<tr>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
<th>BUT</th>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some teenagers think it is important to be intelligent</td>
<td>BUT</td>
<td>Other teenagers don’t think it is important to be intelligent.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers don’t think it’s all that important to have a lot of friends</td>
<td>BUT</td>
<td>Other teenagers think that having a lot of friends is important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers think its important to be good at sports</td>
<td>BUT</td>
<td>Other teenagers don’t care much about being good at sports.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers don’t really think that their physical appearance is all that important</td>
<td>BUT</td>
<td>Other teenagers think that their physical appearance is important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers don’t care that much about how well they do on a paying job</td>
<td>BUT</td>
<td>Other teenagers feel it’s important that they do well on a paying job.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers think it’s important that the people they are romantically interested in like them back</td>
<td>BUT</td>
<td>Other teenagers don’t really care that much whether someone they are interested in likes them that much.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers don’t think it’s that important to do the right thing</td>
<td>BUT</td>
<td>Other teenagers think that doing the right thing is important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some teenagers think it’s important to be able to make close friends</td>
<td>BUT</td>
<td>Other teenagers don’t think making close friends is all.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Really close friends</td>
<td>That important.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don’t think that doing well in school is really that important</td>
<td></td>
<td>think that doing well in school is important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>think it’s important to be popular</td>
<td></td>
<td>don’t care that much about whether they are popular.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don’t think that being athletic is that important</td>
<td></td>
<td>think that being athletic is important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>think that how they look is important</td>
<td></td>
<td>don’t care that much about how they look.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>think it’s important to do their best on a paying job</td>
<td></td>
<td>don’t think that doing their best on a job is all that important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don’t care that much whether they are dating someone they are romantically interested in</td>
<td></td>
<td>think it’s important to be dating someone they are interested in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>think it’s important to act the way they are supposed to</td>
<td></td>
<td>don’t care that much about whether they are acting the way they are supposed to.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some teenagers</strong></td>
<td><strong>BUT</strong></td>
<td><strong>Other teenagers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don’t care that much about having a close friend they can trust</td>
<td></td>
<td>think it’s important to have a really close friend you can trust.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What group of teenagers were you comparing yourself to when you were thinking about how important the things in the above questions were?

- Other teenagers in my class at school
- Other teenagers who have my chronic illness
APPENDIX C: Parent Support Subscale of the
Inventory of Parent and Peer Attachment (IPPA)

Armsden & Greenberg (1987)

Directions: For each of the following items, please respond whether you feel they are almost always or always true, often true, sometimes true, seldom true, or almost never or never true for you.

1. My parents respect my feelings.
2. I feel my parents are successful as parents.
3. I wish I had different parents.
4. My parents accept me as I am.
5. I have to rely on myself when I have a problem to solve.
6. I like to get my parents' point of view on things I'm concerned about.
7. I feel it's no use letting my feelings show.
8. My parents sense when I'm upset about something.
9. Talking over my problems with my parents makes me feel ashamed or foolish.
10. My parents expect too much from me.
11. I get upset easily at home.
12. I get upset a lot more than my parents know about.
13. When we discuss things, my parents consider my point of view.
15. My parents have their own problems, so I don't bother them with mine.
16. My parents help me to understand myself better.
17. I tell my parents about my problems and troubles.
18. I feel angry with my parents.
19. I don't get much attention at home.
20. My parents encourage me to talk about my difficulties.
21. My parents understand me.
22. I don't know whom I can depend on these days.
23. When I am angry about something, my parents try to be understanding.
24. I trust my parents.
25. My parents don't understand what I'm going through these days.
26. I can count on my parents when I need to get something off my chest.
27. I feel that no one understands me.
28. If my parents know something is bothering me, they ask me about it.
APPENDIX D: Depression Subscale of the Hospital Anxiety and Depression Scale (HADS)
Zigmond & Snaith (1983)

This questionnaire is designed to assess how you feel. Read each item and choose the reply which comes closest to how you have been feeling in the past week. Don’t take too long over your replies; your immediate reaction to each item will probably be more accurate than a long, thought out response.

1. I feel tense or ‘wound up’:
   a. Most of the time
   b. A lot of the time
   c. From time to time, occasionally
   d. Not at all

2. I still enjoy the things I used to enjoy:
   a. Definitely as much
   b. Not quite so much
   c. Only a little
   d. Hardly at all

3. I get a sort of frightened feeling as if something awful is about to happen:
   a. Very definitely and quite badly
   b. Yes, but not too badly
   c. A little but it doesn’t worry me
   d. Not at all

4. I can laugh and see the funny side of things:
   a. As much as I always could
   b. A lot of the time
   c. From time to time, but not too often
   d. Only occasionally

5. Worrying thoughts go through my mind:
   a. A great deal of the time
   b. A lot of the time
   c. From time to time, but not too often
   d. Only occasionally

6. I feel cheerful:
a. Not at all
b. Not often
c. Sometimes
d. Most of the time

7. I can sit at ease and feel relaxed:
   a. Definitely
   b. Usually
   c. Not often
   d. Not at all

8. I feel as if I am slowed down:
   a. Nearly all the time
   b. Very often
   c. Sometimes
   d. Not at all

9. I get a sort of frightened feeling like butterflies in the stomach:
   a. Not at all
   b. Occasionally
   c. Quite often
   d. Very often

10. I have lost interest in my appearance:
    a. Definitely
    b. I don’t take so much care as I should
    c. I may not take quite as much care
    d. I take just as much care

11. I feel restless as if I have to be on the move:
    a. Very much indeed
    b. Quite a lot
    c. Not very much
    d. Not at all

12. I look forward with enjoyment to things:
    a. As much as I ever did
    b. Rather less than I used to
    c. Definitely less than I used to
    d. Hardly at all

13. I get sudden feelings of panic:
    a. Very often indeed
    b. Quite often
    c. Not very often
d. Not at all

14. I can enjoy a good book, or radio or T.V. programme:
   a. Often
   b. Sometimes
   c. Very often
   d. Very seldom
APPENDIX E: Pediatric Quality of Life Inventory – Version 4.0

(PEDS-QL)

Varni, Seid, & Kurtin (2001)

**DIRECTIONS:** The following is a list of things that might be a problem for you. Please tell us *how much of a problem* each one has been for you during *the past ONE month* by choosing:

0 if it is **never** a problem  
1 if it is **almost never** a problem  
2 if it is **sometimes** a problem  
3 if it is **often** a problem  
4 if it is **almost always** a problem

There are no right or wrong answers.  
If you do not understand a question, please leave it blank.

*In the past ONE month, how much of a problem has this been for you...*

<table>
<thead>
<tr>
<th>About My Health and Activities (problems with...)</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is hard for me to walk more than one block</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is hard for me to run</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is hard for me to do sports activity or exercise</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is hard for me to lift something heavy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is hard for me to take a bath or shower by myself</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is hard for me to do chores around the house</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I hurt or ache</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I have low energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>About My Feelings (problems with...)</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel afraid or scared</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I feel sad or blue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I feel angry</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I have trouble sleeping</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I worry about what will happen to me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**How I Get Along with Others (problems with...)**

<table>
<thead>
<tr>
<th>I have trouble getting along with other teens</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other teens do not want to be my friend</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Other teens tease me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I cannot do things that other teens my age can do</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>It is hard to keep up with my peers</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**About School (problems with...)**

| It is hard to pay attention in class          | 0     | 1            | 2         | 3     | 4             |
| I forget things                               | 0     | 1            | 2         | 3     | 4             |
| I have trouble keeping up with my schoolwork | 0     | 1            | 2         | 3     | 4             |
| I miss school because of not feeling well     | 0     | 1            | 2         | 3     | 4             |
| I miss school to go to the doctor or hospital | 0 | 1 | 2 | 3 | 4 |

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APPENDIX F: Adolescent Autonomy Questionnaire (AAQ)

Noom (1999)

The next questions concern how you deal with everyday life. Choose the answer that best suits you.

<table>
<thead>
<tr>
<th>Not at all descriptive of me</th>
<th>Hardly descriptive of me</th>
<th>Sometimes descriptive/sometimes not descriptive of me</th>
<th>Fairly descriptive of me</th>
<th>Very descriptive of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

1. I find it difficult to decide what I want.
2. I know how to achieve my goal.
3. I find it easy to resist the pressure of other people.
4. Making a choice comes easy for me.
5. I find it difficult to get what I want.
6. I hesitate about my decisions.
7. I adapt myself to what other people want.
8. I know what I want.
9. I feel ok to disagree with other people.
10. I easily step up to something new.
11. I tell other people that they are right, even when I am not sure.
12. I know what my goals are.
13. I am afraid about my future.
14. I change my mind when I listen to the opinion of other people.
15. I have doubts about what I want.
16. I hesitate about which actions to take.
17. I defend my opinion in discussions with other people.
18. I feel at ease in new situations.
APPENDIX G: Data Recruitment Strategy and Results

The original proposed study required approximately 210 participants. Below is a chart of the data recruitment strategy and results after each phase of participant recruitment.

<table>
<thead>
<tr>
<th>PHASE 1</th>
<th>DATES</th>
<th>ASSOCIATION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan-April, 2010</td>
<td>Canadian Arthritis Society</td>
<td>All of these associations were contacted via email with regular follow-up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Canadian Arthritis Network</td>
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<tr>
<td></td>
<td></td>
<td>Canadian Rheumatology Research Consortium</td>
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<td></td>
<td></td>
<td>Arthritis Consumer Experts (Joint Health)</td>
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<td></td>
<td></td>
<td>Canadian Arthritis Patient Alliance</td>
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<tr>
<td></td>
<td></td>
<td>Canadian Rheumatology Association (CRA)</td>
<td>Some agreed to send out the recruitment notice to their email</td>
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<tr>
<td></td>
<td></td>
<td>CRA Pediatric Section</td>
<td></td>
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<td></td>
<td></td>
<td>Canadian Alliance of Pediatric Rheumatology Investigators (CAPRI)</td>
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<tr>
<td></td>
<td></td>
<td>The Arthritis Foundation</td>
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<tr>
<td></td>
<td></td>
<td>Juvenile Diabetes Research Foundation Canada</td>
<td>As above</td>
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<tr>
<td></td>
<td></td>
<td>Canadian Diabetes Association (CDA)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>CDA – NB, NS, PEI, NL and Labrador</td>
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<tr>
<td>Sections</td>
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<td>------------------------------------------------------------------------</td>
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<tr>
<td>Diabetes Centre Fredericton</td>
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<tr>
<td>Asthma Society of Canada</td>
<td>As above</td>
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<tr>
<td>Canadian Network for Asthma Care</td>
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<tr>
<td>Childhood Asthma Foundation</td>
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<tr>
<td>Asthma Allergy Information Association</td>
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<tr>
<td>Canadian Lung Association (CLA)</td>
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<tr>
<td>CLA – NB, NS, PEI, NL, BC, AB, SASK, MAN, ON provincial sections</td>
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<tr>
<td>Children’s Asthma Education Centre (MB)</td>
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<tr>
<td>University of Alberta</td>
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<tr>
<td>Anaphylaxis Canada</td>
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<tr>
<td>Allergic Living</td>
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<tr>
<td>Fred Kids</td>
<td>These non-specific groups were all contacted for support via personal connections. As above, some agreed to send out the recruitment notice to their members</td>
<td></td>
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<tr>
<td>Algoma Family Services (SSM, ON)</td>
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<tr>
<td>Algoma Health (SSM, ON)</td>
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<tr>
<td>North Shore Sentinel Newspaper</td>
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<tr>
<td>YMCA – Fredericton</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Date</td>
<td>Activity</td>
<td>Details</td>
<td></td>
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<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Jan-Aug, 2010</td>
<td>Kijiji postings in 10 cities in “volunteer” section&lt;br&gt;Joined 12 Facebook groups related to illnesses&lt;br&gt;CPA research portal&lt;br&gt;Chat rooms on HealingWell.com</td>
<td>whereas others declined.</td>
<td></td>
</tr>
<tr>
<td>March, 2010</td>
<td>Memo to UNB REB to change data recruitment procedure to include school boards across Canada and to add the inducement of a chance to win an ipod Touch.</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>As of March, despite all of the above efforts, N=11. The UNB REB, after several weeks and a committee meeting to discuss the issue, approved the changes.</td>
<td></td>
</tr>
<tr>
<td>PHASE 2</td>
<td></td>
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<tr>
<td>April – August 2010</td>
<td>Re-contacted all of the above with changes to incentive where the recruitment notices had been sent out</td>
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<tr>
<td>Dr. Everett Chalmers Hospital</td>
<td>Printed posters and</td>
<td></td>
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<tr>
<td>River Valley Health Asthma Education Clinic</td>
<td>distributed throughout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Asthma Clinic (SJ)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10 physicians’ offices and walk-in clinics in Fredericton</td>
<td></td>
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<tr>
<td><strong>NB - District 2</strong></td>
<td>Applied to the ethics boards of 32 school boards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NB - District 6</strong></td>
<td>With board approval, I then contacted</td>
<td></td>
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</tr>
<tr>
<td><strong>NB - District 8</strong></td>
<td>principals for every school within the school board. Some agreed to approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NB - District 10</strong></td>
<td>individual students who met criteria,</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NB - District 14</strong></td>
<td>others posted my notice on their school website,</td>
<td></td>
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<tr>
<td><strong>NB - District 15</strong></td>
<td>others included my notice in their school newsletter.</td>
<td></td>
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<tr>
<td><strong>NB - District 16</strong></td>
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<tr>
<td><strong>NB - District 17</strong></td>
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<tr>
<td><strong>NB - District 18</strong></td>
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<tr>
<td><strong>PEI - Eastern School District</strong></td>
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<tr>
<td><strong>PEI - Western School District</strong></td>
<td></td>
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<tr>
<td><strong>NS - Annapolis Valley Regional School Board</strong></td>
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<td><strong>NS - Cape Breton Victoria Regional School Board</strong></td>
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<tr>
<td><strong>NS - Chignecto Central Regional SB</strong></td>
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<td><strong>NS - Tri-County Regional SB</strong></td>
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<tr>
<td><strong>NS - Strait Regional SB</strong></td>
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<tr>
<td><strong>NS - Halifax Regional SB</strong></td>
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<tr>
<td><strong>NS - South Shore Regional SB</strong></td>
<td></td>
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<tr>
<td><strong>NL - Labrador District SB</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>NL – Western School District</strong></td>
<td></td>
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<tr>
<td><strong>NL - Nova Central School District</strong></td>
<td></td>
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<tr>
<td>NL – Eastern School District</td>
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<tr>
<td>----------------------------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Toronto District School Board</td>
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<tr>
<td>Toronto Catholic District School Board</td>
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<tr>
<td>Durham District School Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durham Catholic District School Board</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Vancouver School Board</td>
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<tr>
<td>Calgary Board of Education</td>
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<tr>
<td>Winnipeg School Division</td>
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<tr>
<td>Ottawa Carleton District School Board</td>
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<td></td>
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<tr>
<td>Regina Public Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saskatoon Public Schools</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

| **August, 2010** | Left Fredericton for Pre Doctoral Internship in Halifax, NS | Despite all of the above efforts, at the end of the summer N=23 |

**PHASE 3**

| Sept – Dec, 2010 | IWK Health Centre | At the start of my internship at the IWK Health Centre, I applied to the IWK REB to recruit within the hospital clinics. |
This process took several months as the REB required some changes to my project.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct - Dec, 2010</td>
<td>School principal contact</td>
<td>Follow-up with principals in new school year from board approval from spring.</td>
</tr>
<tr>
<td>Jan 2011 – Feb. 2012</td>
<td>IWK Diabetes Clinic</td>
<td>Posters and take-home cards were printed and posted at reception. Admin assistants were active in distributing consent-to-contact forms to youth meeting study criteria.</td>
</tr>
<tr>
<td></td>
<td>IWK Asthma Clinic</td>
<td>As above. In addition, the clinic</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Event</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Nurse of the teen</td>
<td>Distributed cards among group members.</td>
<td></td>
</tr>
<tr>
<td>IWK Rheumatology</td>
<td>Posters and cards printed and posted in clinic only. Head physician did not agree to active recruitment due to competing studies.</td>
<td></td>
</tr>
<tr>
<td>Clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July-August, 2011</td>
<td>Brigadoon Summer Camps</td>
<td>Contacted camp organizers to send recruitment notice to all camp participants</td>
</tr>
<tr>
<td>30 Physicians offices and walk-in clinics</td>
<td>An additional 50 posters and cards were distributed among Halifax offices</td>
<td></td>
</tr>
<tr>
<td>Feb, 2012</td>
<td>Recruitment ceased</td>
<td>After 2 years of data recruitment,</td>
</tr>
<tr>
<td></td>
<td>the most success was through the IWK clinics. Final N = 60</td>
<td></td>
</tr>
</tbody>
</table>
CURRICULUM VITAE

Marcie Jacqueline Balch

Education:

2002 - Present  University of New Brunswick, Fredericton, NB  Ph.D. Clinical Psychology

2001-2002  York University, Toronto, ON  Visiting Student

1994-1998  Queen's University, Kingston, ON  B.A. (Honours)  Psychology-Health

Publications:


Conference Presentations:


Annual Graduate Student Association Conference, Fredericton, NB (2005, February).


