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Trajectories of Breadth of Participation in Organized Activity During Childhood

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Abstract

This study aimed to identify the trajectories of breadth of participation in organized activities during childhood and to examine the predictors of membership in these trajectories (child's individual and family characteristics measured in Kindergarten). A sample of 1038 children, recruited in Kindergarten, was assessed yearly between Kindergarten and grade 4. Semiparametric group-based modeling brought out four trajectories: the no participation group (13.5 percent), the increasing group (26.4 percent), the decreasing group (14.1 percent), and the high group (46.1 percent). Prosociality predicted membership in the no participation group, as compared with the increasing group. Social withdrawal predicted membership in the no participation group, as compared with the high group. High family income and higher maternal education predicted membership in the increasing, decreasing, and high trajectory groups, as compared with the no participation group. Higher paternal education predicted membership in the high group, as compared with the increasing group. Overall, family variables had a greater impact than individual variables on the probability that the child would participate in a broader range of organized activities.

Keywords: organized activities; breadth; developmental trajectories; childhood

Introduction

Organized activities are conceptualized as highly structured contexts characterized by regular participation (usually weekly) in which children are exposed to an adult leader and peers (Mahoney & Stattin, 2000). Organized activities provide a unique developmental context that has been associated with well-being and adjustment among youth (Eccles, Barber, Stone, & Hunt, 2003). To date, most studies on organized activites have involved adolescents, even though participation in many organized activities begins in childhood. According to the National Survey of America's Families, 81 percent of children between the ages of 6 and 11 are

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involved in at least one organized activity (Ehrle & Moore, 1999). In Quebec, 28 percent of 6-year-old children participate in an organized sport (e.g., soccer, swimming) and 35 percent participate in an organized physical activity (e.g., dance, circus arts), at least one time per week (Institut de la Statistique du Québec [ISQ], 2007). In order to link the few existing studies involving children with those involving adolescents, it is important to examine how participation in organized activities evolves during childhood. Moreover, the recent literature highlights the importance of considering the *breadth* of children's participation (Farb & Matjasko, 2012). This study, thus, examines the trajectories of breadth of participation in organized activities between Kindergarten and grade 4 and the predictors of membership in such trajectories.

Participation in organized activities is a multi-dimensional construct. The main organisational dimensions of participation include intensity (time devoted to the activity; typically number of hours per week), duration (number of months or years of participation in the activity) and breadth (number of different types of activities participated in; Bohnert, Fredricks, & Randall, 2010). Studies involving adolescents suggest that breadth is a particularly significant dimension of participation (Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006). The following types of activities have often been identified in studies examining the breadth of participation in organized activities: (1) individual sports (e.g., swimming), (2) team sports (e.g., soccer), (3) artistic activities (e.g., music, theater), (4) clubs and organizations (e.g., scouts), (5) religious activities (e.g., catechism), and (6) educational activities (e.g., language classes) (Allhusen et al., 2004; Bohnert et al., 2010; Eccles et al., 2003). To illustrate the calculation of breadth, if a child were participating in three different team sport activities every week, her breadth would be 1. In contrast, if another child was practicing a team sport and piano lessons, her breadth would be 2.

From a theoretical perspective, involvement in a broad range of activities during childhood is thought to allow children to practice a wider repertoire of abilities and explore the various facets of their self-concept (academic self-concept, social self-concept, athletic self-concept) (Fredricks & Eccles, 2006; Marsh, 1990). For this reason, the dimension of breadth is more interesting than the number of activities in which one participates. On an empirical level, studies among adolescents have shown that participating in a broader range of activities is associated with fewer externalizing and internalizing problems, as well as better school grades (Bartko & Eccles, 2003; Denault & Poulin, 2009; Feldman & Matjasko, 2005; Fredricks & Eccles, 2006). However, to date, breadth of participation has rarely been considered in studies involving children. Childhood and adolescence represent distinct developmental periods, therefore, it cannot be assumed that the results obtained in adolescence will apply to childhood. It could be particularly relevant to study breadth of participation in the early grades of elementary school because these years are a period of exploration during which children are exposed to new environments (microsystems) outside of the family (Bronfenbrenner, 1979).

Changes in Breadth of Participation in Organized Activities

The number of different types of organized activities that children participate in tends to be limited during early childhood but increases during the elementary school years (5–12 years old) (Simpkins, Ripke, Huston, & Eccles, 2005). However, it is plausible that the breadth of children's participation evolves differently from

one child to another. This hypothesis is based on the results of a longitudinal study conducted in the United States by Mata and Van Dulmen (2012) in which the intensity of participation in organized activities was measured yearly from Kindergarten to grade 5. Using group-based modeling, these authors identified five trajectories: (1) stable low (52.7 percent), (2) decreasing moderate (15.2 percent), (3) decreasing low (14.4 percent), (4) increasing moderate (13.5 percent), (5) increasing high (4.2 percent). Although Mata and Van Dulmen's study focused on the intensity of participation, their results clearly show a significant *heterogeneity* in the way children's participation in organized activities evolved during these years. That being said, breadth of participation would not necessarily follow the same trajectories as intensity of participation. For instance, in adolescence, a longitudinal study showed that breadth evolves differently than intensity (Denault & Poulin, 2009). However, one cannot assume that breadth of participation during childhood, and how it evolves, is similar to what is observed during adolescence. The context surounding organized activities is very different for these two developmental periods. In adolescence, participation in organized activities is mostly on a voluntary basis, whereas in childhood, parents play a greater role in the decision of joining an organized activity (Fletcher, Nickerson, & Wright, 2003). In addition, adolescents have a wider range of opportunities in terms of choice of activities than do children (Fletcher et al., 2003). Accordingly, examining trajectories of breadth of participation during childhood is required.

Predictors of Participation in Organized Activities

Several individual and family factors are likely to predict breadth of participation in organized activities. The child's gender is a first individual variable to consider. Girls spend more time in organized activities during childhood than boys (Mata & Van Dulmen, 2012) and also participate in a broader range of organized activities during adolescence (Feldman & Matjasko, 2005; Fredricks & Eccles, 2006). Involvement in organized activities also appears to depend on the parents' perception of their child's social skills. In particular, children who are perceived by their parents as being prosocial appear to gain access more easily to organized sports (Anderssen & Wold, 1992). It has also been found that children who participate in organized sports are perceived as being less shy and withdrawn by their physical education teachers (McHale et al., 2005). Moreover, Findlay and Coplan (2008) found shyness to be negatively associated with sport participation in middle childhood. Finally, Mata and Van Dulmen (2012) found that children with higher levels of aggression spend more time in organized activities than children with lower levels of aggression. These authors suggest that parents of aggressive children may see organized activities (especially sports) as an opportunity for their children to channel their aggression in a socially acceptable way. In short, some individual characteristics may favor or limit children's involvement in a broader range of organized activities.

With regard to family variables, it has been found that children from middle- and high-income families, with higher educated parents, and from intact families are more likely to participate in organized activities (Allhusen et al., 2004; Hofferth & Sandberg, 2001; Mata & Van Dulmen, 2012; Smith, 2002). These results appear to be attributed to the cost of organized activities and the transportation required (Fletcher et al., 2003; Hofferth & Sandberg, 2001). Furthermore, it is possible that

these same variables also predict breadth of participation in organized activities during childhood. The greater the resources available to families, the more likely the children will be able to participate in a broader range of activities.

The Present Study

The first goal of this study was to identify the trajectories of breadth of participation in organized activities among children, from Kindergarten to grade 4, through five yearly assessments. It was expected that the sample would break down into three subgroups belonging to different breadth of participation trajectories: a group of children whose breadth of participation would be low or nil from Kindergarten to grade 4, a group of children whose breadth of participation would increase steadily over this period, and a group of children whose breadth of participation would be continually high. This hypothesis was based on studies by Mahoney, Harris and Eccles (2006) and Mata and Van Dulmen (2012), who found that some children participated little or not at all in organized activities, whereas the participation of other children increased during childhood, and still other children actively participated in organized activities throughout their childhood.

The second goal was to identify the variables that predicted membership in the different breadth of participation trajectories. The children's individual characteristics (gender, prosociality, social withdrawal, and aggression) and family characteristics (family income, parental education, and family structure) were examined. Regarding the child variables, it was hypothesized that prosocial and aggressive children (both girls and boys) would be found in greater numbers in the trajectories showing greater breadth of participation. Moreover, girls are expected to participate in a wider range of organized activities than boys. In contrast, it was expected that socially withdrawn children would be found in greater numbers in the lower breadth trajectories. Regarding family variables, an intact family structure, higher family income and higher parental education were expected to be associated with the higher breadth trajectories.

Method

Participants

The participants in this longitudinal study came from 250 Kindergarten classes, in 40 elementary schools in a Canadian city with a population of 500 000. The children in this sample were originally recruited as part of a broader research project assessing the impact of a program aimed at preventing violence and school dropout. The study design required recruiting between three to six children per class. Parental authorization was obtained for all of these children. Three cohorts, recruited over three consecutive years (2002, 2003, 2004), were combined to make up the sample of 1038 children used in this study (62 percent boys; mean age = 65.2 months, $SD = 3.7$). In Kindergarten, 72 percent of these children lived in intact two-parent families. The average gross family income was $60 900 per year. Approximately 7 percent of families had an annual income below $20 000 and 18 percent of families had annual incomes greater than $100 000. Also, most of the families were of Canadian origin (85.5 percent) and all were French-speaking. Otherwise, 1.8 percent of participants were born in Asia, 1.0 percent in North or South America, 1.0 percent in Europe, and .3 percent in Africa. Finally, for about 10 percent of the participants, the native country was not available.

Research Design and Procedures

The predictors of participation in organized activities were measured in the fall (November) when participants were in Kindergarten. Breadth of participation was measured yearly over five years: in Kindergarten (May), grade 1 (May), grade 2 (May), grade 3 (May), and grade 4 (May). The parent and teacher questionnaires were distributed (and collected) in the schools by research assistants. The teachers sent the questionnaires to the parents, who were asked to return them in sealed envelopes. The parents and teachers received gift certificates to thank them for their participation in the research project. The study was approved by the Institutional Ethics Committee for Research Involving Human Subjects at the second author's university.

Instruments

Breadth of Participation in Organized Activities (Continuous). Each year of the study (in May), mothers were asked to fill out a questionnaire on their child's organized activities. They were asked to identify all the organized activities in which the child was *currently* participating. Based on pilot studies suggesting that children from this age group rarely participate in more than four activities, the questionnaire provided the mothers with predetermined spaces in which they could list up to four activities. Less than 3 percent of the mothers reported four activities, thus, suggesting that this procedure did not restrict the range in breadth of participation. For each activity, mothers were asked to specify if their child participated in it for at least 30 min per week and the number of adults present during the activity. For an activity to be considered an 'organized activity', it had to meet two criteria: (1) minimum of 30 min per week and (2) presence of one adult (or more). Activities that did not meet these criteria were not retained (fewer than 5 percent).

Calculating the Breadth of Participation Score. The organized activities identified by the mothers were then classified into six different types: (1) individual sports (e.g., swimming), (2) team sports (e.g., soccer), (3) artistic activities (e.g., music, theater), (4) clubs and organizations (e.g., scouts), (5) religious activities (e.g., catechism), and (6) educational activities (e.g., language classes). Each of these types of activities is associated with learning and practicing different skills (Denault & Poulin, 2007; Larson, Hansen, & Moneta, 2006). Breadth of participation referred to the total number of different types of activity in which the child participated. This score could range from 0 to 4, because mothers could report up to a maximum of four activities. A breadth of participation score was calculated for each measurement time. The proportion of children participating in each type of activity at each wave and the mean breadth of participation scores are presented in Table 1. From Kindergarten to fourth grade, the percentage of children who did not participate in any organized activities went from 40.50 percent to 22.60 percent. The percentage of children participating in a single organized activity varied between 40.90 percent and 47.20 percent. The percentage of chilren participating in two organized activitied varied between 16.90 percent and 26.70 percent. The percentage of children participating in three organized activitied varied between 1.50 percent and 4.10 percent. Finally, a single child obtained a breadth score of 4 (.20 percent).

Table 1. Percentages of Participation in Each Type of Activity and Means and Standard Deviations for the Breadth Scores

	Grade				
Types of activities	K	1	2	3	4
Individual sports	47.17	57.80	57.91	48.79	44.91
Team sports	33.67	37.30	50.54	61.82	68.71
Artistic Activities	14.06	14.81	18.53	24.77	23.80
Clubs and Organisations	1.59	2.78	5.04	5.03	3.45
Religious Activities	1.36	2.38	2.70	3.35	3.84
Educational Activities	.79	.26	1.08	.93	1.54
Breadth mean (*SD*)	.80 (.78)	.88 (.78)	1.02 (.78)	1.10 (.80)	1.11 (.79)

Note: The addition of percentages may equal more than 100 percent because the same child can practice several activities.

Predictors Measured in Kindergarten

Family Structure (Dichotomous). Mothers were asked to circle the answer that corresponded to their family structure. This variable was coded dichotomously: 0 = intact family (two biological parents) and 1 = nonintact family.

Annual Family Income (Continuous). Mothers were asked to report the family's annual income on a 10-point scale ranging from under $20 000 to $100 000 and over.

Mother's and Father's Education (Categorical). Mothers were asked to report both their own level of education and that of the father. These two variables were broken down into four categories: 1 = no diploma, 2 = high school or vocational diploma, 3 = college studies (at least one year), 4 = university studies (at least one year). Note that in the province of Quebec where the data were collected, high school is completed in grade 11. After high school, students transition to CEGEP (college) which lasts 2 years (e.g., preparation toward university) or three years (e.g., professionnal degree).

Teacher's Assessment of the Child's Behavior (Continuous). This instrument was developed for the Québec Longitudinal Study of Child Development (ISQ, 2001) by combining items from various validated instruments (Achenbach, 1991; Boyle et al., 1993; Tremblay, Desmarais-Gervais, Gagnon, & Charlebois, 1987). The prosociality (6 items; $\alpha = .90$; example "this child helped other children who didn't feel well") and shyness/social withdrawal (8 items; $\alpha = .82$; example: "this child was shy with children he/she didn't know") subscales were used as suggested by the developers of the instrument. For aggression, a global score (13 items; $\alpha = .95$; example: 'this child physically attacked others') was created by grouping together the items from four available aggression subscales: (1) direct aggression, (2) indirect aggression, (3) proactive aggression, and (4) reactive aggression. These items were measured on a 6-point Likert scale ranging from 1 = 'never or not true' to

6 = 'often or very true'. The global scores for prosociality, social withdrawal and aggression were computed by averaging the individual item scores obtained on each subscale.

Results

The first goal of this study was to identify the trajectories of breadth of participation in organized activities among children. To this end, the data were analyzed using a *nonparametric* multilevel model, with a semiparametric group-based modeling procedure being used to model the trajectories (PROC TRAJ in SAS) (Nagin, 1999). To date, most longitudinal studies have used mean histograms or growth curves (*parametric* multilevel models) in order to illustrate the evolution of participation in organized activities and focused on two dimensions: (1) number of activities and (2) intensity (time spent in these activities) (Denault & Poulin, 2009; Mahoney & Cairns, 1997; Mahoney et al., 2006; Simpkins et al., 2005). We chose to use a nonparametric model because we assumed that the children's breadth of participation in organized activities would evolve in a heterogeneous way. This model, as opposed to a parametric model, is used to identify subpopulations in the sample belonging to different trajectories (Dupéré, Lacourse, Vitaro, & Tremblay, 2007; Nagin, 1999). The PROC TRAJ procedure estimates different models of developmental trajectories and provides fit indices for each model (Nagin, 1999). These fit indices can be used to determine the optimal number and shape of trajectories.

In order to be included in the group-based modeling procedure used to classify the participants into the trajectories, the participants had to have taken part in at least one of the five data collection time points measuring the breadth of their participation in organized activities ($N = 959$). The means and standard deviations for the breadth of participation scores for each measurement time are presented in Table 1. In most longitudinal statistical analysis, participants must have participated in at least two of the data collection time points to be included in the analysis. However, the PROC TRAJ procedure includes a modern missing data analysis method: maximum likelihood estimation. As mentioned in Baraldi and Enders (2010) 'Rather than filling in the missing values, maximum likelihood uses all of the available data—complete and incomplete—to identify the parameter values that have the highest probability of producing the sample data' (p. 18). Technically, with maximum likelihood method, participants with only one data point collection can be included in analysis. Moreover, in this study, missing data for the *breadth of participation in organized activities* variable, at each measurement time, was also dealt with using a weighting method. This statistical method makes it possible to estimate the weight of missing data by considering a set of variables associated with the probability that a participant will have missing data. The weight is calculated using a logistic regression model and is included in the trajectory analyses, which makes it possible to take the missing data into account when estimating the trajectories. The following is the list of variables used to calculate the weight: (1) family structure, (2) family income, (3) mother's education, (4) child's disruptive behaviors in Kindergarten (high vs. low), (5) child's aggression in Kindergarten, (6) child's social withdrawal in Kindergarten, and (7) child's academic achievement in grade 1 as reported by the teacher. Because the present study was part of a larger research project, the data used to estimate the weight included some data that were not described above.

Comparative analyses were performed to determine whether the participants who were not included ($N = 79$) in the trajectory analyses differed from the participants who were ($n = 959$). These comparative analyses revealed that the participants who were included in the trajectory analyses were more prosocial ($t[1008] = -2.104$; $p = .036$), were more likely to live in intact families ($\chi^2[1] = 16.412$; $p < .001$), and came from families with a higher annual income ($t[915] = -4.451$; $p < .001$) than those who were excluded from the trajectories.

Identifying the Trajectories

Next, we conducted semiparametric group-based modeling analysis to identify the number of trajectories that best fit with the data. We used the following criteria to identify the model that best represented the data: the Bayesian Information Criterion (BIC), the Akaike Information Criterion (AIC), and practical usefulness (Nagin, 2005). The closer to zero the BIC and the AIC, the better the fit of the model. We tested two-, three-, four-, five-, and six-group models (with a censored normal model). We decided to stop at the six-group model because it did not converge. Table 2 presents the BIC and the AIC obtained for the first four models tested. Based on these indicators, the four- and five-group models clearly represented the best options. The five-group model fit indices were closer to zero, suggesting a better fit. However, this model was not pratical because it proposed trajectories that were too qualitatively similar. We then chose the four-group model for its practical usefulness, and also because it was more parsimonious (see Figure 1).

We also tested the different shapes (linear, quadratic, or cubic) that the identified could have taken. The final four-group model included two cubic trajectories, one quadratic trajectory and one linear trajectory (see Table 3). The *no participation* group (cubic form) consisted of children who participated in very few organized activities between Kindergarten and grade 4 (13.50 percent). The *increasing* group (cubic form) represented children whose breadth of participation in organized activities was nil in Kindergarten and then increased up to grade 4 (26.40 percent). The *decreasing* group (quadratic form) consisted of children whose breadth of participation in organized activities was high in Kindergarten and then decreased up to grade 4 (14.10 percent). Lastly, the *high* group (linear form) represented children whose breadth of participation in organized activities was high in Kindergarten and increased slightly up to grade 4 (46.10 percent).

Table 2. Choosing a Model Based on the Bayesian Information Criterion (BIC) Based on the Number of PARTICIPANTS ($n = 959$) and the Akaike Information Criterion (AIC)

Number of groups	BIC ($n = 959$)	AIC
2	−4040.16	−4015.83
3	−3991.22	−3954.72
4	−3936.24	−3887.58
5	−3933.85	−3873.02

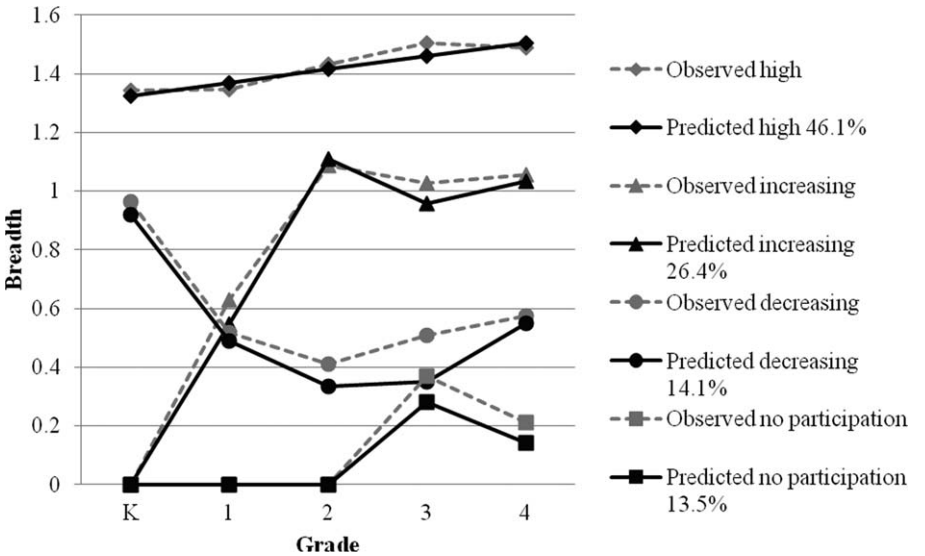

Figure 1. Observed and Estimated Parameters for the Trajectories of Breadth of Participation in Organized Activities.

The accuracy of the participants' classification into each trajectory group was tested. The average posterior probabilities of group membership ranged from .75 to .88. According to Nagin (2005), the average probability should be at least .70 for all groups, which was the case in our study.

Predictors of Trajectory Groups

The second goal of this study was to determine which variables predicted membership in the breadth of participation trajectories. To this end, multinomial logistic regressions were performed. It is recommended that all the variables be tested in the

Table 3. Parameter Estimates and Standard Errors of Breadth Trajectories

	Trajectories			
Parameters	No participation	Increasing	Decreasing	High
Intercept	3.257	−83.150***	8.022***	1.079***
	(2.940)	(9.706)	(1.941)	(.103)
Linear	−24.760***	32.980***	−2.161***	.047**
change	(.232)	(4.205)	(.597)	(.015)
Quadratic	−5.744***	−4.276***	.146***	—
change	(.028)	(.597)	(.043)	
Cubic	−.338***	.183***	—	—
change	(.002)	(.028)		

** $p < .01$; *** $p < .001$.

same regression, because adding new variables may change the model (Nagin, 1999, 2005).

The sample used to identify the trajectory predictors consisted of the participants who were included in the trajectory analyses and for whom no trajectory predictor data were missing ($N = 763$). Compared with the participants who were not included in this sample ($N = 275$), those who were included were more likely to live in intact families ($\chi^2[1] = 49.385$; $p < .001$), came from families with a higher annual income ($t[204.740] = -6.778$; $p < .001$) and had higher educated mothers ($\chi^2[3] = 32.870$; $p < .001$).

We examined whether some individual and family variables predicted the probability of group membership for the different breadth of participation trajectories. The child's individual variables that we examined were: gender, prosociality, social withdrawal, and aggression. The family variables that we investigated were: family structure, annual family income, and the level of education of both parents. The parameter estimates, standard errors and odds ratios are presented in Tables 4 and 5. For both mother's and father's education, the 'no diploma' group was used as a reference. This group was compared with the 'high school or vocational diploma' group, 'college studies' group and 'university studies' group.

Given that participation in organized activities has been associated with better social and school adjustment during childhood, it was important to identify the variables characterizing the children whose participation in organized activities was low. The *no participation* trajectory was first compared with the *increasing* trajectory. Regarding individual variables, prosocial children were 1.364 times more likely to be assigned to the *no participation* trajectory than to the *increasing* trajectory (OR = .733, $p = .024$). As for family variables, children from higher-income families were 1.199 times more likely to be assigned to the *increasing* trajectory than to the *no participation* trajectory (OR = 1.199, $p = .014$). The higher the mother's level of education, the more likely the child was to be classified into the *increasing* group rather than the *no participation* group (high school or vocational diploma = 7.785 times more likely; college studies = 9.318 times more likely; university studies = 16.269 times more likely).

The *no participation* trajectory was then compared with the *decreasing* trajectory. Regarding individual variables, no significant differences were found between these two groups. As for family variables, children from higher-income families were 1.298 times more likely to be assigned to the *decreasing* group than to the *no participation* group (OR = 1.298, $p = .001$). The higher the mother's level of education, the more likely the child was to be classified into the *decreasing* group rather than the *no participation* group (high school or vocational diploma = 2.839 times more likely; college studies = 4.348 times more likely; university studies = 5.253 times more likely). These family-based differences may explain why the children in the *decreasing* trajectory participated in a greater range of organized activities than the children in the *no participation* trajectory, across all measurement times.

Last, the *no participation* trajectory was compared with the *high* trajectory. Regarding individual variables, socially withdrawn children were 1.493 times more likely to be assigned to the *no participation* group than to the *high* group (OR = .670, $p = .011$). As for family variables, children from higher-income families were 1.325 times more likely to be assigned to the *high* group than to the *no participation* group (OR = 1.325, $p < .001$). The higher the mother's level of education, the more likely the child was to be classified into the *high* group rather than the *no participation* group

Table 4. Predictors of Trajectory Group Membership Using the No participation Group as a Reference

	Increasing			Decreasing			High		
Predictors	B	SE B	OR	B	SE B	OR	B	SE B	OR
Gender (0 = female)	−.258	.290	.699	−.227	.322	.797	−.037	.280	.964
Prosociality	−.310*	.137	.733	−.273∼	.153	.761	−.145	.130	.865
Social withdrawal	−.272∼	.163	.762	−.211	.180	.810	−.401*	.158	.670
Aggression	.127	.154	1.136	.301∼	.165	1.352	.108	.149	1.114
Family structure (0 = intact)	.412	.375	1.510	.265	.424	1.303	.165	.372	1.180
Family income	.181*	.074	1.199	.261**	.081	1.298	.281***	.071	1.325
Mother's education (h.s./voc)	2.052***	.512	7.785	1.043∼	.563	2.839	1.361**	.479	3.901
Mother's education (coll)	2.232***	.535	9.318	1.470*	.574	4.348	2.007***	.493	7.443
Mother's education (univ)	2.789***	.624	16.269	1.659*	.670	5.253	2.766***	.577	15.897
Father's education (h.s./voc)	−.583	.415	.558	−.351	.503	.704	.050	.427	1.051
Father's education (coll)	−.580	.443	.560	.050	.519	1.051	−.036	.453	.964
Father's education (univ)	−.462	.530	.630	.186	.602	1.204	.398	.529	1.489

Note: OR = odds ratio.
∼ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5. Predictors of Trajectory Group Membership Using the *High* Group as a Reference

Predictors	Increasing			Decreasing		
	B	SE B	OR	B	SE B	OR
Gender (0 = female)	−.321	.196	.725	−.190	.238	.827
Prosociality	−.165∼	.094	.848	−.128	.114	.880
Social withdrawal	.129	.116	1.137	.190	.138	1.210
Aggression	.020	.101	1.020	.194∼	.115	1.214
Family structure (0 = intact)	.247	.255	1.280	.100	.320	1.105
Family income	−.100*	.047	.905	−.021	.057	.980
Mother's education (h.s./voc)	.691	.556	1.996	−.318	.600	.728
Mother's education (coll)	.225	.553	1.252	−.538	.590	.584
Mother's education (univ)	.023	.573	1.023	−1.107∼	.621	.330
Father's education (h.s./voc)	−.633∼	.348	.531	−.401	.456	.670
Father's education (coll)	−.544	.349	.581	.086	.448	1.090
Father's education (univ)	−.860*	.375	.423	−.213	.477	.808

Note: OR = odds ratio.
∼ $p < .10$; * $p < .05$; ** $p < .01$

(high school or vocational diploma = 3.901 times more likely; college studies = 7.443 times more likely; university studies = 15.897 times more likely).

The *high* trajectory group was also used as a reference because it included almost half the sample. It was first compared with the *increasing* trajectory group. Regarding individual variables, no significant differences were found between these two groups. As for family variables, children from higher-income families were 1.105 more likely to be assigned to the *high* trajectory than to the *increasing* trajectory (OR = .905, $p = .033$). Moreover, children whose fathers had been involved in university studies were 2.364 times more likely to be classified into the *high* group rather than the *increasing* group.

Next, the *high* trajectory group was compared with the *decreasing* trajectory group. No significant differences were found between these two groups with respect to the individual or family variables investigated in this study.

Discussion

The aims of this study were twofold: (1) to identify the trajectories of breadth of participation in organized activities between Kindergarten and grade 4 and (2) to examine individual and family variables that were likely to predict membership in these trajectories. Breadth represents the number of different types of activities practiced (Bohnert et al., 2010).

Previous studies, based on mean histograms or growth curves, have shown that breadth of participation in organized activities increases between early childhood and early adolescence (Allhusen et al., 2004; Mahoney et al., 2006; Simpkins et al., 2005). However, such methods do not provide information regarding sample

heterogeneity. The analyses brought out four different trajectories: no participation, increasing, decreasing and high. Our findings indicate that breadth of participation in organized activities evolved in a heterogeneous way in childhood.

In our study, a significant increase in the breadth of participation was seen for only 26.40 percent of the children (*increasing* group) and most of the increase happenned between Kindergarten and grade 2. This trajectory can be explained in two ways. First, between Kindergarten and grade 4, children become more autonomous and begin to explore new environments (Bronfenbrenner, 1979). Second, in early childhood, opportunities to participate in organized activities are more limited, whereas these opportunities improve in middle childhood and continue to improve up to early adolescence (Fletcher et al., 2003). An increase in the breadth of participation was also seen in the *no participation* and *high* groups, but was so minor that it did not reflect a real change in the number of different types of activities. Last, for approximately 15 percent of children, the breadth of participation in organized activities decreased between Kindergarten and grade 4 (*decreasing* group). This trajectory was not expected. Again, most of the deacrease happened between Kindergarten and grade 2, suggesting that significant changes in breadth of participation occured during this period. The decrease in breadth could reflect a specialization effect: the child does not necessarily participate in fewer organized activities, he/she simply concentrates on one type of activity in particular.

The second goal of this study was to identify the individual and family variables, measured at the begenning of Kindergarten, that predicted membership in the trajectories. Contrary to our expectations, gender did not predict membership in the breadth trajectories. Yet, previous studies have reported that girls tend to be involved in a broader range of activities during adolescence and that they spend more time in organized activities during childhood (Feldman & Matjasko, 2005; Fredricks & Eccles, 2006; Mata & Van Dulmen, 2012). During childhood, parents play a greater role in choosing which organized activities their child will practice. In adolescence, the child's choice becomes more autonomous. In our study, the parents' decision to enroll their child in a broader range of organized activities did not appear to be influenced by the child's gender. If gender differences do in fact exist, they are more likely to be detected during adolescence.

Various dimensions of the child's social behavior were also examined. Children who were more prosocial were more likely to be assigned to the *no participation* trajectory, compared with the *increasing* trajectory. This finding contradicts Anderssen and Wold's (1992) finding that prosocial children participated more in organized sports than their less prosocial classmates. It is possible that parents were aware of their child's prosociality and, thus, decided that their child did not need to participate in organized activities in order to further develop their social skills. The greater breadth of participation of the children in the other three trajectories can also be explained by family variables that were more favorable to enrollment in organized activities, such as higher income and higher maternal education.

As expected, being socially withdrawn was associated with a more limited breadth of participation in organized activities. A study by Findlay and Coplan (2008) showed shyness to be negatively associated with sport participation in middle childhood. Moreover, a study by McHale et al. (2005) showed that children who participated in organized sports were seen as being less socially withdrawn by their teachers. Because organized activities involve interactions with unknown adults and peers and require voluntary participation, it is expected that being socially

withdrawn would be associated with lower enrollment in such activities. Children who are socially withdrawn are, thus, deprived of a socialization context that could be beneficial for them.

Aggression did not predict membership in the breadth of participation trajectories. The results of Mata and Van Dulmen's (2012) study indicated that children with higher levels of aggression spent more time in organized activities than children with lower levels of aggression. These authors suggested that parents may use organized activities as a way to allow their children to channel their aggressive energy. However, aggression did not influence the breadth of participation of the children in our study. It is possible that the parents of aggressive children focus on a single type of activity (most likely sports). This hypothesis could explain why agression was not related to breadth of participation, although it was associated with a higher intensity in the study of Mata and Van Dulmen (2012).

Some family characteristics were also investigated. As expected, higher annual family income predicted membership in the higher breadth of participation trajectories, which was in line with previous studies (Allhusen et al., 2004; Mata & Van Dulmen, 2012; Smith, 2002). During childhood, few organized activities are offered at school, prompting families to turn to activities offered in the community, which tend to be more expensive (Fletcher et al., 2003). Children from low-income families, thus, have less access to organized activities, especially during childhood. This finding is a source of concern because these children have access to fewer material resources and are often less intellectually stimulated at home (Guo & Harris, 2000). Organized activities represent a stimulating context in which children can socialize, learn new skills and explore different facets of their identity (Fredricks & Eccles, 2006; Marsh, 1990).

In line with our hypotheses, the level of education of both parents also predicted membership in the different breadth of participation trajectories. The higher the mother's and father's level of education, the more likely the child was to be assigned to the higher breadth trajectories. Of all the predictors investigated, mother's education was the strongest predictor of membership in the four trajectories. These results are in line with those of several studies reporting a positive association between parental education and participation in organized activities (Allhusen et al., 2004; Mahoney et al., 2006; Mata & Van Dulmen, 2012). In Mata and Van Dulmen's (2012) study, mother's education predicted the amount of time spent in organized activities during childhood, but father's education was not investigated. In the current study, it appears that father's education is related to the breadth of participation in organized activities during childhood. Fathers displaying higher levels of education may value exploration of multiple contexts and, thus, enroll their children in a broader range of organized activities.

Contrary to our hypotheses, family structure did not predict membership in breadth trajectories. Hofferth and Sandberg (2001) found that children from single-parent families were less likely to participate in organized activities than children from intact families, because there was one less parent available to accompany the children to these activities. The sample used in the present study was quite homogeneous with regard to this variable (approximately 72 percent of the children lived in intact families at the start of Kindergarten). This lack of variability in terms of family structure may have been responsible for the lack of significant results in this regard. It is also possible that family structure did not predict membership in breadth trajectories because of the way it was operationalized in this study. For

example, the fact of living in a single-parent family compared with living in a two-parent family may be more important than the intact family/non-intact family dichotomy used in our study (Harrison & Narayan, 2003).

Overall, between Kindergarten and grade 4, the breadth of organized activities remains relatively low. In our study, the breadth measure used had a maximum value of four. Indeed, it was very rare for children—even older children and adolescents—to be involved in more than four different types of organized activities. In our sample, only one case in five years (in 3252 observations) reported the maximum score of four. The *high* group, which included the children with the greatest breadth of participation, reached a mean score of 1.50 when the children were in grade 4. Thus, even if opportunities to participate in organized activities improve in middle childhood, it seems to remain more limited than in adolescence. This may be due to the fact that during childhood, most organized activities are available in the community, where the cost is higher compared with activities available in schools (Fletcher et al., 2003). It could also be the case that parents are hesitant to involve their children in too many different activities at the same time (over-scheduling hypothesis) (Mahoney et al., 2006).

However, it is important to remember that the trajectories represent estimations of reality, and not actual pathways. Participants are assigned to the trajectory that best fits their individual trajectory. This means that even though the high trajectory had a mean of 1.50, it included all the children who had a breadth score of 2, 3, or 4. Between Kindergarten and fourth grade, 18 to 30 percent of participants had a breadth score equal to or greater than 2. By comparing the high trajectory to the other trajectories, we are, therefore, comparing children who experience breadth to children who participate with little breadth, as well as to the children who do not participate at all. It means that almost half of the children start to experience some breadth in their organized activities between Kindergarten and grade 4, whereas fewer than 15 percent of the children did not participate in any organized activities during this period (*no participation* trajectory). These results are encouraging because participation in organized activities is associated with many positive developmental outcomes (Allhusen et al., 2004; Fletcher et al., 2003; Hofferth & Sandberg, 2001).

In this study, the breadth scores did not vary much from one trajectory to another. Nevertheless the analyses of predictor variables indicated that there were significant differences between children of the four trajectories on the personal and the family levels. Also, some predictors of the breadth trajectories did not predict intensity trajectories (Mata & Van Dulmen, 2012), and vice versa, which suggests that there are differences between these two dimensions of participation. Besides, the predictors identified for the breadth trajectories in childhood were not the same as the predictors of breadth identified in adolescence by previous studies. For example, gender has not been identified as a significant predictor, and family variables represent the most significant predictors of trajectories. These results suggest that parents play a greater role in their child's organized activity participation (and breadth) in childhood than in adolescence.

Children in the *no participation* trajectory showed a number of developmental risk factors such as low family income, low parental education and a tendency to be socially withdrawn. These results are a source of concern because participating in a broad range of organized activities could represent a protective factor for these children and allow them to develop positively despite the presence of individual and family risk factors. For example, a study by Findlay and Coplan (2008) revealed

that participation in sports was associated with benefits, particularly for shy children. Shy children who participated in sports presented greater self-esteem than shy children who did not participate in sports. Social policies could help address this situation by facilitating access, in financial terms, to organized activities for children from less fortunate families.

Limitations and Future Research

This study presents some limitations. First, our sample was quite homogeneous socio-demographically. It would be relevant to replicate the results of this study with samples that are more culturally and economically diverse. Second, it is possible that certain activities were not included in the calculation of the breadth score as parents were asked to report activitities that were presently being practiced. It is, therefore, possible that the breadth score was under estimated. In fact, the breadth of activities practiced throughout the year (cumulative breadth) could be distinguished from the breadth of presently practiced activities (simultaneous breadth). Future research could ask parents to report on all organized activities in which their child participated throughout the year in order to obtain a measure of cumulative breadth. All the same, the measure of breadth used in the present study represents a reliable estimate of simultaneous breadth and its evolution over time. Third, the accuracy with which the participants were classified into the four trajectory groups was acceptable but not high. This may stem from the fact that the participants presented very different individual trajectories regarding the breadth of their participation in organized activities. Fourth, the predictors examined in this study were treated as static variables, even though they may have varied over time (especially children's characteristics). Additionally, the child's individual characteristics could change over time as a function of participation in organized activities. Future trajectory modeling studies could examine these same predictors but measure them several times, treating them as dynamic variables in the statistical analyses.

Now that the breadth of participation dimension has been examined in isolation, the next step would be to examine several dimensions simultaneously, including the intensity and duration of participation. Future studies could create profiles based on various dimensions of participation using latent class analysis or model joint trajectories, considering several of these dimensions. Future studies should also model trajectories over a longer time period, including, for example, the preschool period and the transition to adolescence. Other predictors should also be examined, such as parental attitudes toward the child's organized activities, the parents' own current or past involvement in organized activities, and the siblings' involvement in organized activities (Mata & Van Dulmen, 2012). Last, the psychosocial and academic impacts associated with distinct trajectories of breadth of participation in organized activities have never been investigated during childhood.

To conclude, this study found four different trajectories of breadth of participation in organized activities among children between Kindergarten and grade 4. These trajectories included a group of children who participated little or not at all in organized activities, a group whose breadth of participation increased between Kindergarten and grade 4, a group whose breadth of participation decreased during this period, and a group whose breadth of participation was high right from the start. These trajectories show that most children participated in organized activities between Kindergarten and grade 4 and that many children were already

participating in a somewhat diverse range of activities. However, children who were socially withdrawn or who came from less well-off families were more likely to belong to the *no participation* group. These results are a source of concern because they suggest that the very children who could benefit the most from participating in organized activities in fact participate the least.

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