

Academic and behavioral outcomes associated with organized activity participation trajectories during childhood

Florence Aumètre, François Poulin*

Department of Psychology, Université du Québec à Montréal, C. P. 8888, succursale Centre-Ville, Montréal H3C 3P8, Québec, Canada



ARTICLE INFO

Keywords:

Organized activities
Breadth of participation
Developmental trajectories
Childhood
Academic skills
Internalizing and externalizing problems

ABSTRACT

Academic and behavioral (externalizing and internalizing problems) outcomes associated with trajectories of breadth of participation in organized activities were examined in a sample of 548 children. Four previously modeled trajectories from Kindergarten to Grade 4 were compared: no participation, increasing breadth, decreasing breadth, high and stable breadth. Potential confounding variables (i.e. sex, academic and behavioral indicators in Kindergarten, and mother's education) were included as covariates in the analyses, and the children's disruptive behavior status was tested as a moderator. Following the inclusion of the covariates, the children assigned to the high trajectory displayed lower internalizing problems than the children assigned to the no participation and decreasing trajectories. Children's disruptive behavior status did not moderate the associations between breadth of participation trajectories and outcomes. It thus appears that participation in a wider range of organized activities during childhood may help prevent subsequent internalizing problems.

1. Introduction

Organized activities (e.g., sports, clubs, arts) provide a unique developmental context that has consistently been associated with both adjustment and well-being during childhood. More specifically, previous studies have reported associations with lower externalizing and internalizing problems as well as increased self-regulation, social skills and academic performance (Crosnoe, Smith, & Leventhal, 2015; Denault & Déry, 2014; Piché, Fitzpatrick, & Pagani, 2015). To date, most studies on the effects of involvement in organized activities have focused on adolescent populations, despite the fact that many such activities begin in childhood. Indeed, according to Denault and Déry (2014), 46% of 6- to 10-year-old children living in Quebec, Canada (where the current study was also conducted), are involved in at least one organized activity during the school year. Similar rates are found among children in the US (NICHD *Early Child Care Research Network*, 2004). The current study examined both the academic and behavioral adjustment outcomes associated with trajectories of breadth of participation in organized activities among children from Kindergarten to Grade 4 and investigated the potential moderating effect of the children's levels of disruptive behaviors on these links.

1.1. Operationalizing the organized activity concept and its dimensions

Organized activities involve a regular schedule under adult

supervision, entail integration into a peer group, focus on the acquisition of specific skills and typically promote positive youth development (Mahoney, Larson, & Eccles, 2005; Mahoney & Stattin, 2000). These activities can take place at school, but are often more widely available in the community during childhood (Fletcher, Nickerson, & Wright, 2003). Participation in organized activities is a multi-dimensional construct. The main structural dimensions of participation include its intensity (time devoted to the activity, typically measured in number of hours per week), duration (number of months or years) and breadth (number of different types of activities engaged in) (Bohnert, Fredricks, & Randall, 2010). Previous studies have shown greater intensity of participation to be associated with better social skills and fewer behavioral problems during childhood (Denault & Déry, 2014; Simoncini & Caltabiono, 2012), and greater duration of participation (over two years) to be related to higher school achievement, better adaptive behavior, and fewer internalizing problems (Metsäpelto & Pulkkinen, 2012). Studies involving adolescents have shown that higher breadth of participation is associated with fewer externalizing and internalizing problems, as well as higher school grades (Bartko & Eccles, 2003; Feldman & Matjasko, 2007; Fredricks & Eccles, 2006). The impact of breadth of participation in organized activities has not been studied extensively among school-aged children. To our knowledge, it is the object of only two studies. Morris and Kalil (2006) measured breadth by creating portfolios of activities for children aged 6 to 12. Five profiles were identified: (1) high involvement in clubs, (2) high involvement in

* Corresponding author.

E-mail addresses: aumetre.florence@courrier.uqam.ca (F. Aumètre), poulin.francois@uqam.ca (F. Poulin).

sports, (3) high involvement in sports and clubs, (4) high involvement in sports, clubs and lessons, and (5) low involvement in clubs, sports and lessons. Children who had high levels of participation in sports, clubs and lessons adopted more prosocial behaviors and obtained better grades than those who did not participate in any organized activities. In another study, children that participated in both sports and clubs had better social skills than children who were not involved at all in organized activities (Howie, Lukacs, Pastor, Reuben, & Mendola, 2010). The fact that breadth of participation in school-aged children has received little attention is surprising given that studies simultaneously examining both breadth and intensity of participation have shown breadth to be a stronger predictor of psychosocial and academic adjustment during adolescence (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006; Denault & Poulin, 2009). Involvement in a broad range of activities may allow children to develop a wider range of abilities and explore various facets of their self-concept (Fredricks & Eccles, 2006; Marsh, 1990). It therefore appears important to examine whether breadth of participation is also associated with positive outcomes during childhood.

1.2. Examining longitudinal patterns of participation

Two longitudinal studies have investigated evolving patterns of participation in organized activities over the school-age years. Mata and van Dulmen (2012) assessed intensity of participation from Kindergarten to Grade 5 and identified five trajectories: (1) stable low, 52.7%, (2) decreasing moderate, 15.2%, (3) decreasing low, 14.4%, (4) increasing moderate, 13.5%, and (5) increasing high, 4.2%. Aumètre and Poulin (2016) modeled trajectories of breadth of participation from Kindergarten to Grade 4, and they identified four groups: (1) no participation, 13.5%, (2) increasing breadth, 26.4%, (3) decreasing breadth, 14.1%, and (4) high and stable breadth, 46.1%. Overall, these findings reveal that the development of activity participation during the school-age period is rather heterogeneous. Individual and contextual predictors of trajectory membership have also been examined. In Mata and van Dulmen's study, girls were more likely than boys to be assigned to higher intensity trajectories. In addition, children who exhibited more aggressive behaviors were more likely to be assigned to higher intensity trajectories. In Aumètre and Poulin's study, neither sex nor aggression was predictive of trajectory membership. However, both prosocial behavior and social withdrawal predicted assignment to the lower trajectories. Finally, in both studies, higher income and higher parental education predicted membership in higher intensity or breadth of participation trajectories. These findings suggest that pre-existing individual and family characteristics may affect changes in participation over time. Some authors have hypothesized that the positive outcomes previously associated with organized activities might derive from these pre-existing characteristics, rather than from participation in these activities, through a selection effect (Fletcher et al., 2003; Mahoney et al., 2005; Mata & van Dulmen, 2012). Longitudinal studies examining the correlates and outcomes of participation in organized activities should therefore control for these pre-existing individual and contextual factors in order to rule out this selection effect.

We nonetheless hypothesize that organized activities do promote children's adjustment and well-being well beyond this potential selection effect in several ways. First, these activities constitute unique learning environments that entail specific regulations and goals that children must commit to, which likely foster the adoption of prosocial behaviors (e.g., sharing materials, listening to and helping peers) (Denault & Déry, 2014; Mahoney, Cairns, & Farmer, 2003). This high level of structure combined with the reinforcement of prosocial behavior may contribute to reducing externalizing problems. Furthermore, these activities also emphasize skill building and knowledge acquisition (e.g., organization, patience, problem solving and reasoning), which may, in turn, promote academic adjustment. These newly acquired skills could subsequently be reinvested within the school context

(Mahoney et al., 2005). Finally, organized activities also provide socialization experiences that promote warm, supportive and long-lasting relationship formation with prosocial peers and adults (Fredricks & Eccles, 2006; Mahoney et al., 2005). These relationships typically foster feelings of integration and belonging, which can contribute to preventing or reducing internalizing problems such as anxiety or depression (Mahoney et al., 2005).

1.3. Does participation provide greater benefits to children with disruptive behaviors?

Previous research has shown that the positive outcomes associated with organized activities may be even greater for at-risk children. For instance, the relationship between participation in organized activities and increased academic performance during elementary school has been shown to be stronger among children from low-income families or families with low socioeconomic status (SES) (Covay & Carbonaro, 2010; Crosnoe et al., 2015; Dumais, 2006).

Children with other risk factors such as high levels of disruptive behaviors may also derive greater benefits from participation in organized activities. Children who persist in exhibiting such behaviors after the preschool period often follow a problematic developmental trajectory (Broidy et al., 2003; Vitaro, Brendgen, Larose, & Tremblay, 2005). They typically exhibit lower social competence (Moisan, Poulin, Capuano, & Vitaro, 2014), tend to misinterpret social situations (Crick & Dodge, 1996) and have a hard time recognizing and regulating emotions (Denham et al., 2003). Participating in organized activities could help improve their social competence and reduce their externalizing problems (Larson, 2000; Mahoney & Stattin, 2000).

Participation in organized activities implies integration into a peer group that is typically prosocial. In this context, the social competence of disruptive children could improve through vicarious learning (Bandura, 1977). They could learn new ways to behave and new emotional responses by observing the actions of others, the consequences of their actions and the affective reaction following these consequences. Another mechanism that may contribute to reducing externalizing problems involves the supervision provided by the adults in charge of organized activities. During adolescence, involvement in organized activities, as compared to unsupervised activities, is characterized by the tighter supervision and better support provided by the adults in charge of these activities (Mahoney & Stattin, 2000). Lastly, children with disruptive behaviors who participate in organized activities have less time on their hands to engage in unsupervised activities or hang out with deviant peers (Mahoney, 2000).

Findlay and Coplan (2008) specifically examined whether children with aggressive behaviors (a specific form of disruptive behaviors) derived greater benefit from participating in organized sports than non-aggressive children. They found only one marginal difference ($p < 0.07$): aggressive children who were involved in sports showed higher self-esteem than aggressive children who were not involved in sports. However, the potential moderating effect of children's disruptive behaviors on the relationship between participation in organized activities and subsequent adjustment has yet to be tested.

1.4. Study aims and hypotheses

The first aim of the current study was to disentangle potential associations between trajectories of breadth of participation in organized activities during childhood (modeled from Kindergarten to Grade 4), and academic and behavioral outcomes. The indicators considered were those most frequently assessed in studies examining the outcomes of participation in organized activities, namely academic skills, and externalizing and internalizing problems (Mahoney et al., 2005; Shulruf, 2010). A previous study using the same sample of participants (Aumètre & Poulin, 2016) identified the four following trajectories of breadth of participation in organized activities: the no participation

group, the increasing group, the decreasing group, and the high and stable group. In the current study, children assigned to both the increasing and high trajectories were expected to display better academic and behavioral outcomes (i.e. higher academic skills, and fewer externalizing and internalizing problems) than children assigned to the no participation or decreasing trajectories in Grade 4.

To account for potential selection effects, some individual and contextual covariates were included in the analyses: (1) child's sex, based on previously documented sex differences with regard to organized activity participation and adjustment (Feldman & Matjasko, 2005; Fredricks & Eccles, 2006; Mata & van Dulmen, 2012), (2) mother's education, given that higher parental educational status has repeatedly been associated with both involvement in organized activities and adjustment among children (Aumètre & Poulin, 2016; Mata & van Dulmen, 2012; NICHD *Early Child Care Research Network*, 2004); and (3) child behavior and school readiness (in Kindergarten) prior to participation in organized activities, to account for potential stability over the years (Aumètre & Poulin, 2016; Mahoney et al., 2005; Mata & van Dulmen, 2012).

The second aim was to investigate whether the children's disruptive behavior status in Kindergarten (high versus low levels of disruptive behaviors) moderated the relationship between trajectories of breadth of participation in organized activities and academic and behavioral outcomes. Previously hypothesized differences between trajectories with regard to academic and behavioral outcomes were expected to be greater for children displaying high levels of disruptive behaviors in Kindergarten.

2. Method

2.1. Participants and research design

The data used in this study was collected in the context of a broader research project involving Kindergarten children displaying high levels of disruptive behaviors, and investigating the impact of a program aimed at preventing violence and school dropout. In order to recruit a sufficient number of participants, three consecutive youth cohorts from over 40 different schools in a large urban Canadian city were screened for the study in 2002, 2003, and 2004, respectively.

The following steps and criteria were used to screen and recruit students displaying high levels of disruptive behaviors. Written parental consent was collected prior to screening (90% agreed). At the beginning of October, the teachers were asked to complete a screening questionnaire for each student in their class (see description below). The same questionnaire was sent to the parents. Students whose total score on the scale was *above* the 65th percentile both in class (based on teacher ratings) and at home (based on parent ratings) were identified as displaying a high level of disruptive behaviors (high-disruptive). These students were then randomly assigned to control or intervention conditions (the children's intervention status – control or intervention – was included as a control variable in the current analyses). Another group of students whose total score was *below* the 65th percentile for both teacher and parent ratings was also recruited among the remaining participants (low-disruptive). These students were not involved in the intervention but took part in the same assessments. In total, 3774 students were screened. The final sample consisted of 1038 children (62% boys; mean age = 65.2 month, SD = 3.7) including 320 high-disruptive and 718 low-disruptive children.

In Kindergarten, 72% of the participants lived in intact two-parent families. Their average gross family income was \$60,900 per year, with 7% of families having an annual income of less than \$20,000 and 18% of families having an annual income of more than \$100,000. Most parents had completed post-secondary studies (mothers = 69.1%; fathers = 64.0%). Most of the families originated from Canada (85.5%), and all were French-speaking.

Some participants could not be included in the analyses on account

of missing data. In Grade 4, data were collected for 548 participants (245 high-disruptive and 303 low-disruptive), and only these participants were included in the current study analyses. Chi square and *t*-test analyses were performed to determine whether these participants ($N = 548$) differed from the excluded participants ($N = 490$). The results revealed that the participants included in the analyses were more likely to live in intact families ($\chi^2[1] = 5.145; p = 0.023$), to come from families with higher annual incomes ($t[915] = -3.559; p < 0.001$) and to have mothers with higher education levels ($t[871.313] = -2.543; p = 0.011$).

2.2. Procedures

Participation in organized activities was measured from Kindergarten to Grade 4 (five years) using a parent questionnaire completed each year in May. The scores for the children's externalizing and internalizing problems, and academic skills were based on teacher ratings collected in Kindergarten (November), as control variables, and in Grade 4 (May), as outcomes. The mother's level of education was also measured in Kindergarten (November) as a control variable. 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 authors' university.

2.3. Measures

2.3.1. Disruptive behaviors screening instrument

This questionnaire contained 18 items targeting various forms of disruptive behavior including oppositional defiant disorder, conduct disorder, attention-deficit/hyperactivity disorder, and indirect aggression (DSM-IV, American Psychiatric Association, 1994; Björkqvist, Lagerspetz, & Österman, 1992). It was derived from the *Questionnaire d'Évaluation des Comportements au Préscolaire* (QECP; Tremblay, Desmarais-Gervais, Gagnon, & Charlebois, 1987). The response format was a 3-point Likert scale: (0) "never or not true" (1) "sometimes or somewhat true" and (2) "often or very true." The total score for the instrument could range from 0 to 36. Parents and teachers completed the same version and internal consistency was good ($\alpha = 0.83$ for parents; $\alpha = 0.93$, for teachers).

2.3.2. Trajectories of breadth of participation in organized activities from Kindergarten to Grade 4

Every year, during the month of May, mothers were asked to fill out a questionnaire regarding their child's participation in organized activities. They were asked to identify all the organized activities that the child was currently involved in. Based on a pilot study suggesting that very few children in this age group participate in more than four activities, the questionnaire provided the mothers with four pre-determined spaces in which they could list their child's activities. For each activity, they were also asked to specify whether their child's participation lasted at least 30 min per week and whether adults were present during the activity. Unsupervised activities or activities that lasted < 30 min per week were not considered. The latter represented < 5% of the activities listed.

All the valid organized activities identified were then classified into six different types of activities based on the current literature: (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) (Denault & Poulin, 2007; Larson, Hansen, & Moneta, 2006). Breadth of participation was defined as the total number of types of activities each child was involved in. The

breadth score could range from 0 to 4 since, as previously stated, mothers could report up to a maximum of four activities. Annual breadth of participation scores were computed for each participant from Kindergarten to Grade 4.

The developmental trajectories were identified and described in a previous study (see Aumètre & Poulin, 2016, for a detailed account of the analytic strategy, model selection criteria, and model fit statistics). A group-based trajectory modeling (GBTM) procedure was used, with censored-normal distributions (PROC TRAJ in SAS; Nagin, 1999, 2016). This analytic method was chosen over growth curve analysis because it can identify homogenous subpopulations following qualitatively different trajectories within a larger heterogeneous population (Jung & Wickrama, 2008; Nagin, 1999, 2005; Nesselroade, 1991). Previous studies have shown that participation in organized activities (and changes in participation over time) are not homogenous across individuals (Hofferth & Sandberg, 2001; Mahoney, Harris, & Eccles, 2006; Mata & van Dulmen, 2012; Simoncini & Caltabiono, 2012).

Two fit indicators were used to choose the final model: the Bayesian and Akaike Information Criterion (BIC and AIC). The four- and five-group models represented the best options. However, on a qualitative level, the five-group model proposed trajectories that were overly similar (BIC = -3933.85; AIC = -3873.02). The second best option (four-group model; BIC = -3936.24; AIC = -3887.58) was therefore used. The *no participation* group (cubic form, 13.5% of participants) consisted of children who did not participate in organized activities between Kindergarten and Grade 4. The *increasing* group (cubic form, 26.4% of participants) represented children who did not participate in organized activities in Kindergarten but then increased their participation up to Grade 4. The *decreasing* group (quadratic form, 14.1% of participants) consisted of children who participated in organized activities in Kindergarten, but then became intermittent participants between Grade 1 and Grade 4. Lastly, the *high* group (linear form, 46.1% of participants) represented children who participated in organized activities from Kindergarten to Grade 4 and presented the highest breadth scores. The estimated trajectories are displayed in Fig. 1.

2.3.3. Externalizing and internalizing problems in Grade 4

The Social Behavior Questionnaire was initially developed for the Quebec Longitudinal Study of Child Development (ISQ, 2001) by combining items from an array of previously validated instruments (Achenbach, 1991; Boyle et al., 1993; Tremblay et al., 1987). Its response format is a 6-point Likert scale, with 1 corresponding to “never or not true” and 6 corresponding to “often or very true”. Two subscales from the teacher rating instrument were used in the current study: (1) externalizing problems (35 items; $\alpha = 0.97$; e.g.: “damaged or broke his own things”, “could not sit still, was restless or hyperactive”, “was rebellious or refused to comply”) and (2) internalizing problems (23 items; $\alpha = 0.89$; e.g.: “seemed unhappy or sad”, “avoided the other

children”, “was overly fearful or anxious”). The scores for each scale were computed by averaging all item responses.

2.3.4. Academic skills in Grade 4

Academic skills were measured using a 7-item teacher questionnaire previously used by van Lier et al. (2012). The items tapped the following academic skills: reading comprehension, oral reading, oral expression, writing, arithmetic, problem solving, and global academic skills. The teachers rated the children on all skills using the following 5-point Likert scale: (1) “well below average”, (2) “slightly below average”, (3) “average”, (4) “slightly above average”, or (5) “well above average”. Internal consistency was excellent ($\alpha = 0.96$). The global score for this scale was computed by averaging all item responses.

2.3.5. Covariates in Kindergarten

The variables were collected in the fall (November) of Kindergarten six months prior to the assessment of activity participation. Externalizing and internalizing problems were assessed through teacher ratings using the same instrument subsequently used in Grade 4. Since academic skills cannot technically be assessed in Kindergarten, we measured the children's *academic readiness* using the Language and Cognitive Development subscale from the Early Development Instrument (EDI; Janus & Offord, 2007). This subscale was completed by the Kindergarten teacher and encompassed four subsets: basic numeracy skills, basic literacy skills, advanced literacy skills, and memory. The items from the four subsets were combined to produce an overall language and cognitive development score ($\alpha = 0.88$). Finally, mother's education was operationalized as the total number of years spent in educational institutions and was self-reported.

2.4. Data analytic strategy

The current study investigates potential associations between trajectories of breadth of participation in organized activities, and academic and behavioral indicators. Analyses of variance were performed to disentangle the associations found between these trajectories and academic skills, and externalizing and internalizing problems (Huberty & Petoskey, 2000). Pillai's trace test (V), generally referred to as the most powerful and robust statistic, was used (Field, 2009). Partial correlations were performed between the three dependent variables to determine whether they should be analyzed in a multivariate model. Based on the results, externalizing and internalizing problems were analyzed simultaneously in a multivariate model, ($r = 0.41$, $p < 0.001$; Cohen, 1988), while academic skills were examined separately in a univariate model ($r < 0.30$ with both externalizing and internalizing problems). Analyses of variance were conducted in two steps: first, without including any covariates, and, second, including the appropriate covariates for each academic and behavioral indicator. Our goal was to examine whether the significant differences observed in the first set of analyses would persist after the control variables were included. Bivariate correlations indicated that child's sex, externalizing problems in Kindergarten, internalizing problems in Kindergarten, and mother's education should be controlled for when investigating externalizing and internalizing problems in Grade 4. When examining academic skills, child's sex, school readiness in Kindergarten, mother's education, and intervention status were included as covariates. Bonferroni's post hoc tests were used to disentangle significant results among all the different trajectories. Effect sizes were computed using the Partial Eta square (η_p^2), which is the advised method when control variables are included in the research design (Richardson, 2011). To investigate the potential moderating effect of child's disruptive behavior status on the associations found between the trajectories of breadth of participation, and child's academic and behavioral indicators, the analyses of variance were re-conducted including the interaction term Breadth trajectory X Disruptive behaviors (high/low). For the missing data (Grade 4 outcomes), listwise deletion was used. This method is not

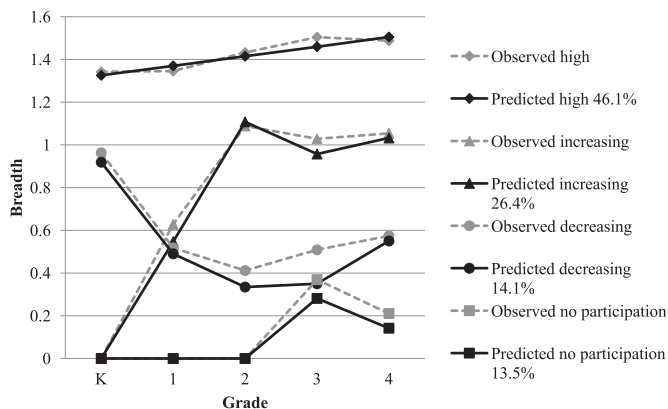


Fig. 1. Observed and estimated parameters for the breadth trajectories.

Table 1
Comparison of breadth trajectories: descriptive data, ANOVAs and post hoc test results.

Academic and behavioral indicators (Grade 4)	Breadth trajectories				df	F	η_p^2	Post hoc
	NP M (SD)	I M (SD)	D M (SD)	H M (SD)				
Externalizing problems	2.10 (0.10)	1.94 (0.07)	2.00 (0.09)	1.79 (0.05)	(3,544)	3.83**	0.021	H < NP
Internalizing problems	2.23 (0.09)	2.13 (0.07)	2.17 (0.07)	1.89 (0.04)	(3,544)	8.21*	0.043	H < I, D & NP
Academic skills	2.77 (0.14)	3.26 (0.11)	2.82 (0.13)	3.35 (0.06)	(3,544)	8.49***	0.045	I & H > D & NP

Note. n = 548; NP = no participation, I = increasing, D = decreasing, H = high.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

generally recommended and is often considered obsolete. However, in the current study, multiple imputations could not be used because the percentage of missing data was too high (47%) (Lee & Simpson, 2014), nor could Full Information Maximum Likelihood (FIML) because the sample size was too small and the data were not missing at random (MAR) (Little, Jorgensen, Lang, & Moore, 2013; Schafer & Graham, 2002). Nevertheless, including the covariables in the analyses of variance reduced the bias inherent in listwise deletion (Graham, 2009).

3. Results

3.1. Descriptive data

The means and standard deviations for all Grade 4 academic and behavioral indicators are displayed for each trajectory (see Table 1). Bivariate correlations between academic and behavioral indicators, and control variables are provided in Table 2. Externalizing and internalizing problems were normalized using logarithmic transformations because their distributions were revealed to be asymmetric in both Kindergarten and Grade 4. The means for the three outcomes considered (i.e., academic skills, externalizing problems and internalizing problems) were also compared between children initially classified as “low-disruptive” and those initially classified as “high-disruptive”, given that disruptive behavior status was conceptualized as a potential moderator in the current study. Children classified as “high-disruptive” displayed more externalizing ($t(549) = 12.46, p < 0.001$) and internalizing problems ($t(549) = 6.55, p < 0.001$) than their counterparts in Grade 4 (high-disruptive externalizing problems mean = 2.28; high-disruptive externalizing problems mean = 1.54; high-disruptive internalizing problems mean = 2.25; low-disruptive internalizing problems mean = 1.89). They also exhibited lower academic skills based on teacher ratings ($t(549) = -6.28, p < 0.001$; high-disruptive

mean = 2.88; low-disruptive mean = 3.40).

3.2. Differences between breadth trajectories with regard to academic and behavioral indicators

Prior to the inclusion of the covariates, significant differences were observed between the trajectories with regard to both externalizing and internalizing problems ($V = 0.05, F(3, 544) = 4.46, p < 0.001$; see Table 1). Children assigned to the high trajectory displayed fewer externalizing problems than children assigned to the no participation trajectory ($p = 0.011$) as well as fewer internalizing problems than children assigned to the no participation ($p = 0.001$), increasing ($p = 0.010$), and decreasing trajectories ($p = 0.002$) in Grade 4. With respect to academic skills, children assigned to the increasing and high trajectories scored higher than children assigned to the no participation and decreasing trajectories did ($p < 0.05$). The effect size of the breadth trajectories was found to be small for externalizing problems ($\eta_p^2 = 0.021$), and small to medium for both internalizing problems ($\eta_p^2 = 0.043$) and academic skills ($\eta_p^2 = 0.045$).

Following the inclusion of the covariates, only the scores for internalizing problems differed between the trajectories ($V = 0.03, F(3, 497) = 2.34, p < 0.05$; see Table 2 for a detailed account of the analyses including the covariates). Children assigned to the high trajectory displayed fewer internalizing problems than children assigned to both the no participation and decreasing trajectories ($p = 0.03$) in Grade 4. The effect size of the breadth trajectories was now small for internalizing problems ($\eta_p^2 = 0.028$, as compared to 0.043 prior to the inclusion of covariates) but nonetheless larger than that of both mother’s education ($\eta_p^2 = 0.005$), and prior externalizing ($\eta_p^2 = 0.024$) and internalizing problems ($\eta_p^2 = 0.006$), as assessed in Kindergarten. With regard to externalizing problems and academic skills, the best predictor of differences between the trajectories was prior level of adjustment,

Table 2
Comparison of breadth trajectories: descriptive data, ANCOVAs and post hoc test results.

Academic and behavioral indicators (Grade 4)	Correlations with covariates (Kindergarten)				Breadth trajectories				df	F	η_p^2	Post hoc
	Sex	Prior level of adj.	Mother’s educ.	Intervention condition	NP M (SD)	I M (SD)	D M (SD)	H M (SD)				
Externalizing problems	0.20**	0.52**	-0.21**	0.03	2.10 (0.10)	1.94 (0.07)	2.00 (0.09)	1.79 (0.05)	(3,498)	1.16	0.007	-
Internalizing problems	0.12*	0.19**	-0.16**	-0.02	2.23 (0.09)	2.13 (0.07)	2.17 (0.07)	1.89 (0.04)	(3,498)	4.70*	0.028	H < D & NP
Academic skills	-0.12*	0.49**	0.27**	-0.12*	2.77 (0.14)	3.26 (0.11)	2.82 (0.13)	3.35 (0.06)	(3,474)	2.26 ⁻	0.014	-

Note. n = 548; sex (0 = girl, 1 = boy); NP = no participation, I = increasing, D = decreasing, H = high.

⁻ $p < 0.10$.

* $p < 0.01$.

** $p < 0.001$.

assessed in Kindergarten (externalizing problems, $\eta_p^2 = 0.280$; school readiness, $\eta_p^2 = 0.182$). When combined, these results suggest that internalizing problems may be less stable in childhood than externalizing problems and academic skills.

3.3. Moderating effect of disruptive behaviors

The Breadth trajectory \times Disruptive behaviors interaction was not significant for externalizing or internalizing problems ($V = 0.01$, $F(3, 544) = 0.43$, *ns*), nor for academic skills ($F(3, 544) = 1.76$, *ns*), which reveals that children's disruptive behavior status did not moderate the relationship between the breadth trajectories, and academic and behavioral indicators. The interaction remained non-significant after the covariates were included in the model.

4. Discussion

The main goal of this study was to examine whether academic and behavioral adjustment indicators in Grade 4 were related to trajectories of breadth of participation in organized activities modeled from Kindergarten to Grade 4. The findings confirmed our first hypothesis, revealing that assignment to the higher breadth trajectories was globally associated with better scores for academic and behavioral outcomes in Grade 4. However, no significant differences among the trajectory groups with regard to academic skills or externalizing problems persisted after their baseline levels in Kindergarten and some prior family variables were controlled for. Contrary to our second hypothesis, the associations observed between breadth trajectory membership, and academic and behavioral outcomes were not moderated by the children's disruptive behavior status.

4.1. Breadth trajectories and academic and behavioral outcomes

Having identified four heterogeneous trajectories of breadth of participation in organized activities from Kindergarten to Grade 4 in a previous study using the same participant sample (Aumètre & Poulin, 2016), we wondered whether trajectory membership might exert differential effects on child adjustment. On a theoretical level, being exposed to a wider range of skills, contexts, and people was thought likely to impact children's subsequent adjustment at some point. Accordingly, our findings revealed that children assigned to both the increasing and high trajectories were rated as more academically competent by their teachers in Grade 4. Furthermore, children assigned to the high trajectory displayed lower externalizing problems in Grade 4 than children assigned to the no participation trajectory, and lower internalizing problems than children assigned to both the no participation and decreasing trajectories. Previous findings have revealed that youths reporting organized activity participation of longer duration and higher intensity show better adjustment during childhood (Denault & Déry, 2014; Metsäpelto & Pulkkinen, 2012; Simoncini & Caltabionio, 2012). Greater breadth of participation during the adolescent years has also been associated with better adjustment (Denault & Poulin, 2009; Feldman & Matjasko, 2007; Fredricks & Eccles, 2006). The current study is the very first to yield empirical knowledge on the outcomes of breadth trajectories during childhood. Once the participants' sex, academic and behavioral adjustment levels in Kindergarten as well as mother's education were included as covariates in the analyses, only one significant result remained: children assigned to the high and stable trajectory exhibited lower internalizing problems than those assigned to the no participation and decreasing trajectories.

Beyond the associations previously reported between breadth trajectories and academic and behavioral outcomes in Grade 4, our most interesting finding lies in our subsequent examination of effect sizes, which revealed that, in our tested model (including child's sex, prior externalizing and internalizing problems in Kindergarten, and mother's education), breadth trajectories were in fact the strongest predictor of

internalizing problems in Grade 4. Several mechanisms may be involved. First, as previously stated by Mahoney et al. (2005), organized activities promote the acquisition of new skills, which may have an ensuing positive impact on children's sense of competence and global self-esteem. Children in higher breadth trajectories also likely have a better opportunity to develop an array of different skills given their simultaneous involvement in various activity domains over longer periods of time (Fredricks & Eccles, 2006). Furthermore, given that the context of organized activities typically involves positive relationships with other peers and responsible adults, children involved in a larger pool of activities are especially likely to benefit from numerous sources of emotional support and to enjoy greater feelings of belongingness across multiple activity contexts (Fredricks & Eccles, 2006; Mahoney et al., 2005). Vicarious learning could also be involved (Bandura, 1977). For instance, children may learn effective strategies for coping with their problems or distress from prosocial peers with whom they interact in the context of organized activities, which could prevent or reduce internalizing problems. On the other hand, the strongest predictors of academic skills and externalizing problems in Grade 4 were revealed to be prior academic and behavioral indicators (as measured in Kindergarten).

Thus, in our study, trajectories of breadth of participation in organized activities did not predict either externalizing problems or academic skills in Grade 4. Several hypotheses can be put forward to explain these results. On the one hand, it is possible that participating in a wider variety of organized activities has no real impact on externalizing problems or academic skills during childhood. For instance, externalizing problems and academic skills may be more stable and unchanging in childhood than internalizing problems, which would make them more difficult to alter over time. Therefore, some of the previous studies reporting benefits of organized activities with regard to academic skills and externalizing problems in childhood (Dumais, 2006; Simoncini & Caltabionio, 2012) may have captured a selection effect rather than actual outcomes of different trajectories of participation in organized activities. It is also possible that other dimensions of organized activities, not considered in the current study, (i.e., intensity, type, duration) may impact these variables whereas breadth does not. Indeed, recent findings lend support to this hypothesis, showing that higher intensity of participation was predictive of lower externalizing problems during childhood, even when behavioral adjustment in Kindergarten was controlled for (Denault & Déry, 2014). As for the lack of associations between breadth trajectories and academic skills in Grade 4 after the covariates were included, it may be that the breadth scores of our study participants were generally low (with 69.8 to 81.4% of children reporting simultaneous involvement in fewer than two organized activities). During adolescence, youths gain access to a wider range of activities (Fletcher et al., 2003) and their breadth scores generally tend to be higher (Busseri et al., 2006). This may help explain why greater breadth of participation has previously been linked to higher academic performance in adolescence whereas this was not the case in the current study. It could also be that more organized activities take place in the school setting during adolescence (Fletcher et al., 2003), which could in turn increase school engagement and therefore foster academic skills. On the other hand, it is possible that breadth of participation does indeed have an impact on these indicators, but that the method used in our study did not bring it out. Further research on these questions, using different methods, is needed.

As mentioned above, the participants' breadth scores in this study were generally low (very few students were reported to participate in two or more types of activities). In other studies, intensity of participation has been shown to vary a great deal from one individual to another during childhood (Denault & Déry, 2014; Hofferth & Sandberg, 2001; Mata & van Dulmen, 2012; Simoncini & Caltabionio, 2012). Thus, it is possible that intensity of participation is the most easily quantifiable dimension of participation in organized activities among children. Nevertheless, future studies should consider breadth of participation in

conjunction with intensity.

Several researchers have suggested that the benefits of organized activities are likely the result of individual and contextual factors preceding participation in such activities (selection effect; Covay & Carbonaro, 2010; Hofferth & Sandberg, 2001; Mata & van Dulmen, 2012). As such, better-adjusted children would be more likely to participate in organized activities than children experiencing difficulties. Our findings partially corroborate this hypothesis and highlight the need to account for the baseline levels of some individual and contextual variables in order to bring out the real contribution of organized activities to childhood adjustment as compared to other potential confounding variables. To ensure such a rigorous assessment, the use of a longitudinal design (where potential confounding variables are measured prior to the evaluation of participation in organized activities) as well as both the calculation and report of effect sizes are essential requirements. In any case, although our results partially support the selection effect hypothesis, it is important to note that the effect of the breadth trajectories on internalizing problems persisted even after the aforementioned covariates were included.

4.2. Investigating children's disruptive behavior status as a potential moderator

Academic and behavioral benefits were initially expected to be more obvious among children classified as “high-disruptive” in Kindergarten but our findings failed to support this hypothesis. Potential explanations abound. First, our measure of disruptive behaviors may not have allowed for proper testing of the postulated moderating effect. Children were classified into the “high-disruptive” or “low-disruptive” subgroups without referring to a validated clinical threshold. Second, a conceptual overlap between the moderator (disruptive behaviors) and at least one of the outcomes (externalizing problems) might explain why no moderating effect was found for this outcome. Third, there may in fact be no moderation or this effect may only show up later in life, such as during the adolescent years. Other variables may also exert a more sizeable moderating effect, for example, gross family income or socioeconomic status, both of which have previously been identified as moderators in the organized activities literature (Covay & Carbonaro, 2010; Crosnoe et al., 2015; Dumais, 2006). Fourth, it is possible that disruptive behaviors do in fact moderate the relationship between breadth of participation and other adjustment indicators that were not considered in this study, such as social competence, friendship quality or emotion regulation. Finally, disruptive behaviors may exert a moderating effect on the relationship between dimensions of participation in organized activities other than breadth (e.g., intensity, type of activity) and adjustment during childhood. For instance, some types of activities (e.g., sports) may provide greater benefits for children displaying high levels of disruptive behaviors compared to their counterparts. Mata and van Dulmen (2012) have suggested that parents of aggressive children may be more likely to enlist them in sports, considering this activity type a way for their children to channel their aggression. If children exhibiting high levels of disruptive behaviors do in fact tend to participate exclusively in sports activities, this could help explain the lack of a moderation effect in the current study, as it would reduce these children's breadth scores.

4.3. Strengths, limitations and future research directions

As previously stated, the current study has numerous methodological strengths, including the use of a five-year longitudinal design in which participation in organized activities was captured yearly (thus allowing for trajectory modeling) as well as the inclusion of baseline levels of targeted outcomes as covariates in the model, making the study more rigorous. It is, however, worth noting that this study also has some limitations. First, even though it is longitudinal, the design remains correlational, meaning that the directionality of the effects

cannot be ascertained (which is almost always the case in this literature). Second, our findings may not be easily generalizable given that (1) as a result of financial constraints, a substantial portion of the initial sample was excluded from the research project, thus decreasing the number of participants, and that (2) the sample was quite homogeneous in terms of sociodemographics (mainly originating from Quebec, all French-speaking). Third, missing data for outcomes in Grade 4 were handled using listwise deletion, a technique that is inherently biased, and may have limited the generalizability of our results. However, this technique remained the best option for this study.

In terms of future research directions, we find it relevant to underline once again that the current study only focused on one dimension of organized activity participation, namely breadth, whereas previous studies using adolescent samples examined several dimensions simultaneously. For instance, Viau and Poulin (2015) examined activity portfolios (types) as well as both intensity and duration of participation in late adolescence (ages 14–17). Furthermore, some recently developed data analytic methods such as latent class analyses (LCA; Lanza, Collins, Lemmon, & Schafer, 2007), joint trajectories (Muthén & Muthén, 2007) and latent transition analyses (LTA; Collins & Lanza, 2013) could facilitate the task of researchers when it comes to the simultaneous examination of multiple dimensions of participation. Such methods could clarify the specific outcomes associated with each dimension. Associations between breadth scores, and externalizing problems and academic skills could also be re-examined with another sample. Moreover, other potential moderators such as school readiness and academic adjustment issues could be tested. Potential mediators between breadth trajectories and internalizing problems, such as the sense of competence experienced when performing the activity, and the quality of the relationships formed with organized activity peers and adult leaders, should also be studied. Finally, participation in organized activities during the preschool years has received very little attention despite the fact that such activities are often available and enrolled in before Kindergarten.

4.4. Conclusions and practical implications

The findings of the current study suggest that greater breadth of participation in organized activities may hold promise when it comes to preventing internalizing problems during childhood. Our results add to previous studies reporting other benefits of participation in organized activities, such as higher social competence, lower behavioral problems (Denault & Déry, 2014; Howie et al., 2010; Simoncini & Caltabiono, 2012) and higher academic performance (Covay & Carbonaro, 2010; Crosnoe et al., 2015). When combined, these results really do highlight the potential contribution of organized activities with regard to preventing subsequent adjustment issues. Furthermore, unlike targeted intervention where access is typically limited to at-risk children, organized activities are open to all, making them a less stigmatizing intervention strategy (Denault & Déry, 2014). As these activities are also associated with play, they may encourage commitment among children while promoting the retention of new skills and their generalization to other contexts (Lieberman, 1977; Piaget, 1999). Parents and educators should be informed of the associations between participation profiles and psychosocial outcomes to increase awareness of the benefits of enrolling children in such activities. Moreover, Fletcher et al. (2003) pointed out that access to organized activities remains limited during childhood since most activities are provided in the community rather than at school, increasing both costs and driving time for parents. This portrayal matches our assessment of the situation in Quebec (Denault & Déry, 2014) and again supports our selection effect hypothesis. Since the children in our sample were more likely to come from intact families with higher annual incomes and higher levels of education, they may have had greater opportunities to engage in organized activities. In order for all children to gain access to organized activities, these activities could be provided within the school system as both prevention

and positive youth development programs.

Acknowledgements

This work was supported by research grants from the Social Sciences and Humanities Research Council of Canada [Grant 410-2005-1195], the Canadian Institutes for Health Research [Grant 6840-94081], and the Fonds de Recherche du Québec - Société et Culture [Scholarship 184845]. The authors also wish to thank the teachers, parents, and children who participated in this study.

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