Measuring children’s participation in recreation and leisure activities: construct validation of the CAPE and PAC

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Abstract

There is a need for psychometrically sound measures of children’s participation in recreation and leisure activities, for both clinical and research purposes. This paper provides information about the construct validity of the Children’s Assessment of Participation and Enjoyment (CAPE) and its companion measure, Preferences for Activities of Children (PAC). These measures are appropriate for children and youth with and without disabilities between the ages of 6 and 21 years. They provide information about six dimensions of participation (i.e. diversity, intensity, where, with whom, enjoyment and preference) and two categories of recreation and leisure activities: (i) formal and informal activities; and (ii) five types of activities (recreational, active physical, social, skill-based and self-improvement). This paper presents information about the performance of the CAPE and PAC activity type scores using data from a study involving 427 children with physical disabilities between the ages of 6 and 15 years. Intensity, enjoyment and preference scores were significantly correlated with environmental, family and child variables, in expected ways. Predictions also were supported with respect to differences in mean scores for boys vs. girls, and children in various age groups. The information substantiates the construct validity of the measures. The clinical and research utility of the measures are discussed.

Keywords
children, disability, measure, participation

Introduction

The concept of participation is becoming increasingly important in the field of childhood disability. It is a concept that has face validity – it appears to capture ‘what matters most’ for children with disabilities (Forsyth & Jarvis 2002), as well as their families. The concept of participation figures prominently in the World Health Organization’s (2001) International Classification of Functioning, Disability and Health, which defines participation as ‘involvement in life situations’, and views participation as resulting from the interaction of individuals with their social and physical environments. Increasingly, participation is considered to be a key outcome of rehabilitation programmes and services directed at assisting children and families to adapt to the challenges they face (e.g. King et al. 2002). With respect to service delivery, the concept of participation directs attention to issues of person-environment fit (Law & Dunn 1993; Christiansen & Baum 1997) and to the use of experiential and ecological interventions, which provide children and youth with real-world experiences and address barriers in the social and physical environment (King et al. 2005).

Relatively little is known about the participation of children with physical disabilities. In comparison with children without disabilities, children with disabilities tend to engage in less varied leisure activities and in more quiet recreation activities and fewer social activities, especially social activities of a spontaneous
nature (Margalit 1981; Brown & Gordon 1987; Sillanpää 1987). We also know that the diversity of the participation of children with physical disabilities declines as they move into adolescence and early adulthood (Brown & Gordon 1987; Stevenson et al. 1997). We do not know much about the details of their leisure and recreational participation – the types of activities they tend to engage in and to prefer, who they do them with, how much they enjoy their participation and the extent to which their participation takes place at home or is community-based. We also know little about the relative importance of various factors that may influence the participation of children with disabilities, including environmental factors such as supportive environments, family factors such as family preferences for particular types of activities and child factors such as physical functioning.

Part of the reason for our limited knowledge is that we lack adequate ways of measuring important aspects of children's participation. The development of an adequate measure of participation is seen as a challenging but needed task (Forsyth & Jarvis 2002).

There are relatively few measures of children's participation – that is, their involvement in life situations such as personal maintenance, mobility, social relationships, home life and education (World Health Organization 2001). Existing measures vary in scope, with some focusing on children's physical activities (e.g. Hay 1992), others on play (e.g. Henry 2000), and some including school-based activities (e.g. Diller et al. 1981; Hay 1992; Posner & Vandell 1999). Some measures are self-administered (e.g. Garton & Pratt 1991; Hay 1992; Noreau et al. 2003), some completed by parents (e.g. Diller et al. 1981; Achenbach 1991), and others are interviewer-assisted (Henry 2000) or are based on interviews utilizing children's accounts of their activities (Posner & Vandell 1999). These measures typically document the number of activities a child performs or the child's frequency of engagement in activities [e.g. Diller and colleagues' (1983) Activity Pattern Indicators]. Some of the measures also examine children's enjoyment (e.g. Henry 2000) and/or their preferences or interest in activities (e.g. Garton & Pratt 1991).

With the exception of Henry's (2000) Kid Play Profile and Preteen Play Profile, which capture 'with whom' activities take place, instruments typically do not document whether children perform activities alone or with others. Whether participation is solitary vs. done with others is an important aspect of participation – one that is thought to be as important as the types of activities in which children participate (Whiting & Edwards 1988). Capturing the extent to which activities are performed alone, with family members, or with others in the community can provide important assessment and outcome information for the design and implementation of interventions to increase children's social participation. Furthermore, existing measures do not document 'where' participation takes place; the degree to which participation is home- vs. community-based provides important information about an aspect of participation that might be the target of change through intervention.

The Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities of Children (PAC)

This paper provides construct validity information for two self-report measures of children's participation in recreation and leisure activities (i.e. everyday activities outside of mandated school activities). The CAPE is a 55-item measure of five dimensions of participation (diversity, intensity, with whom, where and enjoyment) providing three levels of scoring: (i) overall participation scores; (ii) domain scores reflecting participation in formal and informal activities; and (iii) scores reflecting participation in five types of activities (i.e. recreational, active physical, social, skill-based and self-improvement activities), which were determined through principal component analyses (King et al. 2004). The PAC is a parallel measure of preference for activities, which can be scored on the same three levels.

Both measures are appropriate for children and youth with and without disabilities between 6 and 21 years of age, as the items reflect activities done by any child. The items were developed through a review of the literature, expert review and pilot testing of the CAPE and PAC with children both with and without disabilities.

The CAPE and PAC are discriminative measurement tools – tools designed to distinguish between individuals on an underlying dimension (Kirshner & Guyatt 1985). They provide a comprehensive and fine-grained assessment of multiple dimensions of participation in different types of recreation and leisure activities, including activities falling into formal vs. informal domains. The distinction between formal and informal activities is an important one (Medrich et al. 1982; Sloper et al. 1990; Larson & Verma 1999). Involvement in formal activities (i.e. organized or structured activities) is considered to be more enjoyable to children and to have advantages with respect to the development of initiative, intrinsic motivation and competence (Larson 2000).

A number of measures quantify children's level of accomplishment or competence in activities (e.g. Achenbach 1991; Henry 2000; Noreau et al. 2003). In contrast, the CAPE was designed to be a direct measure of participation. It documents what a child does, not the child's competence in performing an activity or the degree of support the child requires to take part. The CAPE does not confound the measurement of participa-
tion with the measurement of aids, assistance or environmental supports; it reflects the World Health Organization’s (2001) conceptualization of participation as actual performance of an activity in the context of an individual’s normal environment. According to Forsyth and Jarvis (2002), it is important for a participation measure to capture participation ‘intrinsically’ and separately from other factors, such as aids or assistance. Other variables should not be used as proxies for actual or in vivo participation.

Previous work involving the CAPE and PAC

The CAPE/PAC manual reports evidence of the test–retest reliability, internal consistency and factor structure of the measures, as well as correlations among the various levels of the CAPE participation intensity scores (i.e. overall, formal, informal and activity type) and among the PAC preference scores (King et al. 2004). This psychometric information was gathered in the course of a 3-year longitudinal study of the participation of school-age children with physical disabilities in Ontario, Canada, which examined children’s patterns of participation (Law et al. 2005) and the relative importance of child, family and environmental factors as predictors of the extent or intensity of children’s participation (King et al. 2006).

As reported in detail in the CAPE/PAC manual, the test–retest reliabilities for the CAPE activity type participation intensity scores ranged from 0.72 to 0.81, indicating sufficient test–retest reliability (Kirshner & Guyatt 1985). Internal consistency reliabilities for the PAC formal, informal and activity type preference scores also were acceptable (ranging from 0.67 to 0.84).

The CAPE information has been reported in papers examining differences in participation diversity and intensity for children with central nervous system and musculoskeletal disorders (Law et al. 2004), and the participation patterns of boys and girls with physical disabilities in various age groups (6–8 years, 11 months; 9–11 years, 11 months; 12 years or older) (Law et al. 2005). We also have examined the ability of the CAPE to capture developmental changes in participation intensity over time, by examining growth curves. Information provided in these papers indicates that the CAPE scores can be used to make reliable and valid inferences about children’s activity patterns.

Construct validity evidence for the CAPE and PAC activity type scores

The present paper provides information on the construct validity of the CAPE and PAC activity type scores. This paper goes beyond previously reported psychometric information (see King et al. 2004). Other than information about underlying factor structure, nothing has been published previously that pertains to the construct validity of the PAC preference scores. The data in this paper come from the longitudinal study of the participation of school-age children with physical disabilities described above.

How a test relates to external measures provides evidence of a test’s construct validity (Wiggins 1973). Convergent evidence is demonstrated when a test score is significantly correlated with other measures of the same construct, or with measures of other constructs in expected ways. Discriminant evidence is demonstrated when two tests designed to measure different constructs produce results that are not closely related, or when a measure distinguishes between groups that are expected to perform differently on the measure.

As there are few measures of children’s recreational and leisure participation (which was why we decided to develop the CAPE and PAC), we unfortunately are unable to provide information about the relationship between these measures and other measures of similar constructs. We did, however, collect information on other constructs with which we expected that the CAPE and PAC activity types scores would be correlated.

Based on information in the literature about factors associated with participation, we tested a series of hypotheses about associations between (i) activity type scores on three participation dimensions (CAPE intensity, CAPE enjoyment and PAC preference); and (ii) scores from other measures reflecting characteristics of environments, families and children themselves. We also examined hypothesized differences in intensity of participation, enjoyment and preference for boys vs. girls, and for children in various age groups. In the following section, we provide the rationale for specific predictions, some of which were outlined previously in a conceptual model of the factors affecting the recreation and leisure participation of children with disabilities (King et al. 2003).

Predictions

Relationships between the CAPE activity type participation intensity scores and other variables

We made the following predictions:

- Intensity of participation in recreational activities (e.g. playing with things or toys, playing on equipment) will be associated with the family’s active-recreational orientation (i.e. the family’s extent of participation in social and recreational activities). In a study involving children with Down Syndrome, Sloper and colleagues (1990) found family active-
recreational orientation to be associated with the frequency of children’s participation in both organized activities and informal play contacts.

- Intensity of participation in active physical activities (e.g. doing team sports, racing or track and field) will be associated with (i) parents’ perceptions of barriers in the physical-structural environment (because these activities require the absence of such barriers; Garton & Pratt 1991); (ii) family income and financial constraints (because income has been found to most markedly affect rates of participation in supervised sports; Offord et al. 1998); (iii) family time constraints (because participation in organized activities often requires transportation and a time commitment by parents); (iv) the family’s active-recreational orientation (Slaper et al. 1990); and (v) children’s general health, athletic competence (Trost et al. 1997; DiLorenzo et al. 1998) and physical functioning.

- Intensity of participation in social activities (e.g. going to the movies, talking on the phone) will be associated with (i) children’s perceptions of support from classmates and friends (because classmates and friends provide companionship for participation in informal activities; Patterson & Blum 1996; DiLorenzo et al. 1998); (ii) the family’s active-recreational orientation (Slaper et al. 1990); (iii) children’s social competence, prosocial behaviour, and their social, emotional and behavioural functioning (Rae-Grant et al. 1989); (iv) children’s physical functioning (Lepage et al. 1998); and (v) children’s communicative functioning (because this is required in social activities).

- Intensity of participation in skill-based activities (e.g. learning to dance, playing a musical instrument) will be associated with (i) the family’s active-recreational orientation (Slaper et al. 1990); and (ii) the family’s intellectual-cultural orientation (i.e. the family’s level of interest in political, intellectual and cultural activities). We did not predict an association with family income or financial constraints because skill-based activities are comprised of a mix of activities varying in cost, many of which can be undertaken in more or less costly ways.

- Intensity of participation in self-improvement activities (e.g. going to the public library, reading) will be associated with (i) the family’s active-recreational and intellectual-cultural orientations; and (ii) children’s cognitive and communication functioning.

**Relationships of the CAPE enjoyment and PAC preference scores with other variables**

It was predicted that children would enjoy and prefer types of activities related to their self-perceptions in terms of areas of competence. Significant correlations were predicted between scholastic competence and both enjoyment of, and preferences for, self-improvement activities; athletic competence and enjoyment of, and preferences for, active physical activities; and social competence and enjoyment of, and preferences for, social activities.

**Sex differences**

Based on past research, it was predicted that boys would engage more intensely in active physical activities (and would enjoy these more and report higher preferences for this type of activity), whereas girls would engage more intensely in skill-based, social and self-improvement activities (and would enjoy and prefer these more than would boys).

These predictions were based on the literature on activity participation for children without disabilities, in which sex is generally found to be a major predictor of patterns of participation diversity (Medrich et al. 1982; Garton & Pratt 1991). Sports participation is generally found to be higher for boys than for girls (Medrich et al. 1982; Larson & Verma 1999), and other evidence indicates that girls typically are more involved in skill-based, social and self-improvement activities. For example, Offord and colleagues (1998) reported that, among Canadian children aged 6–11 years, boys participated more highly in sports whereas girls participated more highly in the arts (i.e. skill-based activities). Similarly, Medrich and colleagues (1982) reported that sixth grade girls were more likely to participate in performing and creative arts than were boys. Garton and Pratt (1991) found that boys aged 13–17 years without disabilities had a greater intensity of participation in sports than did girls of this age; girls took part in more vocational and self-improvement activities, such as going to the library. They also found that boys were more interested in sports and girls were more interested in gregarious or social activities. Posner and Vandell (1999) found that third to fifth grade boys without disabilities (i.e. boys between approximately 8 and 10 years of age) were involved in more coached sports than were girls of this age, whereas girls engaged in more academic and socializing activities than did boys.

**Age differences**

It was expected that children’s age would affect their participation intensity, enjoyment and preference scores. Children were grouped into three age groupings (6–8 years, 11 months; 9–11 years, 11 months; and 12 or older). Compared with younger children, older children were expected to have lower mean par-
participation intensity, enjoyment and preference scores on recreational activities, but higher scores on social activities.

There is little literature on the participation of children with disabilities and for typically developing children in the age range of interest (ages 6–15 years). The existing literature indicates that socializing increases with age and that there is a decrease in recreational activities and in watching television. Posner and Vandell (1999) found involvement in outside unstructured activities decreased by half between third and fifth grade (ages 8–10 years approximately) for low-income White and African American children without disabilities, whereas time spent socializing increased twofold during that period. Larson and Richards (1991) reported that girls in ninth grade (approximately 14 years of age) took part in more social activities than did girls in fifth grade (approximately 10 years of age). Brown and Gordon (1987) found that, with increasing age, children with and without disabilities visited and made telephone calls more frequently and spent more time out of the house. There is also evidence that watching television peaks in middle childhood and declines in early and middle adolescence (Larson & Richards 1991; Larson & Verma 1999).

In summary, examining these predictions will provide information about the construct validity of the CAPE and PAC measures. The information will be useful for service providers and researchers interested in the ability of the measures to (i) document children’s participation intensity, enjoyment and preferences for various types of activities; and (ii) discriminate in expected ways between boys and girls, and children of various ages.

Method

Participants

Participants were 427 children with physical functional limitations, and their families, from the province of Ontario, Canada. Ethical approval for the study was obtained from McMaster University in Hamilton, Ontario. Eleven publicly funded regional children’s rehabilitation centres and one children’s hospital assisted with recruitment.

The organizations compiled lists of all children with physical disabilities born between 1 October 1985 and 30 September 1994 (inclusive), and provided us with non-identifiable information about children’s sex, date of birth, primary diagnosis and secondary diagnostic data, if available. Using guidelines developed by the study team, two investigators (a developmental paediatrician and a methodologist) reviewed the lists and selected children who fit the criterion of having a ‘physical functional limitation’. Children with the following primary diagnoses or conditions were included: amputation; cerebral palsy; cerebral vascular accident/stroke (vascular brain disorders); congenital anomalies; hydrocephalus; juvenile arthritis; muscular disorders (non-progressive); neuropathy; orthopaedic conditions (e.g. scoliosis); spinal cord injury; spina bifida; and traumatic brain injury. Children fit into two categories – those with central nervous system-related disorders and musculoskeletal disorders (‘structural’ and primary conditions of muscle tissue).

Families of children who met the inclusion criteria with respect to age and physical functional limitation were invited to participate. Lists of ID numbers of these children were sent to the recruitment sites, which then sent packages from the research team inviting families to participate. Of 469 consenting families, 28 withdrew prior to data collection, two were unsuitable (one child was no longer with the family, one child already had been selected by another site for inclusion in the study), and 12 were judged to be unsuitable by the interviewer because of severe cognitive or communicative limitations (which affected their ability to communicate their responses and/or raised questions about the reliability of their responses), leaving 427 children in the study. The convenience sample included relatively equal cohorts of children (aged 6–8 years, 11 months; 9–11 years, 11 months; 12 years or older), and their families.

Data collection

Data were collected through self-administered measures and a home interview. A package of self-administered questionnaires was mailed to the family, to be completed prior to the home visit by the parent who was most knowledgeable about the child’s daily activities, and then collected at the time of the visit. This package included: a demographic questionnaire; phase 1 of the CAPE (King et al. 2004), which is described below; the Craig Hospital Inventory of Environmental Factors (Whitenack et al. 2004); the Child Health Questionnaire-50 (Landgraf et al. 1996); the Family Environment Scale (Moos & Moos 1994); the Impact on Family Scale (Stein & Riessman 1980); and the Strengths and Difficulties Questionnaire (Goodman 1997). This package also contained the Activities Scale for Kids (Young et al. 2000), which the child completed. As well, parents completed one measure (the Communication Domain of the Vineland Adaptive Behaviour Scales; Sparrow et al. 1984) via a phone interview prior to the home visit.

Families were contacted by a study interviewer to arrange a home-based interview to administer phase 2 of the CAPE and
PAC, the Peabody Picture Vocabulary Test – Third Edition (Dunn & Dunn 1997), the Self-Perception Profile for Children (Harter 1985a) or the Self-Perception Profile for Adolescents (Harter 1988), depending on the age of the child/youth, and the Social Support Scale for Children (Harter 1985b). Fifteen experienced interviewers were involved in this aspect of data collection.

Measures

The CAPE and PAC

The factor analytic structure, test–retest reliabilities and internal consistency reliabilities of these measures are reported in detail in the CAPE/PAC manual (King et al. 2004). The measures have adequate test–retest and internal consistency reliabilities.

In this study, the CAPE was administered in two phases. In phase 1, the child/youth completed a self-administered questionnaire booklet either alone or, when needed, with the assistance of a parent/guardian. For the previous 4-month period, they indicated what activities they participated in, and how often they did each activity.

In phase 2, the interviewer focused on the activities in which the child reported having participated, and obtained the following information for each of these activities: (i) with whom they typically did the activity (e.g. parent, friend); (ii) where they did the activity (e.g. home, at a friend’s house); and (iii) how much they enjoyed doing the activity. Each activity was described verbally to the child/youth and presented on a card containing both a drawing of the activity and a written phrase describing the activity.

The version of the CAPE used in this study had 49 items. There are three levels of scoring for the CAPE and PAC measures: overall (one score), domain (two scores) and activity type (five scores), resulting in eight scores for each dimension of participation (i.e. diversity, intensity, where, with whom, enjoyment and preference). For the purposes of construct validation, we focused on the dimensions of intensity, enjoyment and preference, as measured on the activity type level. Participation intensity is calculated by dividing the sum of item frequency by the number of possible activities for a given level of scoring (e.g. 13 activities, in the case of formal participation). Frequency response options ranged from 1 = ‘1 time in the past 4 months’ to 7 = ‘1 time a day or more’; enjoyment response options ranged from 1 = ‘not at all’ to 5 = ‘love it’; and preference response options ranged from 1 = ‘I would not like to do at all’ to 3 = ‘I would really like to do’.

Other measures

Ten other standardized questionnaires were completed by children or their parents. All measures are widely used and have evidence of adequate reliability and validity. Table 1 contains information about the scale names of the variables used in this study and the measures from which they are derived. The papers cited in the footnote of Table 1 provide detailed information about the psychometric properties of the measures.

Analyses

To examine the convergent and discriminant validity of the CAPE and PAC activity type scores, we correlated these scores with measures of different constructs. Based on past findings, we hypothesized that particular correlations would be significant. Small to moderate (0.15–0.30), yet statistically significant, correlations were expected. This is the range of magnitude of correlations typical in social science research. We also knew that there are many interrelated determinants of participation (King et al. 2003, 2006), and so univariate associations were bound to be modest in magnitude. To control for type I error because of the large number of correlations performed, the level for alpha was set at 0.01, two-tailed. This is a not overly stringent alpha level, in keeping with the expectation that the magnitude of correlations would be relatively small.

Analyses of variance were conducted to test study hypotheses with respect to mean score differences for boys vs. girls, and for children in three age groups. The level of statistical significance for these analyses was set at 0.05, two-tailed (error rate per hypothesis; Kirk 1968). Although there is controversy as to the correct conceptual unit for error rate, tradition favours the hypothesis as the proper unit (Kirk 1968).

Results

Evidence for the convergent and discriminant validity of the CAPE activity type intensity scores

We calculated Pearson product-moment correlation coefficients between the CAPE activity type participation intensity scores and scores on the other measures. These correlations are presented in Table 1; significant correlations are shown in bold print and predicted correlations are indicated by the shaded cells. The expected correlations are positive in nature, except for two variables indicated by asterisks in Table 1 (the physical-structural environment and financial constraints).
As expected, there were small to moderate correlations in predicted directions between the CAPE participation intensity scores and the environmental, family and child variables; the majority of the significant correlations were in the 0.10–0.20 range. All predicted correlations reached statistical significance \((P < 0.01, \text{two-tailed})\). Of the 33 significant correlations, 23 (69.7%) were predicted.

**Evidence for the concurrent validity of the CAPE enjoyment scores and PAC preference scores**

Table 2 presents evidence for the convergent and discriminant validity of the CAPE activity type enjoyment scores and the PAC activity type preference scores. It was predicted that children would enjoy and prefer types of activities related to their self-perceptions in terms of areas of competence, as measured by the Self-Perception Profile for Children (Harter 1985a) or the Self-Perception Profile for Adolescents (Harter 1988). Table 2 shows small yet significant correlations in the expected pattern. Significant correlations are shown in bold print and predicted correlations are indicated by shaded cells in Table 2.

As shown in Table 2, four out of the six predicted correlations were significant. Children’s enjoyment of particular types of activities and their preferences for these activities were related to their areas of competence. For example, enjoyment of active physical activities was significantly related to children’s self-perceptions of their athletic competence \((r = 0.15)\), and preferences for social activities were significantly related to children’s perceptions of their social competence \((r = 0.17)\). Significant correlations were predicted, but not found, between self-improvement activities and scholastic competence.

**Group differences in participation intensity, enjoyment and preference**

We predicted that mean intensity, enjoyment and preference scores for the five types of activities would differ depending on children’s sex and age.

**Sex differences**

Table 3 provides the mean scores for boys and girls for participation intensity, enjoyment and preference, on the level of

<table>
<thead>
<tr>
<th>Variables</th>
<th>Recreational activities</th>
<th>Active physical activities</th>
<th>Social activities</th>
<th>Skill-based activities</th>
<th>Self-improvement activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Physical-structural environment (CHIEF)</td>
<td>−0.08</td>
<td>−0.17</td>
<td>−0.10</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Classmate support (SSSC)</td>
<td>0.12</td>
<td>0.18</td>
<td>0.15</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Close friend support (SSSC)</td>
<td>0.09</td>
<td>0.08</td>
<td>0.18</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Family variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total family income</td>
<td>−0.01</td>
<td>0.21</td>
<td>0.15</td>
<td>0.11</td>
<td>0.18</td>
</tr>
<tr>
<td>*Financial constraints (IOF)</td>
<td>−0.11</td>
<td>−0.21</td>
<td>−0.13</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Time constraints (CHQ-50)</td>
<td>0.03</td>
<td>0.15</td>
<td>0.13</td>
<td>0.00</td>
<td>−0.01</td>
</tr>
<tr>
<td>Active-recreational orientation (FES)</td>
<td><strong>0.17</strong></td>
<td><strong>0.27</strong></td>
<td><strong>0.23</strong></td>
<td><strong>0.20</strong></td>
<td><strong>0.28</strong></td>
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<tr>
<td>Intellectual-cultural orientation (FES)</td>
<td>0.03</td>
<td>0.08</td>
<td>0.05</td>
<td><strong>0.17</strong></td>
<td><strong>0.30</strong></td>
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<tr>
<td>Child variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General health (CHQ-50)</td>
<td>−0.01</td>
<td><strong>0.13</strong></td>
<td>0.00</td>
<td>0.07</td>
<td>−0.05</td>
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<tr>
<td>Athletic competence (SPPC)</td>
<td>0.10</td>
<td><strong>0.29</strong></td>
<td>0.08</td>
<td>0.05</td>
<td>−0.02</td>
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<tr>
<td>Social competence (SPPC)</td>
<td>0.06</td>
<td>0.08</td>
<td><strong>0.16</strong></td>
<td>−0.01</td>
<td>−0.01</td>
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<td>Prosocial behaviour (SDQ)</td>
<td>0.08</td>
<td>0.06</td>
<td><strong>0.18</strong></td>
<td>0.07</td>
<td><strong>0.14</strong></td>
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<td>Social, emotional &amp; behavioural functioning (CHQ-50)</td>
<td>0.03</td>
<td>0.07</td>
<td><strong>0.14</strong></td>
<td>0.04</td>
<td>−0.01</td>
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<td>Physical functioning (ASK)</td>
<td><strong>0.15</strong></td>
<td><strong>0.42</strong></td>
<td><strong>0.30</strong></td>
<td>0.07</td>
<td>0.12</td>
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<td>Cognitive functioning (PPVT-III)</td>
<td>0.08</td>
<td><strong>0.19</strong></td>
<td><strong>0.22</strong></td>
<td>0.07</td>
<td><strong>0.24</strong></td>
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<tr>
<td>Communicative functioning (VABS)</td>
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<td><strong>0.21</strong></td>
<td><strong>0.21</strong></td>
<td>0.14</td>
<td><strong>0.26</strong></td>
</tr>
</tbody>
</table>

*Bolded correlations are significant at the 0.01 level or lower (two-tailed). Shaded cells indicate predicted correlations. Asterisks indicate variables for which correlations were expected to be negative.

ASK, Activities Scale for Kids (Young et al. 2000); CHIEF, Craig Hospital Inventory of Environmental Factors (Whiteneck et al. 2004); CHQ-50, Child Health Questionnaire-50 (Landgraf et al. 1996); FES, Family Environment Scale (Moos & Moos 1994); IOF, Impact on Family Scale (Stein & Riessman 1980); PPVT-III, Peabody Picture Vocabulary Test – Third Edition (Dunn & Dunn 1997); SDQ, Strengths and Difficulties Questionnaire (Goodman 1997); SPPC, standardized scores from the Self-Perception Profile for Children (Harter 1985a) or the Self-Perception Profile for Adolescents (Harter 1988); SSSC, Social Support Scale for Children (Harter 1985b); VABS, Vineland Adaptive Behaviour Scales (Sparrow et al. 1984).
activity type. Table 3 shows that boys reported that they participated significantly more intensively in active physical activities than did girls, whereas girls participated more intensively in social, skill-based and self-improvement activities, as predicted.

Girls reported significantly higher enjoyment of social, skill-based and self-improvement activities than did boys. Boys preferred active physical activities more than did girls; girls preferred skill-based activities and self-improvement activities more than did boys. Boys’ and girls’ preferences therefore mirrored the data for enjoyment and for participation intensity, but slightly less so.

**Age differences**

Table 4 provides the mean participation intensity, enjoyment and preference scores for children with disabilities of different ages, on the level of activity type.

As predicted, with increasing age, children participated less intensely in recreational activities. These recreational activities included some items more relevant for younger children, such as doing crafts and playing with toys, but this category also included watching television. Children in the older age group also had a higher mean participation intensity score for social activities, as expected. As well, enjoyment and preference scores decreased across the age groups.

**Discussion**

This paper utilized data from a large sample of children with varied levels of function and functional limitation (427 children with physical disabilities between the ages of 6 and 15 years) to provide evidence for the construct validity of the activity type scores of the CAPE and its companion measure, PAC (King et al. 2004). The findings indicated that participation intensity, enjoyment and preference scores for five types of activities were associated in predicted ways with scores on selected environmental, family and child variables. Predictions also were supported with respect to differences in mean scores for boys vs. girls, and for children in various age groups. Analyses revealed a number of significant relationships that confirmed a priori hypotheses and therefore serve to validate both the CAPE and PAC as measurement instruments. The findings indicate that the dimensions of activity participation examined in this study – intensity, enjoyment and preference – are distinct from one

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**Table 2.** Correlations between children’s areas of competence and enjoyment and preference scores for types of activities \((n = 427)\)

<table>
<thead>
<tr>
<th>Competence variables</th>
<th>Recreational activities</th>
<th>Active physical activities</th>
<th>Social activities</th>
<th>Skill-based activities</th>
<th>Self-improvement activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enjoyment scores</td>
<td></td>
<td>Preference scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholastic competence</td>
<td>0.07</td>
<td>0.08</td>
<td>0.05</td>
<td>−0.04</td>
<td>0.12</td>
</tr>
<tr>
<td>Athletic competence</td>
<td>0.10</td>
<td><strong>0.15</strong></td>
<td>0.10</td>
<td>−0.01</td>
<td>0.10</td>
</tr>
<tr>
<td>Social competence</td>
<td><strong>0.18</strong></td>
<td>0.12</td>
<td><strong>0.22</strong></td>
<td>0.07</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Bolded correlations are significant at the 0.01 level or lower (two-tailed). Shaded cells indicate predicted correlations.

**Table 3.** Mean participation intensity, enjoyment and preference scores for boys and girls with physical functional limitations \((n = 427)\)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Recreational activities</th>
<th>Active physical activities</th>
<th>Social activities</th>
<th>Skill-based activities</th>
<th>Self-improvement activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intensity scores (on a scale of 0–7)</td>
<td></td>
<td>Enjoyment scores (on a scale of 1–5)</td>
<td>Preference scores (on a scale of 1–3)</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>4.16</td>
<td>1.89&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.11&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.43&lt;sup&gt;h&lt;/sup&gt;</td>
<td>2.02&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Girls</td>
<td>4.17</td>
<td>1.61&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.25&lt;sup&gt;h&lt;/sup&gt;</td>
<td>2.16&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Boys</td>
<td>3.98</td>
<td>4.24</td>
<td>4.14&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.58&lt;sup&gt;h&lt;/sup&gt;</td>
<td>2.01&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Girls</td>
<td>4.05</td>
<td>4.11</td>
<td>4.26&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2.64&lt;sup&gt;h&lt;/sup&gt;</td>
<td>2.33&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

The data are from 229 boys and 198 girls.

Pairs of means with the same superscript are significantly different at \(P < 0.05\), two-tailed.
another, meaningful and interpretable. The CAPE and PAC provide detailed information about participation on these dimensions with respect to five types of activities, and are sensitive to variations in children’s participation across these types of activities.

Study limitations

This paper provides evidence of the psychometric properties of the CAPE and PAC based on a sample of children with physical disabilities. It is therefore important to consider how this sample may have affected the evidence reported for the psychometric properties of the CAPE and PAC. There is, however, evidence that the measures are appropriate for, and provide meaningful information about, the participation patterns of typically developing children.

The correlations reported in this paper as evidence of construct validity were smaller in magnitude than expected (most falling in the 0.10–0.20 range). Although the correlations were small in magnitude, 70% of the significant correlations were predicted.

Another study limitation concerns the clinical meaningfulness of the differences in the participation intensity, enjoyment and preference scores reported for boys and girls, and for children between 6–8, 9–11 and 12 years of age or older. More data from different samples of children and youths are required to consider the meaning and utility of these differences in a clinical setting. The differences do, however, indicate the ability of the CAPE and PAC activity type scores to differentiate in predicted ways among different groups of individuals.

Clinical and research utility of the CAPE and PAC

The psychometric evidence provided in this paper supports the clinical and research utility of the CAPE and PAC. As there are few self-report measures of children’s recreation and leisure participation, these measures fill an important gap for service providers, teachers, service managers and researchers.

In terms of clinical utility, the CAPE and PAC are useful in providing fine-grained assessments of children’s everyday activity patterns (because they provide more than just an overall participation score) and in determining activity preferences. Service providers can use the CAPE to conduct a comprehensive assessment of a child’s direct activity engagement, including the number of activities the child is involved in, the extent or intensity of his/her involvement in activities of different types, his/her enjoyment of these activities and information about the context of participation – with whom and where each activity takes place.

Information from the PAC about children’s activity preferences is particularly useful in identifying activities that children might like to try, and to assist in collaborative goal setting with children and their families. Service providers could discuss the match between activities and the children’s skill level with children and families to ensure that selected activities provide opportunities for children’s skill development, should that be a goal. The five activity types in the PAC allow service providers to explore with clients the acceptability of substituting one activity for another, as at least some activities within each activity type grouping can be considered to be approximate functional equivalents (Medrich et al. 1982). A child who cannot

Table 4. Mean participation intensity, enjoyment and preference scores by age groupings of children with physical functional limitations (n = 427)

<table>
<thead>
<tr>
<th>Age grouping</th>
<th>Recreational activities</th>
<th>Active physical activities</th>
<th>Social activities</th>
<th>Skill-based activities</th>
<th>Self-improvement activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intensity scores (on a scale of 0–7)</td>
<td>Enjoyment scores (on a scale of 1–5)</td>
<td>Preference scores (on a scale of 1–3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6–8 years</td>
<td>4.59a</td>
<td>4.19c</td>
<td>2.57d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9–11 years</td>
<td>4.34b</td>
<td>4.18c</td>
<td>2.49e</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 or older</td>
<td>3.50a</td>
<td>4.09</td>
<td>2.27f</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There were 125 children aged 6–8 years, 176 children aged 9–11 years, and 126 children aged 12 years or older. Groups of means with the same superscripts denote significant main effects for age (P < 0.05, two-tailed) in two-way analyses of variance (age grouping by sex).
fulfil a need with one activity can potentially meet that need through a similar activity. For example, a child might express a strong preference to take part in a social activity, such as visiting or going to a party, but may not have the opportunity to do so. In this case, a service provider could propose an alternate social activity from among those covered in the PAC that might provide the social contact that the child is looking for, and be under the child’s control to initiate (e.g. talking on the phone).

The CAPE and PAC have a number of features contributing to their usefulness for research or evaluation purposes. They are conceptually grounded, provide a comprehensive assessment of a broad range of everyday activities, are appropriate for children with and without disabilities across a wide age range, and assess multiple dimensions of participation (i.e. diversity, intensity, enjoyment, location, with whom and preference).

The measures distinguish between formal vs. informal activities, and among five types of activities, which is of interest to researchers. These classifications of activities are useful in terms of prediction specificity as they allow fine-tuned testing of predictions about determinants of children's participation in activities of particular types. For example, the measures could be used to determine the impact of clinical interventions on participation in different types of activities, or to explore the role of various environmental or family factors in facilitating or hindering children's participation in different types of activities. Researchers also could use the measures to gain important information about how variables of interest relate to different dimensions and types of activity participation, and to examine how different populations of children vary with respect to these aspects of participation.

Another important feature of the CAPE is that it is a direct measure of participation. The CAPE does not confound participation with competence or with amount of assistance: it captures what children do, rather than their skill or the amount of support they require to take part in an activity. This feature contributes to the CAPE’s utility for research and evaluation purposes (Forsyth & Jarvis 2002). As the CAPE provides a direct measure of participation, it can be used to examine the influence of skill-, support- and opportunity-based interventions on children's participation, as well as the influence of impairments and environmental factors.

As the CAPE and PAC are applicable for children, youth and young adults (ages 6–21 years), the measures show promise for use in longitudinal research. Although they were designed to be discriminative measures, they can be used to examine changes in various dimensions of participation as a result of intervention or to examine changes over time, as we have done in a longitudinal study of the factors affecting children’s participation. More information is required about the ability of the CAPE and PAC scores to detect change over time, for both individual children and groups of children, before we can make definitive statements about the responsiveness of the measures. We believe, however, that the instruments will be useful in determining the effectiveness of clinical trials (i.e. as a research tool) and to measure outcomes of recreational programmes and other therapeutic programmes designed to enhance children’s community participation (i.e. as a programme evaluation tool).

In conclusion, this paper has provided evidence for the construct validity of two measures of the recreation and leisure participation of children and youth with and without disabilities. As evaluating the validity of measurement tools is an ongoing process (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education 1999), the future use of the CAPE and PAC will provide more information about the validity of the measures, as well as their utility as clinical and research tools.

**Acknowledgements**

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