The association between organized activity participation and emotional wellbeing among immigrant-origin and non-immigrant children

by

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Abstract

Background: Emotional development during middle childhood is associated with thriving in adolescence and adulthood. Previous research has demonstrated an association between participation in organized activities (OA) and positive development, including emotional wellbeing. However, there is an absence of literature evaluating the role of immigrant background (i.e., immigrant-origin or non-immigrant) in the relationship between OA participation and emotional wellbeing. The objectives of this study were to test for an association between OA participation and immigrant background, to measure the association between OA participation and emotional wellbeing indicators (life satisfaction, depressive symptoms), and to examine whether the relationship between OA participation and wellbeing was dependent on immigrant background among a sample of schoolchildren.

Methods: This study's sample was composed of 14,406 Grade 7 children in British Columbia (BC) who completed the Middle Years Development Instrument (MDI), a population-level self-report survey designed to measure children's wellbeing and assets, between the 2012/2013 and 2016/2017 school years. Children who were born outside of Canada or who had at least one foreign-born parent were classified as immigrant-origin. Odds ratios and the χ^2 test were reported to test for an association between OA participation and immigrant background. Multiple linear regression analyses were used to examine the association between participation in OAs and indicators of emotional wellbeing and to examine whether this relationship varied based on immigrant background, while controlling for demographic factors.

Results: Immigrant background was not associated with overall OA participation. Immigrant background was associated with participation in educational activities, arts and music lessons,

and individual sports, while team sports participation was associated with non-immigrant background. Immigrant background modified the association between overall OA participation and emotional wellbeing, with stronger and beneficial associations generally observed among non-immigrant children.

Conclusions: This study identified a stronger association between OA participation and emotional wellbeing among non-immigrant children than immigrant-origin children. The results underscore the importance of designing OAs sensitive to the diversity of schoolchildren, including those of immigrant-origin. Further research identifying factors that explain differences in this association based on immigrant background can inform the development of OAs that support the emotional wellbeing of immigrant-origin children.

Lay Summary

Emotional development from ages 8-12 is associated with wellbeing throughout life. Organized activities (OA), defined as adult-supervised, structured activities, have been associated with positive developmental outcomes. Among a sample of Grade 7 students in British Columbia, this study examined whether immigrant-origin (i.e., foreign-born child or at least one foreign born parent) was associated with OA participation. This study also tested whether the association between OA participation and emotional wellbeing differed between immigrant-origin and non-immigrant children. Results suggested that the proportion of children who participated in any OA were similar between immigrant-origin and non-immigrant children, although immigrant-origin was associated with participation in educational activities, art and music lessons, and individual sports. Stronger beneficial associations were found between OA participation and some aspects of emotional wellbeing among non-immigrant children. These results warrant exploration of factors accounting for differences in the association between OA participation and emotional wellbeing between immigrant-origin and non-immigrant children.

Preface

This research is based on linkages of multiple population-level datasets from British Columbia, Canada. Linked person-level data consisting of self-report after school activities and social-emotional outcomes, demographic characteristics, and immigration factors were used in this research. Linkages were facilitated and data access was granted by Population Data BC. All inferences, opinions, and conclusions drawn in this thesis are those of the author, and do not reflect the opinions or policies of the Data Steward(s).

The author, Carmela (Melina) Albanese, designed the research plan, conducted the analyses, interpreted the results, and wrote this thesis. Drs. Anne Gadermann (primary supervisor), Eva Oberle (supervisory committee member), and Jason Sutherland (supervisory committee member) provided guidance, including invaluable feedback and support throughout the conceptualization, analyses, writing, and editing processes. Dr. Monique Gagné and Scott Emerson also provided indispensable support by answering questions the author had about the data.

This research was approved by the University of British Columbia's Behavioural Research Ethics Board (Project title: Organized activity participation among immigrant and non-immigrant children, #H20-03669). Content from this thesis may be submitted for publication in peer-reviewed journals.

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List of Abbreviations

BC	British Columbia
CLT	Central limit theorem
FCS	Fully conditional specification
GPA	Grade point average
GVIF	Generalized variance inflation factor
HELP	Human Early Learning Partnership
ICC	Intraclass correlation coefficient
IRCC	Immigrant, Refugees and Citizenship Canada
LRT	Likelihood ratio test
MAR	Missing at random
MDI	Middle Years Development Instrument
MI	Multiple imputation
MLR	Multiple linear regression
MOH	Ministry of Health
MSP	Medical Services Plan
OA	Organized activities
OLS	Ordinary least squares

OR	Odds ratio
PYD	Positive youth development
SES	Socioeconomic status
SWLS-C	Satisfaction with Life Scale adapted for Children
US	United States

Explanation of terms

In this thesis, organized activities (OAs) are defined as structured activities which occur outside of school hours and are adult-supervised, regularly scheduled, and emphasize skill-building. The OAs included in this thesis are educational activities, arts and music activities, individual sports, and team sports.

Immigrant background refers to whether a child is of immigrant-origin (i.e., foreign-born or has at least one foreign-born parent) or is a non-immigrant (i.e., born in Canada and both parents born in Canada).

Immigration generation status is a three-level variable used in the analyses which indicates whether a child is a non-immigrant, first-generation immigrant-origin, or second-generation immigrant-origin child. The following terms describe how different immigrant generation statuses are defined and apply to children in this thesis:

Non-immigrant: A child with no foreign-born parent

First generation: A foreign-born child who migrated to Canada

Second generation: A Canadian-born child with at least one foreign-born parent

In this thesis, migrant class is a three-level variable which applies to children of immigrant-origin only. Migration class denotes under what entry criteria immigrant-origin children, or, in the case of second-generation immigrant-origin children, their parent(s) immigrated to Canada. In this thesis, in cases where a child's parents had been assigned discordant migrant classes, the mother's migrant class was assigned to the child, for the purpose of consistency. The one exception was that, in the case of second-generation immigrant-origin

children, if either parent belonged to the refugee migrant class, then the child was considered to belong to the refugee migrant class. The following terms are based on Statistics Canada's classification of admissions categories of immigrants (Statistics Canada, 2019) and describe how migrant classes are defined and apply to immigrant-origin children in this thesis:

Economic class: Children whose parent(s) entered Canada because of their ability to contribute to Canada's economy

Family class: Children who were or whose parents were granted permanent residence status based on their relationship to someone already in Canada

Refugee: A child or child with at least one parent seeking asylum and accepted based on a well-founded fear of residing in their home country, for example, because of persecution for reasons of race, religion, nationality, membership in a social group, or political opinion

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In loving memory of Oma and Zio Vincenzo.

Chapter 1: Introduction and literature review

Introduction

Middle childhood is the developmental period between early childhood and adolescence that occurs from approximately ages 8 to 12 (Blume & Zembar, 2007). It has been well-documented that the physical, cognitive, social, and emotional transformations that occur during this stage of development are associated with functioning, adjustment, and thriving throughout the life course (Blume & Zembar, 2007; Collins, 1984; Eccles, 1999). Emotional wellbeing—the focus of this thesis— is an important aspect of health during middle childhood, as it is linked to better overall wellbeing and provides a foundation for a positive transition to adolescence and adulthood (Kansky et al., 2016; Lerner et al., 2010; Masten & Tellegen, 2012; Moilanen et al., 2010).

Despite the importance of emotional wellbeing during middle childhood, declines in emotional wellbeing have been reported during the middle childhood years, and the onset of mental illness often begins during middle childhood or adolescence (Canadian Mental Health Association, 2014; Eccles, 1999; Parasuraman et al., 2020; Schonert-Reichl, 2011). The importance of emotional wellbeing during middle childhood is further underscored by the fact that suicide consistently ranks within the top three leading causes of death among adolescents aged 10-14 as well as older adolescents and young adults aged 15-24 in Canada (Statistics Canada, 2021). Identifying prevention and intervention strategies to promote emotional wellbeing during middle childhood is vital to fostering overall health and thriving during middle childhood and, in turn, across adolescence and adulthood (Kansky et al., 2016; Lerner et al., 2010; Masten & Tellegen, 2012; Moilanen et al., 2010).

While it has been demonstrated that participation in organized activities (OA; structured, adult-supervised, regularly scheduled activities which take place outside of school hours and emphasize skill-building) can promote emotional wellbeing (e.g., life satisfaction, absence of depressive symptoms) throughout childhood and adolescence, research out of the United States (US) has reported differences in OA participation patterns among teenagers based on immigrant background (Jiang & Peterson, 2012), though there is a lack of research which compares OA participation between immigrant-origin and non-immigrant children in Canada. Previous research has identified that in the US observed differences in participation patterns between immigrant-origin and non-immigrant children are the result of barriers to accessing activities, such as low socioeconomic status (SES) and family resources (Jiang & Peguero, 2017; Vandell et al., 2015). These factors have been shown to contribute to differences in overall participation rates as well as the types of activities children from immigrant families are able to attend. Given the possible developmental benefits that OA participation may accrue, it is valuable to explore participation patterns of immigrant and non-immigrant children in a Canadian context to determine whether rates of participation are disproportionate between immigrant-origin and non-immigrant children during the middle childhood years. Such knowledge will enable identification of areas in which interventions may be necessary to promote equal access to or participation in OAs.

Furthermore, it has been argued that immigrant background may moderate the association between OA participation and developmental outcomes (Simpkins et al., 2017; Vandell et al., 2015), although research exploring the role of immigrant background is limited (Camacho & Fuligni, 2015; Jiang & Peterson, 2012). This area of study is of particular interest because immigration is the leading cause of population growth in Canada (Statistics Canada, 2020) and

because, within a bioecological framework, immigration and related factors (i.e., immigration experiences, postmigration reception, hybrid cultural identities, lack of social/cultural capital, minority status) can uniquely impact a child's experiences in OAs and, consequently, developmental outcomes (Simpkins et al., 2017; Vandell et al., 2015). While empirical research has demonstrated differences in the association between OA participation and grade point average (GPA) (Camacho & Fuligni, 2015) and problem behaviour (Jiang & Peterson, 2012) between immigrant-origin and non-immigrant teenagers, to my knowledge, there is an absence of studies investigating whether OA participation is differentially associated with the emotional wellbeing of non-immigrant and immigrant-origin children.

To address the lack of research comparing OA participation of non-immigrant and immigrant-origin children in Canada, this study describes the prevalence of overall OA participation and OA participation by activity type (i.e., educational activities, art and music lessons, individual sports, and team sports) among a sample of non-immigrant and immigrant-origin children in British Columbia (BC). This study also measures the association between OA participation and indicators of emotional wellbeing (i.e., life satisfaction and depressive symptoms) during middle childhood and tests whether these relationships vary between non-immigrant and immigrant-origin children.

In 2015 the British Columbia (BC) Ministry of Education modified the curriculum to include "personal and social competency," demonstrating that BC policy-makers recognize the importance of children's social-emotional development (Thomson et al., 2018). This study will contribute further knowledge of the connection between OA participation and emotional wellbeing that can help inform the development of OAs to promote the emotional development of immigrant-origin and non-immigrant children throughout middle childhood and beyond.

The remainder of this chapter begins by describing the importance of middle childhood as a developmental period, followed by a description of the theoretical frameworks of development that informed this thesis. The current state of knowledge regarding emotional development and wellbeing during middle childhood is presented next, followed by a description of OAs as developmental contexts. In each section, special focus is placed on the role of immigrant background as an important factor. Finally, this chapter concludes by identifying the gaps in the literature that motivated this thesis and by describing the objectives, research questions, and hypotheses of the present study.

Middle childhood

Middle childhood is the developmental period between early childhood and adolescence, from approximately ages 8 to 12 (Blume & Zembar, 2007). The middle childhood years are an important period to focus on because positive physical, cognitive, social, and emotional development during this stage of development is associated with thriving throughout the life course (Blume & Zembar, 2007; Collins, 1984; Eccles, 1999). For example, development during middle childhood is a strong predictor of adjustment, behaviours, success, and health in adolescence and adulthood (Collins, 1984; Feinstein & Bynner, 2004; Kansky et al., 2016). Although development during middle childhood spans multiple domains, this thesis focuses on emotional wellbeing during middle childhood, which is a foundation for a positive transition to adolescence (Moilanen et al., 2010; Schonert-Reichl, 2011).

During middle childhood, the prefrontal cortex—which is responsible for decision-making and emotion regulation— undergoes rapid changes (Paus, 2005; Schonert-Reichl, 2011; Steinberg, 2005). Middle childhood can be a stressful period as expectations increase and children face more challenges than during early childhood across multiple contexts (e.g., school,

peer groups), which can lead to emotional instability (Larson et al., 2002) and poor emotional wellbeing (Eccles, 1999; Schonert-Reichl, 2011). Identifying strategies which can support emotional wellbeing during middle childhood is important because emotional wellbeing is associated with overall wellbeing and thriving throughout school and life (Thomson et al., 2018). Of particular interest in this thesis is the association between emotional wellbeing and OA participation during middle childhood.

In summary, middle childhood represents an important developmental period, during which changes occur across many domains. Emotional wellbeing is an indicator of healthy development during middle childhood that is predictive of wellbeing and adjustment later in life. It is therefore important to identify prevention and intervention strategies that support emotional wellbeing during these transformative years.

Theoretical frameworks of development

This thesis draws on the positive youth development (PYD) framework to understand factors which impact children's development. PYD posits that all individuals possess strengths that can be harnessed to promote thriving (Lerner et al., 2010). The PYD framework provides an alternative strength-based perspective to historically dominant deficit-based models of development that focus solely on conditions which prevent problems (Lerner et al., 2010; Mahoney et al., 2009). Instead, PYD-informed research focuses on finding assets or factors related to positive outcomes, including relationships between the individual and context that promote thriving (Lerner et al., 2010). For example, measuring children's subjective wellbeing (a positive indicator) aligns with the PYD approach (Gadermann et al., 2010). In turn, PYD hypothesizes that promotion of positive development is also associated with a decrease in

negative wellbeing indicators, such as depressive symptoms, and problematic behaviours during development, such as alcohol use and violence (Lerner et al., 2010).

PYD is informed by the bioecological perspective, which posits that multiple levels of the child's environment interact to impact development (Lerner et al., 2010). Bronfenbrenner's bioecological theory describes the idea that the developing child is a biological system that interacts with other, external systems (Bronfenbrenner, 1979). This framework defines four levels of environment or ecology which interact with the developing child to influence development (Bronfenbrenner, 1979):

Microsystem: The microsystem encompasses interactions between the developing child and individuals, such as parents, teachers, activity leaders, and peers.

Mesosystem: The mesosystem includes interactions between two or more microsystems, for example between the norms of the OA and the family values of the developing child.

Exosystem: The exosystem comprises external influences on the child's development in which one of the microsystems does not include the developing child, such as parents' work schedules and OAs.

Macrosystem: The macrosystem is the final level of the child's ecology and includes the overall beliefs and value of society as observed in culture, religion, and the socioeconomic structure. The macrosystem influences the other systems; for example, social class may influence opportunities for participation in OAs.

Under the PYD framework, features of an individual's ecology that support healthy human development are termed external developmental assets (Lerner et al., 2010). The PYD view of child and adolescent development seeks to identify individual and ecological factors that

support thriving to inform development of programs which foster PYD (Lerner et al., 2010). Children encounter experiences combining effort, concentration, and choice when they participate in OAs, and this psychological experience is thought to contribute to positive development through the building of initiative and motivation to sustain effort towards a challenging goal (Mahoney et al., 2009). In addition, positive interactions with supportive adults and peers can contribute to learning and emotional wellbeing (Lerner et al., 2010). Because of the opportunities to build life skills and form positive adult-child or adult-peer relations they provide, OAs are recognized as developmental assets (Lerner et al., 2010; Mahoney et al., 2009).

Development of immigrant-origin children

The development of immigrant-origin children is not well understood and is likely to depend on the sample, receiving society, domain of development, and age of the children (Cote & Yuen, 2013; Suárez-Orozco et al., 2018). On one hand, immigrant-origin children may be at risk of poor developmental outcomes owing to acculturation stress when their parents are not well-accultured to the receiving country. In this case, whether immigrant-origin children over-identify with their culture of origin, the mainstream culture, or become alienated from both, familial conflict or feelings of discrimination and marginalization by peers may be associated with internalizing negative perceptions and ethnic self-hate, depressive symptoms, and problem behaviours (Pumariega et al., 2005). Relevant to this study, empirical evidence has demonstrated an association with cultural adjustment difficulties and higher risk of mental health problems (Yeh, 2003).

Alternatively, the immigrant paradox describes the finding that, for many immigrant-origin groups, children's accomplishments and health exceeds those of their non-immigrant peers (Cote & Yuen, 2013; Hofferth & Moon, 2016; Suárez-Orozco et al., 2018). However, the

immigrant paradox is not observed consistently; for example, research from Europe has found support for the immigrant paradox when considering academic achievement outcomes but poorer emotional development among first-generation immigrant-origin youth aged 13 to 18 (Sam et al., 2008).

Explanations for the success of immigrant children include high social capital in terms of the relationships within and between families, in which families tend to be stably led by two parents and extended family members play supervisory roles (Hofferth & Moon, 2016). Additionally, the cultural capital of immigrant families may contribute to immigrant children's successes (Hofferth & Moon, 2016). Culture can be conceptualized as a set of values, beliefs, and expectations that are shared within a group, such as immigrants (Hofferth & Moon, 2016; Tudge et al., 2006). Relevant to this thesis is that immigrant parents typically have high expectations for their children and that immigrant families demonstrate high levels of familial support or optimism for their children's success (i.e., "cultural capital") (Hofferth & Moon, 2016). For example, despite low financial resources, many immigrant parents seek ways to support their children in participating in activities that require parental consent, involvement, and financial support as well as reinforce children's belief in their abilities (Hofferth & Moon, 2016). In addition to this cultural capital influencing academic achievement, it can contribute to immigrant children participating in pathways that promote development, such as extracurricular involvement and academic tutoring (Hofferth & Moon, 2016). Moreover, Canada's selective immigration policy, which favours immigrants who are healthy, educated, and occupationally-skilled, may account for the success of many immigrant families (Beiser et al., 2002).

An integrative risk and resilience model extending bioecological theories of development to understand immigrant-origin children and youth's adaptation was recently proposed (Suárez-

Orozco et al., 2018). In this model, Suárez-Orozco and colleagues highlight life satisfaction and absence of depressive symptoms as important indicators of immigrant-origin children's adaptation and point to numerous factors that are important to consider in the adaptation and development of immigrant-origin children and youth (Suárez-Orozco et al., 2018). They identify immigrant generation status as an important individual-level factor to consider and suggest that research distinguish between first-generation and second-generation statuses when considering immigrant-origin, due to differences in experiences between these two generations (Suárez-Orozco et al., 2018). They argue that first-generation immigrant-origin children may view their post-migration environment as an improvement and that this perspective may contribute to an increased sense of optimism relative to second-generation immigrant children (Suárez-Orozco et al., 2018). However, first-generation immigrant-origin children's transition to their new environment may be made difficult by the necessity of learning English as a second language (Suárez-Orozco et al., 2018). They argue that second-generation immigrant-origin children may be more attuned to the cultural practices of their environment but may experience greater conflict with their parents, who may wish their children to adhere to homeland practices and values (Suárez-Orozco et al., 2018).

This thesis is primarily concerned with microsystem (i.e., OA participation) and individual factors (i.e., immigrant generation status) that influence children's emotional wellbeing. Microsystem (i.e., peer belonging), exosystem-level influences (i.e., SES), and individual characteristics (i.e., biological sex) are controlled for in the analyses as they can influence selection into OAs (the main independent variable of interest) and predict emotional wellbeing (the main dependent variable).

Emotional wellbeing during middle childhood

Emotional wellbeing has been defined as the presence of positive and absence of negative feelings about life (Keyes, 2007). In addition to physical and social wellbeing, emotional wellbeing has been recognized as a key aspect of overall wellbeing by the World Health Organization since 1948 (WHO, 2021). Emotional wellbeing can be measured by assessing both positive (e.g., life satisfaction) and negative indicators (e.g., depressive symptoms) (Keyes, 2007).

During middle childhood, emotional wellbeing is an important indicator of thriving (Thomson et al., 2018). For example, emotional wellbeing can be indicative of emotional competence which, enabling individuals' to identify and manage emotions as well as address and solve problems, is associated with better emotional wellbeing (Ciarrochi & Scott, 2006). Emotional wellbeing during middle childhood is also vital to consider because it sets the foundation for a positive transition to adolescence (Schonert-Reichl, 2011) and because emotional wellbeing during childhood and adolescence is a strong predictor of emotional wellbeing and adjustment in adulthood (Aronen & Soininen, 2000; Kansky et al., 2016; Lerner et al., 2010; Masten & Tellegen, 2012; Moilanen et al., 2010).

Indicators of negative wellbeing during middle childhood, such as depressive symptoms, are also important to measure. Middle childhood can be a stressful period as expectations increase and children face more challenges across multiple contexts (e.g., school, peer groups) than during early childhood, which research suggests is associated with emotional instability (Larson et al., 2002) and poor emotional wellbeing (Eccles, 1999; Schonert-Reichl, 2011). As children progress through middle childhood and experience changes in emotion regulation, they

are vulnerable to internalizing problems, such as depressive symptoms (Ahmed et al., 2015; Theurel & Gentaz, 2018), and empirical evidence indicates that mental health problems such as depression, anxiety, and conduct disorders often start during childhood or adolescence and are evident during middle childhood (Beesdo et al., 2009; Parasuraman et al., 2020; Russo & Beidel, 1994). It has been estimated that up to 14% of children and adolescents have clinically important mental health disorders at a given time (Waddell et al., 2002). Targeting children's mental health is important because poor mental health in childhood and adolescence is also predictive of poor mental health and self-perceived overall health in adulthood (Aronen & Soininen, 2000; Keenan-Miller et al., 2007). Because prevention and intervention strategies may be more effective near onset of mental health problems, it is important to support children's emotional wellbeing, and researchers, educators, and policy-makers are particularly interested in children's mental health during middle childhood (Schonert-Reichl, 2011).

With immigration consistently ranking as the strongest driver of Canada's population growth (Statistics Canada, 2020), supporting the emotional wellbeing of immigrant children is an important consideration for educators and policy makers. Research in Canada has demonstrated that immigrant children and their families tend to display resilience in adapting to the challenges of resettlement without severe impact to their mental health, although the likelihood of being poor is higher among immigrant families (Beiser et al., 2002, Beiser et al. 2011). This is substantial because low SES has been shown to be associated with poor mental health (Reiss, 2013; Reiss et al., 2019).[1] Consistent with the immigrant paradox, a national study of Canadian

[1] It has been argued that low SES can contribute to poor mental health through the increased adversity of low social positions (social causation) and that genetically predisposed individuals who develop mental health problems may drift to or fail to rise from lower social classes (social selection), with empirical evidence showing that both these pathways may act to produce a cyclic pattern of deprivation and mental health problems across generations (Murali & Oyebode, 2004; Reiss, 2013).

children aged 4-11 demonstrated that immigrant-origin children had lower rates of parent-reported emotional problems and problem behaviour than children born to non-immigrant parents, even though immigrant-origin children were more likely to live in poor families (36.4% among first-generation vs. 13.5% among second-generation vs. 13.3% among non-immigrant) (Beiser et al., 2002). However, it is important to note that emotional and behavioural problems were still detected among the immigrant-origin subgroup (Beiser et al., 2002).

Despite this paradox, discrimination in the receiving country remains a threat that is associated with poor mental health of immigrant-origin children (Beiser et al., 2001, 2011; Noh et al., 1999; Pumariega et al., 2005; Vargas et al., 2020). Immigration also poses the risk of marginalization when children feel discriminated against or denigrated by the mainstream culture of the recipient society, which has been shown to be associated with mental health problems among Chinese, Korean, and Japanese immigrant-origin children in the US and among immigrant-origin children from Hong Kong, Mainland China, and the Philippines living in Canada (Beiser et al., 2011; Yeh, 2003).

When children's parents are not well-accultured or reject the values of mainstream society, children can feel conflicted in terms of their identity and family conflict or marginalization can arise, which have been associated with conduct disorder and substance use (Pumariega et al., 2005). In addition, immigrant-origin children represent a diverse group with varying experiences. For example, refugee children worldwide have demonstrated high levels of mental health problems owing to their traumatic life histories (Hadfield et al., 2017). Unlike second-generation immigrant-origin children, children who are of first-generation immigrant-origin have experienced firsthand moving to a new country; research has shown that the stress

associated with major life event such as this can be associated with declines in life satisfaction (Proctor et al., 2009).

To summarize, emotional wellbeing is an important domain of overall wellbeing and an indicator of thriving during middle childhood. Supporting children's emotional wellbeing through intervention and prevention strategies during middle childhood is of particular importance because emotional wellbeing during middle childhood is associated with wellbeing throughout life, yet the changing pressures and challenges that children face during middle childhood place them at risk of poor psychological health (Aronen & Soininen, 2000; Beesdo et al., 2009; Keenan-Miller et al., 2007; Schonert-Reichl, 2011). Because immigration is a main driver of Canada's population growth, it is important that research identifies factors associated with the emotional wellbeing of immigrant-origin children. This thesis focuses on life satisfaction as a positive indicator and depressive symptoms as a negative indicator of emotional wellbeing among non-immigrant and immigrant-origin children during middle childhood.

Life satisfaction

Life satisfaction has been defined as both "an individual's overall appraisal of the quality of his or her life" (Gilman & Huebner, 2003, p.193) and "a cognitive evaluation of one's life" (Pavot & Diener, 2008, p.138). A recent review of the literature identified life satisfaction as a key indicator of subjective wellbeing that is strongly associated with positive development (Proctor et al., 2009). For example, high levels of life satisfaction are associated with many indicators of wellbeing measures among children and adolescents, including active coping, positive purpose in life, participation in prosocial activities, self-efficacy, as well as lower likelihood of involvement in drugs, alcohol, and internalizing/externalizing behaviour (Gilman & Huebner, 2003; Huebner, 2004). Low levels of life satisfaction are also predictive of

internalizing and externalizing behaviour (Haranin et al., 2007), relational victimization, and prosocial experiences (Martin et al., 2008). In consideration of its relationship to other positive indicators of wellbeing and externalizing behaviours, life satisfaction represents an important protective psychological factor for children and adolescents, linked to positive growth and development (Gadermann et al., 2010).

While most children and adolescents report high levels of life satisfaction, a substantial proportion (estimated around 11%, by one US study) report low life satisfaction (Huebner et al., 2000; Proctor et al., 2009). Moreover, declines in life satisfaction have been reported in middle childhood (Eccles, 1999; Schonert-Reichl, 2011). Research has indicated that social support, including peer belonging, is strongly associated with life satisfaction cross-sectionally (Gadermann et al., 2016; Proctor et al., 2009) and longitudinally (Oberle, Ji, Guhn, et al., 2019) in middle childhood and adolescence. Research has also indicated that higher family income is associated with better life satisfaction (Gadermann et al., 2016).

Depressive symptoms

The absence of depressive symptoms is indicative of healthy development and emotional wellbeing (Schonert-Reichl, 2011). Depressive symptoms during middle childhood are predictive of depression during the teenage years (Bellamy & Hardy, 2015). Aronen and Soininen showed that depressive symptoms in middle childhood are predictive of psychiatric symptoms, poor self-esteem, and poor adaptive functioning in young adulthood (Aronen & Soininen, 2000). It has also been shown that history of depression identified at age 15 is predictive of poorer self-perceived health in young adulthood, even when controlling for concurrent depression in adulthood (Keenan-Miller et al., 2007).

Several factors have been associated with depressive symptoms among children and adolescents. A Finnish study demonstrated that among children in Grade 6, depressive symptoms were associated with being female (Uusitalo-Malmivaara & Lehto, 2013). It has also been shown that low peer belonging is associated with depressive symptoms, while high peer belonging may protect against depressive symptoms (Oberle, Ji, Guhn, et al., 2019; Uusitalo-Malmivaara & Lehto, 2013). A recent systematic review concluded that that low SES is associated with mental health problems among children and adolescents (Reiss, 2013). .

Organized activities as contexts of development

Organized activities are structured activities that take place outside of the school curriculum, are regularly-scheduled, adult-supervised, and emphasize skill-building (Mahoney et al., 2005). Examples include individual and team sports, performing or visual arts, and music programs (Mahoney et al., 2005; Vandell et al., 2015). Such activities may be defined by when they occur. For example, when OAs take place during the after-school hours, they may be referred to as organized after-school activities (Mahoney et al., 2005). OAs are viewed as developmental assets because they generally promote healthy development and are associated with wellbeing (Deutsch et al., 2017). However, there is evidence that participation in different activity types may be associated with different outcomes (Mahoney et al., 2009). Furthermore, while currently understudied, it is important to consider how the association between participation in OA and emotional wellbeing may vary between groups of children, such as between non-immigrant and immigrant-origin children (Vandell et al., 2015).

In this thesis, OA refers to organized activities that take place after school between 3:00PM and 6:00PM, on weekdays. This definition was used to reflect the questions asked about OA participation in the Middle Years Development Instrument (MDI), which were used to

measure participation in this thesis (Schonert-Reichl et al., 2013). During development of the MDI, community leaders expressed particular interest in the 'critical hours' during which children are out of school but their parents may still be at work (Thomson et al., 2018).

Factors associated with OA participation

While research has documented that most young people participate in at least one OA, there is a substantial proportion of youth who do not (Jiang & Peterson, 2012; Parasuraman et al., 2020). It is important to understand factors that influence selection into OA not only to inform activities that maintain youth's interest and involvement, but also to identify appropriate statistical controls for quantitative analyses investigating the link between OA participation and children's developmental outcomes (Vandell et al., 2015). Statistically controlling for factors associated with selection into OAs strengthens quantitative analyses that aim to investigate relationships between OA participation and children's developmental outcomes by reducing the likelihood that observed benefits of OA participation are due to selection effects (Vandell et al., 2015). A substantial amount of literature dealing with children's OA has identified factors associated with OA participation and the types of OAs that children and youth participate in, and the results of these studies are described below.

Sociodemographics. Ability and interest to participate in activities is strongly predicted by demographic factors, such as sex and SES (Mahoney et al., 2009). Empirically, sex-based differences in OA participation have been reported by some studies. For example, research from the US and Czech Republic indicates that being female is associated with participation in performing and fine arts whereas being male is associated with sports participation (Badura et al., 2015; Denault & Poulin, 2009). Additional research from the US has also linked female sex with participation in arts activities (Camacho & Fuligni, 2015; Simpkins et al., 2005).

There is an abundance of empirical evidence supporting the association between SES and both participation in OAs and which types of OAs youth participate in. Higher family SES has been shown to be associated with participation in OA, particularly among high-investment activities such as sports and art or music lessons (Denault & Poulin, 2009; Hofferth & Moon, 2016; Mahoney et al., 2009; Pedersen, 2005; Simpkins et al., 2005; Vandell et al., 2015). SES is related to both the affordability of activities and children's ability to participate (Mahoney et al., 2009). In addition to financial constraints preventing participation or determining which types of activities children from low-income families can access, low-income families may also face time and transportation restraints (Mahoney et al., 2009). For example, parents of low-income families may not have as much time readily available to transport their children to and from activities (Simpkins et al., 2005). Restraints on the free time of children from lower-income families may also limit their ability to participate; for example, children may need to provide child care for younger siblings or maintain other household responsibilities that keep them from participating in OAs during their out-of-school time (Simpkins et al., 2005; Vandell et al., 2015).

Peer influence. A primary motivating factor which compels children and adolescents to join, stay, and leave activities is spending time with friends (Mahoney et al., 2009). Empirical research has documented this trend. In a qualitative study of adolescents who participated in arts or athletic OAs, Fredricks and colleagues found that children reported an important reason they chose to participate in a given OA was because their friends participated (Fredricks et al., 2002). In another study, best friends' participation was associated with hours spent in sports among Grade 7 boys (Denault & Poulin, 2009). Among urban girls age 10 and older (mean age = 12.6 years), Loder and Hirsch found that peers played a major role in recruitment and retention of girls to youth development organizations (Loder & Hirsch, 2003). Specifically, they documented

that the activity itself was the primary reason girls were drawn to youth clubs while the second most prevalent reason girls reported participating in youth development organizations was because of friends (Loder & Hirsch, 2003). Other research has reported that friends' endorsement, or how important it is to be involved in OAs among one's friend group, was associated with participation in after-school extracurricular activities (Huebner & Mancini, 2003). Collectively, these studies demonstrate that friends' participation in out-of-school activities, which may include after-school OAs, can profoundly influence children's participation in out-of-school activities.

Immigrant background. In this thesis, immigrant background refers to whether a child is of immigrant-origin (i.e., foreign-born or with at least one foreign-born parent) or non-immigrant (i.e., born in Canada and no foreign-born parents). Immigrant generation status consists of three levels, which are defined as follows: non-immigrant generation status applies to children who were born in the host country and whose parents are not foreign-born, first-generation is used to describe immigrant-origin children who themselves were foreign-born, and second generation describes immigrant-origin children who were born in the host country but have at least one foreign-born parent.

Research from the US has indicated that immigrant generation status is associated with participation in OAs (Jiang & Peguero, 2017; Jiang & Peterson, 2012; Peguero, 2010). Based on the existing research, OA participation appears higher among non-immigrant youth than among their first- and second-generation counterparts (Jiang & Peterson, 2012; Peguero, 2010). One study reported that participation in OA was highest among non-immigrant high-schoolers (80%), followed by second-generation (72%) and first-generation (67%) youth; participation rates were significantly lower among immigrant-origin youth than their non-immigrant peers (Jiang &

Peterson, 2012). Researchers have demonstrated that characteristics which place Hispanic immigrant youth at risk of not participating include lower family resources, such as low income, low parental education levels, and lack of parental supervision (Jiang & Peguero, 2017). In particular, immigrant youth from families with low financial, human, or social capital may be unable to participate in high-investment activities that require investment in transportation, fees, and uniforms or equipment (Hofferth & Moon, 2016). The need for children to assist in alternative responsibilities such as supervising younger siblings or household chores also restricts access to OAs (Hofferth & Moon, 2016). While many immigrant families face barriers to accessing OAs, as discussed previously, some immigrant parents have been shown to be highly supportive of their children's involvement in OAs and may find additional ways to make participation possible, such as by establishing saving accounts and encouraging their children to participate (Hofferth & Moon, 2016).

Relation to emotional wellbeing

Participation in OAs is generally associated with positive developmental outcomes (Mahoney et al., 2009; Simpkins et al., 2009; Vandell et al., 2015). Of relevance to this thesis is that OAs have been identified as playing an important role in maintaining and promoting emotional wellbeing among children and adolescents (Agans et al., 2014; Badura et al., 2015; Bartko & Eccles, 2003; Panza et al., 2020).

OAs have been argued to contribute to emotional wellbeing because they provide children opportunities for learning social-emotional and additional life skills (Darling, 2005; Fredricks & Eccles, 2005; Vandell et al., 2015). For example, they may provide opportunities for goal setting, persistence, problem solving, teamwork, managing emotions, and managing time (Larson et al., 2006). Empirical research has supported the role of OA participation in learning to

manage anger, anxiety, and stress by showing that participation in OAs provides children with higher rates of experiences related to learning emotional regulation than unstructured or leisure activities (Hansen et al., 2003). Furthermore, PYD theory considers OA developmental assets or contexts that promote healthy and positive development (Mahoney et al., 2009). This is because OAs provide a safe place with adult supervision where children can build supportive relationships, nurture their interests, build skills, and develop a sense of purpose (Fredricks & Simpkins, 2012; Lerner et al., 2010; Mahoney et al., 2009).

Specifically, as summarized by Mahoney and colleagues (Mahoney et al., 2009), scholars have proposed eight features of OA that are linked to PYD:

1. Supportive relationships with adults and peers
2. Appropriate structure
3. Opportunity for skill building
4. Support for efficacy and mattering
5. Opportunities for belonging
6. Physical and psychological safety
7. Positive social norms
8. Integration of family, school, and community efforts

There is a growing body of empirical evidence which supports the contribution of OA participation to PYD, including emotional wellbeing. For example, research has shown that participation in OA is associated with better psychological functioning, including self-regulation (i.e., reduction in internalizing/externalizing behaviour, managing emotions) and depressed mood, among high schoolers in the USA and Czech Republic (Badura et al., 2015; Bohnert et al., 2008; Mahoney et al., 2009; Randall & Bohnert, 2009). Research has also reported an

association between OA participation and life satisfaction (Badura et al., 2015; Gilman & Huebner, 2006; Maton, 1990). Such associations have been reported during both middle childhood and among teenagers (Badura et al., 2015; Gilman & Huebner, 2006; Maton, 1990).

The associations between OA and emotional wellbeing may not be consistent across activity types (Bohnert et al., 2010; Mahoney et al., 2009; Vandell et al., 2015). This is because the process dimensions, such as the cognitive and affective content of peer-to-peer and youth-to-adult interactions, may be different for different types of activities, leading to differences in developmental outcomes (Larson et al., 2006; Mahoney et al., 2009). While some empirical work has demonstrated that different activities are associated with different aspects of development, the literature is inconclusive as to how benefits of OA participation differ across OA activity types and whether specific types of activities are systematically and consistently related to specific outcomes (Mahoney et al., 2009; Vandell et al., 2015). For this reason, in addition to considering overall OA participation, this thesis also considers participation in activity types (i.e., educational, arts and music, individual sports, team sports) as separate predictors of emotional wellbeing.

Sports participation. Through their emphasis on goal-setting, participation in both individual and team sports have been shown to provide experiences related to the development of initiative (Larson et al., 2006). While this focus on goal-setting is thought to explain the reported association between sports participation and academic achievement, the high focus on goal achievement in sports activities has also been shown to be associated with high levels of stress among youth who participate in sports (Larson et al., 2006; Scanlan et al., 2005). On the other hand, research has shown that sports participation provides more experiences related to learning emotional regulation among adolescents compared to other OAs, particularly academic lessons

or activities (Hansen et al., 2003, 2010; Larson et al., 2006). Researchers have argued that the competitive nature of sports and participants' drive to excel may promote the development of strategies to manage emotions (Hansen et al., 2003). For example, the excitement and disappointments of competition have been argued to provide opportunities to develop emotional regulation among sports-participants (Larson et al., 2006).

The physical training aspect of sports has also been argued to contribute to the association between sports participation and emotional wellbeing reported in the literature since physical activity is associated with better physical and mental health (Badura et al., 2015; Biddle & Asare, 2011; Hallal et al., 2006; Janssen & Leblanc, 2010). Consistent with this argument, research has documented associations between sports participation and lower self-reported symptoms of anxiety and depression (Bartko & Eccles, 2003; Fredricks & Eccles, 2005; Panza et al., 2020). Cross-sectional research has also reported stronger associations between participation in individual and team sports and higher life satisfaction during middle childhood and adolescence than participation in other types of OAs (Badura et al., 2015).

Developmental experiences afforded by team and individual sports are not identical. It has been theorized that team sports require greater efforts towards collaboration with peers, including group processes and dynamics (Hansen et al., 2010). Unlike individual sports, team sports require cooperation towards a common goal, which has been shown to promote teamwork and social skills (Hansen et al., 2010). However, empirical work exploring the extent to which team versus individual sports participation are associated with teamwork and social skills or other developmental outcomes is limited.

Arts and music participation. Literature exploring how arts and music activities contribute to emotional wellbeing relative to other activity types is limited (Larson et al., 2006).

However, it is theorized that arts and music participation may contribute to emotional wellbeing through initiative and identity development (Larson et al., 2006), developing a sense of purpose (Zarobe & Bungay, 2017), and through fulfilling emotional needs (for example, as a means to create, enhance, sustain, and change a person's moods) (O'Neill, 2005). Empirical research has linked arts and music participation to initiative building among 11th graders (Larson et al., 2006) and it has been shown that arts and music participation is associated with higher rates of experiences related to initiative than other OA types, with the exception of sports (Hansen et al., 2010). Participation in music may also contribute to motivation, confidence, and self-esteem (Guhn et al., 2019), and empirical research has linked arts and music participation to self-confidence and self-esteem among 11 to 18 year-olds (Zarobe & Bungay, 2017). A literature review also found that participation in arts activities has been linked to life satisfaction and lower rates of depressive and anxiety symptoms among children and teenagers, supporting the association between participation in arts and music activities and emotional wellbeing (Badura et al., 2015).

Educational activities. Research has shown that participation in educational activities is primarily related to the development of academic skills (Hansen et al., 2003; Larson et al., 2006). One study showed that among 11th graders, participation in educational activities was associated with fewer self-reported opportunities for developmental experiences, particularly emotional regulation experiences, than all other OAs (Larson et al., 2006). It has also been suggested that academic activities provide fewer opportunities for teamwork and cooperation than other OAs, such as team sports (Hansen et al., 2010).

However, by promoting academic skills, participation in educational activities may improve children's academic achievements, which can, in turn, promote emotional wellbeing if

progress aligns with children's goals. For example, making progress toward goals (such as academic goals) has been associated with higher emotional wellbeing, including life satisfaction (Diener et al., 1999). This thesis further explored whether educational activities are related to children's emotional wellbeing.

The role of immigrant background

Recent literature has acknowledged that the associations between OA participation and development are not consistent among all groups of children (Jiang & Peterson, 2012; Vandell et al., 2015). Scholars studying children and adolescent's OA participation have identified immigrant background as a potential effect modifier in the relationship between OA participation and developmental outcomes (Vandell et al., 2015). Previous research has focused on the relations between OA participation with academic achievement (Camacho & Fuligni, 2015) and absence of problem behaviours (Jiang & Peterson, 2012) as indicators of development. In addition, existing research has focused on teenagers, and research in children is lacking.

Immigrant-origin children represent a culturally diverse group with varying cultures and immigration experiences (Simpkins et al., 2017; Vandell et al., 2015). It is important that OAs be sensitive to these variations (Vandell et al., 2015). For example, within a generational group, there are differences in the reasons that immigrant-origin children and their families enter the host country. In many countries, such as Canada, a selective immigration policy applies, and these differences in entry criteria determine what migrant class a family and their children belong to (Beiser et al., 2002). In Canada, immigrant families or children may be considered economic class immigrants, selected because of their ability to contribute to the country's economy, or family class immigrants, who are granted permanent resident status based on their relationship to someone already in the country (Statistics Canada, 2019). Like many other countries, Canada

also accepts refugees. Refugee class immigrants are asylum seekers accepted on the basis of a well-founded fear of residing in their home country, for example, because of persecution for reasons of race, religion, nationality, membership in a social group, or political opinion (Statistics Canada, 2019). Traumatic pre-migration experiences among refugees are common and include violence, war, death of family members, and separation from family (Heptinstall et al., 2004). Pre-migration exposure to violence has been identified as a key risk factor for poor mental health among refugee children while stable settlement and social support in the host country have been documented as having a positive impact on refugee children's psychological functioning (Fazel et al., 2012).

Among first-generation immigrants, OA can play "bridging roles" that help children adapt to their new environments by connecting them to peers in similar situations and to adults who serve as cultural guides (Gaytan et al., 2007; Vandell et al., 2015). Participating in OA awards immigrant-origin children opportunities to develop social connections to peers, adult mentors, and with the larger community (Jiang & Peguero, 2017). In this way, it is possible that first-generation children may stand to gain greater benefits from OA participation than their second-generation and non-immigrant counterparts. In fact, one study focusing on high school students in the US found that immigrant background modified the association between OA participation and GPA, with greater gains in GPA among first-generation students than other children (Camacho & Fuligni, 2015). The authors attributed this finding to gains in social capital awarded through OA participation.

On the other hand, it has also been argued that the potential benefit first- and second-generation immigrant-origin children accrue from participation may depend on their compatibility with the programs in which they engage (Simpkins et al., 2017; Vandell et al.,

2015). One example is cultural responsiveness, or the extent to which the relationship between OA and participants is dynamic and synergistic, considering the multiplicity and fluidity of cultural practices, beliefs, and knowledge of participants (Simpkins et al., 2017). It is important that OA are culturally responsive and safe spaces for all children (including minority children) to explore their identities since exploration of resolution of ethnic and racial identity occurs during middle childhood (Eccles, 1999), underscoring the importance of racial, ethnic, and cultural fit during this developmental period. Moreover, as discussed previously, criteria for OA to contribute to PYD included "physical and psychological safety" and "supportive relationships with adults and peers." However, these characteristics of OA may not hold across a diverse population, and Simpkins and colleagues suggest that OA may not be positive spaces for all youth (Simpkins et al., 2017). Expectations that immigrant-origin children show similar levels of performance, enthusiasm, ritual celebration, and English language ability in understanding and interpreting instructions as non-immigrant children can lead to alienation or marginalization (Jiang & Peterson, 2012). Alienation, in turn, is associated with maladjustment, including depressive symptoms (Bohnert et al., 2009). Perceived discrimination has been associated with problem behaviours, such as substance use (Kullis et al., 2009). Development is enhanced when minority youth, including immigrant-origin children, are in settings that support their cultures (García et al., 1996). Simpkins also advocates that activities should be structured in ways such that adolescents feel comfortable expressing their hybrid sense of identities (Simpkins et al., 2017).

Although such discussions around the negative experiences faced by minority youth in OA have gained popularity only recently (Simpkins et al., 2017), the claim that OA may not be equally safe and supportive contexts across diverse populations of children is supported by

recent empirical findings across minority groups in a variety of settings. For example, a study in the US documented that Latino adolescents, representing a cultural and ethnic minority group, felt misunderstood, marginalized, and discriminated against at OA (Lin et al., 2016). Such negative experiences have also been reported in other institutional settings, such as schools, among ethnic or racial minority and immigrant adolescents (Gay, 2010; Simpkins et al., 2017).

Although there is a lack of research considering immigrant generation status specifically in the association between OA participation and PYD, the two available studies that consider immigrant background as an effect modifier between OA participation and development focus on academic outcomes and lack of problem behaviours as indicators of development. While it is widely assumed that OA participation is equally beneficial for all children (Jiang & Peterson, 2012), empirical work has in fact documented mixed results regarding the association between OA participation and indicators of development, based on immigrant background and dependent on the specific outcomes examined (Camacho & Fuligni, 2015; Jiang & Peterson, 2012).

Jiang and Peterson studied American adolescents in Grades 7 through 12 and found that OA participation was associated with lower odds of self-reported involvement in violent behaviour among non-immigrants and higher odds of violent behaviour among first- and second-generation immigrants, relative to their non-participating counterparts (Jiang & Peterson, 2012). Their results challenge the perspective that OA participation is equally beneficial towards all youth, and the authors state potential cultural conflict, role strain, marginalization, and discrimination as possible explanations for the positive association between OA participation and violence among immigrant youth (Jiang & Peterson, 2012).

In contrast, an American study of high school students by Camacho and Fuligni reported a stronger association between any OA participation and GPA among first-generation immigrant

youth than second-generation or non-immigrant youth, controlling for demographic factors and previous GPA (Camacho & Fuligni, 2015). Second-generation youth showed an association of magnitude between that observed for first-generation and non-immigrant youth (Camacho & Fuligni, 2015). The same study also reported an association between greater breadth of OA participation and GPA among first-generation youth, but not among second-generation or non-immigrant children (Camacho & Fuligni, 2015). The authors explain this finding by suggesting that OAs compensate for the lack of familiarity with the American school system that first-generation families sometimes demonstrate (i.e., lack of social capital), familiarizing children with the school system and facilitating achievement (Camacho & Fuligni, 2015). They argue that participation in OAs allowed first-generation immigrant teenagers to meet the high academic expectations of themselves and their families (Camacho & Fuligni, 2015), which is consistent with reasoning used to explain the immigrant paradox.

Children are a diverse group, and researchers have drawn attention to the paucity of research that investigates differences in the association between OA participation and PYD based on *who* is participating (Jiang & Peterson, 2012; Simpkins, 2015). For example, there is a lack of research that explores differences based on immigrant background (Jiang & Peterson, 2012). Such discrepancies in terms of the associations between participation in OAs and developmental outcomes between non-immigrant and immigrant-origin children have not been reconciled (Camacho & Fuligni, 2015; Jiang & Peterson, 2012). Furthermore, to my knowledge, no prior research has investigated whether the association between OA participation or type of OA participation and emotional wellbeing varies based on immigrant background.

Gaps in the literature

While there is a wide body of literature investigating OA participation and its association with emotional wellbeing among school-aged children and youth generally, gaps in the literature remain.

First, research has not considered whether reported associations between OA participation and emotional wellbeing vary between immigrant-origin and non-immigrant children. Research considering immigrant background as an effect modifier between OA participation and development has focused on academic achievement and involvement in violence as outcomes (Camacho & Fuligni, 2015; Jiang & Peterson, 2012). The lack of literature examining the role of immigrant background in the relationship between OA participation and emotional wellbeing is striking. Features of OA that are thought to contribute to healthy development include safety and supportive relationships with peers and adults (Mahoney et al., 2009), yet immigrant-origin and minority children may be vulnerable to feelings of discrimination and at risk of marginalization (Lin et al., 2016). The importance of designing culturally responsive activities that create comfortable environments for immigrant-origin children to express their hybrid cultural identities has also been raised by predominant scholars in the OA field (Simpkins et al., 2017). This hypothesis that participation in OAs is not equally beneficial for all children and youth is supported empirically by Jiang and Peterson's study, which reported associations between immigrant-origin and involvement in violence (i.e., a problem behaviour) in adolescence, while participation in OAs was associated with non-involvement in violence among non-immigrant children (Jiang & Peterson, 2012). Alternatively, it has been suggested that first-generation immigrant-origin children and adolescents may stand to gain more from participating in OA than their non-immigrant and second-generation

counterparts due to gains in cultural and social capital owing to the bridging roles that OAs may play (Vandell et al., 2015). Empirically, a stronger association between OA participation and GPA among first-generation immigrant-origin children compared to non-immigrant children has been reported (Camacho & Fuligni, 2015). Whether the association between OA participation and emotional wellbeing varies between non-immigrant and immigrant-origin children has not yet been studied empirically.

Second, the few studies that explored immigrant generation status as an effect modifier between OA participation and development have focused on adolescents in high school (Camacho & Fuligni, 2015; Jiang & Peterson, 2012). More generally, much of the current research investigating the relationship between OA participation and emotional wellbeing has included adolescents or focused on young adults. Research focusing on the relationship between OA participation emotional wellbeing specifically during middle childhood (i.e., ages 8 to 12) is lacking, and particularly research which considers unique associations based on immigrant background or generation status. It is important to identify prevention strategies, such as OAs, that foster emotional wellbeing specifically during middle childhood since transformations that occur during this period affect the life course (Blume & Zembar, 2007; Eccles, 1999; Schonert-Reichl et al., 2013).

Third, there is a scarcity of research investigating OA participation among immigrant-origin children in a Canadian context. There is reason to think participation may vary based on immigrant background because research from the US shows that immigrant-origin children are less likely to participate in OAs than non-immigrant children (Behtoui, 2019; Peguero, 2011) and are more likely to face barriers to accessing organized activities, such as low family resources (Jiang & Peguero, 2017). Research considering immigrant background as an effect modifier, as

previously discussed, is limited in the Canadian context. Understanding the role of organized activities in positive youth development among immigrant-origin children is important as international migration is the main driver of Canada's population growth (Statistics Canada, 2020). This gap extends such that, broadly, research which investigates the relationship between OA participation and emotional wellbeing during middle childhood in a Canadian context is limited.

The Current Study

In 2015, the BC Ministry of Education adjusted the curriculum for all kindergarten to grade 12 students to include personal and social competency, demonstrating that BC policy-makers realize the importance of social-emotional development (Thomson et al., 2018). Under the PYD perspective, out-of-school organized activities are one ecological asset that contribute to thriving in adolescence, such as by supporting social competence and confidence (Lerner et al., 2010). However, to my knowledge, there is a lack of research investigating the association between participation in OA and emotional wellbeing by immigrant background. Second, while differences in OA participation patterns and associations with (different aspects of) development have been reported between immigrant groups among older populations and in the U.S. (Camacho & Fuligni, 2015; Jiang & Peterson, 2012), there is a paucity of research in middle childhood and in the Canadian context.

Research questions and objectives

The objectives of this study were to compare participation in OA overall and by activity type between immigrant-origin and non-immigrant Grade 7 children, to measure the association between OA participation and emotional wellbeing, and to determine whether the associations

between OA participation and emotional wellbeing indicators differ between children of immigrant-origin (first- or second-generation) and non-immigrant children. Considering the paucity of research considering immigration background, this study focused on the presence or absence of OA participation (i.e., yes/no) overall as well as by type of OA as the main explanatory variables of interest. This approach is described in further detail in the Methods section.

The research questions stipulated to meet this study's objectives and their corresponding hypotheses were:

Q1: Does the proportion of children who participate in (any) OA or in each OA type (i.e., educational activities, arts and music, individual sports, team sports) vary between immigrant-origin and non-immigrant children?

H1: Overall OA participation rates will be higher among non-immigrant children than immigrant-origin children. Activity-specific participation rates will also vary based on immigrant background, with an association between participation in high-investment activities (art and music lessons, individual sports, team sports) and non-immigrant background.

Q2: What is the association between participation in (any) OA or specific types of OA and: 1) satisfaction with life or 2) depressive symptoms, adjusting for child's sex, SES, and peer belonging?

H2: Participation in OA will be associated with better satisfaction with life and lower depressive symptoms after controlling for confounding variables.

Q3: Does the relationship between participation in (any) OA or specific types of OA and: 1) satisfaction with life or 2) depressive symptoms depend on immigrant background?

H3: The relationship between participation in (any) OA/specific types of OA and wellbeing indicators will differ between immigrant-origin and non-immigrant children.

The results of this study can be used to inform the development of OAs that foster positive emotional development among immigrant-origin children throughout middle childhood. PYD research has seen contributions from policy makers interested in improving the life chances of diverse youth (Lerner et al., 2010). The present study aims to provide additional knowledge that can further inform public policy, program development, and future research to contribute to the availability of activities that can support positive development among a diverse population of children.

Chapter 2: Materials and Methods

Study design

This was a cross-sectional study based on observational data. Demographic characteristics and immigration factors were obtained from administrative data linkages. Self-report variables were measured using the Middle Years Development Instrument (MDI) (Schonert-Reichl et al., 2013). The dependent variables of interest were self-reported life satisfaction and depressive symptoms, a selection of indicators reflective of children's emotional wellbeing and suggestive of mental health and thriving in childhood (Thomson et al., 2018). The main independent variable of interest was self-reported OA participation. The potential role of immigrant generation status as an effect modifier in the relationship between the independent and dependent variables was also of interest.

Data source

Data were sourced from Population Data BC. The approved study population included children who ever attended school in the ten largest urban or suburban school districts in BC[2], which represent over 80% of immigrant-origin children in the province. These districts are: 34 (Abbotsford), 35 (Langley), 36 (Surrey), 37 (Delta), 38 (Richmond), 39 (Vancouver), 40 (New Westminster), 41 (Burnaby),43 (Coquitlam), 61 (Greater Victoria). Linked person-level data consisting of self-reported after-school OA participation, connectedness to peers, and social-emotional outcomes based on the MDI and provided by UBC's Human Early Learning Partnership (HELP; HELP, 2017), demographic variables from the BC Ministry of Health (MOH; BC MOH, 2017) and immigration-related variables from Immigrant, Refugees and

[2] At the time of data collection, students attended 276 unique schools in 20 school districts because children may have moved between school districts over time.

Citizenship Canada (IRCC; IRCC, 2017) were used for this analysis. Population Data BC applied a probabilistic-deterministic linkage approach to link individuals across data sources, using personal education and personal health numbers.

Participants

This study's sample was composed of Grade 7 students attending a subset of public elementary and middle schools in BC who participated in the MDI between the 2012/2013 and 2016/2017 school years and were included in the immigrant data linkage approved for use in this study. Of the 15,371 children who participated in the MDI and were included in the immigrant data linkage, data analysis was conducted on a final sample of N = 14,406 children (47.8% female; mean age = 12.0 years, SD = 0.55) from 276 schools and 164 neighbourhoods.

Data collection

The MDI was administered to students during the 2012/2013 school year through the 2016/2017 school year. In the 2012/2013 school year, the survey was administered by school staff in January or February; thereafter, implementation occurred in November or December due to administrative reasons. Students completed the MDI electronically or on-paper over two forty-minute class periods. It has been reported elsewhere that differential item functioning and missingness did not differ between the two administration routes (Oberle, Ji, Guhn, et al., 2019).

Measures

The Middle Years Development Instrument

The MDI is a population-based self-report tool that assesses children's social-emotional development and wellbeing in their home, school, and neighbourhood contexts (Thomson et al., 2018). The survey is comprised of five domains: social-emotional development, connectedness to peers and adults, school experiences, physical health and wellbeing, and constructive use of

after-school time (Schonert-Reichl et al., 2013; Thomson et al., 2018). The instrument was informed by literature encompassing strengths- and asset-based approaches to child development as well as ecological theories of human development, consistent with PYD (Schonert-Reichl et al., 2013). The MDI was developed based on a knowledge-to-action framework (CIHR, 2016), involving a team of researchers, educators, and other stakeholders in the development process to ensure that MDI data would be useful for the design and implementation of intervention and prevention efforts across multiple contexts (Schonert-Reichl et al., 2013; Thomson et al., 2018). Student feedback was also obtained throughout the development process (Schonert-Reichl et al., 2013). Research has demonstrated strong validity evidence of the MDI to measure social-emotional development and wellbeing among BC schoolchildren (Schonert-Reichl et al., 2013).

In this analysis, life satisfaction and depressive symptoms were used as indicators of emotional wellbeing and were measured using scales from the social-emotional development domain of the MDI. Items from the constructive use of after-school time domain were used to measure participation in OA. Peer belonging was measured using a scale from the connectedness to peers and adults domain.

Satisfaction with Life. Life satisfaction was measured using the *Satisfaction With Life Scale adapted for Children* (SWLS-C) (Gadermann et al., 2010), a modified version of the *Satisfaction with Life Scale* (Diener et al., 1985). The subscale is comprised of five items, with responses ranging from "Disagree a lot" to "Agree a lot," where higher scores represent greater agreement and higher life satisfaction (Gadermann et al., 2010). Sample item: "I am happy with my life." Life satisfaction scores ranged from 1 to 5 (mean = 3.96, SE = 0.08). The scale demonstrated good internal consistency (Cronbach's $\alpha = 0.86$).

Depressive symptoms. Depressive symptoms were measured using a three-item subscale adapted from the *Seattle Personality Questionnaire* (Kusche, Greenberg, & Beilke, 1988). Items have five responses ranging from "Disagree a lot" to "Agree a lot," with higher scores indicating greater agreement and worse depressive symptom severity. Sample item: "I feel unhappy a lot of the time." Scores ranged from 1 to 5 (mean = 2.60, SE = 0.09). Internal consistency of this scale was acceptable (Cronbach's $\alpha = 0.78$).

Participation in organized activities. Participation in OAs was measured using items from the constructive use of after-school time domain of the MDI. These questions ask children, "During last week from after school to dinner time (about 3:00 pm to 6:00 pm), how many days did you participate in: a) Educational lessons or activities b) Art or music lessons c) Youth organizations d) Individual sports with a coach or instructor, or e) Team sports with a coach or instructor." For each activity type, responses ranged from "Never" to "5 times a week (every day)." In this study, only participation in educational activities, art or music lessons, individual sports, and team sports were assessed due to their higher popularity relative to youth organizations.

Given that OA participation is understudied among immigrant-origin children, this study chose to look at overall participation in OA, that is, the presence (i.e., participation in any/at least one OA) or absence of participation. To compare the emotional wellbeing of children who participated in any OA and children who did not, the participation status variable was dichotomized (0 = response pattern of "never" across all four OA variables, 1 = participation in any activity on one or more days of the week) to capture OA participants and non-participants. Previous research investigating associations between children's OA and wellbeing indicators or problem behaviour has employed this procedure (Badura et al., 2015; Camacho & Fuligni, 2015;

Gilman & Huebner, 2006; Jiang & Peterson, 2012; Oberle, Ji, Magee, et al., 2019; Pedersen, 2005).

Additional analyses were conducted to explore the relationship between participation in different types of OAs and emotional wellbeing indicators. For these analyses, the presence or absence of participation was identified for each type of organized activity (0 = response of "never" to the activity, 1 = participation in the activity on one or more days of the week). Activities considered were educational lessons or activities, arts and music lessons, individual sports, and team sports.

Peer belonging. As previously discussed, research has found that one reason children participate in OAs is because OAs provide opportunities to see friends (Fredricks et al., 2002) and because friends participate (Denault & Poulin, 2009), suggesting that peer belonging can influence a child's decision to participate in OAs. Peer belonging has also been shown to be associated with higher life satisfaction and the absence of externalizing and internalizing problems (Arslan et al., 2020). In this thesis, peer belonging was conceptualized to act as a confounder in the relationship between OA participation and wellbeing and was included as a covariate in the models.

In this study, a modified 3-item version of the *Relational Provisional Loneliness Questionnaire* was used to measure peer belonging (Hayden-Thomson, 1989). The five-point response scale ranged from "disagree a lot" to "agree a lot," with higher scores indicating higher agreement and higher peer belonging. Sample item: "I feel part of a group of friends that do things together." Scores ranged from 1 to 5 (mean = 4.11, SE = 0.09) Internal consistency of the scale was good (Cronbach's $\alpha = 0.81$).

Administrative data

Demographic information was obtained from numerous sources. BC's medical services plan (MSP; the province's universal health insurance program) records were used to measure history of MSP subsidy and children's sex. In this study, MSP subsidy status was a binary variable that indicated whether the household had ever received a subsidy and reflected the family's income level. Families with household income below a certain threshold (cut-off increased incrementally over time) were eligible to apply for MSP payment subsidies from the BC MOH. In this study, history of any (i.e., partial or full) MSP subsidy (yes/no) was used as a proxy for SES, following an approach that has been used in other studies (Guhn et al., 2020; Thomson et al., 2017).

Immigration variables were obtained from IRCC. The immigrant generation status variable indicated whether a child was of first-generation immigrant-origin, second-generation immigrant-origin, or a non-immigrant. First-generation indicated that the child was born outside of Canada and immigrated to Canada, second-generation indicated that the child was born in Canada but that at least one of the child's parents immigrated to Canada, and non-immigrant indicated that neither the child nor the child's parents were born outside of Canada. Based on their entry criteria, immigrants are assigned to different migrant classes (Beiser et al., 2002; Statistics Canada, 2019). The migrant class variable in this thesis consisted of three levels or classes. These classes were economic (selected for their ability to contribute to Canada's economy), family (granted permanent resident status on the basis of their relationship to a Canadian citizen or permanent resident), and refugee (granted permanent resident status based on a well-founded fear of returning to their home country) (Statistics Canada, 2019). In the case of second-generation immigrant-origin children whose parents had discordant migration classes, the

mother's migrant class was applied to the child for the purpose of consistency. The one exception was that if either parent belonged to the refugee migrant class, then the child was considered to belong to the refugee migrant class.

Data analysis

Data access was granted by Population Data BC and analyses were conducted in a Secure Research Environment. For all statistical tests, the Type I error rate was set *a priori* at 0.05, or 5%. All analyses were conducted using R Version 4.0.3 (Foundation for Statistical Computing, Vienna, Austria).

Missing data

Figure 1 outlines the approach used to handle missing data and derivation of the final analytic sample. There was no missing data on demographic variables, which were obtained from administrative data sources. Missing data was limited to MDI survey items. 12,888 children (83.8%) had complete data on all variables used in the analyses. In total, 965 children representing 6.3% of the original sample were excluded because they had missing responses to all survey items pertaining to at least one variable used in the analyses (life satisfaction, depressive symptoms, OA participation, peer belonging).

Among the remaining 1518 children with missing data, the majority (85.6%) were missing responses to only one item and most children were missing three or fewer items (99.2%). 685 children were missing one or more items asking about OA participation only. 540 children were missing one or more items pertaining to the main outcome variables of interest (life satisfaction or depressive symptoms) only. 206 children were only missing items pertaining to peer belonging. The remaining 87 children had missing responses across items pertaining to other combinations of variables.

Multiple imputation (MI) was used to impute missing data to reduce bias and increase power of the analyses (Little & Rubin, 2002; Sterne et al., 2009). I assumed that data were missing at random (MAR). When missing values are dependent only on observed variables or when the reason for missingness is not related to the values of missing data of any measured variable, data can be imputed assuming their missingness is MAR (Jeliĉić et al., 2009; Liu & De, 2015). This is a reasonable assumption for OA participation items, which occur at the end of the MDI and may be missing because of survey fatigue or because children accidentally skip a question. Responses on the depressive symptoms or satisfaction with life measures may also be missing because children accidentally skip a question or because children intentionally do not respond to questions that ask about sensitive topics. However, prior to taking the survey, children were informed that their answers were confidential and very important to help improve activities and programs for children their age. Furthermore, development of the MDI revealed that most children enjoyed taking the survey, felt it was important to participate, and many liked the confidentiality (Schonert-Reichl et al., 2013).

To account for the mix of numeric and categorical variables included in the analyses, MI by fully conditional specification (FCS) was applied. The FCS method does not assume linearity or normality and allows for a different regression model to be specified for each variable being imputed (Liu & De, 2015; van Buuren & Groothuis-Oudshoorn, 2011). All variables were used to impute missing values (van Buuren & Groothuis-Oudshoorn, 2011). 200 imputations were specified. Composite scores for wellbeing variables and dichotomization of the OA participation variable were calculated on the complete and imputed data.

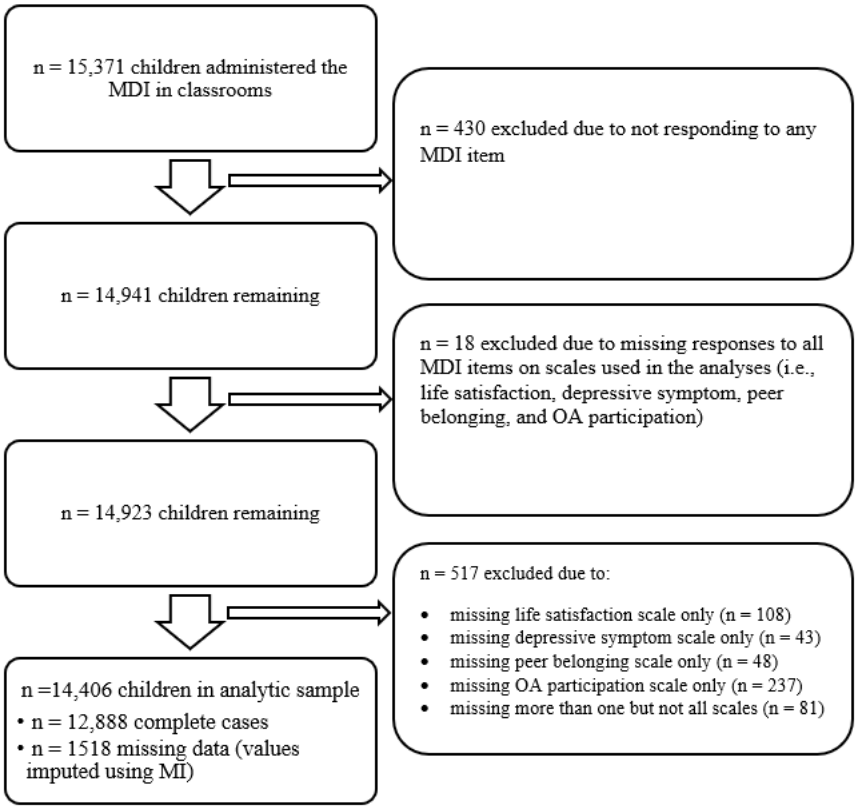

Figure 1. Approach to missing data and derivation of final analytic sample.

Univariate and bivariate analyses

Distribution and reliability of survey responses. Descriptive statistics for all survey items (means, ranges, standard errors, skewness, kurtosis) were computed, and identical results were obtained using the observed and imputed data. Cronbach's alpha (α) was computed as an estimate of reliability for multi-item measures (i.e., life satisfaction, depressive symptoms, peer belonging).

Demographic characteristics. For descriptive purposes, univariate statistics were reported on demographic characteristics of the sample. The mean and standard error were reported for numeric variables; the frequency was reported for categorical variables.

OA participation. The proportion of children who identified as OA participants and non-participants was also reported. Differences in demographic characteristics and regression model covariates between OA participants and non-participants were also reported to examine associations with the primary explanatory variable of interest, overall OA participation. For categorial variables, the chi-squared (χ^2) test was used to test for an association between demographic factors or covariates and OA participation. For numeric variables, Welch's two-sample *t*-test[3] was employed. This analysis was important to compare characteristics associated with OA participation in this sample to the characteristics in other populations of children beyond the present study and to gain an understanding of what factors are associated with OA participation among children in BC, specifically. An understanding of factors associated with OA participation was also thought to enhance interpretation and discussion of the results.

To examine whether the types of OA that children participated in varied between non-immigrant and immigrant-origin children, frequencies and percentages of children who participated in each OA type (i.e., educational, arts and music, individual sports, team sports) stratified by immigrant generation status were reported. Setting non-immigrant children as the reference group, odds ratios (OR), 95% confidence intervals, and p-values from χ^2 tests were computed to determine whether immigrant generation status was associated with participation in different OA types. This was of interest because immigrant-origin children may experience barriers to accessing various types of activities or simply choose to engage in different activities, as previously discussed. In addition, understanding whether immigrant-origin and non-immigrant

[3] Because Welch's *t*-test, which assumes unequal group variances, produces consistently lower type-I error rates when population variances are unequal than the Student's t-test and preliminary testing of the homogeneity of group variances is not recommended (Ruxton, 2006), variances of the comparison groups were assumed to be unequal for all *t*-tests. Consequently, all *t*-tests performed were Welch's *t*-test.

children participate in different OAs and observing trends in participation by activity type was thought to enrich discussion of the analyses in this study that incorporate activity types as the explanatory variables of interest as well as point to direction for further research.

Multiple linear regression (MLR) models

To estimate the association between OA participation (overall and by OA type) and wellbeing, controlling for potential confounders and independent predictors, multiple MLR models were fit.

Intraclass correlation

The use of multilevel regression models was considered as an alternative to ordinary least squares (OLS; i.e., traditional) regression in this analysis because of concerns that children within similar settings (i.e., schools or neighbourhoods) may be exposed to similar settings or characteristics and therefore would not represent independent observations. Compared to OLS regression, multilevel models reduce bias in estimated standard errors of model coefficients and allow for inclusion of group-level characteristics into models when data are statistically dependent, such as observations within schools (O'Dwyer & Parker, 2014).

To determine whether multilevel modeling is necessary, the intraclass correlation (ICC) value can be calculated. The ICC measures the proportion of total variance in the dependent variable that is attributable to between-group or group-level variance (O'Dwyer & Parker, 2014; Park & Lake, 2005). An ICC equal to zero indicates that data are statistically independent while an ICC of one signifies statistically dependency in the data (O'Dwyer & Parker, 2014; Park & Lake, 2005). In other words, the ICC would increase if observations in the same group (i.e., students in the same schools/neighbourhoods) experienced more similar environments and if as a

result the responses of observations within groups became more alike (Park & Lake, 2005). ICC values less than 0.05 indicate the data are nearly independent and traditional multiple regression analysis can be expected to provide unbiased estimates of regression coefficients and parameters (Thomas & Heck, 2001).

In this analysis, to compute the ICC, schools or neighbourhoods with fewer than five observations (n = 67 and n = 57, respectively) were excluded from the sample, as research has found five observations per cluster to be adequate for multilevel models (Clarke, 2008).[4] This left 209 schools and 107 neighbourhoods, with the number of observations per school ranging from n = 5 to n = 745 children and the number of observations per neighbourhood ranging from n = 5 to n = 1157 children. Next, the ICC was determined from an intercept-only model (Kumar, 2021; Park & Lake, 2005). In this case, a two-level regression model with school or neighbourhood as the group-level variable and one of the emotional wellbeing variables was fit. The ICC was calculated using the variance of groups (Level 2) and observations (Level 1). This process was repeated for each model.

ICC values ranged between 0.018 for depressive symptoms and 0.031 for life satisfaction with school as the group variable, indicating that 1.8% and 3.1% of the total variance in children's depressive symptoms and life satisfaction scores, respectively, was due to school-to-school differences (O'Dwyer & Parker, 2014). When neighbourhood was the second-level variable, ICC values were 0.006 for depressive symptoms and 0.019 for life satisfaction, denoting that 0.6% and 1.9% of the total variance in children's depressive symptoms and life satisfaction scores, respectively, was due to neighbourhood-to-neighbourhood variance. None of

[4] ICC's were also calculated allowing the minimum number of observations per group to be n = 2 and were found to be identical to those described when the minimum number of observations per group was n = 5.

the ICC values for any model approached the threshold of 0.05 (Thomas & Heck, 2001), which would indicate dependency strong enough that the use of traditional regression analysis was unwarranted. Therefore, traditional multiple linear regression (MLR) was chosen as the analytic method to model the relationship between OA participation, covariates, and emotional wellbeing variables.

Choice of covariates

Variables related to both the exposure and outcome but not on the causal pathway are confounding variables; in statistical modeling, it has been recommended to include covariates that may cause the main exposure, outcome, or both (VanderWeele, 2019). In this analysis, the main exposure of interest was OA participation, and the primary outcomes were life satisfaction and depressive symptoms, indicators of wellbeing in middle childhood. Biological sex, MSP subsidy (proxy for SES), and peer belonging were included as covariates in the models, based on conceptual understanding and empirical evidence that these factors are associated with OA participation and wellbeing and not on the causal pathway.

Testing for effect modification

Overall OA participation. To determine whether immigrant generation status was an effect modifier in the relationship between OA participation and life satisfaction or depressive symptoms, nested MLR models were fit for each wellbeing indicator (outcome variable). The first model contained the main explanatory and outcome variable and all covariates described previously (see choice of covariates section). This model was "nested" within the second model, which also included an interaction term between OA participation and immigrant status. The fit of this second model, termed the *full model,* was compared to the fit of the model without any

interaction terms (i.e., the *reduced model*) using the likelihood ratio test (LRT), where rejecting the null hypothesis is indicative that the full model fit the data better than the reduced model. Thus, rejecting the null hypothesis would be taken as evidence that the relationship between OA participation and wellbeing depends on immigrant generation status. It was decided *a priori* that in this case the full model including the interaction term would be interpreted. If there was insufficient evidence to reject the null hypothesis, then the reduced model would be interpreted.

As an additional method for checking the presence of effect modification, MLR models stratified by immigrant generation status were also fit. These models are presented in Appendix B.

Assumptions

Assumptions of MLR models were checked. Linearity and homoscedasticity were assessed using a residual plot and normality was assessed using a QQ plot. Furthermore, the central limit theorem (CLT) states that the sum or mean of a large number of measurements randomly sampled from a non-normal population is approximately normally distributed (Whitlock & Schluter, 2015). Given the sample sizes in this analysis are larges, the assumption of normality was likely met by the CLT. Multicollinearity was assessed by calculating generalized variance inflation factors (GVIFs; largest $GVIF^{1/2df} < 10^{1/2}$ for acceptable levels of collinearity; Samuel-Rosa et al., 2020).

Ethics

Ethics approval of this study was obtained by UBC's Behavioural Research Ethics Branch (H20-03669).

Chapter 3: Results

Sample demographics

Demographic characteristics of the overall sample and characteristics specific to immigrant-origin children are shown in Table 1. After applying the exclusion criteria (see Missing Data section), the final sample consisted of 14,406 children. Just under half the sample were female (47.8%) and one-third (33.0%) were from families that had received an MSP subsidy (i.e., because of low household income). Over two-thirds of the sample were non-immigrant children (65.2%) while about one-third were first- (14.2%) or second-generation (20.6%) immigrant-origin children.

Among children of immigrant-origin, over half were economic class immigrants (57.5%), over one-fifth (28.4%) were family class immigrants, and refugees represented 13.2% of immigrant-origin children. Children who entered Canada for other miscellaneous reasons (i.e., reasons that did not fall into the primary three migration classes) comprised 0.8% of the sample. Immigrant-origin children were primarily from East Asia and Pacific (60.9%), Europe and Central Asia (13.5%), Middle East and North Africa (7.5%), and South Asia (6.9%).

Demographic characteristics of children excluded due to missing data versus those included in the analytic sample are presented in Table 2. Exclusion from the analytic sample was associated with being male ($\chi^2 = 13.59$, $p < 0.01$), ever having received an MSP subsidy ($\chi^2 = 8.22$, $p = 0.01$), and first-generation immigrant generation status ($\chi^2 = 4.41$, $p = 0.04$). Exclusion from the analytic sample was not associated with second-generation immigrant generation status ($\chi^2 = 1.35$, $p = 0.25$).

Table 1. Sample demographics

Characteristic	
Age, mean (SE)	12.0 (0.00)
Categorial variables, n (%)	
Overall sample	14,406 (100)
Immigrant generation status	
Non-immigrant	9393 (65.2)
1st generation	2047 (14.2)
2nd generation	2966 (20.6)
Sex	
Male	7515 (52.2)
Female	6891 (47.8)
MSP Subsidy	
No	9657 (67.0)
Yes	4749 (33.0)
Immigrant-origin children	5,013 (100)
Migration class	
Economic (Ref.)	2883 (57.5)
Family	1421 (28.4)
Refugee	667 (13.3)
Other[1]	42 (0.8)
Region of origin	
North America (US) (Ref.)	199 (4.0)
East Asia and Pacific	3048 (60.8)
Europe and Central Asia	674 (13.5)
Latin America and Caribbean	256 (5.1)
Middle East and North Africa	374 (7.5)
South Asia	344 (6.9)
Sub-Saharan Africa	116 (2.3)
Numeric variables, mean (SE)	
Years since arrival in Canada[2]	7.57 (0.07)

[1]Other indicates other miscellaneous forms of entry into Canada that do not fall into the economic, family, or refugee categories
[2]Applies to first-generation only. Estimated as MDI completion year – year of arrival.

Table 2. Comparison of excluded children and analytic sample

Characteristic	Overall N = 15,371	Excluded[5] N = 965	Analytic sample N = 14,406	Test statistic (χ^2)	p-value
Categorial variables, n (%)					
Immigrant generation status					
1st generation	2212 (14.4)	165 (17.1)	2047 (14.2)	4.41	0.04*
2nd generation	3143 (20.4)	177 (18.3)	2966 (20.6)	1.35	0.25
Sex					
Female	7293 (47.4)	402 (41.7)	6891 (47.8)	13.59	< 0.01*
MSP Subsidy					
Yes	5111 (33.3)	362 (37.5)	4749 (33.0)	8.22	< 0.01*

Reference groups: non-immigrant, male, no history of MSP subsidy.

[5] Children were excluded because of missing data. See Missing data section for details.

OA Participation

This sub-section describes the sample's OA participation. First, the percentage of children who participated in any OA at least one day in the preceding week (i.e., overall OA) is described, and demographic characteristics and peer belonging scores are compared between OA participants and OA non-participants. Because OA participation represents an imputed variable, these statistics are reported for the observed (i.e., non-imputed) sample and on one version of imputed data (imputation number 22), which was selected randomly using statistical software.[6] Next, the types of OAs that non-immigrant, first-generation, and second-generation immigrant-origin children participated in are described and compared to infer whether the types of OA children participated in was associated with immigrant generation status. The results presented in this subsection will characterize characteristics of OA participants (both overall and by OA type) and will be considered in the discussion of the MLR results.

Overall OA participation

Observed data. The frequency and proportion of OA participants and non-participants, including their demographic characteristics and peer belonging scores are presented in Table 3. Among the observed data, 15.5% (n = 2226) of children in the sample did not participate in any OA, 83.9% (n = 12,086) participated in at least one activity, and 0.6% (n = 94) of the sample's OA participation status could not be discerned.[7]

[6] Since m = 200 versions of the data were generated using MI, one version was described so that categorical variables could be summarized using frequencies and percentages and compared to the original sample.
[7] The OA participation status of children with a combination of "never" and non-responses to all items asking about OA participation was perceived as indiscernible, and these children's overall OA participation status was considered missing.

In this study's sample, participation in OA was associated with female sex ($\chi^2 = 12.56$, $p < 0.01$) and higher peer belonging ($t = 12.74$, $p < 0.01$) while having ever received an MSP subsidy ($\chi^2 = 93.77$, $p < 0.01$) was associated with OA non-participation. While most children (above 80%) participated in OA, the greatest difference in OA participation was observed based on MSP subsidy, with 80.4% of children who had ever received an MSP subsidy reporting participation in OA compared to 86.5% of children participating in the no subsidy group. Immigrant generation status was not associated with participation in OA (1st generation: $\chi^2 = 0.75$, $p = 0.39$; 2nd generation: $\chi^2 = 0.22$, $p = 0.64$).

Among immigrant-origin children, belonging to the economic migrant class was associated with participation in OA. This was indicated by the greater representation of economic class immigrants among OA participants than non-participants (59.2% vs. 48.5%) and the higher representation of family (31.3% vs 27.8%; $\chi^2 = 12.67$, $p < 0.01$) and refugee (19.2% vs 12.2%; $\chi^2 = 36.36$, $p < 0.01$) class immigrants among OA non-participants than among OA participants. Relative to being born in the US, the region of origins East Asia or Pacific ($\chi^2 = 4.27$, $p = 0.04$) and Latin America and the Caribbean ($\chi^2 = 4.39$, $p = 0.04$) were associated with OA non-participation.

Imputed data. Table 4 summarizes overall OA participation based on one version of the imputed data, including demographic characteristics and peer belonging scores of OA participants and non-participants. Comparable to the observed data, 15.8% (n = 2280) of children did not participate in any OA and 84.2% (n = 12,126) of children participated in at least one OA. Again, participation in OA was not associated with immigrant generation status (1st generation: $\chi^2 = 1.04$, p = 0.31; 2nd generation: $\chi^2 = 0.20$, p = 0.66). Also consistent with the observed data, participation in OA was associated with female sex ($\chi^2 = 12.74$, p < 0.01) and higher peer

belonging scores ($\chi^2 = 13.01$, $p < 0.01$) while MSP subsidy was associated with OA non-participation ($\chi^2 = 91.41$, $p < 0.01$).

Similar associations between OA participation and immigrant-specific characteristics to those reported when only complete-cases were considered (i.e., using the observed data) were found analyzing the imputed data. Economic class immigrants were overrepresented in the OA participation group (59.2%) compared to the non-participation group (48.4%). In contrast, family ($\chi^2 = 13.36$, $p < 0.01$) and refugee ($\chi^2 = 37.02$, $p < 0.01$) migrant classes were associated with OA non-participation. Consistent with trends discovered in the observed data based on complete cases, the regions of origin East Asia and Pacific ($\chi^2 = 4.59$, $p = 0.03$) as well as Latin America and Caribbean ($\chi^2 = 4.77$, $p = 0.03$) were associated with OA non-participation.

Table 3. Comparison of OA participants and non-participants

Characteristic	Did not participate in OA[1] N = 2226	Participated in any OA N = 12,086	Test statistic (χ^2 or t-stat)	p-value
Overall sample				
Categorial variables, n (%)				
Migrant status				
1st generation	301 (13.5)	1734 (14.3)	0.75	0.39
2nd generation	471 (21.2)	2478 (20.5)	0.22	0.64
Sex				
Female	988 (44.4)	5861 (48.5)	12.56	< 0.01*
MSP Subsidy				
Yes	932 (41.9)	3788 (31.3)	93.77	< 0.01*
Numeric variables, mean (SE)				
Peer belonging[2]	3.87 (0.02)	4.16 (0.01)	12.74	< 0.01*
Immigrant-specific characteristics	N = 772	N = 4212		
Categorial variables, n (%)				
Migration class				
Economic (Ref.)	374 (48.5)	2495 (59.2)	-	-
Family	242 (31.3)	1169 (27.8)	12.67	< 0.01*
Refugee	148 (19.2)	514 (12.2)	36.36	< 0.01*
Other[3]	8 (1.0)	34 (0.8)	0.84	0.36
Region of origin[4]				
North America (Ref.)	21 (3.0)	177 (4.2)	-	-
East Asia/Pacific	499 (64.6)	2536 (60.2)	4.27	0.04*
Europe/Central Asia	85 (11.0)	583 (13.8)	0.46	0.50
Latin America/Caribbean	46 (6.0)	208 (4.9)	4.39	0.04*
Middle East/North Africa	50 (6.5)	322 (7.6)	0.71	0.40
South Asia	52 (6.7)	289 (6.9)	1.93	0.17
Sub-Saharan Africa	19 (2.5)	95 (2.3)	1.87	0.17
Numeric variables, mean (SE)				
Years since arrival in Canada[5]	7.65 (0.17)	7.57 (0.07)	0.44	0.66

Reference groups: non-immigrant, male, no MSP subsidy.

[1]N = 94 children had a combination of "never" and missing responses to all items asking about OA participation and their participation status could not be discerned. They are not represented in the comparison.

[2]N = 254 children had missing responses to at least one item on the peer belonging scale and were not included in the calculation of the mean peer belonging score.

Table 4. Comparison of OA participants and non-participants (imputed data number 22)

Characteristic	Did not participate in OA N = 2280	Participated in any OA N = 12,126	Test statistic (χ^2 or t-stat)	p-value
Overall sample				
Categorial variables, n (%)				
Migrant status				
1st generation	306 (13.4)	1741 (14.4)	1.04	0.31
2nd generation	482 (21.1)	2484 (20.5)	0.20	0.66
Sex				
Female	1012 (44.4)	5879 (48.5)	12.74	< 0.01*
MSP Subsidy				
Yes	949 (41.6)	3800 (31.3)	91.41	< 0.01*
Numeric variables, mean (SE)				
Peer belonging	3.87 (0.02)	4.16 (0.01)	13.01	< 0.01*
Immigrant-specific characteristics	N = 788	N = 4225		
Categorial variables, n (%)				
Migration class				
Economic (Ref.)	381 (48.4)	2502 (59.2)	-	-
Family	248 (31.5)	1173 (27.8)	13.36	< 0.01*
Refugee	151 (19.2)	516 (12.2)	37.02	< 0.01*
Other	8 (1.0)	34 (0.8)	0.77	0.38
Region of origin[1]				
North America (Ref.)	21 (2.7)	178 (4.2)	-	-
East Asia/Pacific	506 (64.2)	2542 (60.2)	4.59	0.03*
Europe/Central Asia	88 (11.2)	586 (13.9)	0.67	0.41
Latin America/Caribbean	47 (6.0)	209 (4.9)	4.77	0.03*
Middle East/North Africa	52 (6.6)	322 (7.6)	1.03	0.31
South Asia	55 (7.0)	289 (6.8)	2.66	0.10
Sub-Saharan Africa	19 (2.4)	97 (2.3)	1.75	0.19
Numeric variables, mean (SE)				
Years since arrival in Canada	7.59 (0.17)	7.57 (0.07)	0.16	0.87

Reference groups: non-immigrant, male, no MSP subsidy.

[1] N = 2 immigrant children from the OA non-participant group were missing data on this variable, which was not imputed.

OA participation by activity type

The number and proportion of non-immigrant, first-generation, and second-generation children who participated in different OA types is presented in Table 5 (observed data) and Appendix A (imputed dataset number 22). For each analysis, non-immigrant children represented the reference group. The results of analyses on the observed data and imputed data were similar.

Analysis of the observed data indicated that the proportion of missingness for each OA type was similar across generations and did not exceed 2.0%. Participation in educational activities was associated with first- (OR = 2.35, $p < 0.01$) and second-generation (OR = 1.85, $p < 0.01$) immigrant generation status. Participation rates were as follows: 28.2% of non-immigrants, 47.9% of first-generation immigrants, and 42.0% of second-generation children reported participating in an educational OA. Participation in arts and music activities was also associated with first- (OR = 1.82, p = < 0.01) and second-generation (OR = 1.63, $p < 0.01$) immigrant generation status. 47% of first-generation children participated in arts or music activities, followed by 44.5% of second-generation and 33.0% of non-immigrant children. Participation in individual sports was associated with first-generation immigrant generation status (OR = 1.26, $p < 0.01$) but not second-generation (OR = 1.09, $p = 0.05$). Participation rates in individual sports were 39.8% among non-immigrants, 45.4% among first-generation, and 42.1% among second-generation children. In contrast to other OA types, participation in team sports was associated with non-immigrant generation status ($OR_{1st\ generation} = 0.69$, $p < 0.01$; $OR_{2nd\ generation} = 0.62$, $p < 0.01$). 57.4% of non-immigrant children participated in team sports compared to only 48.3% of first-generation and 46.0% of second-generation immigrant-origin children. Results obtained

through analysis of imputed dataset 22 (Appendix A) were similar to those obtained using the observed data and are therefore not described here.

Table 5. Participation in OA activity types, stratified by immigrant generation status

Educational							
Immigrant generation status	*Missing* N (%)	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
					Lower	Upper	
Non-immigrant (ref.)	112 (1.2)	2649 (28.2)	6632 (70.6)	-	-	-	-
First generation	25 (1.2)	980 (47.9)	1042 (50.9)	2.35	2.13	2.60	< 0.01
Second generation	32 (1.1)	1245 (42.0)	1689 (56.9)	1.85	1.69	2.01	< 0.01

Arts/music							
Immigrant generation status	*Missing* N (%)	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
					Lower	Upper	
Non-immigrant (ref.)	141 (1.5)	3098 (33.0)	6154 (65.5)	-	-	-	-
First generation	33 (1.6)	962 (47.0)	1052 (51.4)	1.82	1.65	2.00	< 0.01
Second generation	35 (1.2)	1319 (44.5)	1612 (54.3)	1.63	1.49	1.77	< 0.01

Individual sports							
Immigrant generation status	*Missing* N (%)	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
					Lower	Upper	
Non-immigrant (ref.)	191 (2.0)	3737 (39.8)	5465 (58.2)	-	-	-	-
First generation	35 (1.7)	930 (45.4)	1082 (52.9)	1.26	1.14	1.39	< 0.01
Second generation	43 (1.4)	1248 (42.1)	1675 (56.5)	1.09	1.00	1.19	0.05

Team sports							
Immigrant generation status	*Missing* N (%)	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
					Lower	Upper	
Non-immigrant (ref.)	146 (1.6)	5394 (57.4)	3853 (41.0)	-	-	-	-
First generation	30 (1.5)	989 (48.3)	1028 (50.2)	0.69	0.62	0.76	< 0.01
Second generation	41 (1.4)	1364 (46.0)	1561 (52.6)	0.62	0.57	0.68	< 0.01

Multiple linear regression models

Using the methods outlined previously, the assumptions of MLR (independent observations, normality, homoscedasticity, no collinearity) were deemed met for all models.

Overall OA participation

Results of the MLR models fit to 1) measure the association between overall OA participation and life satisfaction or depressive symptoms, and 2) test whether the association between overall OA participation and wellbeing depended on immigrant generation status, controlling for demographic factors and peer belonging, are presented in Table 6. A visual depiction of the statistically significant interactions between overall OA participation and immigrant generation status are presented in Figures 2 and 3.[8]

The interaction term OA participation*1st generation was statistically significant in the model with life satisfaction ($\beta_{OA*1st\ gen}$ = -0.13, $p < 0.01$) as the dependent variable and in the model with depressive symptoms ($\beta_{OA*1st\ gen}$ = 0.23, $p < 0.01$) as the dependent variable. The interaction term OA participation*2nd generation was statistically significant only in the model with depressive symptoms as the dependent variable ($\beta_{OA*2nd\ gen}$ = 0.22, $p < 0.01$). LRT results also suggested that the strength of association between OA participation and both life satisfaction and depressive symptoms depended on immigrant generation status (life satisfaction: test-statistic = 3.69, p = 0.03; depressive symptoms: test-statistic = 12.31, $p < 0.01$). Therefore, the full models were interpreted for both indicators of emotional wellbeing.

[8] The vertical axes have been reduced to more clearly visualize the interactions and do not represent the full range of possible scores on the life satisfaction or depressive symptoms scales (range: 1-5)

Controlling for immigrant generation status, biological sex, MSP subsidy, and peer belonging, participation in OA was significantly associated with better life satisfaction ($\beta = 0.14$, $p < 0.01$) and lower depressive symptoms ($\beta = -0.20$, $p < 0.01$) scores. Specifically, among the reference group (i.e., non-immigrant, male, no MSP subsidy), on average, OA participants scored 0.14 points higher on the life satisfaction scale than non-participants and -0.20 points lower on the depressive symptoms scale.

Covariates that were associated with life satisfaction and depressive symptoms were child's sex, SES, and peer belonging. Female sex ($\beta = -0.04$, $p < 0.01$) and history of MSP subsidy ($\beta = -0.14$, $p < 0.01$) were associated with lower life satisfaction scores, while higher peer belonging was associated with higher life satisfaction ($\beta = 0.44$, $p < 0.01$). Female sex ($\beta = 0.13$, $p < 0.01$) and history of MSP subsidy ($\beta = 0.09$, $p < 0.01$) were also associated with higher depressive symptoms, while higher peer belonging was associated with lower depressive symptoms ($\beta = -0.41$, $p < 0.01$).

The coefficient associated with the interaction term can be interpreted as "the change in the effect of OA participation for a first- or second-generation immigrant child relative to a non-immigrant child." The interaction effects of OA participation and immigrant generation status are displayed in Figures 2 and 3. The interaction effects observed are described below, based on immigrant generation status.

First-generation children. Relative to non-immigrant children ($\beta_{OA} = 0.14$, $p < 0.01$), the magnitude of association between OA participation and life satisfaction was diminished among first-generation immigrants ($\beta_{OA*1st\ gen} = -0.13$, $p = 0.01$), to no association. While OA participation was associated with lower depressive symptoms scores among non-immigrant children ($\beta_{OA} = -0.20$, $p < 0.01$), among first-generation immigrant-origin children OA

participation was associated with higher depressive symptoms ($\beta_{OA*1st\ gen} = 0.23$, $p < 0.01$), although stratified analyses indicated that this association was not statistically significant among first-generation immigrant-origin children.

Second-generation children. The strength of association between OA participation and life satisfaction was also reduced among second-generation immigrant-origin children relative to non-immigrant children ($\beta_{OA*2nd\ gen} = -0.06$, $p = 0.18$), although this difference was not as pronounced as between non-immigrant and first-generation children. In addition, it should be noted that the interaction term did not reach statistical significance. The association between OA participation and depressive symptoms reversed direction among second-generation children relative to non-immigrant children ($\beta_{OA*2nd\ gen} = 0.22$, $p < 0.01$), indicating that OA participation was associated with increased depressive symptoms scores among second-generation children. The change in association was to a similar degree as the difference observed between non-immigrant and first-generation children, described previously. Again, the magnitude of association between OA participation and depressive symptoms for second-generation children was small and stratified analyses indicated this association was statistically insignificant.

Table 6. MLR models with overall OA participation as independent variable of interest

	Reduced Model			Full Model		
Satisfaction with life	Coefficient (*B*)	SE	P-value	Coefficient (*B*)	SE	P-value
Intercept	2.18	0.03	< 0.01	2.15	0.04	< 0.01
OA Participation (yes)	0.11	0.02	< 0.01	0.14	0.02	< 0.01
1st generation	-0.13	0.02	< 0.01	-0.02	0.05	0.73
2nd generation	-0.09	0.02	< 0.01	-0.04	0.04	0.34
Female	-0.04	0.01	< 0.01	-0.04	0.01	< 0.01
MSP Subsidy (yes)	-0.14	0.01	< 0.01	-0.14	0.01	< 0.01
Peer Belonging	0.44	0.01	< 0.01	0.44	0.01	< 0.01
OA Participation * 1st generation	-	-	-	-0.13	0.05	0.01
OA Participation * 2nd generation	-	-	-	-0.06	0.04	0.18
R-squared	0.2301			0.2305		
Adjusted R-squared	0.2298			0.2301		
Depressive symptoms						
Intercept	4.28	0.04	< 0.01	4.34	0.04	< 0.01
OA Participation (yes)	-0.13	0.02	< 0.01	-0.20	0.03	< 0.01
1st generation	0.04	0.02	0.05	-0.15	0.06	0.01
2nd generation	0.02	0.02	0.22	-0.16	0.05	< 0.01
Female	0.13	0.02	< 0.01	0.13	0.02	< 0.01
MSP Subsidy (yes)	0.10	0.02	< 0.01	0.09	0.02	< 0.01
Peer Belonging	-0.41	0.01	< 0.01	-0.41	0.01	< 0.01
OA Participation * 1st generation	-	-		0.23	0.06	< 0.01
OA Participation * 2nd generation	-	-		0.22	0.05	< 0.01
R-squared	0.1477			0.1492		
Adjusted R-squared	0.1474			0.1487		

Reference groups: no OA participation, non-immigrant, male, no MSP subsidy.

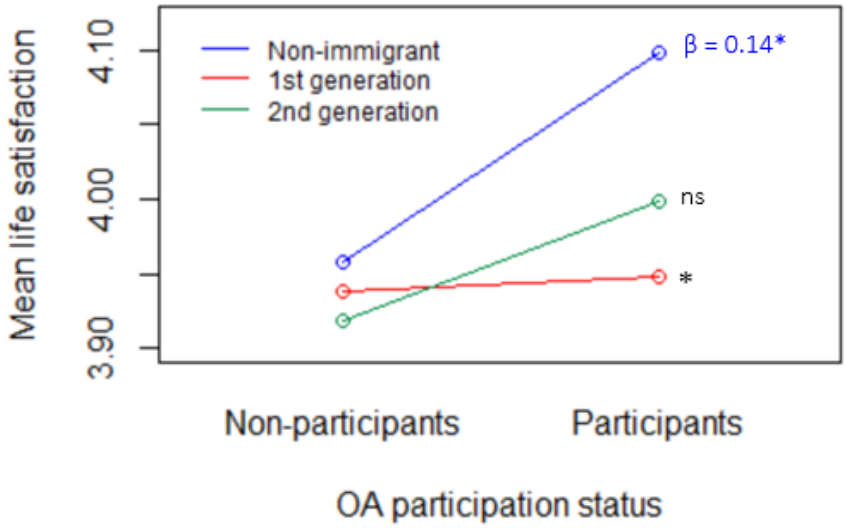

Figure 2. Interaction plot showing life satisfaction (mean SWLS-C scores; scale range: 1-5) versus overall OA participation status, stratified by immigrant generation status. Higher SWLS-C scores denote higher life satisfaction. OA participation was associated with higher life satisfaction among non-immigrant children relative to OA non-participation ($\beta = 0.14$, *$p < 0.05$). The association between OA participation and life satisfaction was significantly reduced among first-generation immigrant-origin children relative to non-immigrant children (*p interaction term < 0.05). No difference in the association between OA participation and life satisfaction was found among second-generation immigrant-origin children relative to non-immigrant children.

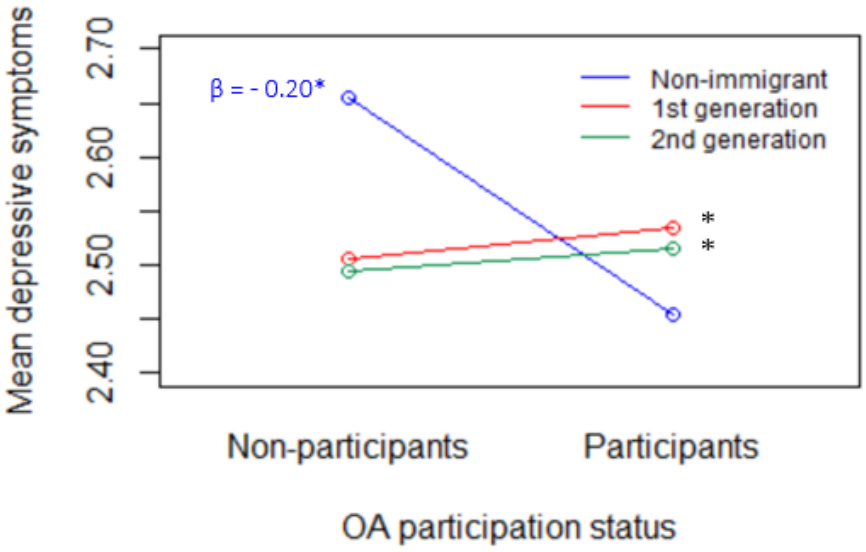

Figure 3. Interaction plot showing depressive symptoms (scale range: 1-5) versus overall OA participation status, stratified by immigrant generation status. Higher scores indicate worse depressive symptoms. OA participation was associated with lower depressive symptoms among non-immigrant children (β = -0.20, *p < 0.05). The association between OA participation and depressive symptoms was significantly different among first-generation and second-generation immigrant-origin children relative to non-immigrant children (*p interaction terms < 0.05), with a positive and almost null association observed among both generations of immigrant-origin children.

OA participation by activity type

Results of the MLR models fit to 1) measure the association between participation in different types of OA and life satisfaction or depressive symptoms, and 2) test whether the association between participation in different types of OA and wellbeing indicators depended on immigrant generation status while controlling for demographic factors and peer belonging are presented in Table 7. Visual depictions of the statistically significant interactions between participation in different types of OAs and immigrant generation status are shown in Figures 4-7.[9]

LRT results indicated that the association between participation in different types of OA and life satisfaction did not depend on immigrant generation status (test-statistic = 1.02, $p = 0.42$). This was consistent with the conclusions drawn from assessing the interaction terms in the full model, none of which were statistically significant ($p \geq 0.05$). When comparing the reduced and full models with depressive symptoms as the dependent variable, LRT results indicated that the full model fit the data better, suggesting that the association between OA participation and depressive symptoms varied based on immigrant generation status (test-statistic = 4.87, $p < 0.01$). The interaction terms indicated that the relationships between depressive symptoms and participation in individual sports ($\beta_{\text{individual sports *2nd gen}} = 0.10$, $p = 0.02$) and team sports ($\beta_{\text{team sports*1st gen}} = 0.19$, $p < 0.01$; $\beta_{\text{team sports*2nd gen}} = 0.12$, $p < 0.01$) were dependent on immigrant generation status. Considering these findings, the reduced model (no interaction terms) was interpreted for life satisfaction and the full model (with interaction terms) was interpreted for depressive symptoms.

[9] The vertical axes has been reduced to more clearly visualize the interactions and do not represent the full range of possible scores on the life satisfaction or depressive symptoms scales (range: 1-5)

Life satisfaction. As previously mentioned, the reduced model was interpreted to identify relationships between participation in different OA activity types and life satisfaction. Participation in individual ($\beta = 0.05$, $p < 0.01$) and team sports ($\beta = 0.07$, $p < 0.01$) were associated with higher life satisfaction, although the magnitude of these associations were relatively small. Participation in educational ($\beta = -0.02$, $p = 0.26$) and art and music activities ($\beta = 0.00$, $p = 0.81$) were not found to be associated with life satisfaction.

Depressive symptoms. As previously stated, the full model was interpreted to identify relationships between participation in different OA activity types and depressive symptoms. Participation in individual sports was associated with decreased depressive symptoms among non-immigrant ($\beta = -0.08$, $p < 0.01$) and first-generation immigrant-origin children, as shown in Figure 5. The magnitude of association was similar between these groups, and the interaction term for first-generation children did not reach statistical significance ($\beta = 0.03$, $p = 0.47$). In contrast, participation in individual sports was associated with worse depressive symptoms among second-generation immigrant-origin children relative to non-immigrant children ($\beta_{\text{individual sports *2nd gen}} = 0.10$, $p = 0.02$).

Participation in team sports was associated with a decrease in depressive symptoms among non-immigrant children ($\beta = -0.14$, $p < 0.01$) but with a slight increase in depressive symptoms among first-generation immigrant-origin children, as depicted in Figure 6. Stratified analyses indicated there was no association between participation in team sports and depressive symptoms among first-generation immigrant-origin children. As visualized in Figure 6, no association between participation in team sports and depressive symptoms was observed among second-generation immigrant-origin children ($\beta_{\text{team sports*2nd gen}} = 0.12$, $p < 0.01$).

Interaction terms corresponding to participation in arts and music activities as well as educational activities were not statistically significant for either immigrant generation. Moreover, participation in arts and music activities was not associated with depressive symptoms (β = -0.04, p = 0.09) while participation in educational activities was associated with worse depressive symptoms (β = 0.07, p < 0.01).

Table 7. MLR models with OA activity type as independent variable of interest

	Reduced Model			Full Model		
	β	SE	P-value	β	SE	P-value
Satisfaction with life						
Intercept	2.22	0.03	< 0.01*	2.21	0.03	< 0.01*
Educational	-0.02	0.01	0.26	-0.03	0.02	0.13
Arts/music	0.00	0.01	0.81	0.02	0.02	0.22
Individual sports	0.05	0.01	< 0.01*	0.06	0.02	< 0.01*
Team sports	0.07	0.01	< 0.01*	0.09	0.02	< 0.01*
1st generation	-0.12	0.02	< 0.01*	-0.08	0.03	0.02*
2nd generation	-0.08	0.01	< 0.01*	-0.05	0.03	0.06
Female	-0.03	0.01	0.01*	-0.03	0.01	0.01*
MSP Subsidy (yes)	-0.14	0.01	< 0.01*	-0.13	0.01	< 0.01*
Peer Belonging	0.43	0.01	< 0.01*	0.43	0.01	< 0.01*
Educational * 1st generation				0.05	0.04	0.23
Educational * 2nd generation				0.02	0.03	0.55
Arts/music*1st generation				-0.05	0.04	0.19
Arts/music*2nd generation				-0.05	0.03	0.16
Individual sports*1st generation				-0.01	0.04	0.76
Individual sports*2nd generation				-0.01	0.03	0.87
Team sports*1st generation				-0.07	0.04	0.05
Team sports*2nd generation				-0.02	0.03	0.60
R-squared	0.2310			0.2315		
Adjusted R-squared	0.2305			0.2306		
Depressive symptoms						
Intercept	4.22	0.04	< 0.01*	4.26	0.04	< 0.01*
Educational	0.07	0.02	< 0.01*	0.07	0.02	< 0.01*
Arts/music	-0.02	0.02	0.24	-0.04	0.02	0.09
Individual sports	-0.05	0.02	< 0.01*	-0.08	0.02	< 0.01*
Team sports	-0.08	0.02	< 0.01*	-0.14	0.02	< 0.01*
1st generation	0.03	0.02	0.22	-0.07	0.04	0.10
2nd generation	0.01	0.02	0.62	-0.13	0.04	< 0.01*
Female	0.13	0.02	< 0.01*	0.13	0.02	< 0.01*
MSP Subsidy (yes)	0.09	0.02	< 0.01*	0.09	0.02	< 0.01*
Peer Belonging	-0.40	0.01	< 0.01*	-0.40	0.01	< 0.01*

Educational * 1st generation		-0.07	0.05	0.17
Educational * 2nd generation		0.06	0.04	0.13
Arts/music*1st generation		0.05	0.05	0.35
Arts/music*2nd generation		0.03	0.04	0.48
Individual sports*1st generation		0.03	0.05	0.47
Individual sports*2nd generation		0.10	0.04	0.02*
Team sports*1st generation		0.19	0.05	< 0.01*
Team sports*2nd generation		0.12	0.04	< 0.01*
R-squared	0.1490	0.1513		
Adjusted R-squared	0.1484	0.1503		

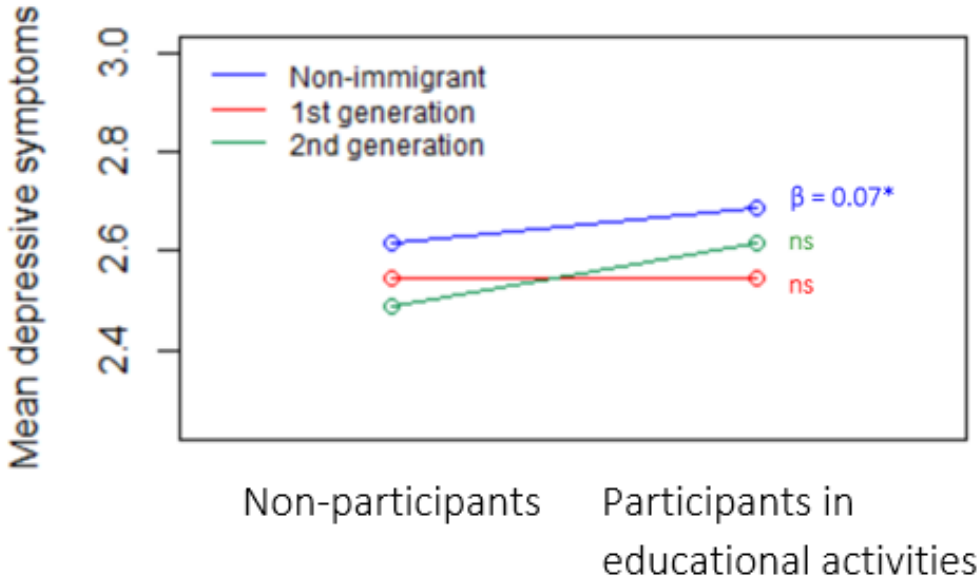

Figure 4. Interaction plot showing mean depressive symptoms (scale range: 1-5) based on participation status in educational activities, stratified by immigrant generation status.

Higher scores indicate worse depressive symptoms. Participation in educational activities was associated with increased depressive symptoms among children of non-immigrant background relative to non-participants ($\beta = 0.07$, $^*p < 0.05$). No statistically significant differences in the association between participation in educational activities and depressive symptoms were observed between first-generation or second-generation immigrant-origin children relative to non-immigrant children.

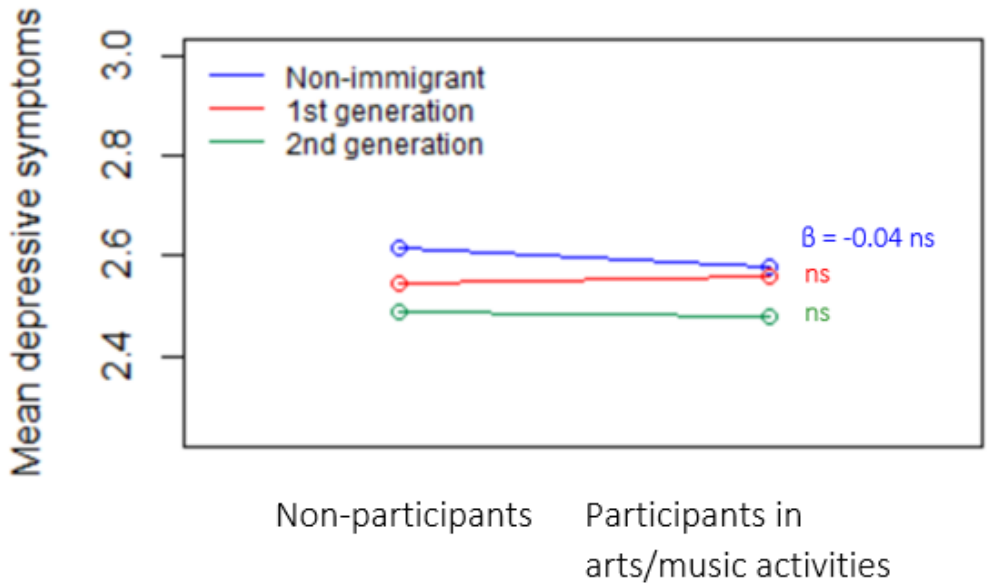

Figure 5. Interaction plot showing mean depressive symptoms (scale range: 1-5) based on participation status in arts/music activities, stratified by immigrant generation status.

Higher scores indicate worse depressive symptoms. Participation in arts/music activities was not associated with depressive symptoms among children of non-immigrant background ($\beta = -0.04$, $^*p < 0.05$). No statistically significant differences in the association between participation in arts/music activities and depressive symptoms were observed between first-generation or second-generation immigrant-origin children relative to non-immigrant children.

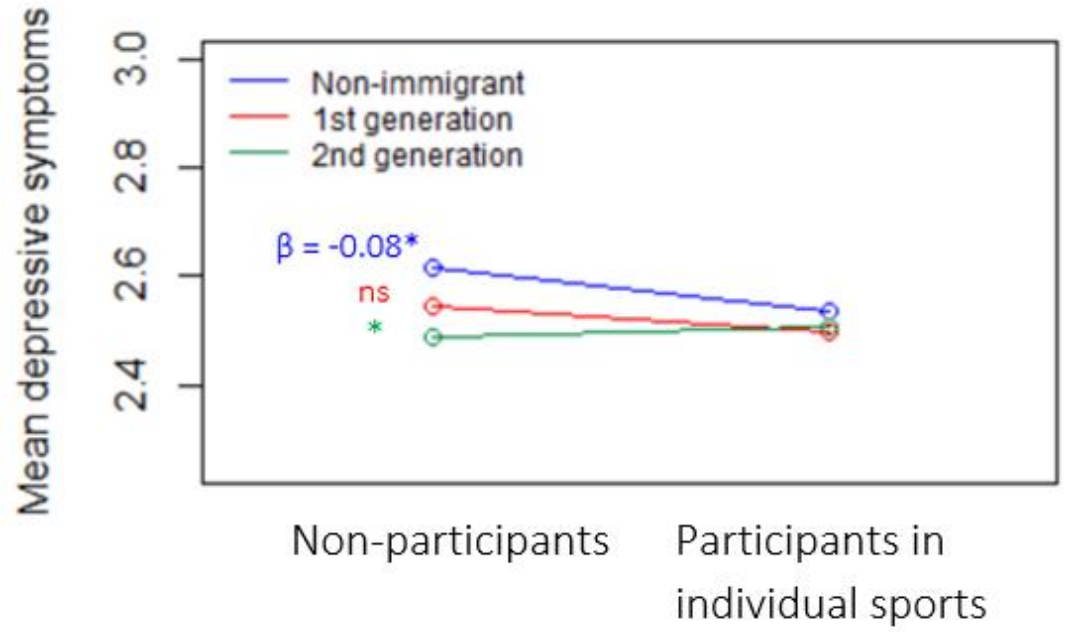

Figure 6. Interaction plot showing mean depressive symptoms (scale range: 1-5) based on participation status in individual sports, stratified by immigrant generation status.

Higher scores indicate worse depressive symptoms. Participation in individual sports was associated with reduced depressive symptoms among children of non-immigrant background relative to non-participants ($\beta = -0.08$, $^*p < 0.05$). The association between team sports participation and depressive symptoms did not differ between first-generation immigrant-origin children and non-immigrant children (*p interaction term < 0.05). The association between individual sports participation and depressive symptoms differed among second-generation immigrant-origin children relative to non-immigrant children (*p interaction term < 0.05); among second-generation children, participation in individual sports was associated with an increase in depressive symptoms, although this association was very small.

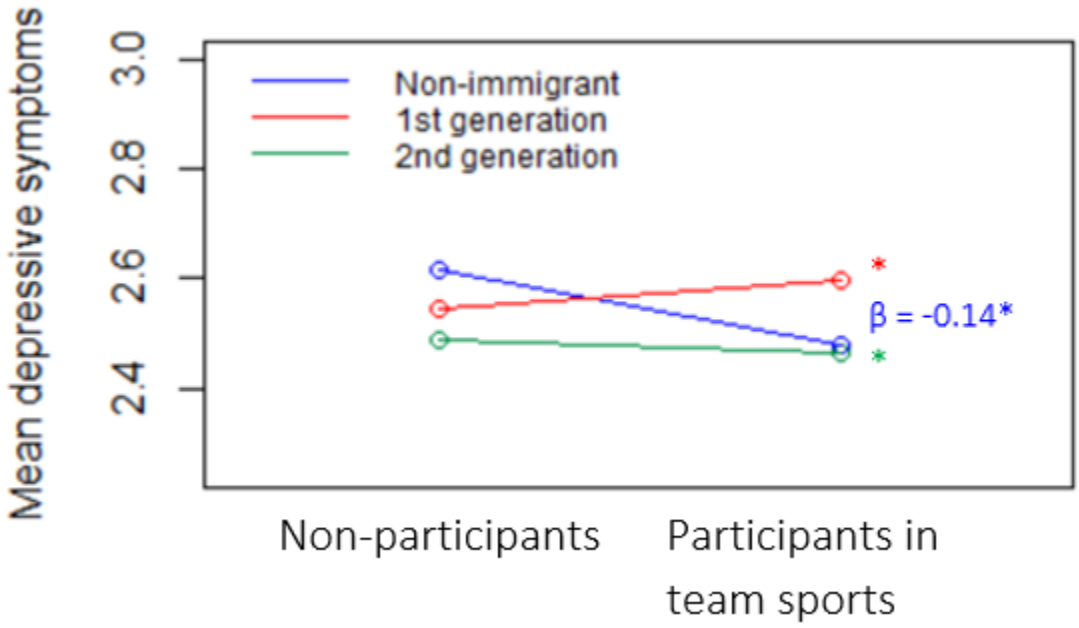

Figure 7. Interaction plot showing mean depressive symptoms (scale range: 1-5) based on participation status in team sports, stratified by immigrant generation status.

Higher scores indicate worse depressive symptoms. Participation in team sports was associated with reduced depressive symptoms among children of non-immigrant background relative to non-participants ($\beta = -0.14$, $^*p < 0.05$). The association between team sports participation and depressive symptoms was dependent on immigrant generation status ($^*p$ interaction terms < 0.05). The association between participation in team sports and depressive symptoms was diminished to almost no association among second-generation immigrant-origin children. Among first-generation children, participation in team sports was associated with worse depressive symptoms, although this association was very small.

Chapter 4: Discussion

To address the scarcity of research that explores OA participation and its relation to emotional wellbeing while considering immigrant background, this study measured the association between OA participation (overall and for different activity types) and emotional wellbeing indicators and tested whether these relationships were modified by immigrant generation status. This study also sought to describe OA participation rates (overall and for different activity types) of non-immigrant and immigrant-origin Grade 7 children to determine whether immigrant-origin children's participation rates differed from those of non-immigrant children. The findings extend research that has investigated the role of immigrant background in relation to OA participation and other developmental outcomes. Practical implications of this study include relevancy of the findings to informing the development and promotion of programs that support the emotional development of immigrant-origin children.

Relationship between overall OA participation and emotional wellbeing

This study investigated whether immigrant generation status modified the relationship between OA participation and emotional wellbeing among Grade 7 schoolchildren in BC. The findings provide some evidence that the association between overall OA participation (in any activity) and emotional wellbeing is dependent on immigrant background. Specifically, immigrant generation status was identified as an effect modifier in the relationship between OA participation and both life satisfaction as well as depressive symptoms.

Findings of the present study indicated a positive association between OA participation and life satisfaction among non-immigrant children and second-generation immigrant-origin children. In contrast, this association was diminished to no relationship among first-generation

immigrant-origin children. Collectively, these results indicated that, in the study population, OA participation was associated with better life satisfaction among non-immigrant and second-generation children, but OA participation was not associated with life satisfaction among first-generation children.

In contrast to the beneficial or neutral associations observed between OA participation and life satisfaction among non-immigrant and immigrant-origin children, the results indicated that OA participation was associated with worse depressive symptoms among both first- and second-generation immigrant-origin children, although this relationship was very small and not statistically significant. The important finding is that OA participation was clearly related to lower depressive symptoms among non-immigrant children while it appears there was no association (or a very small and positive association) between OA participation and depressive symptoms among first- and second-generation immigrant-origin children. Importantly, the association observed between overall OA participation and lower depressive symptoms among non-immigrant children was the strongest association reported in this study, suggesting that among non-immigrant children only, OA participation may be associated with lower depressive symptoms.

While it was beyond the scope of this study to identify factors which explain the difference in association based on immigrant background, one possible explanation for the lack of association between participation and life satisfaction among first-generation immigrant-origin children is that OAs may expose first-generation immigrant-origin children to situations which provoke feelings of marginalization and discrimination (Jiang & Peterson, 2012). Acculturation stress offers another explanation for the lack of association between OA participation and life satisfaction among first-generation immigrant-origin children. It is possible

that for some first-generation immigrant-origin children, participating in OAs facilitated assimilation into mainstream culture, and that discordance between mainstream values and familial values created parent-child conflict (Jiang & Peterson, 2012). However, the reason for differential relationships based on immigrant background cannot be concluded from this study, and it is important that future research identify factors that explain why the association between OA participation and emotional wellbeing may vary based on immigrant generation status.

Relationship between OA participation in different activity types and emotional wellbeing

This study found some evidence that differences in the associations between participation in different types of OAs and emotional wellbeing exist between immigrant-origin and non-immigrant children, although this relationship can vary based on the wellbeing indicator considered.

The associations between participation in educational activities, arts and music lessons, individual sports, or team sports and life satisfaction did not vary between immigrant-origin and non-immigrant children. Among Grade 7 children, participation in both individual and team sports were associated with similar increases in life satisfaction relative to non-participants. While statistically significant, the association was small. Participation in educational activities or arts and music lessons were not associated with life satisfaction.

Relationships between participation in different OA types and depressive symptoms varied between immigrant-origin and non-immigrant children. Participation in individual sports and participation in team sports were associated with lower depressive symptoms among non-immigrant children, with the strength of association stronger for team sports. Participation in individual sports and participation in team sports were associated with increased depressive

symptoms among second-generation immigrant-origin children relative to non-immigrant children, to no relationship. Among first-generation immigrant-origin children, participation in team sports was also not associated with depressive symptoms. The relationship between individual sports participation and lower depressive symptoms observed among first-generation children was comparable to that of non-immigrant children.

While prior research has not specifically investigated the role of immigrant background in the relationship between different types of OA participation and emotional wellbeing, studies have indicated that marginalization and discrimination, exposures which may be more likely among team sports than other types of OAs because of the social nature of team sports, are possible reasons why immigrant-origin children may not experience the same benefits from OA participation as non-immigrant children and why participation in group activities may be associated with poor outcomes among immigrant-origin or minority groups (Jiang & Peterson, 2012; Kullis et al., 2009; Simpkins et al., 2017). This may partially explain why this study observed an association between team sports and reduced depressive symptoms only among non-immigrant children.

Furthermore, it is not unsurprising that OA participation was differentially related to depressive symptoms but not life satisfaction between non-immigrant and immigrant-origin children. While sometimes associated, life satisfaction and depressive symptoms are distinct components of emotional wellbeing (Gilman & Huebner, 2003). Unlike depressive symptoms, life satisfaction not only captures the immediate effects of life events and mood states but incorporates appraisal of all aspects of life (Gilman & Huebner, 2003). Scholars have argued that life satisfaction adds unique variance to measures of subjective wellbeing that depressive symptoms do not account for (Gilman & Huebner, 2003). Considering that this study found the

association between OA participation and life satisfaction did not depend on immigrant background while the association between OA participation and depressive symptoms did, these results highlight the importance of considering different indicators of development when considering the role of immigrant background.

Taken together, these results provide initial evidence that immigrant generation status may influence the relationship between overall OA participation and emotional wellbeing, but that its role as a moderator may depend on the type of activity considered and the specific wellbeing indicator. Further research examining potential pathways through which immigrant generation status can influence OA's relationship with emotional wellbeing is needed to understand how to develop programs that can benefit the development of all children.

Involvement in OAs by immigrant generation

Contrary to expectations, the results of this study indicate that OA participation was not associated with immigrant background. Among non-immigrant, first-generation, and second-generation immigrant-origin children, the proportion of children who participated in at least one OA was consistently 84%. These results are inconsistent with the findings of Jiang and Peterson, who reported lower participation rates among immigrant-origin versus non-immigrant adolescents among a national sample of US adolescents attending grades 7 to 12 (Jiang & Peterson, 2012). In their sample, Jiang and Peterson found that rates of participation in OA were lower among first- (67%) and second-generation (72%) immigrant-origin adolescents than their non-immigrant peers (80%) (Jiang & Peterson, 2012).

Also surprising is that participation in arts and music lessons and individual sports—high investment activities— were positively associated with first- and second-generation immigrant-

origin generation statuses. It is generally thought that social (e.g., lack of familiarity with activities offered) and economic barriers hinder immigrant-origin children's participation in OAs (Camacho & Fuligni, 2015; Jiang & Peguero, 2017). Empirical evidence based on a sample of US adolescents has demonstrated that lack of family resources including low SES explained differences in participation observed between generations of Hispanic youth, supporting this common view (Jiang & Peguero, 2017).

The high OA participation rate among immigrant-origin children and particularly among high-investment activities observed in this study may be a consequence of Canada's selective immigration policy. Canada's selective immigration policy indicates that many migrant households are comprised of well-educated, occupationally-skilled, healthy people (Beiser et al., 2002). These characteristics may well apply to this study's sample, of whom most immigrant children were economic class immigrants whose families entered Canada on the basis that they were skilled workers who could contribute to the nation's economy (Statistics Canada, 2019). It follows that a significant proportion of immigrant families may have been able to afford the direct costs of their children's participation in OAs (e.g., financial cost of equipment or lessons) as well as indirect costs, such as time commitments. Furthermore, previous research has demonstrated a link between Asian ethnicity and participation in non-sports activities, including arts and music as well as educational activities, probably owing to ethnic or cultural differences regarding which activities and skills are valued (Jiang & Peguero, 2017; Mahoney et al., 2009; Peguero, 2011). Most immigrant-origin children in this sample were from East Asian countries, which, although not examined in this study, might explain why first and second-generation immigration generation statuses were positively associated with participation in arts and music activities and negatively associated with participation in team sports. Further research is needed

to identify whether cultural factors explain the associations between immigrant generation status and OA participation observed in this study.

The strong association found between immigrant status and participation in educational activities may reflect the tendency for immigrant families to hold strong aspirations for their children, including the importance placed on schooling and education by parents (Hofferth & Moon, 2016). Again, it may also be explained by the high proportion of immigrants from East Asia in the sample, who tend to be involved in OAs with an academic or scholastic focus (Peguero, 2011; Yeh, 2003).

In light of previous research and this study's findings that participation in OAs appears positively associated with life satisfaction, it is reassuring that no differences in the proportion of youth who participated in OAs was found. While the results indicated overall participation was associated with worse depressive scores among immigrant children, this association was small and possibly insignificant from a practical perspective. However, it is important for future research to consider whether depressive symptoms are associated with participation in OA among immigrant-origin children to inform policy. Furthermore, even though this study found small associations between participation and indicators of emotional wellbeing, other studies have linked OA participation to other positive developmental outcomes among immigrant-origin children, such as academic achievement (Camacho & Fuligni, 2015). The strong association between first generation children's participation in educational activities is also reassuring as participating in educational activities was associated with higher GPA among first-generation teenagers in Camacho's and Fuligni's study (Camacho & Fuligni, 2015).

While the present work aimed to identify whether any differences in absolute overall participation or participation in different activity types existed between non-immigrant and

immigrant-origin children attending Grade 7 in BC, it was not this study's focus to consider what characteristics mediate the relationship between immigrant generation status and OA participation. Other research has identified that lack of family resources and cultural values of different ethnic groups can influence overall OA participation and participation in different types of OA (Jiang & Peguero, 2017). Given that this research was conducted in the US, it would be interesting to examine whether such characteristics also mediate the relationship between immigrant background and OA participation among children in Canada. Additionally, as the first to consider the role of immigrant generation status in the relationship between OA participation and emotional wellbeing, this study considered only the presence of absence of OA participation and not the intensity or breadth of activities that children participate in. Differences in participation between immigrant-origin and non-immigrant children may exist when these additional aspects of OA participation are considered. Further research should identify and examine factors that influence immigrant-origin children's participation in OAs as well as consider different aspects of OA participation across immigrant generations, particularly in a Canadian context. Such research can further contribute to the development and promotion of activities to support the emotional wellbeing of immigrant-origin children.

Limitations

While this study was able to use data from a representative sample of Grade 7 children attending BC schools, including the schools representing over 80% of immigrant-origin children in the province, it is not without limitations. First, because of the cross-sectional nature of this study, the direction of association between OA participation and emotional wellbeing indicators cannot be confirmed. Therefore, the findings do not confirm that OA participation causes the emotional wellbeing outcomes described.

Next, reports of OA participation were limited to activities in which children participated in between 3:00 to 6:00PM on weekdays or to *after school* OAs– therefore, any participation in OAs that occurred outside of this window (e.g., on the weekends/weeknights) was not captured in the data, and actual participation in OA may be underestimated. It is possible that this is why similar rates of participation were observed among immigrant-origin and non-immigrant children, since after-school activities may take place at the school setting and therefore not represent as much commitment in terms of transportation and costs as off-campus activities that may take place later in the day. Also related to the measurement of OA participation, because this research used self-report data to measure OA participation that occurred the previous week, the data may be prone to recall bias.

Another limitation applies to how this study measured SES. By using MSP subsidy—a binary variable—to measure SES, this variable captured only whether a household's income was below a certain level. Additionally, low-income British Columbians are required to apply for an MSP subsidy, and previous research has documented that up to one-quarter of eligible British Columbians do not receive the subsidy (Guhn et al., 2020; Warburton, 2005). Therefore, misclassification bias may be present in this study as some low-income households may not have applied for an MSP subsidy and would not have been classified as low SES in the present analysis.

Implications and future directions

The results of this study should caution against the "one-size fits all" approach, or the idea that OA participation is equally beneficial for all children. The results underscore the importance of designing activities that are sensitive to the diversity of BC schoolchildren,

including immigrant-origin children. BC policy-makers and educators should consider the needs of immigrant-origin children when designing after-school organized activities. This study also supports previous research, which has reported positive associations between OA participation and emotional development among non-immigrant children.

This study also implicates several directions for future research. First, the findings support further examination of whether immigrant generation status modifies the relationship between OA participation and additional indicators of emotional wellbeing, since the associations in this study varied based on the indicator considered in this analysis. Additional research in this area can clarify whether or not an association really exists, since the reported associations in this study were small. While small effect sizes can still be meaningful when considering factors which influence development since development is a multifactorial, cumulative process during which small changes compound over contexts and time (Simpkins, 2015), additional research in this area can lend support to or contradict the current findings. Longitudinal study designs can help to assign a direction to the association observed between OA participation and emotional wellbeing.

Next, while this study was exploratory in nature and focused on the presence or absence of OA participation, other aspects of OA participation need to be considered in future research investigating the role of immigrant generation status in the relationship between OA participation and emotional wellbeing, including the intensity and breadth of participation (Jiang & Peterson, 2012). Patterns of OA participation between immigrant generations can also be explored considering these components. Factors which explain the participation patterns of immigrant-origin children are also important to examine. Immigrant-origin children are a heterogeneous group with varying cultural background and migration experiences. Further research, including

qualitative work, can explore how factors including culture and migrant class impact the association between OA participation and emotional wellbeing. Future research should also measure children's participation outside of the after-school hours to gain a more complete picture of children's actual total participation in OAs.

Future research exploring factors which explain differences in the association between OA participation and emotional development based on immigrant background is also important. While it was beyond the scope of this study to explore factors such as culture, ethnicity, and feelings of discrimination as potential explanatory factors, it is important for policy makers and educators to understand what factors explain such differences to design programs that benefit immigrant-origin children. Qualitative work can be useful to identify potential explanatory factors, such as feelings of discrimination.

Conclusion

This study's findings showed that the proportion of children who participated in OAs among a sample of BC schoolchildren was equal between immigrant-origin and non-immigrant children. The findings also demonstrated that associations between OA participation and emotional wellbeing are complex and that their dependence on immigrant generation status may vary based on the wellbeing indicators considered. The current research highlights the importance of considering children's diversity in OA settings. Further research is needed to elucidate the pathway through which immigrant background influences participation in OAs and the relationship between OA participation and emotional wellbeing.

References

Agans, J. P., Champine, R. B., DeSouza, L. M., Mueller, M. K., Johnson, S. K., & Lerner, R. M. (2014). Activity Involvement as an Ecological Asset: Profiles of Participation and Youth Outcomes. *Journal of Youth and Adolescence, 43*, 919–932. https://doi.org/10.1007/s10964-014-0091-1

Ahmed, S. P., Bittencourt-Hewitt, A., & Sebastian, C. L. (2015). Neurocognitive bases of emotion regulation development in adolescence. *Developmental Cognitive Neuroscience, 15*, 11–25. https://doi.org/10.1016/j.dcn.2015.07.006

Aronen, E. T., & Soininen, M. (2000). Childhood Depressive Symptoms Predict Psychiatric Problems in Young Adults. *Can J Psychiatry, 45*, 465–470. https://doi.org/10.1177/070674370004500507

Arslan, G., Allen, K. A., & Ryan, T. (2020). Exploring the Impacts of School Belonging on Youth Wellbeing and Mental Health among Turkish Adolescents. *Child Indicators Research*, *13*(5), 1619–1635. https://doi.org/10.1007/s12187-020-09721-z

Badura, P., Geckova, A. M., Sigmundova, D., Van Dijk, J. P., & Reijneveld, S. A. (2015). When children play, they feel better: Organized activity participation and health in adolescents Energy balance-related behaviors. *BMC Public Health*, *15*(1), 1–8. https://doi.org/10.1186/s12889-015-2427-5

Bartko, W. T., & Eccles, J. S. (2003). Adolescent Participation in Structured and Unstructured Activities: A Person-Oriented Analysis. *Journal of Youth and Adolescence, 32*(4), 233–241. https://doi.org/10.1023/A:1023056425648

BC MOH. (2017). *BC Ministry of Health - Medical Services Plan (MSP) Payment Information File*. Population Data BC. https://www.popdata.bc.ca/data

Beesdo, K., Knappe, S., & Pine, D. S. (2009). Anxiety and Anxiety Disorders in Children and Adolescents: Developmental Issues and Implications for DSM-V. *Psychiatric Clinics of North America*, *32*(3), 483–524. https://doi.org/10.1016/j.psc.2009.06.002

Behtoui, A. (2019). Swedish young people's after-school extra-curricular activities: attendance,

opportunities and consequences. *British Journal of Sociology of Education*, *40*(3), 340–356. https://doi.org/10.1080/01425692.2018.1540924

Beiser, M., Hou, F., Hyman, I., & Tousignant, M. (2002). Poverty, family process, and the mental health of immigrant children in Canada. *American Journal of Public Health*, *92*(2), 220–227. https://doi.org/10.2105/AJPH.92.2.220

Beiser, M., Noh, S., Hou, F., Kaspar, V., & Rummens, J. (2001). Southeast Asian Refugees' Perceptions of Racial Discrimination in Canada. *Canadian Ethnic Studies Journal*, *33*(1), 46.

Beiser, M., Zilber, N., Simich, L., Youngmann, R., Zohar, A. H., Taa, B., & Hou, F. (2011). Regional effects on the mental health of immigrant children: Results from the New Canadian Children and Youth Study (NCCYS). *Health and Place*, *17*(3), 822–829. https://doi.org/10.1016/j.healthplace.2011.03.005

Bellamy, S., & Hardy, C. (2015). Factors Predicting Depression across Multiple Domains in a National Longitudinal Sample of Canadian Youth. *Journal of Abnormal Child Psychology*, *43*(4), 633–643. https://doi.org/10.1007/s10802-014-9940-3

Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine*, *45*, 886–895. https://doi.org/10.1136/bjsports-2011-090185

Blume, L. B., & Zembar, M. J. (2007). *Middle Childhood to Middle Adolescence: Development from ages 8 to 18*. Pearson Education, Inc.

Bohnert, A., Fredricks, J., & Randall, E. (2010). Capturing unique dimensions of youth organized activity involvement: Theoretical and methodological considerations. *Review of Educational Research*, *80*(4), 576–610. https://doi.org/10.3102/0034654310364533

Bohnert, A. M., Kane, P., & Garber, J. (2008). Organized activity participation and internalizing and externalizing symptoms: Reciprocal relations during adolescence. *Journal of Youth and Adolescence*, *37*(2), 239–250. https://doi.org/10.1007/s10964-007-9195-1

Bohnert, A. M., Richards, M., Kohl, K., & Randall, E. (2009). Relationships between discretionary time activities, emotional experiences, delinquency and depressive symptoms

among urban African American adolescents. *Journal of Youth and Adolescence*, *38*(4), 587–601. https://doi.org/10.1007/s10964-008-9336-1

Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard Press.

Camacho, D. E., & Fuligni, A. J. (2015). Extracurricular Participation Among Adolescents from Immigrant Families. *Journal of Youth and Adolescence*, *44*(6), 1251–1262. https://doi.org/10.1007/s10964-014-0105-z

Canadian Mental Health Association. (2014). *Mental Illness in Children and Youth*. https://cmha.bc.ca/documents/mental-illnesses-in-children-and-youth-2/

Ciarrochi, J., & Scott, G. (2006). The link between emotional competence and well-being: A longitudinal study. *British Journal of Guidance and Counselling*, *34*(2), 231–243. https://doi.org/10.1080/03069880600583287

CIHR. (2016). *The Knowledge to Action Process*. https://cihr-irsc.gc.ca/e/29418.html#6

Clarke, P. (2008). When can group level clustering be ignored? Multilevel models versus single-level models with sparse data. *Journal of Epidemiology and Community Health*, *62*(8), 752–758. https://doi.org/10.1136/jech.2007.060798

Collins, W. (1984). *Panel to Review the Status of Basic Research on School-Age Children: Development During Middle Childhood: The Years from Six to Twelve* (W. A. Collins (ed.)). National Academy Press. http://www.nap.edu/catalog/56.html

Cote, L. R., & Yuen, C. X. (2013). Children abroad: Immigrant children's development in worldwide perspective. *Human Development*, *56*(1), 76–81. https://doi.org/10.1159/000342934

Darling, N. (2005). Participation in extracurricular activities and adolescent adjustment: Cross-sectional and longitudinal findings. *Journal of Youth and Adolescence*, *34*(5), 493–505. https://doi.org/10.1007/s10964-005-7266-8

Denault, A. S., & Poulin, F. (2009). Predictors of adolescent participation in organized activities: A five-year longitudinal study. *Journal of Research on Adolescence*, *19*(2), 287–311. https://doi.org/10.1111/j.1532-7795.2009.00597.x

Deutsch, N. L., Blyth, D. A., Kelley, J., Tolan, P. H., & Lerner, R. M. (2017). Let's Talk After-School: The Promises and Challenges of Positive Youth Development for After-School Research, Policy, and Practice. In N. L. Deutsch (Ed.), *After-School Programs to Promote Positive Youth Development* (Vol. 1, pp. 45–68). Springer Nature. https://doi.org/10.1007/978-3-319-59132-2

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. In *Journal of Personality Assessment* (Vol. 49, Issue 1, pp. 71–75). https://doi.org/10.1207/s15327752jpa4901_13

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*(2), 276–302. https://doi.org/10.1037/0033-2909.125.2.276

Eccles, J. S. (1999). The development of children ages 6 to 14. *Future of Children*, *9*(2), 30–44. https://doi.org/10.2307/1602703

Fazel, M., Reed, R. V., Panter-Brick, C., & Stein, A. (2012). Mental health of displaced and refugee children resettled in high-income countries: Risk and protective factors. *The Lancet*, *379*, 266–282. https://doi.org/10.1016/S0140-6736(11)60051-2

Feinstein, L., & Bynner, J. (2004). The importance of cognitive development in middle childhood for adulthood socioeconomic status, mental health, and problem behavior. *Child Development*, *75*(5), 1329–1339.

Fredricks, J. A., Alfeld-Liro, C. J., Hruda, L. Z., Eccles, J. S., Patrick, H., & Ryan, A. M. (2002). A qualitative exploration of adolescents' commitment to athletics and the arts. *Journal of Adolescent Research*, *17*(1), 68–97. https://doi.org/10.1177/0743558402171004

Fredricks, J. A., & Eccles, J. S. (2005). Developmental benefits of extracurricular involvement: Do peer characteristics mediate the link between activities and youth outcomes? *Journal of Youth and Adolescence*, *34*(6), 507–520. https://doi.org/10.1007/s10964-005-8933-5

Fredricks, J. A., & Simpkins, S. D. (2012). Promoting Positive Youth Development Through Organized After-School Activities: Taking a Closer Look at Participation of Ethnic Minority Youth. *Child Development Perspectives*, *6*(3), 280–287.

https://doi.org/10.1111/j.1750-8606.2011.00206.x

Gadermann, A. M., Guhn, M., Schonert-Reichl, K. A., Hymel, S., Thomson, K., & Hertzman, C. (2016). A Population-Based Study of Children's Well-Being and Health: The Relative Importance of Social Relationships, Health-Related Activities, and Income. *Journal of Happiness Studies*, *17*(5), 1847–1872. https://doi.org/10.1007/s10902-015-9673-1

Gadermann, A. M., Schonert-Reichl, K. A., & Zumbo, B. D. (2010). Investigating validity evidence of the satisfaction with life scale adapted for children. *Social Indicators Research*, *96*(2), 229–247. https://doi.org/10.1007/s11205-009-9474-1

García, C., Lamberty, G., Jenkins, R., Mcadoo, H. P., Crnic, K., Wasik, B. H., García, H. V., Coll, C. G., Jenkins, R., & Mcadoo, H. P. (1996). An Integrative Model for the Study of Developmental Competencies in Minority Children. *Child Development*, *67*(5), 1891–1914.

Gay, G. (2010). *Culturally Responsive Teaching: Theory, Research, and Practice* (J. A. Banks (ed.); 2nd ed.). Teachers College Press.

Gaytan, F. X., Carhill, A., & Suarez-Orozco. (2007). Understanding and responding to the needs to newcomer immigrant youth and families. *The Prevention Researcher*, *14*(4).

Gilman, R., & Huebner, E. S. (2006). Characteristics of adolescents who report very high life satisfaction. *Journal of Youth and Adolescence*, *35*(3), 293–301. https://doi.org/10.1007/s10964-006-9036-7

Gilman, R., & Huebner, S. (2003). A review of life satisfaction research with children and adolescents. *School Psychology Quarterly*, *18*(2), 192–205. https://doi.org/10.1521/scpq.18.2.192.21858

Guhn, M., Emerson, S. D., & Gouzouasis, P. (2019). A Population-Level Analysis of Associations Between School Music Participation and Academic Achievement. *Journal of Educational Psychology*, *112*(2), 308–328. https://doi.org/10.1037/edu0000376

Guhn, M., Emerson, S. D., Mahdaviani, D., & Gadermann, A. M. (2020). Associations of Birth Factors and Socio-Economic Status with Indicators of Early Emotional Development and Mental Health in Childhood: A Population-Based Linkage Study. *Child Psychiatry and Human Development*, *51*, 80–93. https://doi.org/10.1007/s10578-019-00912-6

Hadfield, K., Ostrowski, A., & Ungar, M. (2017). What can we expect of the mental health and well-being of Syrian refugee children and adolescents in Canada? *Canadian Psychology*, *58*(2), 194–201. https://doi.org/10.1037/cap0000102

Hallal, P. C., Victoria, C. G., Azevedo, M. R., & Wells, J. C. K. (2006). Children's physical activity and health. *Sports Medicine*, *36*(12), 1019–1030. https://doi.org/10.2165/00007256-200636120-00003

Hansen, D. M., Larson, R. W., & Dworkin, J. B. (2003). What adolescents learn in organized youth activities: A survey of self-reported developmental experiences. *Journal of Research on Adolescence*, *13*(1), 25–55. https://doi.org/10.1111/1532-7795.1301006

Hansen, D. M., Skorupski, W. P., & Arrington, T. L. (2010). Differences in developmental experiences for commonly used categories of organized youth activities. *Journal of Applied Developmental Psychology*, *31*, 413–421. https://doi.org/10.1016/j.appdev.2010.07.001

Haranin, E. C., Huebner, E. S., & Suldo, S. M. (2007). Predictive and incremental validity of global and domain-based adolescent life satisfaction reports. *Journal of Psychoeducational Assessment*, *25*(2), 127–138. https://doi.org/10.1177/0734282906295620

Hayden-Thomson, L. K. (1989). *The development of the Relational Provisions Lonliness Questionnaire for Children*. University of Waterloo.

HELP. (2017). *Human Early Learning Partnership (HELP) - Middle years development instrument*. Population Data BC. http://www.popdata.bc.ca/data

Heptinstall, E., Sethna, V., & Taylor, E. (2004). PTSD and depression in refugee children: Associations with pre-migration trauma and post-migration stress. *European Child and Adolescent Psychiatry*, *13*(6), 373–380. https://doi.org/10.1007/s00787-004-0422-y

Hofferth, S. L., & Moon, U. J. (2016). How Do They Do It? The Immigrant Paradox in the Transition to Adulthood. *Soc Sci Res*, *57*(8), 177–194. https://doi.org/10.1016/j.ssresearch.2015.12.013

Huebner, A. J., & Mancini, J. A. (2003). Shaping Structured Out-of-School Time Use among Youth: The Effects of Self, Family, and Friend Systems. *Journal of Youth and Adolescence*, *32*(6), 453–463. https://doi.org/10.1023/A:1025990419215

Huebner, E. S. (2004). Research on assessment of life satisfaction of chidren and adolescents. *Social Indicators Research*, *66*(1–2), 3–33. https://doi.org/10.1023/B:SOCI.0000007497.57754.e3

Huebner, E. S., Drane, W., & Valois, R. F. (2000). Levels and Demographic Correlates of Adolescent Life Satisfaction Reports. *School Psychology International*, *21*(3), 281–292. https://doi.org/10.1177/0143034300213005

IRCC. (2017). *Immigration, Refugees, and Citizenship Canada (IRCC) Permanent Resident Database*. Population Data BC. http://www.popdata.bc.ca/data

Janssen, I., & Leblanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, *7*(40). https://doi.org/10.1186/1479-5868-7-40

Jeliĉić, H., Phelps, E., & Lerner, R. M. (2009). Use of Missing Data Methods in Longitudinal Studies: The Persistence of Bad Practices in Developmental Psychology. *Developmental Psychology*, *45*(4), 1195–1199. https://doi.org/10.1037/a0015665

Jiang, X., & Peguero, A. A. (2017). Immigration, Extracurricular Activity, and the Role of Family. *Education and Urban Society*, *49*(3), 314–340. https://doi.org/10.1177/0013124516643759

Jiang, X., & Peterson, R. D. (2012). Beyond Participation: The Association Between School Extracurricular Activities and Involvement in Violence Across Generations of Immigration. *Journal of Youth and Adolescence*, *41*(3), 362–378. https://doi.org/10.1007/s10964-011-9736-5

Kansky, J., Allen, J. P., & Diener, E. (2016). Early Adolescent Affect Predicts Later Life Outcomes. *Applied Psychology. Health and Well-Being*, *8*(2), 192–212. https://doi.org/10.1111/aphw.12068

Keenan-Miller, D., Hammen, C. L., & Brennan, P. A. (2007). Health Outcomes Related to Early Adolescent Depression. *Journal of Adolescent Health*, *41*(3), 256–262. https://doi.org/10.1016/j.jadohealth.2007.03.015

Keyes, C. L. M. (2007). Psychological Well-Being. In *Encyclopedia of Gerontology* (Second, pp.

399–406). Elsevier. https://doi.org/10.1016/B0-12-370870-2/00156-6

Kullis, S., Marsiglia, F. F., & Nieri, T. (2009). Perceived ethnic discrimination versus acculturation stress: Influences on substance use among Latino youth in the southwest. *J Health Soc Behav*, *50*(4).

Kumar, A. (2021). Intra-class correlation. In *Responsible applied statistics in R for behavioral and health data* (Version-).

Kusche, C. A., Greenberg, M. T., & Beilke, R. (1988). Seattle Personality Questionnaire for Young School Aged Children. *Unpublished Manuscript*. https://fasttrackproject.org/techrept/s/spq/%0A

Larson, R. W., Hansen, D. M., & Moneta, G. (2006). Differing profiles of developmental experiences across types of organized youth activities. *Developmental Psychology, 42*(5), 849–863. https://doi.org/10.1037/0012-1649.42.5.849

Larson, R. W., Moneta, G., Richards, M. H., & Wilson, S. (2002). Continuity , Stability , and Change in Daily Emotional Experience across Adolescence. *Child Development, 73*(4), 1151–1165.

Lerner, R. M., von Eye, A., Lerner, J. V., Lewin-Bizan, S., & Bowers, E. P. (2010). Special issue introduction: The meaning and measurement of thriving: A view of the issues. *Journal of Youth and Adolescence, 39*, 707–719. https://doi.org/10.1007/s10964-010-9531-8

Lin, A. R., Menjívar, C., Vest Ettekal, A., Simpkins, S. D., Gaskin, E. R., & Pesch, A. (2016). "They Will Post a Law About Playing Soccer" and Other Ethnic/Racial Microaggressions in Organized Activities Experienced by Mexican-Origin Families. *Journal of Adolescent Research*, *31*(5), 557–581. https://doi.org/10.1177/0743558415620670

Little, R. J. A., & Rubin, D. B. (2002). *Statistical Analysis with Missing Data* (2nd ed.). John Wiley & Sons, Inc. https://doi.org/10.1002/9781119013563

Liu, Y., & De, A. (2015). Multiple imputation by fully conditional specification for dealing with missing data in a large epidemiologic study. *Int J Stat Med Res*, *4*(3), 287–295. https://doi.org/10.6000/1929-6029.2015.04.03.7.

Loder, T. L., & Hirsch, B. J. (2003). Inner-city youth development organizations: The salience of peer ties among early adolescent girls. *Applied Developmental Science*, *7*(1), 2–12. https://doi.org/10.1207/S1532480XADS0701_1

Mahoney, J. L., Larson, R. W., Eccles, J. S., & Lord, H. (2005). Organized activities as developmental contexts for children and adolescents. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development: Extracurricular activities, after-school and community programs* (pp. 3–22). Lawrence Erlbaum Associates.

Mahoney, J. L., Vandell, D. L., Simpkins, S., & Zarrett, N. (2009). Adolescent out-of-school activities. In R. Lerner & L. Steinberg (Eds.), *Handbook of Adolescent Psychology: Contextual influences on adolescent development* (3rd ed., pp. 228–267). Wiley.

Martin, K., Huebner, E. S., & Valois, R. F. (2008). Does life satisfaction predict victimization experiences in adolescence? *Psychology in the Schools*, *45*(8), 705–714. https://doi.org/10.1002/pits.20336

Masten, A. S., & Tellegen, A. (2012). Resilience in developmental psychopathology: Contributions of the Project Competence Longitudinal Study. *Development and Psychopathology*, *24*(2), 345–361. https://doi.org/10.1017/S095457941200003X

Maton, K. I. (1990). Meaningful involvement in instrumental activity and well-being: Studies of older adolescents and at risk urban teen-agers. *American Journal of Community Psychology*, *18*(2).

Moilanen, K. L., Shaw, D. S., & Maxwell, K. L. (2010). Developmental cascades: Externalizing, internalizing, and academic competence from middle childhood to early adolescence. *Development and Psychopathology*, *22*(3), 635–653. https://doi.org/10.1017/S0954579410000337

Murali, V., & Oyebode, F. (2004). Poverty, social inequality and mental health. *Advances in Psychiatric Treatment*, *10*(3), 216–224. https://doi.org/10.1192/apt.10.3.216

Noh, S., Beiser, M., Kaspar, V., Hou, F., & Rummens, J. (1999). Perceived Racial Discrimination, Depression, and Coping : A Study of Southeast Asian Refugees in Canada. *Journal of Health and Social Behavior*, *40*(3), 193–207.

https://www.jstor.org/stable/2676348

O'Dwyer, L. M., & Parker, C. E. (2014). A primer for analyzing nested data: multilevel modeling in SPSS using an example from a REL study. In *Applied Research Methods*. http://ies.ed.gov/ncee/edlabs

O'Neill, S. A. (2005). Youth Music Engagement in Diverse Contexts. In J. Mahoney, R. Larson, & J. Eccles (Eds.), *Organized activitites as contexts of development: Extracurricular activities, after-school and community programs* (1st ed., pp. 255–274). Psychology Press.

Oberle, E., Ji, X. R., Guhn, M., Schonert-Reichl, K. A., & Gadermann, A. M. (2019). Benefits of Extracurricular Participation in Early Adolescence: Associations with Peer Belonging and Mental Health. *Journal of Youth and Adolescence*, *48*, 2255–2270.

Oberle, E., Ji, X. R., Magee, C., Guhn, M., Schonert-Reichl, K. A., & Gadermann, A. M. (2019). Extracurricular activity profiles and wellbeing in middle childhood: A population-level study. *PLoS ONE*, *14*(7), 1–17. https://doi.org/10.1371/journal.pone.0218488

Panza, M. J., Graupensperger, S., Agans, J. P., Doré, I., Vella, S. A., & Evans, M. B. (2020). Adolescent Sport Participation and Symptoms of Anxiety and Depression: A Systematic Review and Meta-Analysis. *Journal of Sport and Exercise Psychology*, *42*, 201–218. https://doi.org/10.1123/JSEP.2019-0235

Parasuraman, S. R., Ghandour, R. M., & Kogan, M. D. (2020). Epidemiological profile of health and behaviors in middle childhood. *Pediatrics*, *145*(6). https://doi.org/10.1542/peds.2019-2244

Park, S., & Lake, E. T. (2005). Multilevel Modeling of a Clustered Continuous Outcome: Nurses' Work Hours and Burnout. *Nurs. Res.*, *54*(6), 406–413.

Paus, T. (2005). Mapping brain maturation and cognitive development during adolescence. *Trends in Cognitive Sciences*, *9*(2), 60–68. https://doi.org/10.1016/j.tics.2004.12.008

Pavot, W., & Diener, E. (2008). The Satisfaction With Life Scale and the emerging construct of life satisfaction. *Journal of Positive Psychology*, *3*(2), 137–152. https://doi.org/10.1080/17439760701756946

Pedersen, S. (2005). Urban adolescents' out-of-school activity profiles: Associations with youth, family, and school transition characteristics. *Applied Developmental Science*, *9*(2), 107–124. https://doi.org/10.1207/s1532480xads0902_5

Peguero, A. A. (2010). A profile of Latino school-based extracurricular activity involvement. *Journal of Latinos and Education*, *9*(1), 60–71. https://doi.org/10.1080/15348430903253076

Peguero, A. A. (2011). Immigrant youth involvement in school-based extracurricular activities. *Journal of Educational Research*, *104*(1), 19–27. https://doi.org/10.1080/00220670903468340

Proctor, C. L., Linley, P. A., & Maltby, J. (2009). Youth life satisfaction: A review of the literature. *Journal of Happiness Studies*, *10*(5), 583–630. https://doi.org/10.1007/s10902-008-9110-9

Pumariega, A. J., Rothe, E., & Pumariega, J. B. (2005). Mental Health of Immigrants and Refugees. *Community Mental Health Journal*, *41*(5), 581–597. https://doi.org/10.1007/s10597-005-6363-1

Randall, E. T., & Bohnert, A. M. (2009). Organized activity involvement, depressive symptoms, and social adjustment in adolescents: Ethnicity and socioeconomic status as moderators. *Journal of Youth and Adolescence*, *38*(9), 1187–1198. https://doi.org/10.1007/s10964-009-9417-9

Reiss, F. (2013). Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. *Social Science and Medicine*, *90*, 24–31. https://doi.org/10.1016/j.socscimed.2013.04.026

Reiss, F., Meyrose, A. K., Otto, C., Lampert, T., Klasen, F., & Ravens-Sieberer, U. (2019). Socioeconomic status, stressful life situations and mental health problems in children and adolescents: Results of the German BELLA cohort-study. *PLoS ONE*, *14*(3), 1–16. https://doi.org/10.1371/journal.pone.0213700

Russo, M. F., & Beidel, D. C. (1994). Comorbidity of childhood anxiety and externalizing disorders: Prevalence, associated characteristics, and validation issues. *Clinical Psychology*

Review, *14*(3), 199–221. https://doi.org/10.1016/0272-7358(94)90008-6

Ruxton, G. D. (2006). The unequal variance t-test is an underused alternative to Student's t-test and the Mann-Whitney U test. *Behavioral Ecology*, 688–690. https://doi.org/10.1093/beheco/ark016

Sam, D. L., Vedder, P., Liebkind, K., Neto, F., & Virta, E. (2008). Immigration, acculturation and the paradox of adaptation in Europe. *European Journal of Developmental Psychology*, *5*(2), 138–158. https://doi.org/10.1080/17405620701563348

Samuel-Rosa, A., dos Anjos, L. H. C., Vasques, G., Heuvelink, G. B. M., Olsen, T., Kincaid, T., Cuetos, J. C. ruiz, Garcia, M. E. P., Rodriguez, P. G., French, J., Kleinman, K., Brus, D., Harrell, F., & Xu, R. (2020). *Package "pedometrics."*

Scanlan, T. K., Babkes, M. L., & Scanlan, L. A. (2005). Participation in sport: A developmental glimpse at emotion. In J. Mahoney, R. Larson, & J. Eccles (Eds.), *Organized Activities As Contexts of Development* (1st ed., pp. 275–309). Psychology Press.

Schonert-Reichl, K. A. (2011). Middle Childhood Inside and Out: The Psychological and Social Worlds of Canadian Children Ages 9-12, Full Report. In *Report for the United Way of the Lower Mainland*. http://earlylearning.ubc.ca/media/publications/uwlm_middle_childhood_full_report_2011.pdf

Schonert-Reichl, Kimberley A., Guhn, M., Gadermann, A. M., Hymel, S., Sweiss, L., & Hertzman, C. (2013). Development and validation of the Middle Years Development Instrument (MDI): Assessing children's well-being and assets across multiple contexts. *Social Indicators Research*, *114*, 345–369. https://doi.org/10.1007/s11205-012-0149-y

Simpkins, S. D. (2015). When and How Does Participating in an Organized After-School Activity Matter? *Applied Developmental Science*, *19*(3), 121–126. https://doi.org/10.1080/10888691.2015.1056344

Simpkins, S. D., Fredricks, J. A., Davis-Kean, P. E., & Eccles, J. S. (2009). Healthy mind, healthy habits: The influence of activity involvement in middle childhood. In A. C. Huston & M. N. Ripke (Eds.), *Developmental Contexts in Middle Childhood: Bridges to*

Adolescence and Adulthood (pp. 283–302). Cambridge University Press. https://doi.org/10.1017/CBO9780511499760.015

Simpkins, S. D., Riggs, N. R., Ngo, B., Vest Ettekal, A., & Okamoto, D. (2017). Designing Culturally Responsive Organized After-School Activities. *Journal of Adolescent Research*, *32*(1), 11–36. https://doi.org/10.1177/0743558416666169

Simpkins, S. D., Ripke, M., Huston, A. C., & Eccles, J. S. (2005). Predicting participation and outcomes in out-of-school activities: similarities and differences across social ecologies. *New Directions for Youth Development*, *105*, 51–69. https://doi.org/10.1002/yd.107

Statistics Canada. (2019). *Classification of admission category of immigrant*. https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=323293&CVD=323294&CLV=0&MLV=4&D=1

Statistics Canada. (2020). *Quarterly Demographic Estimates: April to June 2020*. https://www150.statcan.gc.ca/n1/pub/91-002-x/91-002-x2020002-eng.htm

Statistics Canada. (2021). *Table 13-10-0394-01 Leading causes of death, total population, by age group*. https://doi.org/10.25318/1310039401-eng

Steinberg, L. (2005). Cognitive and affective development in adolescence. *Trends in Cognitive Sciences*, *9*(2), 69–74. https://doi.org/10.1016/j.tics.2004.12.005

Sterne, J. A. C., White, I. R., Carlin, J. B., Spratt, M., Royston, P., Kenward, M. G., Wood, A. M., & Carpenter, J. R. (2009). Multiple imputation for missing data in epidemiological and clinical research: Potential and pitfalls. *BMJ (Online)*, *338*. https://doi.org/10.1136/bmj.b2393

Suárez-Orozco, C., Motti-Stefanidi, F., Marks, A., & Katsiaficas, D. (2018). An integrative risk and resilience model for understanding the adaptation of immigrant-origin children and youth. *American Psychologist*, *73*(6), 781–796. https://doi.org/10.1037/amp0000265

Theurel, A., & Gentaz, E. (2018). The regulation of emotions in adolescents: Age differences and emotion-specific patterns. *PLoS ONE*, *13*(6). https://doi.org/10.1371/journal.pone.0195501

Thomas, S. L., & Heck, R. H. (2001). Analysis of large-scale secondary data in higher education research: Potential perils associated with complex sampling designs. *Research in Higher Education*, *42*(5), 517–540. https://doi.org/10.1023/A:1011098109834

Thomson, K. C., Guhn, M., Richardson, C. G., Ark, T. K., & Shoveller, J. (2017). Profiles of children's social-emotional health at school entry and associated income, gender and language inequalities: A cross-sectional population-based study in British Columbia, Canada. *BMJ Open*, *7*, 1–10. https://doi.org/10.1136/bmjopen-2016-015353

Thomson, K. C., Oberle, E., Gadermann, A. M., Guhn, M., Rowcliffe, P., & Schonert-Reichl, K. A. (2018). Measuring social-emotional development in middle childhood: The Middle Years Development Instrument. *Journal of Applied Developmental Psychology*, *55*, 107–118. https://doi.org/10.1016/j.appdev.2017.03.005

Tudge, J. R. H., Odero, D., Piccinini, C. A., Doucet, F., Sperb, T. M., & Lopes, R. S. (2006). A window into different cultural worlds: Young children's everyday activities in the United States, Brazil, and Kenya. *Child Development*, *77*(5), 1446–1469.

Uusitalo-Malmivaara, L., & Lehto, J. E. (2013). Social Factors Explaining Children's Subjective Happiness and Depressive Symptoms. *Social Indicators Research*, *111*(2), 603–615. https://doi.org/10.1007/s11205-012-0022-z

van Buuren, S., & Groothuis-Oudshoorn, K. (2011). MICE: Multivariate imputation by chained equations in R. *Journal of Statistical Software*, *45*(3). https://doi.org/10.18637/jss.v045.i03

Vandell, D. L., Larson, R. W., Mahoney, J. L., & Watts, T. W. (2015). Children's Organized Activities. In R. M. Lerner (Ed.), *Handbook of Child Psychology and Developmental Science* (7th ed.). John Wiley & Sons, Inc.

VanderWeele, T. J. (2019). Principles of confounder selection. *European Journal of Epidemiology*, *34*, 211–219. https://doi.org/10.1007/s10654-019-00494-6

Vargas, S. M., Huey, S. J., & Miranda, J. (2020). A critical review of current evidence on multiple types of discrimination and mental health. *American Journal of Orthopsychiatry*, *90*(3), 374–390. https://doi.org/10.1037/ort0000441

Waddell, C., Offord, D. R., Shepherd, C. A., Hua, J. M., & McEwan, K. (2002). Child

psychiatric epidemiology and Canadian public policy-making: The state of the science and the art of the possible. *Canadian Journal of Psychiatry*, *47*(9), 825–832. https://doi.org/10.1177/070674370204700903

Warburton, R. (2005). Takeup of income-tested health-care premium subsidies: evidence and remedies for British Columbia. *Can Tax J*, *53*(1).

Whitlock, M. C., & Schluter, D. (2015). The normal distribution. In *The Analysis of Biological Data* (2nd ed., pp. 273–300). Roberts and Company Publishers, Inc.

WHO. (2021). *Frequently asked questions*. https://www.who.int/about/who-we-are/frequently-asked-questions

Yeh, C. J. (2003). Age, acculturation, cultural adjustment, and mental health symptoms of Chinese, Korean, and Japanese immigrant youths. *Cultural Diversity and Ethnic Minority Psychology*, *9*(1), 34–48. https://doi.org/10.1037/1099-9809.9.1.34

Zarobe, L., & Bungay, H. (2017). The role of arts activities in developing resilience and mental wellbeing in children and young people: A rapid review of the literature. *Perspectives in Public Health*, *137*(6), 337–347. https://doi.org/10.1177/1757913917712283

Appendices

Appendix A Participation in OA activity types (imputed dataset number 22)

Educational						
Immigrant generation status	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
				Lower	Upper	
Non-immigrant (ref.)	2689 (28.6)	6704 (71.4)	-	-	-	-
First generation	998 (48.8)	1049 (51.2)	2.37	2.15	2.61	< 0.01
Second generation	1255 (42.3)	1711 (57.7)	1.83	1.68	1.99	< 0.01

Arts/music						
Immigrant generation status	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
				Lower	Upper	
Non-immigrant (ref.)	3153 (33.6)	6240 (66.4)	-	-	-	-
First generation	980 (47.9)	1067 (52.1)	1.82	1.65	2.00	< 0.01
Second generation	1335 (45.0)	1631 (55.0)	1.62	1.49	1.76	< 0.01

Individual sports						
Immigrant generation status	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
				Lower	Upper	
Non-immigrant (ref.)	3820 (40.7)	5573 (59.3)	-	-	-	-
First generation	945 (46.2)	1102 (53.8)	1.25	1.14	1.38	< 0.01
Second generation	1271 (42.9)	1695 (57.1)	1.09	1.01	1.19	0.04

Team sports						
Immigrant generation status	Participants, N (%)	Non-participants, N (%)	OR	95% CI		p-value
				Lower	Upper	
Non-immigrant (ref.)	5491 (58.5)	3902 (41.5)	-	-	-	-
First generation	1004 (49.0)	1043 (51.0)	0.68	0.62	0.75	< 0.01
Second generation	1383 (46.6)	1583 (53.4)	0.62	0.57	0.67	< 0.01

Appendix B MLR results stratified by immigrant generation status

	Non-immigrant (N = 9393)				First generation (N = 2047)				Second generation (N = 2966)			
	β	SE	95% CI	P-value	β	SE	95% CI	P-value	β	SE	95% CI	P-value
Satisfaction with life												
Intercept	2.17	0.04	[2.09, 2.25]	< 0.01	2.06	0.09	[1.88, 2.24]	< 0.01	2.12	0.08	[1.97, 2.27]	< 0.01
OA Participation	**0.14**	**0.02**	**[0.09, 0.18]**	**< 0.01**	0.00	0.05	[-0.10, 0.09]	1.00	**0.08**	**0.04**	**[0.01, 0.16]**	**0.03**
Female	-0.04	0.02	[-0.07, -0.01]	0.02	0.01	0.03	[-0.06, 0.07]	0.84	-0.07	0.03	[-0.13, -0.02]	0.01
MSP Subsidy (yes)	-0.15	0.02	[-0.19, -0.12]	< 0.01	-0.15	0.03	[-0.22, -0.08]	< 0.01	-0.10	0.03	[-0.16, -0.05]	< 0.01
Peer Belonging	0.43	0.01	[0.42, 0.45]	< 0.01	0.45	0.02	[0.41, 0.49]	< 0.01	0.43	0.02	[0.40, 0.46]	< 0.01
Depressive symptoms												
Intercept	4.38	0.05	[4.28, 4.48]	< 0.01	3.93	0.11	[3.72, 4.14]	< 0.01	4.21	0.09	[4.03, 4.39]	< 0.01
OA Participation	**-0.19**	**0.03**	**[-0.25, -0.14]**	**< 0.01**	0.01	0.06	[-0.10, 0.12]	0.82	0.01	0.05	[-0.08, 0.10]	0.83
Female	0.11	0.02	[0.07, 0.15]	< 0.01	0.17	0.04	[0.10, 0.25]	< 0.01	0.18	0.03	[0.12, 0.25]	< 0.01
MSP Subsidy	0.13	0.02	[0.08, 0.17]	< 0.01	0.08	0.04	[0.00, 0.16]	0.04	0.02	0.03	[-0.05, 0.08]	0.61
Peer Belonging	-0.42	0.01	[-0.44, -0.40]	< 0.01	-0.34	0.02	[-0.39, -0.30]	< 0.01	-0.41	0.02	[-0.45, -0.37]	< 0.01

Reference groups: no OA participation, non-immigrant, male, no MSP subsidy.
Statistically significant ($p < 0.05$) coefficients corresponding to OA participation status are in bold.

	Non-immigrant (N = 9393)				First generation (N = 2047)				Second generation (N = 2966)			
	β	SE	95% CI	P-value	β	SE	95% CI	P-value	β	SE	95% CI	P-value
Satisfaction with life												
Intercept	2.22	0.04	[2.15, 2.30]	< 0.01	2.05	0.09	[1.88, 2.22]	< 0.01	2.17	0.07	[2.02, 2.31]	< 0.01
Educational	-0.03	0.02	[-0.06, 0.01]	0.14	0.02	0.04	[-0.05, 0.10]	0.53	-0.01	0.03	[-0.07, 0.05]	0.75
Arts/music	0.02	0.02	[-0.01, 0.05]	0.22	-0.04	0.04	[-0.11, 0.04]	0.34	0.02	0.03	[-0.08, 0.04]	0.45
Individual sports	**0.06**	**0.02**	**[0.03, 0.09]**	**< 0.01**	0.04	0.04	[-0.03, 0.12]	0.23	0.06	0.03	[0.00, 0.11]	0.06
Team sports	**0.09**	**0.02**	**[0.06, 0.12]**	**< 0.01**	0.02	0.04	[-0.05, 0.08]	0.66	**0.07**	**0.03**	**[0.01, 0.13]**	**0.02**
Female	-0.03	0.02	[-0.06, 0.00]	0.04	0.01	0.03	[-0.06, 0.08]	0.72	-0.06	0.03	[-0.12, -0.01]	0.03
MSP Subsidy (yes)	-0.15	0.02	[-0.18, -0.11]	< 0.01	-0.15	0.03	[-0.21, -0.08]	< 0.01	-0.10	0.03	[-0.15, -0.04]	< 0.01
Peer Belonging	0.43	0.01	[0.41, 0.45]	< 0.01	0.45	0.02	[0.41, 0.49]	< 0.01	0.43	0.02	[0.40, 0.46]	< 0.01
	R^2	0.233	*Adj* R^2	0.233	R^2	0.217	*Adj* R^2	0.214	R^2	0.209	*Adj* R^2	0.208
Depressive symptoms												
Intercept	4.30	0.05	[4.21, 4.40]	< 0.01	3.94	0.10	[3.74, 4.14]	< 0.01	4.17	0.09	[4.00, 4.34]	< 0.01
Educational	**0.07**	**0.02**	**[0.02, 0.11]**	**< 0.01**	0.00	0.04	[-0.08, 0.09]	0.94	**0.14**	**0.04**	**[0.07, 0.21]**	**< 0.05**
Arts/music	-0.03	0.02	[-0.07, 0.01]	0.13	0.01	0.04	[-0.08, 0.09]	0.89	-0.01	0.04	[-0.08, 0.06]	0.73
Individual sports	**-0.08**	**0.02**	**[-0.12, -0.04]**	**< 0.01**	-0.05	0.04	[-0.14, 0.03]	0.24	0.01	0.04	[-0.06, 0.08]	0.77
Team sports	**-0.13**	**0.02**	**[-0.17, -0.09]**	**< 0.01**	0.05	0.04	[-0.03, 0.13]	0.26	-0.01	0.03	[-0.08, 0.05]	0.69
Female	0.10	0.02	[0.07, 0.14]	< 0.01	0.18	0.04	[0.10, 0.26]	< 0.01	0.18	0.03	[0.11, 0.25]	< 0.01
MSP Subsidy (yes)	0.12	0.02	[0.07, 0.16]	< 0.01	0.08	0.04	[0.00, 0.16]	0.04	0.01	0.03	[-0.06, 0.07]	0.78
Peer Belonging	-0.41	0.01	[-0.43, -0.39]	< 0.01	-0.34	0.02	[-0.39, -0.30]	< 0.01	-0.41	0.02	[-0.45, -0.37]	< 0.01
	R^2	0.160	*Adj* R^2	0.159	R^2	0.109	*Adj* R^2	0.106	R^2	0.151	*Adj* R^2	0.149

Reference groups: no OA participation, non-immigrant, male, no MSP subsidy.
Statistically significant ($p < 0.05$) coefficients corresponding to OA participation status are in bold.

Appendix C Middle Years Development Instrument (MDI)[10]

Sadness/depressive symptoms

10. I feel unhappy a lot of the time.

11. I feel upset about things.

12. I feel that I do things wrong a lot.

Response options: Disagree a lot (1), Disagree a little (2), Don't agree or disagree (3), Agree a little (4), Agree a lot (5)

Satisfaction with life

16. In most ways my life is close to the way I would want it to be.

17. The things in my life are excellent.

18. I am happy with my life.

19. So far I have gotten the important things I want in life.

20. If I could live my life over, I would have it the same way.

Response options: Disagree a lot (1), Disagree a little (2), Don't agree or disagree (3), Agree a little (4), Agree a lot (5)

Peer belonging

Please answer the following questions about you and <u>your friend(s)</u> and <u>your school</u>.

		Disagree a lot	Disagree a little	Don't agree or disagree	Agree a little	Agree a lot
37.	I feel part of a group of friends that do things together.	☐	☐	☐	☐	☐
38.	I feel that I usually fit in with other kids around me.	☐	☐	☐	☐	☐
39.	When I am with other kids my age, I feel I belong.	☐	☐	☐	☐	☐

[10] (Schonert-Reichl et al., 2013) The full MDI is available at: http://earlylearning.ubc.ca/media/documents/MDI%20Toolkit%20Documents/2015-16_grade_7_mdi_survey.pdf

Response options: Disagree a lot (1), Disagree a little (2), Don't agree or disagree (3), Agree a little (4), Agree a lot (5)

Organized activity participation

The next questions are about activities that are **organized**. That is, the questions are about activities that are planned and supervised by a teacher, instructor, adult, coach, or volunteer.

We would like to know what you did after school **last week**.

68. During last week from **after school to dinner time (about 3:00 pm to 6:00 pm)**, how many days did you participate in:	Never	Once a week	Twice a week	3 times a week	4 times a week	5 times a week (every day)
a) Educational lessons or activities (for example, tutoring, math, language school, or something else)?	☐	☐	☐	☐	☐	☐
b) Art or music lessons (for example, drawing, painting, playing a musical instrument, or something else)?	☐	☐	☐	☐	☐	☐
c) Youth organizations (for example, Scouts, Girl Guides, Boys and Girls Clubs, or something else)?	☐	☐	☐	☐	☐	☐
d) Individual sports with a coach or instructor (for example, swimming, dance, gymnastics, tennis, skating, or something else)?	☐	☐	☐	☐	☐	☐
e) Team sports with a coach or instructor (for example, basketball, hockey, soccer, football, or something else)?	☐	☐	☐	☐	☐	☐