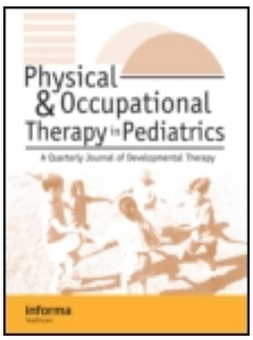

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The Assessment of Preschool Children's Participation: Internal Consistency and Construct Validity

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ABSTRACT. Participation in activities provides the means for young children to learn, play, develop skills, and develop a sense of personal identity. The Assessment of Preschool Children's Participation (APCP) is a newly developed measure to capture the participation of children aged 2 to 5 years and 11 months in the areas of play, skill development, active physical recreation, and social activities. Data from a clinical trial involving 120 children with cerebral palsy indicated that the APCP has moderate to very good internal consistency. The measure distinguishes between children below or above 4 years of age across levels of the Gross Motor Classification System, and between income levels below or above the median regional income range. The APCP, with a focus on preschool children, has potential use for assessment and identification of activity areas in which the child is participating and areas in which participation may be restricted.

KEYWORDS. Cerebral palsy, leisure and recreation, play, playfulness, psychometric testing

Participation is defined by the World Health Organization (WHO) as "involvement in a life situation" (World Health Organization, 2001, p. 10). In addition, Coster and Khetani (2008, p. 643) suggested that life situations are "sets of organized sequences of activities directed toward a personally or socially meaningful goal." Participation in activities is the context in which young children learn, form friendships, develop skills and competencies, express creativity, and develop a sense of personal identity (Coatsworth, Palen, & Sharp, 2006).

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A majority of the recent research regarding the participation of children with disabilities has focused on children over the age of 6 years. There has been little research about the participation of preschool children, particularly research focusing on the measurement of sets of activities. A challenge in studying participation for children under 6 years of age is the lack of validated measures of the participation for preschool children. Such measures have potential use to identify patterns of participation for activities for both families and service providers.

The Assessment of Preschool Children's Participation (APCP) (King, Law, Petrenchik, & Kertoy, 2006c) is a newly developed measure designed to capture the activity participation of children aged 2 to 5 years and 11 months. The purpose of this paper is to provide data regarding psychometric properties of the APCP among children with cerebral palsy. More specifically, we examined the internal consistency and construct validity of the APCP by conducting an item analysis and testing group differences in participation using variables that are known to be related to the construct of childhood participation. To further establish validity, we examined the association between number of health conditions in addition to cerebral palsy with levels of participation diversity and intensity across all activity types/domains.

BACKGROUND INFORMATION

The participation of children in everyday activities is associated with the cultivation of children's social relationships, the development of essential skills and competencies (Larson & Verma, 1999; Mahoney, Larson, & Eccles, 2005), and the promotion of mental, physical, and behavioral health (Sandler, Ayers, Suter, Schultz, & Twohey-Jacobs, 2004; Wright & Masten, 2005). The preschool years are particularly important for development across all areas, as development is impacted significantly by a child's participation in everyday social and solitary activities.

Dunst, Hamby, Trivette, & Raab (2002) examined participation in family and community activities of preschool children from birth to 6 years who had or were at risk for a developmental delay. Using family and community surveys with over 1,400 parents, they found that children participated in a large range of activities, with considerable variability in individual participation patterns. The percentage of children participating in different types of activities increased in a linear fashion as children got older.

The participation of preschool children with disabilities has not been studied in depth, as most research has focused on measurement of body function and structure (e.g., reaching, range of motion, eye–hand coordination) or activity limitations (e.g., ability to hold a spoon independently, putting on clothes, or undo buttons). Simeonsson et al. (2003) wrote about the need to develop and test measures that reflect the broad content of the new International Classification of Functioning, Disability and Health (ICF) (WHO, 2001). They identified 14 measures commonly used in pediatric rehabilitation, the majority of which focused on assessment of functional and developmental areas rather than participation. Over the past decade, there has been substantial development of health-related quality-of-life measures for children, but less development of measures focused specifically on the participation domain of the ICF. As well, there are several assessments of preschool play skills, which include only one area of participation such as outdoor play.

The Lifestyle Assessment Questionnaire (LAQ) (Jessen, Colver, Mackie, & Jarvis, 2003) is an assessment designed to measure the impact of disability across the participation domains of communication, mobility, self-care, domestic life, social and civic activities, and family impact. The LAQ has been used to assess impact of disability in two studies of children 5 years of age (Forsyth, Colver, Alvanides, Woolley, & Lowe, 2007; Welsh, Jarvis, Hammal & Colver, 2006), but is predominantly used for assessment in research with children aged over 5 years. The Functional Independence Measure for Children (Wee-FIM) (Msall et al., 1994) and the Pediatric Evaluation of Disability Inventory (PEDI) (Haley, Coster, Ludlow, Haltiwanger, & Andrellos, 1992) are the most commonly used assessments in preschool intervention studies for children with rehabilitation needs. Both of these assessments focus on the level of performance and include items related to mobility, self-care, and social functioning, but do not include broader sets of activities that comprise preschool participation such as play and community activities.

One preschool participation assessment, which has been developed and is currently undergoing psychometric testing, is the Preschool Activity Card Sort (PACS) (Berg & LaVesser, 2006; Stoffel & Berg, 2008). The PACS is designed to be used to set intervention goals for children 3 to 6 years of age. The PACS covers six domains using 85 activity cards. The assessment uses photographs of childhood activities across the domains of self-care, community mobility, leisure, social interaction, domestic chores, and education. Through this assessment, parents use the activity photographs to identify the activities in which their child participates and five activities for which they wish occupational therapy services. The PACS has been translated and tested in Spanish (Stoffel & Berg, 2008) and the English version demonstrated that it discriminated between preschool children with and without autism (LaVesser & Berg, 2011).

The APCP is a measure designed to document children's participation in day-to-day activities. The APCP is modeled after the Children's Assessment of Participation and Enjoyment (CAPE) (King et al., 2004), which uses drawings of everyday activities to ask parents and children about the nature and frequency of participation in recreational, active physical, social, skill-based, and self-improvement activities during non-school hours. The APCP includes 45 drawings of everyday activities in the areas of play, skill development, active physical recreation, and social activities. Parents are asked to identify activities their child has participated in during the past 4 months and how often they did them. In developing the APCP, we recognized that the participation of preschool children is significantly influenced by their family and the participation choices that parents make. While preschool children can make choices about activities, these choices are based on what is available to them in settings typically structured by adults. Thus, the participation of preschool children is often a reflection of their family's participation choices, child-care needs, and opportunities available within the child's immediate environment.

Findings from previous research on childhood participation guided the development of hypotheses regarding construct validity of the APCP. In a sample of preschool children without disabilities, researchers found evidence of age-related differences in participation across groups of children at risk or with a developmental delay (Dunst et al., 2002). Studies of preschool children with cerebral palsy have found several predictors of participation, including severity of impairment (Forsyth

et al., 2007), the level of cognitive, motor, and communicative functioning, and families' district of residence (Hammal, Jarvis & Colver, 2004). Among children aged 6 years and older with a disability, participation differences have been found to be significantly influenced by a child's age (Law et al., 2006), sex (King, Law, Hurley, Petrenchik, & Schwellnus, 2010), functional ability (King et al., 2006a; Majnemer et al., 2010; Palisano et al., 2009, level of family income (Law et al., 2006), child preferences (King et al., 2006a), and family's participation in social and recreational activities (King et al., 2006a). Children with disabilities generally participate in lower levels of recreation and leisure activities than children without disabilities (Bult et al., 2010; Imms, Reilly, Carlin, & Dodd, 2008; King et al., 2010; Law et al., 2006; Majnemer et al., 2008).

The purpose of this paper is to provide an evaluation of psychometric properties of the APCP with respect to its ability to discriminate patterns of intensity and diversity of participation as a function of children's age, sex, level of gross motor function, and annual family income. Data presented in this paper were collected through a randomized controlled trial evaluating the efficacy of a child-focused versus context-focused intervention in improving performance of functional tasks and mobility in young children with cerebral palsy (Law et al., 2011). The trial included 128 children with cerebral palsy across Levels I–V on the Gross Motor Classification System (GMFCS) (Palisano et al., 1997). Children received child-focused ($N = 71$) or context-focused intervention ($N = 57$) over 6 months, returning to their regular therapy schedule and approach between the end of intervention at 6 months and follow-up at 9 months. The primary outcome was performance on the PEDI (Haley et al, 1992). Outcome evaluators were masked to group assignment and completed assessments at baseline, 6 months, and 9 months. The analyses in this paper used the baseline data for children in the trial who were 2 to 5 years and 11 months of age ($N = 120$). The analyses were designed to investigate the following hypotheses regarding the construct validity of the APCP:

1. Children over 4 years of age will be involved in more activities than younger children, but not more frequently.
2. Girls will participate in more social activities than boys; boys will participate in more active physical recreation activities, and more frequently.
3. Children with higher levels of impairments in self-care and motor functioning or higher number of health conditions will participate in fewer activities and with less frequency than children with lower levels.
4. Children living in families with higher median annual incomes will participate in more activities and with greater frequency than children living in lower income families.

Participants

Participants were 120 children with cerebral palsy who were between 2 years and 5 years and 11 months of age and attended one of 19 children's rehabilitation centers in Ontario and Alberta, Canada. Ethics approval for the study was obtained from the Office of Research Ethics at McMaster University and the University of Alberta, and parents provided informed consent for the study. The sample included

TABLE 1. Characteristics of 120 Children with Cerebral Palsy

Variable	Category	*N*	%
Sex	Boys	71	59.2
	Girls	49	40.8
GMFCS	Level I	36	30
	Level II	21	17.5
	Level III	18	15
	Level IV	21	17.5
	Level V	24	20
Family income	<$15,000	7	6.7
	$15,000–$29,999	11	9.2
	$30,000–$44,999	14	11.7
	$45,000–$59,999	15	12.5
	$60,000–$74,999	13	10.8
	$75,000–$89,999	18	15
	≥$90,000	34	28.3
	Missing	7	5.8
Family unit	Two-parent family	106	88.3
	Single parent family	13	10.8
	Missing	1	0.8
Ethnicity background	Caucasian	92	76.7
	Asian	9	7.5
	African-American	6	5
	Latin	4	3.3
	N. American Indian	3	2.5
	Others	6	5
Community	Large metropolitan	23	19.2
	Medium metropolitan	38	31.7
	Small-metro	25	20.8
	Non-metro urbanized area	19	15.8
	Rural	15	12.5
Additional health conditions	Behavioral disorder	3	2.5
	Developmental delay	61	50.8
	Seizure disorder	30	25
	Vision impairment	42	35
	Hearing impairment	9	7.5
	Learning disorder	15	12.5
	Others	33	27.5

120 children aged 2 to 6 years (mean = 4.1, SD = 1.1), all diagnosed with cerebral palsy. The number of additional health conditions ranged from 0 to 6 (mean = 1.3, SD = 1.3, median = 1). Table 1 summarizes additional demographic and clinical information for the children in the study and their families.

Measures

The evaluation of psychometric properties of the APCP used data from several outcome measures. The PEDI (Haley et al., 1992) was used to measure the performance of functional tasks of self-care and mobility. Each domain, i.e., self-care and mobility, is measured using a Functional Skills Scale (FSS) that is rated as 0 (unable, or limited capacity to perform the skill) or 1 (able to perform the skill), and a Caregiver Assistance Scale (CAS) that is rated from 0 (total assistance) to 5 (independent). Thus, four scores are generated from the PEDI. The PEDI has been

validated in many studies and has excellent reliability and validity for this study population.

The GMFCS (Palisano et al., 1997) is a five-level system that classifies children's gross motor function in everyday routines within four age strata. Specific levels on the GMFCS are based on the child's motor abilities and use of mobility devices.

APCP Development

The APCP is a paper and pencil, parent completed questionnaire containing 45 drawings of everyday activities. Parents are asked to identify activities their child has participated in during the past 4 months and how often they did them, as done in the CAPE (King et al., 2006b). The purpose of the assessment is to capture preschool children's activity patterns in the areas of play (e.g., playing with toys, creating a craft), skill development (e.g., drawing and coloring, taking music lessons), active physical recreation (e.g., riding a tricycle, playing on playground equipment), and social activities (e.g., playing a board game, going on an outing). The APCP reflects the conceptual framework underlying WHO's (2001) ICF. This framework distinguishes between impairments, activity limitations, and participation restrictions. The APCP focuses on a subset of the ICF domains of participation. The items constitute a categorization of sets of activities based on a comprehensive review of the literature and feedback from families through a pilot study, as well as items from the CAPE (i.e., skill-based, physical, and social) and scoring scales deemed appropriate for younger children. The APCP includes 7 items not in the CAPE, 23 identical items, and 15 similar items modified to fit preschool children.

Like the CAPE, the APCP captures aspects of children's participation in a range of non-academic activities in a variety of everyday environments, including home, preschool, nursery school, or kindergarten and child care arrangements such as day care, before and after school programs, and supervised care. Unlike the CAPE, the APCP is parent-completed (rather than child- or youth-completed) and does not include measurements of where and with whom activities take place, or the child's rating of enjoyment. The items selected for use in the APCP reflect the most common types of everyday activities discussed in the literature across populations of children and age groups. Item generation was based on review of developmental literature and existing measures of participation, which excluded basic self-care activities.

The initial version of the APCP included 43 items; initial pilot testing identified additional five new items, for a total of 48 items. As previously indicated, items are organized into four activity areas, three of which are in the CAPE—play activities, skill development, active physical recreation, and social activities. On the assessment, parents identify "yes" or "no" to indicate whether their child participates in each activity. If the child does participate, they record how often the child participated over the past 4 months using a 7-point ordinal scale ranging from once over the past 4 months to once daily or more. Two scores are generated for each item and across the four activity areas. Participation diversity is a count of the total number of a child's reported activities over the previous 4 months. For group data, diversity can also be reported as a percentage of activities overall and by activity type. Participation intensity represents the average amount of time that a child spends participating in activities across the total number of possible activities. Intensity

is calculated by dividing the sum of frequency across all items by the number of possible items in each activity area. Preliminary testing with 57 parents of children with typical development attending four local day care centers in southern Ontario, Canada indicated that the activity scales had levels of internal consistency between 0.60 and 0.70; these levels improved after the elimination of three items that were endorsed less than 10% of the time, resulting in a final measure of 45 items. Administration time was approximately 30–40 min.

Data Analyses

The internal consistency reliability of the APCP was examined through an item analysis of the intensity scale for each of the four activity domains, i.e., play (9 items), skill development (15 items), active physical recreation (10 items), and social (11 items) activities. Cronbach's alpha values were reported; values greater than 0.7 were considered acceptable internal consistency (Portney & Watkins, 2000).

In order to examine whether the APCP can distinguish between subgroups, the sample of 120 children was divided into groups by age, sex, family income, and GMFCS levels. Two age-related subgroups were created by dividing the sample into groups of children based on whether they were under or over the age of 4 years, based on developmental theory (Piaget & Inhelder, 1964), in which the preoperational stage (age 2 to 6) is divided into two sub-stages, and the age of transition to full-time academic-based schooling). Based on these criteria, 45% of the children were under 4 years of age and 55% were 4 years old and above. Children were then assigned to subgroups based on GMFCS levels to examine whether the APCP differentiated children based on GMFCS level. As in research conducted by Majnemer et al. (2008) and Palisano et al. (2009), the five GMFCS levels were collapsed to form two groups: children classified in GMFCS levels I–III (62%) and children classified in GMFCS levels IV–V (38%). Annual family income, which did not vary significantly by province, was measured by classifying family income as $60,000 or above, based on the median income in the 2006 Canadian census (Statistics Canada, 2006). Based on this classification, 43% of the families had annual incomes lower than $60,000, while 57% reported above median incomes.

Independent *t*-tests were performed to test the differences among the subgroups (i.e., age, sex, income, and GMFCS), and consequently examine construct validity of the APCP. In order to test the magnitude of the differences, effect size values were calculated based on the omega square (ω^2) formula: $\omega^2 = (t^2 - 1)/(t^2 + N_1 + N_2 - 1)$[1]. These values were interpreted according to Kirk's classification (1996), where $\omega^2 = 0.01$ was considered as a small, $\omega^2 = 0.059$ as a medium, and $\omega^2 = 0.138$ as a large effect size. Analysis of covariance was performed to verify that the differences in the GMFCS are still observed while controlling for sex, age, and income. Finally, to examine the association between number of additional health conditions and levels of participation, and to test the association between the APCP and PEDI scores, Pearson correlations were performed. The magnitude of correlation coefficients was considered moderate if >0.40 and strong if >0.60 (Domholdt, 2000). The level of significance (two-tailed) was set to 0.01 because of the number of analyses conducted. SPSS 19 was used to conduct all statistical analyses.

[1] t = *t*-statistic; N_1 = number of participants in group 1; N_2 = number of participants in group 2.

TABLE 2. Internal Consistency of Items in Each Activity Type

	Number of Children	Number of Items	Cronbach's Alpha
Participation intensity			
Play	118	9	0.65
Skill development	113	15	0.70
Active physical recreation	89	10	0.52
Social	116	11	0.66
Participation diversity			
Play	118	9	0.76
Skill development	115	15	0.85
Active physical recreation	119	10	0.76
Social	120	11	0.73

RESULTS

Internal Consistency

The Cronbach's alpha coefficient for the four domains of the APCP varied from 0.73 to 0.85 for diversity scores and from 0.52 to 0.70 for intensity scores (see Table 2). Since the Cronbach's test uses list-wise deletion for missing values, only 89 children were included in this analysis for the Active Physical Recreation scale, as the remainder did not take part in these activities at all, so did not have a diversity or intensity score.

Construct Validity

As shown in Table 3, significant differences in participation intensity and diversity were found between children under 4 years of age ($N = 54$) and children above 4 years of age ($N = 66$) across all activity types with the exception of diversity and intensity of active physical recreation activities and intensity of play activities. Children aged 4 years and older participated in a greater variety of activities (i.e., diversity) and more frequently (i.e., intensity) than younger children (under 4 years of age). Effect size values were medium ($\omega^2 = 0.07$) for participation diversity in skill development, social and total activities, and small for diversity of play activities ($\omega^2 = 0.02$). We further explored whether specific items changed by age and found that one item, team sports, was reported in the older group and children with the GMFCS levels < III.

Significant differences in participation diversity and intensity across all activity types were found between children classified in the GMFCS levels I–III compared with children in levels IV–V. Children in levels I–III or less participated in a greater range of activities and more frequently than children in levels IV–V. Effect size values, calculated by ω^2, were large and ranged from 0.21 to 0.23 with the exception of overall diversity and intensity of social activities, in which effect size values were medium to large ($\omega^2 = 0.08$–0.16). Analyses of covariance accounting for child age, sex, and family income indicated similar differences ($8.3 < F < 53.5$, $p < .005$) with similar effect size (0.07 to 0.33) in participation patterns between GMFCS groups.

Significant differences in participation diversity were found between income levels across all activity types. Income-related differences were significant for the intensity of play and skill development activities, but not for intensity of social

TABLE 3. Descriptive Data and *t*-tests, and Effect Size (ω^2) for Assessment of Preschool Children's Participation

	Age Group				GMFCS Levels	Income Levels						Sex			
	<4 yr M (SD)	≥4 yr M (SD)	*t*	ω^2	≤III M (SD)	≥IV M (SD)	*t*	ω^2	<$60,000 M (SD)	≥$60,000 M (SD)	*t*	ω^2	Boys M (SD)	Girls M (SD)	*t*	ω^2
Play																
Diversity	60.7 (23.8)	70.1 (26.7)	−2.0*	0.0	76.5 (18.3)	48.1 (26.9)	6.3***	0.2	58.1 (28.4)	71.1 (23.1)	−2. 7**	0.1	61.5 (23.8)	72.0 (27.4)	−2.3*	0.0
Intensity[1]	3.7 (1. 3)	3.9 (1.5)	−1.1	N/A	4.4 (1.0)	2.8 (1.6)	5.7***	0.2	3.3 (1.6)	4.1 (1.2)	−3**	0.1	3.5 (1.4)	4.2 (1.4)	−2.6*	0.1
Skill																
Diversity	44.5 (20.8)	57.4 (22.4)	−3.3**	0.1	61.1 (16.5)	35.7 (22.4)	6.6***	0.3	44.2 (25.7)	51.5 (23.9)	−2.6*	0.1	48.5 (21.5)	56.0 (23.5)	−1.8	N/A
Intensity	2.5 (1.19)	3.1 (1.3)	−2.9**	0.1	3.4 (0.9)	1.9 (1.3)	6.6***	0.3	2.5 (1.5)	3.1 (1.1)	−2.2*	0.0	2.7 (1.3)	3.0 (1.3)	−1.5	N/A
Physical																
Diversity	46.1 (24.6)	53.8 (25.5)	−1.7	N/A	60.8 (19.5)	32.8 (24.3)	6.9***	0.3	43.8 (26.8)	54.8 (23.9)	−2. 3*	0.0	46.0 (24.0)	56.0 (26.0)	−2.1*	0.0
Intensity	2. 5 (1.2)	2.9 (1.2)	−1.7	N/A	3.1 (1.1)	2.0 (1.1)	4. 9***	0.2	2.6 (1.3)	2.8 (1.2)	−0.8	N/A	2.6 (1.3)	2.9 (1.3)	−1.5	N/A
Social																
Diversity	49.2 (22.4)	62.3 (23.8)	−3.1**	0.1	62.2 (22.8)	46.7 (23.1)	3.6**	0.1	49.6 (21.9)	61.5 (24.7)	−2.7**	0.1	53.0 (22.0)	61.0 (25.8)	−1.9	N/A
Intensity	1.98 (0.8)	2.6 (1.1)	−3.3**	0.1	2.6 (1.02)	1.9 (0.95)	3.4**	0.1	2.1 (1.03)	2.4 (1.05)	−1.5	N/A	2.1 (0.9)	2.6 (1.1)	−2.3*	0.0
Total																
Diversity	49.2 (20.4)	60.3 (21.8)	−2.9**	0.1	64.4 (16.3)	40.3 (21.7)	6.5***	0.3	48.2 (23.2)	60.0 (20.1)	−2. 9**	0.1	51.7 (20.0)	60.5 (23.0)	−2.2*	0.0
Intensity	2.6 (0.98)	3.1 (1.1)	−2.4*	0.0	3.3 (0.85)	2.1 (1.1)	6.4***	0.3	2.6 (1.2)	3.1 (0.98)	−2.3*	0.0	2.7 (1.0)	3.2 (1.2)	−2.3*	0.0

*$p < .05$; **$p < .01$; ***$p < .001$.
N/A = when *t* was not significant, ω^2 was not calculated/applicable.
Diversity scores are calculated as percentages.
[1]Maximum intensity score is 7.

TABLE 4. Pearson Correlations Between the Number of Additional Health Conditions and Assessment of Preschool Children's Participation Scores

	Play		Skill Development		Active Physical Recreation		Social		Total	
	N	r	*N*	r	*N*	r	*N*	r	*N*	r
Diversity	120	−0.27*	120	−0.33**	120	−0.38**	120	−0.35**	120	−0.37**
Intensity	119	−0.29*	120	−0.40**	115	−0.32*	119	−0.37**	119	−0.41**

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

and active physical recreation activities. Children of families with higher median incomes participated in more activities and more frequently than children of families with lower median income. Effect size values were small to medium for diversity and intensity (0.03 to 0.07). When analyses of variance were performed to account for child age and sex, similar differences ($.002 < p < .022$) with similar effect sizes (0.04 to 0.09) were observed.

Differences between boys and girls were found in participation diversity and intensity in play and total activities in which girls participated in a broader range of activities and more frequently than boys (effect size ranged from 0.03 to 0.05). In addition, girls participated more intensely in social and more diversely in active physical recreation activities (effect size values were low, both 0.03).

Significant negative correlations were found between number of additional health conditions and level of participation diversity and intensity across all activity types (see Table 4). In other words, higher the number of additional health conditions, lower the diversity and intensity of a child's participation in everyday activities.

Finally, positive moderate to strong correlations were found between participation diversity and intensity and levels of performance of self-care and mobility (PEDI scores) across all activity types ($0.51 < r < 0.78, p < .001$). Higher the level of functional skills and independence in performing self-care and mobility tasks, higher the levels of participation (see Table 5).

DISCUSSION

This paper describes initial validation data for use of the APCP with children with cerebral palsy. Results indicate that the internal consistency of the APCP is good to excellent for diversity scores and moderate for the intensity scores. The relatively lower value of Chronbach's alpha for the active physical recreation intensity scale (0.52) may reflect variability in frequency of participation across children with cerebral palsy in the study sample. Notably, internal consistency values for the intensity scores were not expected to be high, as many factors are expected to influence frequency of participation (King et al., 2006a). Further examination of internal consistency in larger samples of children with cerebral palsy and across a range of diagnoses and developmental stages will indicate whether the current structure of the four scales for the assessment is appropriate.

TABLE 5. Pearson Correlations Between Pediatric Evaluation of Disability Inventory (PEDI) and Assessment of Preschool Children's Participation Scores

	Play		Skill Development		Active Physical Recreation		Social		Total	
	Diversity	Intensity	Diversity	Intensity	Diversity	Intensity	Diversity	Intensity	Diversity	Intensity
PEDI self-care										
Functional skills	0.73*	0.70*	0.73*	0.73*	0.71*	0.60*	0.64*	0.61*	0.78*	0.77*
Caregiver assistance	0.69*	0.68*	0.73*	0.72*	0.71*	0.59*	0.61*	0.55*	0.76*	0.75*
PEDI mobility										
Functional skills	0.65*	0.65*	0.71*	0.71*	0.72*	0.62*	0.57*	0.54*	0.74*	0.73*
Caregiver assistance	0.67*	0.65*	0.71*	0.73*	0.68*	0.55*	0.54*	0.51*	0.73*	0.71*

*$p < .001$.

The APCP characterized differences in participation for children with cerebral palsy who were under and over 4 years of age. As hypothesized, when compared with the younger group, children over the age of 4 participated in a broader range of activities and did so with greater intensity. This finding is consistent with developmental theory, which indicates a broadening of interests and activities as preschool children engage in activities outside their home environment more often and begin to be involved in more social play (Piaget & Inhelder, 1964). Dunst and colleagues (2002) also found that the percentage of children at risk for or with a developmental delay who participated in family and community activities increased significantly from birth to 6 years. Similarly, our findings indicate a higher intensity of participation in skill and social development activities in children with cerebral palsy as their age increases.

Participation profiles of children with disabilities over the age of 6 have found significant differences in both diversity and intensity of participation between boys and girls (Engler-Yeger, 2009; King et al., 2010). Our findings that girls participated more frequently in social activities than boys are similar to the results of studies of children more than 6 years of age (Law et al., 2006). Although the effect size was small, we also found that preschool age girls had more diverse and intense play participation, as well as more diverse active physical participation than boys, contrary to our hypothesis. In our sample, there were more girls with better gross motor functioning (GMFCS I–III) than boys; this might explain the differences in participation levels in these activities. However, no significant correlation was found between sex and GMFCS levels ($\chi^2 = 2.8, p = .09$). It is plausible that at this early development stage (age 2 to 6), the social implications of the sex of the children do not come into play as much as in later age groups. Also, the greater levels of participation observed in girls may reflect the fact that girls typically develop faster than boys during the preschool years.

Diversity scores of children with cerebral palsy were significantly influenced by levels of family income for all areas; intensity scores were influenced in the activity areas of play and skill activities and overall participation. These findings are similar to other studies completed with children over 6 years of age (Law et al., 2006), which have found income related restrictions in participation in children's everyday activities. This finding highlights the need to make universally accessible early intervention programs and community organizations (e.g., YMCA) available to low-income families.

The construct validity of the APCP is supported by the findings of significant differences, with medium to large effect sizes, across all activity types between children classified in levels I–III and children in levels IV–V on the GMFCS, even after adjustment for the effects of age, sex, and income. Likewise, parents of children with a higher number of health and development conditions reported both lower diversity and intensity of participation across all activity types. Cerebral palsy is a condition characterized by primary motor impairment, and is also associated with many other health and development conditions such as cognitive impairment, communication disorders, epilepsy, and visual and perceptual dysfunction (Dormans & Pellegrino, 1998). While the finding that GMFCS level and number of health and development conditions are significantly related to participation is not surprising, it does highlight the need to assess levels of participation at an early age. Provision

of information about participation opportunities and strategies for parents, as well as intervention to modify environments to support participation, can be started at an early age if assessment indicates participation restrictions.

For families and rehabilitation practitioners, the APCP can be used to capture a child's overall level of participation, including the diversity and intensity of activity engagement. Service providers and researchers can use the APCP to assess and monitor children's participation in specific types of activities or patterns of participation, both of which answer basic questions about the nature of preschool children's participation.

These analyses have several limitations. First, the results are from a relatively small sample of children diagnosed with cerebral palsy. Additional studies, including larger samples of children with and without disabilities, will provide additional information about the psychometric properties of this assessment. Likewise, examination of test-retest reliability and confirmation of the factor structure is required.

CONCLUSION

The APCP is a newly developed measure designed to capture the participation of children aged 2 to 5 years and 11 months in the areas of play, skill development, active physical recreation, and social activities. In this study involving 120 children with cerebral palsy, evidence of internal consistency and the ability to distinguish groups of children with cerebral palsy based on a child's age, sex, GMFCS levels, and level of family income. The APCP, with focus on preschool children, has potential use for assessment and identification of activity areas in which the child is participating and areas in which participation may be restricted.

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