

Why are some Children Left Out? Factors Barring Canadian Children from Participating in Extracurricular Activities

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Abstract

Using three waves of data from the Canadian National Longitudinal Survey of Children and Youth, this study examines the impact of child, family and community level characteristics on children's participation in extracurricular activities between the ages of 4 and 9 (n=2,289). Results show a large positive effect of family income on children's participation in structured activities. Living in a poor neighbourhood constitutes an extra disadvantage for children's participation in organized sport activities. Our study also identifies a positive association between parent's education and children's participation in most activities, and a negative association between family size and some structured activities. Furthermore, children of immigrants, as well as children of visible minority and aboriginal children were found to be disadvantaged in their participation in some activities.

Key words: *children, extracurricular activities, longitudinal data*

Résumé

Sur la base de trois cycles de données de l'Enquête canadienne longitudinale sur les enfants et les jeunes, cette étude examine l'impact des caractéristiques de l'enfant, de la famille et de la communauté sur la participation des enfants de 4 à 9 ans (n=2,289) dans des activités parascolaires. Les résultats démontrent un fort effet positif du revenu familial sur la participation dans des activités structurées. Vivre dans un quartier pauvre constitue un désavantage supplémentaire pour la participation des enfants dans des activités de sport organisé. Notre étude identifie aussi une association positive entre la scolarité des parents et la participation des enfants à la plupart des activités, et une association négative entre la taille de la famille et certaines activités structurées. De plus, on a trouvé que les enfants d'immigrants, de même que les enfants de minorités visibles et les enfants autochtones étaient désavantagés par rapport à leur participation dans certaines activités.

Mots clés: *enfants, activités parascolaires, données longitudinales*

Introduction

Children's participation in structured extracurricular activities has been shown in the literature to be associated with many positive developmental outcomes. For example, children who participate in extracurricular activities are at lower risk for dropping out of high school, are more likely to attend college, less likely to smoke or engage in illicit substance use, and exhibit better emotional adjustment than children who do not participate in extracurricular activities (Broh, 2002; Darling, 2005; Eccles et al., 2003; Fredricks and Eccles, 2006; Gardner et al., 2008; Holland and Andre, 1987; Lareau, 2003; Lerner, 2005; Mahoney, 2000; Mahoney and Cairns, 1997; Mahoney et al., 2003; McNeal, 1995; Simpkins et al., 2005; Zaff et al., 2003). Participation in structured extracurricular activities is believed to be critical to child development for a number of reasons, including that such participation allows children to develop specific skills that may be useful in later life, creates a sense of belonging and attachment to one's community, cultivates social networks with peers and adults that can be drawn upon in the future, and socializes children to respond positively to challenges (Eccles et al., 2003).

Although researchers have documented a wide range of positive developmental outcomes of participation, predictors of children's participation in extracurricular activities are less well understood (Wimer et al., 2008; Simpkins et al., 2005). While a few studies have identified a number of barriers to children's participation in extracurricular activities, this literature is generally limited to descriptive analyses, and usually to only one type of extracurricular activity (eg. sports). In this paper, we add to this literature by analyzing data from three waves of the Canadian National Longitudinal Survey of Children and Youth to evaluate predictors associated with participation in a wide range of extracurricular activities.

Review of the Literature

Our review of literature is organized around four main categories of predictors that have been shown to be associated with children's participation in extracurricular activities: (1) family income; (2) neighbourhood environment; (3) demographic characteristics; and (4) parental preferences.

Family income: The income of families is considered to be one of the strongest predictors of participation in extracurricular activities, with studies consistently finding that children from low income families are less likely than their more advantaged counterparts to participate in extracurricular activities, especially in organized sport (Clark, 2008; Guèvremont et al., 2008; La Torre et al., 2006; Kremerik, 2000; Offord et al., 1998; Simpkins et al., 2005; White and Gager, 2007). However, many studies do not adequately control for other factors that might make spurious the association between income and participation in extracurricular activities. Although some studies have begun to include a wider range of background factors that might be causally linked to children's participation in extracurricular activities (Offord et al., 1998; White and Gager, 2007), few studies have controlled for other characteristics of the household including the characteristics of the neighborhood where children live and parents' time availability.

Characteristics of the neighbourhood: Neighbourhoods constitute an important aspect of the social environment that may influence children's participation in extracurricular activities. Neighbourhoods that are low in economic resources may provide fewer options for recreation, may not be safe for children and may lack the social cohesion found in more advantaged neighbourhoods (Wen et al., 2007; Wimer et al., 2008). Using data from the first cycle of the National Longitudinal Study of Children and Youth, Offord and his colleagues found that living in a "civic" neighbourhood (i.e. a neighbourhood's social support and safety) and the presence of good parks, playgrounds, and play spaces was positively related with participation in some extracurricular activities, especially in supervised and unsupervised sport

activities (Offord et al., 1998). Similarly Wimer et al. (2008) also found that a high level of neighbourhood risk (based on an index that combined neighbourhood poverty, disorder, collective efficacy, and safety) was associated with a low athletic participation of children.

Few studies have evaluated the relative importance of neighbourhood characteristics and family economic disadvantage in the same statistical model. Gordon-Larsen et al. (2000) found that adolescents' participation in physical activity was related to both family income (positive effect) and the incidence of serious crime in the neighbourhood (negative effect). Similarly, Wen and her colleagues found that neighbourhood poverty and household income both independently predicted physical activity in adults (Wen et al., 2007). Although these studies clearly suggest that neighbourhood characteristics can operate over and above the effects of household poverty, the limitation of both of these studies is that the dependent variable was physical activity, which is conceptually different from our measure of participation in extracurricular activities.

Demographic characteristics: There are a number of demographic characteristics that are associated with participation in extracurricular activities. Child gender and age are important predictors of participation. Girls participate in more activities and a wider range of activities than boys, but boys are more likely than girls to participate in coached sports (Eccles et al., 2003; Guèvremont et al., 2008; Posner and Vandell, 1999; Wimer et al., 2008). Participation rates also vary by age, such that there is a general trend of increasing participation with age until adolescence (Guèvremont et al., 2008; Wimer et al., 2008).

There are also a number of household level characteristics that are associated with participation. Participation in extracurricular activities, especially for younger children, not only requires a financial investment from parents, but also a time investment. In particular, the time that parents spend on providing transportation, supervision, and coaching as well as their presence during these activities can all play an important role in children's involvement in extracurricular activities (Clark, 2008; Huebner and Mancini, 2003; Hoefler et al, 2001). When direct measures of parental time investment are not available, researchers typically operationalize parental time availability with the employment status of the parent, parental mental health and household composition. Parental employment may place limitations on a parent's time availability, with significantly lower levels of positive interaction with children among parents who are employed in the labour market relative to parents who are not in the paid labour market (Stroschein et al., 2008). Parental depression may also reduce children's participation in extracurricular activities, with research showing that depressed parents are less likely to monitor their children and are more rejecting of their children than parents who are not depressed (Elgar et al., 2007). The absence of an additional adult in a single-parent

household may result in less time available for children relative to a two-parent household. Based on bivariate analyses, Clark (2008) reported that children from intact two-parent families have a higher participation rate in sport activities than children from lone-parent families. Posner and Vandell (1999) found that in a low-income neighbourhood, children from single-parent families spent more time in unstructured activities than children from two-parent families. Similarly, households with higher numbers of children dilute parental resources, with children in larger households receiving comparatively less parental time and attention than children in smaller households (Blake, 1981; Downey, 1995).

Parental preferences: Parental preferences may also predict whether children participate in extracurricular activities. Such preferences may be shaped by educational attainment, where highly educated parents are more likely than parents with low educational attainment to view extracurricular participation as a way of enriching a child's social development (Dunn et al., 2003; Lareau, 2002; 2003). Parental preferences may also be shaped by race/ethnicity or by immigrant status. American studies find that rates of participation in some extracurricular activities are higher for white than Hispanic or black children (McNeal, 1998; Wimer et al., 2006). Children of immigrant parents may be less likely to participate in some extracurricular activities if their parents come from cultures that do not recognize the value of such activities for children.

Our Objectives and Contribution to the Literature

Using Canadian longitudinal survey data, this study examines the child, family and neighbourhood barriers to participation in extracurricular activities of children between the age of 4 and 9 years old. Our contribution to the literature is three-fold. First, while most studies on the determinants of children's participation in extracurricular activities use cross-sectional data, our analysis examines the longitudinal relationship between repeated measurements of child participation and both time-invariant and time-variant predictors. Second, while most studies have focused on the effect of the families' income on children's participation in extracurricular activities, we expand the theoretical framework to include other possible predictors of children's participation in extracurricular activities including neighbourhood income, parents' time availability and other characteristics such as immigrant status, race/ethnicity and parental education. Finally, unlike most studies, we analyze a wider range of children's extracurricular activities. We model these activities separately to see if participation in different activities is influenced similarly by child, family and neighbourhood level predictors.

Methods

Sample

Our study uses data from three cycles (cycles 2 to 4) of the National Longitudinal Survey of Children and Youth (NLSCY), conducted by Statistics Canada.¹ The ongoing NLSCY began in 1994/1995 (cycle 1) and collects detailed information on children and their families from a nationally representative sample of Canadian children at approximately two-year intervals. At cycle one, 22,831 children aged 0-11 from 13,439 households were selected into the survey sample through a complex multi-stage probability sample design. Children living in institutions and on First Nations reserves were not included in the sample frame. Up to 4 children were randomly selected from each selected household. At cycle 2, the sample was restricted to a maximum of two children per household. Furthermore, households that participated in another survey were also removed from the sample. This resulted in a longitudinal sample of 16,897 children from 11,190 households. By cycle 4, 15,632 children from the longitudinal sample remained in the survey and 84.5% of these children participated in the survey (Statistics Canada, 2001). For each child, one person in his or her household was identified as the person most knowledgeable about the child (PMK). In most cases, the PMK is the mother of the child. Information regarding children and their families is collected from the identified PMK.

Information regarding participation in extracurricular activities is only collected from PMKs for children aged 4 to 9.² This restricts the number of cycles that we can include in our longitudinal analysis. Given that questions regarding child participation in extracurricular activities were modified between cycle 1 and cycle 2 and that attrition from the sample increased with time, we chose to use cycles 2 - 4.³ Our sample is therefore composed of children who participated in cycle 2 and were ages 4-5. We then tracked these children over time, such that they were aged 6-7 in cycle 3 and aged 8-9 in cycle 4. In cycle 2, there were 2,657 children aged 4-5 in the sample. In order to deal with the issue of non-independence of cases, we randomly selected one child from each household, thus reducing our sample to 2,589. We further restricted our sample to the children who have the same PMK across cycles.⁴ This reduced our final sample from 2,589 to 2,289 in cycle 2. Among these children 2,090 participated in cycle 3 and 1,797 participated in cycle 4. A small number of observations with missing values were also excluded from the analysis.

Outcome Variables

The NLSCY distinguishes five types of extracurricular activities.⁵ In the survey, the PMKs were asked: “In the past 12 months, outside of school hours, how often has the child: a) taken part in sports (except dance or gymnastics) with a coach or instructor; b) taken lessons or instruction in other organized physical activities with a coach or instructor such as dance, gymnastics or martial arts; c) taken part in unorganized sports or physical activities without a coach or instructor; d) taken lessons or instruction in music, art or other non-sport activities; and e) taken part in any clubs, groups or community programs with leadership, such as Beavers, Sparks or church groups? Responses, which assessed the frequency of children’s participation in each of these activities, were dichotomized to contrast children who take part in such activities on at least a weekly basis (coded 1) with those whose participation occurs only once a month or less (coded 0).⁶ We ran separate models for each of these five types of activities. We also tested an additional model to see whether or not a child was regularly participating in at least one of the three structured activities (sports, dance/gymnastics, music/arts) as a dependent variable (using the same independent variables).

Explanatory Variables

To measure parental financial resources, we used an index of household income adequacy derived by Statistics Canada. Income adequacy is a five-level categorical measure based on the parent's report of household income for the past twelve months and adjusted for family size (Statistics Canada, 1995).⁷ This variable was originally coded into five categories: “lowest”, “lower middle”, “middle”, “upper middle”, and “highest”. Since there were too few cases in the “lowest” category in our sample, we collapsed the bottom two categories as “low”. We transformed these categories into a set of dummy variables and used “low” as our reference group.

To assess the impact of neighbourhood environment, we used the average household income of census enumeration areas. Based on the 1996 census profile data, we differentiated four neighbourhood income levels: neighbourhoods with an average household income ranked in the 10th or less percentile, between the 11th and 50th percentile, between the 51st and 75th and between the 76th and 100th.⁸ We selected the tenth percentile as the cut-off point for low-income neighbourhoods on the basis of preliminary investigation that identified neighbourhoods below the tenth percentile as the most vulnerable. We want to know whether participation in extracurricular activities of children from the most vulnerable neighbourhoods is different from that of children from more wealthy neighbourhoods

Demographic characteristics include child gender, child age, employment status of the PMK, parental depression, family structure and number of children in the household. Gender of the child is coded 1 for female and 0 otherwise. Child age is assessed in years. Employment status of the PMK was assessed with dummy variables that distinguished: “employed full-time” (our reference group), “employed part-time” and “not in paid employment”. Parental depression is assessed with a shorter version of the CESD depression scale (Statistics Canada, 1995). Twelve questions were administered to the PMK to measure the frequency and severity of symptoms associated with depression during the previous week and summed to produce a scale ranging from 0 to 36. The alpha reliability based on cycle 1 data for this scale is 0.82 (Statistics Canada, 1995). Family structure is a variable that compares children in intact two-parent families (two biological or adoptive parents) (reference group) with those in other two-parent families (step parent and blended family) and single parent families. The number of children aged 0-17 in the household is coded as a series of dummy variables to compare families with only one child in the household with families with two, three, or four or more children.

As to parental preferences, we used as a proxy PMK’s education where we distinguish: “less than high school” (our reference group), “high school graduation”, “some postsecondary education” and “college or university degree”. Education is included in our analysis as a time-variant variable. We also include PMK immigrant status to compare children with an immigrant PMK with those with non-immigrant PMK, and for a child’s ethnicity by comparing white and non-white children (i.e. visible minority and Aboriginal children).⁹

Finally, we included a number of control variables in our model including an indicator of rural vs. urban residence and the region of residence as a time-varying variable to adjust for regional differences in participation. We use Quebec as the reference group to compare with the other regions: Atlantic, Ontario, the prairie provinces and British Columbia. All sample characteristics are reported in Table 1.

All variables are time-variant except for child gender, ethnicity and PMK’s immigrant status.

Analysis

To establish the longitudinal relationship between repeated measures of our outcome variables (participation in five types of extracurricular activities) and explanatory variables, we used a population-averaged generalized estimation equation (GEE) approach to estimate the effects of covariates. Since observations for the same subjects in longitudinal data tend to be correlated, standard logistic regression methods can lead to biased estimation of the parameters’ standard errors (Ghisletta and Spini, 2004). GEE allows both time-

**Table 1. Sample Characteristics, Children Ages 4-5, Cycle 2,
National Longitudinal Survey of Children and Youth (N = 2,289)**

Sample Characteristics	Frequency Distribution (%)	Mean (standard deviation)
Child Characteristics		
Child is female	50.5	
Child's age (in years)		4.5 (0.50)
Child is white	91.3	
Household Characteristics		
Income adequacy		
Low and low middle	20.5	
Middle income	29.3	
Upper middle	33.9	
High	16.3	
PMK education		
Less than high school	11.5	
Completed high school	18.5	
Some post-secondary	28.8	
Completed post-secondary	41.2	
PMK employment status		
PMK employed full-time	45.8	
PMK employed part-time	23.1	
PMK not employed	31.1	
Family structure		
Intact	73.8	
Blended or step-family	7.8	
Single-parent	18.4	
Number of children aged 0 - 17		
One	18.8	
Two	46.9	
Three	23.0	
Four or more	11.3	
PMK is an immigrant to Canada	14.6	
Region		
Atlantic provinces	8.0	
Quebec	24.4	
Ontario	37.2	
Prairie provinces	18.7	
British Columbia	11.8	
PMK depression		4.8 (5.28)
Neighbourhood Characteristics		
Rural residence	12.7	
Neighbourhood income		
Up to 10th percentile	7.8	
11th – 50th percentile	31.2	
51st – 75th percentile	30.6	
76th – 100th percentile	30.4	

Note: Because of missing values, the sample size varies.

variant and time-independent covariates and accounts for intra-cluster (child) correlation by introducing the working correlation matrix into the estimation (Hardin and Hilbe, 2003; Horton and Lipsitz, 1999:160). It allows one to specify different forms of the working correlation matrix between two observation times. We assume an unstructured correlation (unspecified) across different observations. By making this assumption, children who have complete information for at least one cycle are included in the estimation. Since the literature points out that GEE results are robust to mis-specification of the correlation structure (Zeger and Liang, 1986), we chose an unstructured correlation over an autoregressive one in order to retain more observations in our model estimation. In order to make our analysis representative of the population of Canadian children, we applied children's longitudinal sample weights (at cycle 2) in our model. We used STATA XTGEE to run all our models.

Results

At initial observation (in cycle 2), children were 4-5 years old. Among these children, 32 percent participated in organized sport at least once a week and 58 percent in unorganized sport (see Table 2). The participation rates in the other types of extracurricular activities were smaller: 26 percent participated at least once a week in dance/gymnastics, 9 percent in art/music, and 18 percent in club/community activities. Forty-seven percent of the children participated at least once a week in one of the structured activities (sports, dance/gymnastics, music/arts). For all activities except organized physical activities such as dance, gym or martial arts, children's participation rates increased as they got older.

Results of the GEE analysis are presented in Table 3. Household income is associated with children's participation in organized sports, dance/gymnastics and arts/music activities (see Table 3). For example, relative to children from low-income families, the odds of participating in organized sport are 1.8 times larger for middle-income families, 2.3 times larger for upper-middle income families, and 3.9 times larger for the highest income families.

Neighbourhood average household income showed a significant effect on organized sport activities, even after adjusting for household income. Relative to children living in the poorest neighbourhood (10th percentile or below), the odds of participation were 1.8 times higher for children living in higher income neighbourhood (between 50 and 75th), and 2.3 times higher for children from the highest income neighbourhood (above 75th percentile). Compared to results of a model without this variable, adding neighbourhood average household

Table 2. Percentage of Canadian Children Participating at Least Weekly in Extracurricular Activities (Cycle 2 - 4, National Longitudinal Survey of Children and Youth)

Activity	Cycle 2	Cycle 3	Cycle 4
	4-5 year old	6-7 year old	8-9 year old
Organized sport (with a coach or instructor)	32.1	52.7	57.2
Lessons in organized physical activities such as dance, gym or martial arts	26.2	33.5	32.0
Lessons in art, music or other non-sport activities	8.9	18.2	25.2
Club/community activities such as Beavers, Brownies or church groups	17.7	30.2	27.8
Unorganized sport (without a coach or instructor)	58.1	63.6	63.6
Participates in any organized sport or lessons (eg. dance, gym, art or music)	46.9	69.1	73.3
N	2289	2090	1797

Table 3. GEE Results
Odds Ratio of Participation in Extracurricular Activities, NLSCY (Cycles 2 to 4)

	Organized Sport	Unorganized Sport	Lessons in Physical Activities (e.g. dance, gymnastics)	Lessons in Non-Sport Activities (e.g. art, music)	Club or Community Activities	Participates in any Organized Sport or Lessons ^h
Household Income						
Income adequacy^a						
Middle income	1.80**	1.21	1.48*	2.01*	1.46	1.81**
Upper middle	2.32***	1.29	2.11**	3.09***	1.44	2.82***
High	3.94***	1.35	2.51***	3.58***	1.68*	4.80***
Neighbourhood Income^b						
10 th -50 th percentile	1.55	1.46	1.23	0.71	1.16	1.08
50 th -75 th percentile	1.79*	1.51	1.43	0.75	1.33	1.26
75 th -and 100 th percentile	2.33**	1.52	1.61	0.98	1.26	1.79*
Demographic Characteristics						
Child is female	0.66***	0.68***	2.00***	1.79***	1.50**	1.08
Child's age (in years)	1.30***	1.07*	1.05	1.33***	1.16***	1.35***
PMK employment status^c						
Employed part-time	1.11	1.22	1.17	1.29	1.26	1.29
Not employed	1.08	1.03	1.19	1.17	1.16	1.11
Family Structure^d						
Blended or step-family	0.85	0.81	1.25	0.68	0.78	0.77
Single-parent	1.02	1.08	0.86	0.92	1.27	0.92
Number of Children^e						
Two	1.15	0.82	0.74	0.91	1.07	0.95
Three	0.99	1.22	0.54**	1.15	1.32	0.78
Four or more	0.63*	1.15	0.40***	0.87	1.24	0.45**
PMK depression	1	0.98	0.99	1	1.01	0.99
Parental Preferences						
PMK education^f						
Completed high school	1.39	0.98	1.24	2.10*	1.14	1.25
Some post-secondary	2.20***	1.46*	1.91*	2.94***	1.69**	2.06***
Completed post-sec	2.26***	1.45	2.29**	4.40***	1.62*	2.69***
PMK is an immigrant	0.52**	0.64*	1.32	0.72	0.72	0.91
Child is non-white	1.05	0.54**	0.64	1.82	0.50*	0.78
Other Characteristics						
Region^g						
Atlantic provinces	1.17	0.92	0.71	1.28	10.43***	0.95
Ontario	1.39	1.08	0.95	1.30	5.36***	1.35
Prairie provinces	1.47*	1.22	1.06	1.73	6.74***	1.43*
British Columbia	1.64*	1.47	1.36	1.53	8.43***	1.64*
Rural residence	0.91	1	0.79	0.92	0.90	0.89
Wald chi-square (df=26)	338.19	110.59	211.97	214.56	187.66	373.79
Number of observations	5624	5624	5625	5625	5625	5624
Number of groups	2203	2203	2203	2203	2203	2203

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

^aReference group is low and low middle income adequacy.

^bReference group is less than 10th percentile.

^cReference group is employed full-time.

^dReference group is intact two-parent family.

^eReference group is one child in household.

^fReference group is less than high school.

^gReference group is Quebec.

^horganized sports, dance/gymnastics, music/arts

income in the model only slightly modified the effect of household income, suggesting that these two variables have a distinct effect (results not shown).

We found mixed results for our demographic variables. Compared to boys, girls were less likely to participate in both organized and unorganized sport, but more likely to participate in dance/gymnastic, music/art and club/community activities. As children become older, they increase their odds of regularly participating in all extracurricular activities, except for participation in organized physical activities such as dance, gym or martial arts. The number of children aged 0-17 in the household was significantly associated with participation in two types of activities. Relative to children in only-child households, children in households with four or more children were less likely to participate in organized sport. Relative to children in only-child households, children in households with three or more children were less likely to participate in physical activity lessons. PMK's employment status, family structure and parental depression were unrelated to children's participation in extracurricular activities, net of other terms in the model.

As to parental preferences, rates of participation were found to be higher for children whose parents had higher levels of education, especially with regard to organized sport, dance/gym, and art/music activities. There was no significant difference in participation between "less than high school" and "high school graduation" except for music/art. PMK's education appears to make a difference only after the high school level. Non-white children were less likely to participate in unorganized sport and club/communities activities. Children of an immigrant parent were less likely to participate in both organized and unorganized sport activities relative to children of a Canadian-born parent. Children from the prairie provinces and British Columbia were more likely to participate in organized sport activities than children living in Quebec. Compared to children living in Quebec, children living in the rest of Canada were more likely to participate in club/communities activities. Rural versus urban residence does not have a significant effect for any of the five types of activities.

The results presented above pertain to the effects of selected covariates on children's participation in each of the extracurricular activities. We also wanted to examine the effects of the same covariates on children's participation in at least one of the organized activities. To do so, we computed a new outcome variable that captures the frequency of regularly participating in at least one of the organized activities (i.e. organized sport, dance/gym, and art/music).¹⁰ We then recoded this outcome variable as a dichotomous one with 'not regularly participating in any of these activities' = 0 and 'regularly participating in at least one of these activities' = 1 (results are presented in table 3 in the last column). Our results show that household income adequacy, neighbourhood income, parental education and number of children in the household are predictors of whether children participate in at least one of these three activities. Household

income remains the strongest predictor with the odds of participation for children from the “highest” income families nearly five times higher than for children from the “lowest and lower” income families.

Discussion

Research has consistently documented the beneficial effects of participation in extracurricular activities on development (Gardner et al., 2008; Mahoney, 2000; Mahoney et al., 2003; McNeal, 1995; Simpkins et al., 2005). As such, it is important for researchers and policymakers to have information about the rates of childhood participation in various extracurricular activities and to identify the barriers that prevent children from engaging in such activities. Our study addresses this gap by using three waves of data from the NLSCY to follow 4 and 5 year old children over a four-year period to evaluate whether participation in extracurricular activities is influenced by child, family and neighbourhood characteristics.

From our descriptive analysis, we find that even though Canadian children increasingly take part in at least weekly extracurricular activities as they grow older, a large percentage of Canadian children do not. Specifically, 26.7% of children ages 8 and 9 who remain in the survey at the last interview do not regularly participate in any organized sport or lessons. This suggests that the lack of participation is not an isolated or a rare event, and that understanding characteristics associated with participation in extracurricular activities represents an important, but overlooked research question.

As hypothesized, low household income emerged as one of the strongest determinants. Income likely operates through families’ financial ability to pay for such activities. That is, fees for organized sport, dance/gym and music/art activities may be barriers that prevent children in poor households from participating in structured extracurricular activities. Such a conclusion is further supported by the lack of significant income differences for participation in unorganized sport that typically entails little or no cost.

The federal government of Canada recently implemented the Children’s Fitness Tax Credit program that will help parents offset some of the costs associated with children’s participation in physical activities. The federal government has also signalled its intention to extend the program to other types of cultural activities including arts and music programs in the future. Given the gradient relationship that we observed between income and participation in extracurricular activities, it is likely that the Fitness Tax Credit program will have a positive effect on children’s participation rates at all income levels, not just for children in the most economically disadvantaged households. Investigating whether the Children’s Fitness Tax Credit program has made a

difference in the participation rates for children living in low-income households is an important question that should be addressed in future research.

Our results also confirm the effect of neighbourhood average household income on children's participation in organized sport activities, even after adjusting for household level income. Our study can not illuminate the mechanisms through which neighbourhood income operates, but it is possible that the lack of recreational facilities or concern with neighbourhood safety in deprived neighbourhoods underlie the observed association. This is an important area for future research as these factors may be more modifiable than neighbourhood levels of income and may therefore represent an important area of intervention.

Economic deprivation at the household and neighbourhood level are not the only barriers to children's participation in various extracurricular activities. Our findings on the effects of child age and gender correspond with what others have found (Guèvremont et al., 2008; Posner and Vandell, 1999; Wimer et al., 2008). Having a parent with only high school or lower education, belonging to a visible minority or an Aboriginal group and having an immigrant parent also reduce the likelihood of participating in various extracurricular activities.

We expected that children in single-parent families and children with a full-time employed parent would be less likely to participate in structured extracurricular activities by limiting the parent's time availability to support children in various activities. In contrast, we were expecting these children to be more likely to participate in unstructured activities. Our findings do not support these hypotheses.¹¹ Previously reported negative effects of parental employment or single parenthood on participation in structured activities by Clark (2008) and Posner and Vandell (1999) are based on bivariate analysis or small non-random samples. Further studies are needed to examine these effects, particularly on the factors that constrain parents' time availability. For example, the Communities Survey conducted in Manitoba in 2002 and 2005 asked the reasons why some parents did not enroll their children in community programs and services. Among others, "not enough time" and "program times not convenient" were listed by parents as major obstacles (Xu et al., 2008). Collecting a more direct measure of time availability may help discern its effect.

Limitations

Limitations of our analysis include too little variability in our measure of child race and parental immigrant status which prevented us from carrying out a detailed analysis of the impact of ethnicity and parental immigrant status on children's participation. In addition, our dependent variable did not allow us to differentiate between school-based and non-school based extracurricular activities. This additional information could have been useful especially since

school-based activities may be less time demanding on parents. Furthermore, the variable related to participation in community/club activities encompassed a wide range of diverse activities including activities involving fees as well as others that may be provided at low-cost or even free such as church-based activities. Factors influencing children's participation in this wide range of activities may be different. The ability to distinguish activities involving fees from those that do not could have helped us to refine our understanding of the effect of family income.

Finally, we should stress that we cannot make a causal inference on the basis of the correlations between our outcome variables and predictors in our GEE modeling. Although our analysis is based on longitudinal data and we include some time-variant covariates, the reported effect of GEE is an overall effect of covariates including the effect of both the initial difference and changes across time. A GEE regression approach cannot differentiate between these two effects. However, predictors in our model are based on our theoretical perspective and we have controlled for various possible confounding factors. Reported large significant effects should be considered as a strong empirical support for our hypotheses.

Conclusion

Considering the beneficial impact of physical, cultural and social activities on children's development, high rates of non-participation among Canadian children, as documented in our paper, suggest the need for policies and targeted interventions that encourage more children to get involved in structured activities. Importantly, it appears that low household income and living in a poor neighbourhood constitute formidable barriers to participation in extra-curricular activities, and may serve to further disadvantage children who live in homes and neighbourhoods with few economic resources.

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End Notes

1. We also made use of the related CRISP NLSCY Files (Willms, J. D. and Fedick, C. B., 2003)
2. After the age of 9, participation in extracurricular activities were asked to the children themselves rather than the PMK. Because of possible inconsistencies between children's and PMK's answers, we restricted our analysis to children until the age of 9.
3. The percentage of first-cycle respondents remaining in cycle 2 was 91.5%, while for cycle 5, it was 74.1%. (Statistics Canada, 2001, 2005)
4. We made this restriction because of some explanatory variables that we are interested in, such as PMK's education and employment status, which could have different values across cycles for the same child just because different PMKs are identified in different cycles even when the child lives with the same parents. To include these children would introduce errors in the measurement of PMK-related variables.
5. We use the term extracurricular activities even though some children in our sample are of pre-school age.
6. The original response set was wider, but a dichotomization was necessary in view of the skewed distribution of the variables.
7. Statistics Canada (1995) defines five levels of household income adequacy as follows: (1) Lowest: Household income is < 10,000 and household size is 1-4 persons; or Household income is < 15,000 and household size is 5 or more persons; (2) Lower middle: Household income is 10,000-14,999 and household size is 1-2 persons; or Household income is 10,000-19,999 and household size is 3-4 persons; or Household income is 15,000-29,999 and household size is 5; (3) Middle: Household income is 15,000-29,999 and household size is 1-2 persons; or Household income is 20,000-39,999 and household size is 3-4 persons; or Household income is 30,000-59,999 and household size is 5; (4) Upper middle: Household income is 30,000-59,999 and household size is 1-2 persons; or Household income is 40,000 -79,999 and household size is 3-4 persons; or Household income is 60,000-79,999 and household size is 5; (5) Highest: Household income is 60,000 or more and household size is 1-2 persons; or Household size is 80,000 or more and household size is 3 or more persons (Statistics Canada, 1995).
8. Neighbourhood average household income was included in the model as a time-variant variable and is not adjusted by household size. The NLSCY data of cycle 2 to cycle 4 were linked with a 1996 census profile using a census enumeration identifier variable (identified by postal code). However, because of changes in the postal code mapping and/or because one postal code can be linked to multiple census enumeration areas, we found that there were cases in which children

appeared to have moved across cycles artificially. There are no perfect variables in the NLSCY to correct for “spurious moves”, but data on “Number of years have lived at this address” and “times moved since last interview” (not available for cycle 4 and have many missing values for cycle 3) were used to check the sensitivity of our results to the coding of the neighborhood. Our analyses (not reported here) revealed our results to be robust.

9. The number of cases was too small to allow for more detailed classification of ethnicity.
10. We excluded community/club activities in the last model because our regression results suggest that the determinants of participation in that type of activity differed from these in the other types of structured activities.
11. Our sample is restricted to children whose PMK remained the same across the three cycles. In doing so, we lost some children whose PMK changed across cycles either because a different PMK was identified across cycles or due to a real change in family structure. The loss of cases due to real changes in family structure may contribute to the fact that no significant effect was found for family structure.

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