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**Leisure participation–preference congruence of children with cerebral palsy: a CAPE International Network descriptive study**

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## **PUBLICATION DATA**

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## **ABBREVIATIONS**

CAPE Children's Assessment of Participation and Enjoyment

GMFCS Gross Motor Function Classification System

PAC Preferences for Activity of Children

[Abstract]

**AIM** To examine participation–preference congruence, regional differences in participation–preference congruence, and predictors of whether children with cerebral palsy participate in preferred activities.

**METHOD** The sample ( $n=236$ ) included 148 males and 88 females aged 10 to 13 years, living in Victoria, Australia ( $n=110$ ), Ontario ( $n=80$ ), or Quebec ( $n=46$ ), Canada. Ninety-nine (41.9%) were classed as having Gross Motor Function Classification System level I cerebral palsy; 89 (37.7%) had level II/III cerebral palsy; and 48 (20.3%) had level IV/V cerebral palsy. Participants completed the Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activity of Children (PAC) questionnaires. Regional comparisons were performed using one-way analyses of variance and exploration of factors influencing participation–preference congruence using multiple linear regression.

**RESULTS** The proportion of children doing non-preferred activities in each activity type was generally low (2–17%), with only one regional difference. Higher proportions were not doing preferred active physical (range 23.2–29.1% across regions), skill-based (range 21.7–27.9% across regions), and social activities (range 12.8–14.5% across regions). Gross Motor Function Classification System level was the most important predictor associated with not doing preferred activities.

**INTERPRETATION** Children with cerebral palsy did not always participate in preferred active physical and skill-based activities. Understanding discrepancies between preferences and actual involvement may allow families and rehabilitation professionals to address participation barriers.

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Participation–preference Congruence *Christine Imms et al.*

#### **What this paper adds**

- Few regional differences in participation–preference congruence were evident.
- More participation in active physical and skill-based activities was desired.
- Greatest participation–preference discrepancy occurred at Gross Motor Function Classification System Levels IV/V.

[Main text]

Cerebral palsy is a disorder of movement and posture that commonly leads to secondary impairments and activity limitations.<sup>1</sup> As a consequence, children with cerebral palsy may experience restricted participation, owing to physical, social, and attitudinal barriers,<sup>2,3</sup> and this may lead to feelings of isolation from peers and communities.<sup>4</sup> Because cerebral palsy is a lifelong condition, self-management, health promotion, and prevention of secondary disability are important foci of families, as well as health and educational professionals.

The World Health Organization defines participation as ‘involvement in a life situation’.<sup>5</sup> Leisure participation, the focus of this paper, is defined as involvement in activities of rest, recreation, enjoyment, and social and community engagement, undertaken with others and on one’s own.

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Preference can be defined simply as a greater liking for one alternative over another,<sup>6</sup> or, more theoretically (in the paediatric rehabilitation context), as the ‘subjective elements of how people explain their participation’.<sup>7</sup> Preferences are both personal and cultural, and are moderated by objective opportunities to participate.<sup>7</sup> Understanding preferences for leisure participation of children with disabilities, and the extent to which they are able to participate in preferred leisure pursuits, is important because preference-based participation promotes learning, knowledge of self, and a sense of mastery.<sup>8</sup> Prior research has also demonstrated that preferences are an important predictor of participation in leisure.<sup>9–11</sup> Because leisure participation is reported to provide fulfilment, friendship, and a sense of belonging, it is also an important avenue for development of self-determination.<sup>12</sup>

Few studies have investigated whether children with cerebral palsy take part in their preferred leisure activities. Bult et al. found that children with disabilities participated in fewer recreation and leisure activities than children with typical development<sup>13</sup>; however, neither group was doing activities for which the children expressed high preferences. The highest discrepancy scores, for both groups, were observed in the active physical and skill-based activity types of the Children’s Assessment of Participation and Enjoyment (CAPE) and Preferences for Activity of Children (PAC). Discrepancies varied by age and sex for children without impairment but not for those with disabilities. Bult et al. also found that children with disabilities had lower preferences for active physical and social activities than children without disabilities.<sup>13</sup> This may reflect that people devalue what they are not good at, but it remains an important finding as past participation experiences predict future preferences and motivations.<sup>8,14,15</sup>

The purpose of this study was to explore participation–preference congruence for children with cerebral palsy living in three different regions: Ontario and Quebec (Canada), and Victoria (Australia). The aim was to determine the extent to which children with cerebral palsy do what they like, and like what they do, and to examine regional differences to determine whether varying community or cultural differences are apparent. Regional differences between Ontario, Quebec, and Victoria were explored as homogeneity could not be assumed between regions in terms of recreational, health, and educational services, because each are funded provincially in Canada, and both nationally and locally in Australia. The potential variation based on funding sources, and language and cultural differences between Ontario and Quebec may influence service availability and/or opportunities and thus outcomes. In addition to

investigating regional differences, we explored the influence of available child and family variables on whether children were participating in their preferred activities.

## **METHOD**

### **Design**

Secondary data analyses using de-identified data aggregated from three descriptive studies were undertaken to meet the study aims. Our research questions were as follows: (1) to what extent are children taking part in their most preferred activities? (2) To what extent are children taking part in their least preferred activities? (3) Is there evidence of regional difference in participation–preference congruence? (4) To what extent are child and family variables associated with participation–preference congruence scores?

### **Ethics**

Each study that contributed data to this study had ethical approval for the conduct of the original study, including meeting the requirements related to consent, and for the conduct of the currently reported study (see ‘Acknowledgements’ for details). As this study involved secondary data analyses, obtaining additional consent from the participants was not possible; therefore, only de-identified data were aggregated.

### **Participants**

The combined dataset contained information from 236 children with cerebral palsy aged 10 to 13 years from Victoria, Australia ( $n=110$ ), and Ontario ( $n=80$ ) and Quebec, Canada ( $n=46$ ). Eligible participants had completed both the CAPE and the PAC (Table I).<sup>16</sup> Recruitment procedures and eligibility for each study have been previously reported.<sup>3</sup> Only children aged 10 to 13 years were included in this CAPE International Network study, as there were no children from Victoria outside this age range. No children from the US study sites were included, because PAC data were not collected.

### **Measures**

The CAPE and PAC are questionnaires, designed for use by children aged 6 to 21 years, which ask about the activities undertaken over the previous 4 months. For each of 55 included

activities, participants are asked if they do the activity (yes/no: measuring diversity or range of activities done); the frequency of participation; where and with whom the activity is undertaken; and extent of enjoyment of the activity. For this study, only diversity scores were used in the calculation of the participation–preference congruence scores. The PAC measures preference by asking how much the child would like to do each of the 55 activities, given a choice: ‘If you could do anything in the world, would you like to be doing...’. PAC scores range from 1 (‘I would not like to do at all’) to 3 (‘I would really like to do’).

In addition to CAPE and PAC scores, common variables in the datasets included child age, sex, Gross Motor Function Classification System (GMFCS) level,<sup>17</sup> family income, parental education, and number of parents/caregivers. As previously described,<sup>3</sup> for the Ontario dataset, which did not collect the GMFCS levels, a valid proxy variable was created based on items from the Activities Scale for Kids.<sup>18</sup> Family income and education was measured using five categories (based on annual household income and highest household educational attainment) corresponding to the Australian Economic Resources and Education and Occupation Indices.<sup>19</sup> In this study, two child (GMFCS level and sex) and two family (income and parental education) variables were assessed for their influence on the participation–preference congruence scores. These variables were chosen because they were available in the combined data set and have previously been shown to be important predictors of participation.<sup>20</sup>

## **Analyses**

Descriptive statistics were computed for CAPE diversity scores and PAC scores for each of the five activity types. ‘Not doing preferred activities’ was defined as items in which the CAPE diversity score was 0 (‘did not do the activity’) and the PAC preference score was 3 (‘would really like to do the activity’). ‘Doing non-preferred activities’ was defined as items in which the CAPE diversity score was 1 (‘did do the activity’) and the PAC preference score was 1 (‘would not like to do at all’). For each participant, the proportion of CAPE items that met the criteria ‘not doing preferred activities’ and ‘doing non-preferred activities’ were computed for each activity type. A proportion of 0 indicated that there were no activities in the activity type that the child would not like to do (i.e. PAC scores 3) and was participating in them all, indicating total congruence between participation and preference. A proportion of 1 indicated that the child was

not participating in any of the activities in the activity type but would like to do them all, indicating total incongruence between participation and preference.

Proportions of children in each region with participation incongruence – that is, not doing preferred and doing non-preferred activities – were calculated for each activity in CAPE's five activity types: recreational; active-physical; social; self-improvement; and skill-based. Regional comparisons of incongruence were undertaken using analysis of variance. The role of child and family characteristics as determinants of a child-specific measure of participation–preference congruence were examined for the whole sample, using activity type congruence scores. Four predictors were considered: parental education, family income, GMFCS level, and sex. As this was an exploratory study, all available variables were considered; none were specifically identified as potential confounders. Initially, the effect of each predictor on the activity-preference congruence score was investigated (univariate analyses). Using a Bonferroni correction to account for multiple tests (five activity types  $\times$  four predictors) and with a global type I error rate of 5%,  $p$ -values less than 0.003 were used to identify differences in participation–preference congruence among groups. The interaction plots, along with the univariate analyses, guided the regression analyses that aimed to build models to determine whether, and how, the predictors affected participation–preference congruence. The most important predictor from the univariate analysis was the starting point, and other predictors were added to the regression model if they were statistically significant (i.e.  $p < 0.003$ ).

## RESULTS

### Not doing preferred activities

Figure 1 (left-hand side) shows the individual CAPE/PAC items grouped according to activity type, and presents the proportions of children that were not doing preferred activities. These data show high variation, with up to 50% of the participants indicating they were not doing active physical, skill-based, and social activities they would prefer to be doing, and up to 25% of participants not doing self-improvement activities they preferred. The fewest discrepancies were observed in the recreational activity type.

The pattern of responses across the regions was very similar: there was no evidence of a difference between the regions in the proportion of children indicating they were not doing activities for which they had a high preference (all  $p > 0.050$ ). However, in each region, high

proportions of children indicated that they were not doing active physical (Victoria: 29.1%; Ontario: 28.5%; Quebec: 23.2%), skill-based (Victoria: 23.4%; Ontario: 27.9%; Quebec: 21.7%), and social (Victoria: 14.5%; Ontario: 12.9%; Quebec: 12.8%) activities they would prefer to be doing (see Fig. S1, online supporting information).

### **Doing non-preferred activities**

The data displayed in Figure 1 (right-hand side) demonstrate that relatively few (0–12%) children were doing non-preferred recreational, active physical, social, and skill-based activities. In contrast, up to 58% were doing self-improvement activities they did not prefer. The overall pattern of responses was similar in each region, with low proportions of children doing non-preferred recreational, active-physical, social and skill-based activities (see Fig. S2). There was evidence that a higher proportion of children from Ontario take part in self-improvement activities they do not prefer (Victoria: 10.7%; Ontario: 16.7%; Quebec: 10.7% [ $p=0.006$ ]). For the most part, the activities within this activity type demonstrating greatest regional variation were homework and chores.

### **Characteristics associated with not doing preferred activities**

Models of predictors for not doing preferred activities were developed using regression for each activity type (Table II). For self-improvement activities, there was no evidence that the included independent variables were predictors of participation–preference congruence. For recreational activities the most important predictor was GMFCS level ( $F_{(2,233)}=20.0$ ,  $p\leq 0.001$ , adjusted  $R^2=0.139$ ), with children at GMFCS level IV/V identifying a higher proportion of preferred activities they were not doing (11.7%) compared with those at GMFCS level I (5.1%). GMFCS level was also a significant predictor of participation–preference congruence in active physical activities ( $F_{(2,233)}=3.61$ ,  $p=0.029$ , adjusted  $R^2=0.03$ ): children at GMFCS levels IV/V had a higher proportion of activities they preferred that they were not participating in (33.8%) than those in the reference group (level I [24.5%]).

The model for social participation–preference congruence indicated that GMFCS and income were important: children at GMFCS levels IV/V had poorer participation–preference congruence than children at GMFCS level I [ $F_{(2, 233)}=5.7$ ,  $p=0.004$ , adjusted  $R^2=0.038$ ]. Although not an important predictor alone, the interaction between having a very low income and GMFCS

level was significant, indicating that children at GMFCS level IV/V in families with low income (<\$15 000) participated, on average, in 17.2% fewer social activities than they would prefer, relative to those with higher family income (adjusted  $R^2=0.048$ ,  $p=0.006$ ).

The model for participation–preference congruence in skill-based activities found that both females and those at GMFCS level IV/V were doing fewer skill-based activities than they would like to [ $F_{(3, 232)}=6.1$ ,  $p=0.001$ , adjusted  $R^2=0.061$ ]. In percentage terms, females were doing 26.8% fewer preferred activities than males, who were doing 17.2% fewer preferred, and those at GMFCS level IV/V were doing 27.2% fewer preferred activities than those at GMFCS level I, who were doing 17.2% fewer.

## DISCUSSION

This study's exploration of participation–preference congruence in children with cerebral palsy across three regions demonstrated more similarities than differences. In particular, a relatively high proportion of children with cerebral palsy were not doing their preferred activities, and this was especially true for active-physical, skill-based, and social activities. There was no evidence of regional variations, suggesting this is a consistent experience that may be indicative of barriers to participation in each region. Bult et al. also found high proportions of children with and without cerebral palsy were not taking part in preferred activities.<sup>13</sup> Direct comparisons with their data are complicated by differing methods of determining participation–preference congruence. Despite this, similar patterns were found, with higher proportions of discrepancy found in active-physical, skill-based, and social activities than in recreational and self-improvement ones. Bult et al. also demonstrated that, although children with cerebral palsy participated at a different level than those without cerebral palsy, they had similar preferences and there was little evidence of differences in their discrepancy scores. This finding suggests that the experience of barriers to desired participation is a common experience for all children, perhaps related to family-level values, activity preferences, and parenting styles. Despite the similar discrepancy scores, the overall lower level of participation of children with impairments heightens the importance of the issue for them.

The lack of differences between regions suggests that these Western, high-income regions were not sufficiently different from each other to influence children's participation–preference congruence. This finding also suggests that other variables, such as those related to

the close environment – that is, the context (people, place, objects, activity, time)<sup>21</sup> in which the participation takes place, or within-person variables such as self-determination – are more important. These contextual and personal factors are likely to contribute to the high variance seen in the congruence scores (Table I) and would benefit from further research.

Regional variations were found in participation–preference congruence related to children doing non-preferred activities. In particular, variation in incongruence was evident, with higher proportions of children in Ontario undertaking self-improvement activities they did not prefer in comparison with the other regions. The Ontario data also demonstrated higher preferences and higher participation diversity in self-improvement, suggesting increased access to self-improvement activities, which, in turn, may reflect variations between the regions in parent values, school structures and programmes, or social expectations.

Severity of activity limitations as represented by three groups of GMFCS level (I, II/III, and IV/V) was an important predictor in each activity type, except self-improvement activities. The finding of no influential variables in self-improvement activities may be owing to the restricted range of scores, in that few children identified that they wanted to do more of these activities, which in itself may reflect the age group of the children and/or that these activities may be managed by parental values and expectations. For all the other activity types, children who were classified as GMFCS level IV/V indicated a higher proportion of activities in which they were not participating but would like to than children of level II/III or I. This finding is likely reflective of the barriers imposed by increased limitations experienced by these children, which might influence physical, cognitive, and communicative skills. This finding reinforces the need for improved mechanisms that support access to and engagement in a variety of activities across the activity types for children of all abilities as an important goal of all health and human services.

The finding that both GMFCS level and low family income influenced social participation–preference congruence is an important indicator of the compounding effect of multiple disadvantages. Families with few resources have expressed increased difficulty with family social participation.<sup>22</sup> These families’ perspectives and experiences highlight the importance of flexible supports that enable the whole family where there are children with complex impairments. Under-resourced families in which there is a child with complex or severe

disability are frequently excluded or missing from research. Further research is recommended to investigate how to best support positive outcomes in this group.

Effects of sex were only evident in relation to skill-based participation–preference congruence, where females were found to participate in fewer of their preferred activities. This finding might be influenced by the higher preference for this type of activity by females,<sup>23</sup> who perhaps then experience similar levels of opportunity as males. Engagement in preferred activities where there are opportunities for skill development is likely to be important to the development of self-efficacy.<sup>8</sup> Thus, families and health professionals may need to seek ways to assist girls to bridge this gap between preferences and participation, and potentially to assist boys to establish stronger preferences for skill-based activities.

Addressing participation restrictions is a major focus of rehabilitation. In particular, rehabilitation efforts should support children in finding and accessing positive activity niches – the patterns of activities they wish to pursue and in which they can develop competency and friendships, find support and meaning, and develop knowledge of self and a sense of mastery. Niches are conceptually similar to social contexts,<sup>21,24</sup> and refer to the experienced setting in a larger environment in which people, places, activities, and objects come together in time.<sup>21</sup> These contexts can be experienced as positive, negative, or neutral, and thus play a role in the development of preferences. In addition, not all contexts or niches are available to all children: some are culturally specific and others are more or less open, depending on the characteristics of the child, as well as the context and wider environment.<sup>24</sup> Contexts for children with impairments might also include the presence of adults, such as aides or assistants, which may, in turn, influence the participation experience. Further research on participation contexts is necessary because it is highly likely that changing any one aspect (i.e. the people, place, activity, objects, time in which participation occurs<sup>21</sup>) may affect the participation experience and outcome.

The transactional relationships between preferences, participation, competence, and self-concepts, including self-efficacy and self-determination,<sup>25</sup> place considerable importance on the need for greater understanding of where, and how, to intervene to promote optimal participation experiences and outcomes, particularly for those children with significant impairments. This might involve seeking alternate activities that match the overall preferences of the individual if specific activities cannot be undertaken. Improved understanding of participation–preference

congruence for children with and without disability will assist our understanding of potential barriers as mediating or moderating variables which may vary between these populations.<sup>13</sup>

### **Study limitations and future directions**

Although the inclusion of a narrow age range of children (those aged 10y–13y) allowed a detailed analysis of one age group, it is also a limitation. The experiences of younger and older children may differ; research that examines participation–preference congruence in a broader age range is warranted. Further research should also capture a broader range of potential influential factors on participation–preference congruence to address the following questions: what is the relative contribution of the children’s perspectives compared with their families’ perspectives? How do other variables, such as the context in which the activities occur, influence congruence between interests and participation? How do preferences co-vary with participation opportunities? How do past experiences and present affordances of contexts/niches affect preferences? Of particular interest is the role of high participation–preference congruence in contributing to the development of core outcomes such as autonomy and self-regulation.

Design limitations include the cross-sectional nature of data, the use of truncated GMFCS classifications and unequal distribution of children in GMFCS level among the regions, and secondary data that precluded collection of important independent variables. The primary studies were conducted prior to the development of a classification of functional communication, and so these data are not available. In addition, findings may not be generalizable to low-resource areas. Despite these identified limitations, the strengths of this paper include the relatively large sample that provided the opportunity to consider the participation–preference congruence of children with cerebral palsy in three regions of two countries. Longitudinal datasets that are sufficiently large to enable person-based analytical approaches will provide more robust estimates of participation outcomes and influences. This more sophisticated approach to addressing participation issues is likely to contribute important knowledge to contemporary models of human development.<sup>26–28</sup>

### **CONCLUSION**

This study found relatively high levels of congruence between what children with cerebral palsy want to do outside mandated school and what they actually do: in particular, they were typically

not doing activities for which they indicated no particular preference. However, there were some discrepancies, and evidence that the children with the most severe mobility limitations experienced the greatest discrepancy between their personal preferences for participation and their actual participation. Given that participation should not be predicated on activity competence, this suggests the presence of barriers to participation in each of the geographic regions studied.

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## **SUPPORTING INFORMATION**

The following additional material may be found online:

**Figure S1:** Regional differences in proportions of children not doing preferred activities by activity type.

**Figure S2:** Regional differences in proportion of children doing non-preferred activities by activity type.

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**Table I:** Participant characteristics

	Victoria (n=110)	Ontario (n=80)	Quebec (n=46)	Total (n=236)
Sex				
Male	64 (58.2)	55 (68.8)	29 (63.0)	148 (62.7)
Female	46 (41.8)	25 (31.2)	17 (37.0)	88 (37.3)
GMFCS				
Level I	26 (23.6)	43 (53.8)	30 (65.2)	99 (41.9)
Level II/III	52 (47.3)	28 (35.0)	9 (19.6)	89 (37.7)
Level IV/V	32 (29.1)	9 (11.2)	7 (15.2)	48 (20.3)
Family income (\$) <sup>a</sup>				
< 15 000	12 (11.0)	2 (2.6)	6 (13.6)	20 (8.7)

15 000–44 000	42 (38.5)	33 (42.9)	21 (47.7)	96 (41.7)
45 000–59 000	24 (22.0)	17 (22.1)	7 (15.9)	48 (20.9)
60 000–74 000	26 (23.9)	8 (10.4)	10 (22.7)	44 (19.1)
75 000–99 000	5 (4.6)	17 (22.1)	0 (0)	22 (9.6)
Parental education <sup>b</sup>				
Less than high school	11 (10.1)	3 (3.8)	2 (4.4)	16 (6.9)
Completed high school	51 (46.8)	19 (24.1)	14 (31.1)	84 (36.1)
Completed college/some university	27 (24.8)	34 (43.0)	13 (28.9)	74 (31.8)
Completed university	15 (13.8)	23 (29.1)	12 (26.7)	50 (21.5)
Graduate degree	5 (4.6)	0 (0)	4 (8.9)	9 (3.9)
Mean (SD) CAPE diversity scores <sup>c</sup>				
Recreational (range 0–12)	7.9 (2.4)	9.7 (1.7)	8.2 (2.2)	
Active Physical (range 0–13)	2.4 (1.5)	3.8 (1.6)	3.3 (1.6)	
Social (range 0–10)	6.6 (1.5)	7.1 (1.6)	6.6 (1.5)	
Skill-based (range 0–10)	2.2 (1.4)	2.2 (1.4)	2.2 (1.4)	
Self-improvement (range 0–10)	4.7 (2.2)	6.5 (1.8)	5.6 (2.1)	
Mean (SD) PAC scores (range 1–3) <sup>c</sup>				
Recreational	2.3 (0.4)	2.4 (0.3)	2.3 (0.4)	
Active physical	2.2 (0.4)	2.4 (0.4)	2.2 (0.5)	
Social	2.6 (0.4)	2.7 (0.3)	2.6 (0.4)	
Skill-based	2.1 (0.5)	2.1 (0.5)	2.0 (0.5)	
Self-improvement	1.9 (0.5)	2.1 (0.5)	2.0 (0.6)	
Mean (SD) participation–preference congruence scores (range 0–1) <sup>c</sup>				
Recreational	0.10 (0.13)	0.07 (0.10)	0.09 (0.09)	
Active physical	0.29 (0.21)	0.28 (0.19)	0.23 (0.20)	
Social	0.15 (0.14)	0.13 (0.14)	0.13 (0.13)	
Skill-based	0.23 (0.22)	0.28 (0.23)	0.22 (0.20)	
Self-improvement	0.08 (0.13)	0.10 (0.13)	0.08 (0.14)	

Data are *n* (%) unless otherwise indicated. Family income and education was measured using five categories (based on annual household income and highest household educational attainment) corresponding to the Australian Economic Resources and Education and Occupation Indices. GMFCS, Gross Motor Function Classification System; SD, standard deviation; CAPE,

Children's Assessment of Participation and Enjoyment; PAC, Preferences for Activities of Children. <sup>a</sup>  $n=230$ . <sup>b</sup>  $n=233$ . <sup>c</sup> All participants provided sufficient data to calculate domain scores for each activity type according to the CAPE/PAC manual (i.e.  $\geq 80\%$  of data available).

**Table II:** Characteristics that predict whether children are doing their preferred activities

	Unstandardized estimate	Standard error	t-value	Pr (>  t )	Adjusted $R^2$ (p)
Recreational					
Intercept	0.051	0.011	4.831	0.000	0.139 ( $\leq 0.001$ )
GMFCS II/III	0.029	0.015	1.889	0.060	
GMFCS IV/V	0.117	0.019	6.293	0.000	
Active physical					
Intercept	0.245	0.020	12.294	0.000	0.030 (0.029)
GMFCS II/III	0.036	0.029	1.253	0.212	
GMFCS IV/V	0.093	0.035	2.679	0.008	
Social					
Intercept	0.122	0.014	8.665	0.000	0.048 (0.006)
GMFCS II/III	0.003	0.020	0.158	0.875	
GMFCS IV/V	0.059	0.024	2.424	0.016	
Low income	-0.021	0.042	-0.506	0.613	
GMFCS II/III/low income	-0.015	0.074	-0.206	0.837	
GMFCS IV/V/low income	0.173	0.081	2.130	0.034	
Skill-based					
Intercept	0.172	0.024	7.174	0.000	0.061 (0.061)
Female	0.096	0.029	3.362	0.001	
GMFCS II/III	0.049	0.031	1.573	0.117	
GMFCS IV/V	0.100	0.037	2.657	0.008	

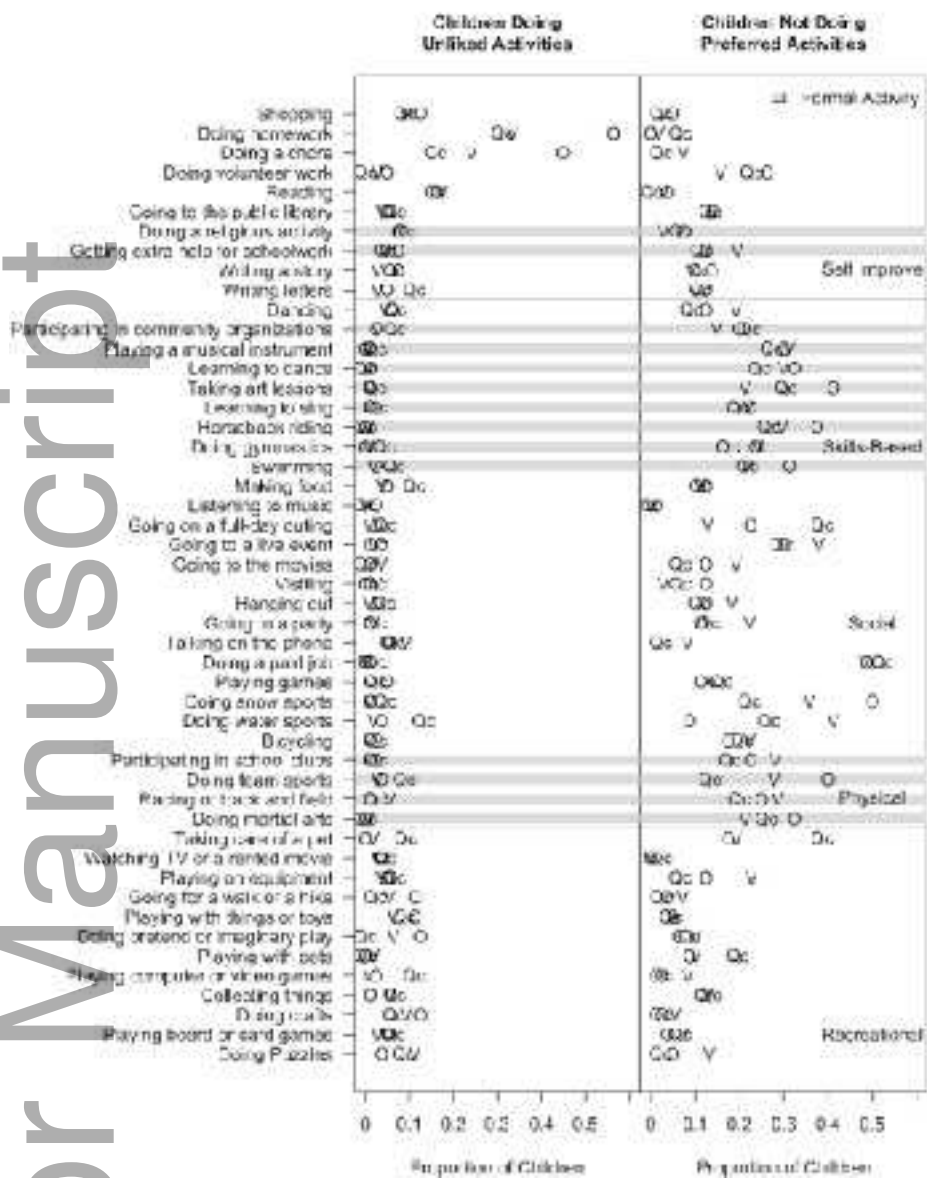
Dependent variable is the participation–preference congruence score, which ranges from 0 to 1, where 0 indicates there are no activities in the activity type that the child would like to do, but is not; and 1 indicates that the child is not participating in any of the activities and would like to do them all. No data presented for self-improvement activities as no independent variables demonstrated significant univariate relationships with the outcome. Regression models including variables with missing data ( $n=3$  parental education;  $n=6$  parental income) were removed from

analyses including those variables. Only variables with statistically significant effects are reported (i.e.  $p < 0.002$ ). GMFCS, Gross Motor Function Classification System.

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**Figure 1:** Incongruence scores displayed as proportion of children not doing preferred activities (left) and doing non-preferred activities (right) in each activity type. This scatter plot displays the incongruence scores for individual items on the  $y$ -axis grouped according to the five activity types. The  $x$ -axis shows the proportion of children not doing preferred activities. Each row of responses represents an item in each activity type. V, Victoria; O, Ontario; Qc, Quebec.

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