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ORIGINAL ARTICLE

The Mediating Role of the Environment in Explaining Participation of Children and Youth With and Without Disabilities Across Home, School, and Community

Dana Anaby, PhD,[a] Mary Law, PhD,[b,c] Wendy Coster, PhD,[d] Gary Bedell, PhD,[e] Mary Khetani, ScD,[f] Lisa Avery, MSc,[g] Rachel Teplicky, MSc[c]

From the [a]School of Physical and Occupational Therapy, McGill University, Montreal, Quebec, Canada; [b]School of Rehabilitation Science and [c]CanChild Centre for Childhood Disability Research, McMaster University, Hamilton, Ontario, Canada; [d]Department of Occupational Therapy, Sargent College of Rehabilitation Sciences, Boston University, Boston, MA; [e]Department of Occupational Therapy, Tufts University, Medford, MA; [f]Department of Occupational Therapy, Colorado State University, Fort Collins, CO; and [g]Avery Information Services Ltd, Orilla, Ontario, Canada.

Abstract

Objective: To test the effect of personal and environmental factors on children's participation across 3 different settings (home, school, community); to ascertain the interrelations between these factors; and to propose and test 3 models, 1 for each setting, using structural equation modeling.

Design: Survey, cross-sectional study, and model testing.

Setting: Web-based measures were completed by parents residing in North America in their home/community.

Participants: Parents (N = 576) of children and youth with and without disabilities, (n = 282 and n = 294, respectively), ages 5 to 17 years (mean age, 11y 2mo), completed the Participation and Environment Measure for Children and Youth (PEM-CY).

Interventions: Not applicable.

Main Outcome Measures: The PEM-CY measured levels of participation frequency and involvement, as well as environmental barriers and supports of participation, in each of the following 3 settings: home, school, and community. Information about the child's health condition and functional issues was also collected.

Results: All 3 models fit the data well (comparative fit index, .89−.97) and explained 50% to 64% of the variance of participation frequency and involvement. Environmental barriers and supports served as significant mediators between child/personal factors (income, health condition, functional issues) and participation outcomes, across all models. The effect of the environment was most pronounced, however, in the community setting.

Conclusions: Our findings highlight the unique role of the environment in explaining children's participation across different settings and, therefore, support the development of interventions targeting modifiable environmental factors.

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Participation in home, school, and community activities has a positive impact on children's health, development, and well-being.[1,2] Through participation, children acquire skills, achieve physical and mental health, and develop social networks that are crucial for their transition to adulthood.[3] It is important, therefore, to develop knowledge about activity patterns of children and youth, as well as the factors that impact these patterns. Environmental factors are of particular importance because they are potentially modifiable.

The participation of children and youth with disabilities, however, is restricted in comparison with their typically developing peers.[4-8] Striking differences were found in a sample,

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reanalyzed in this study, of 576 children and youth living in Canada and the United States; 37% of children and youth with disabilities never took part in organized physical activities in the community, as compared with only 10% among their typically developing peers.[9] In Europe, a large comparative study[10] of more than 800 children with cerebral palsy and the general population (n=2939) revealed similar discrepancies.

Participation is a complex concept that is influenced by personal factors related to the child and family and also by environmental factors.[11] Prior research indicates that participation of all children is influenced significantly by age,[12-15] sex,[5,10,13,16] and income.[13] Among children with disabilities, the severity of their condition,[17] as well as their functional abilities,[18] is also known to influence changes in participation over time. With accumulating knowledge, both theoretical[11] and empirical,[19] it is clear that the environment is inextricably linked to participation. A recent scoping review[20] indicated that all aspects of the environment identified by the *International Classification of Functioning, Disability and Health* (eg, physical accessibility, services and programs, attitudes) served as a barrier, as a support, or both, for participation of children and youth with various types of disabilities. The most common facilitators involved the social support of family and friends and geographic location. The most common barriers included attitudes, physical environment, transportation, policies, and lack of support from staff and service providers. Another qualitative meta-synthesis[21] further supports the impact of the environment on participation among youth with disabilities.

The specific role that the environment plays in the presence of other factors is not well understood. Studies imply that the environment has a direct impact on participation, as levels of participation varied across 8 European districts/countries,[22] and these regions differ in terms of their accessibility.[23] Another study,[24] however, tested a complex model for predicting participation and found that the environment had an indirect effect on participation through its effect on the child's abilities. To date, the environment has not been directly measured as part of the assessment of participation, and in order to disentangle this relationship, other approaches are required. The Participation and Environment Measure for Children and Youth (PEM-CY)[25] is an innovative, comprehensive, psychometrically sound measure that links participation to the environment across different settings (home, school, community) and serves as a promising tool to capture specific aspects of the environment that impact participation.

The purpose of this study is to examine factors that affect participation across home, school, and community settings and to reveal how these factors relate to one another. The proposed model describes our overall hypothesis of the study (fig 1) and is based on previous conceptual and empirical work.[11,24] Overall, the model illustrates that the environment mediates the relationship between the complexity of a child's condition (disability, health condition, functional issues) and participation (ie, frequency and involvement). Previous analysis of PEM-CY data,[26] along with findings of other studies,[24] indicated that sex had a negligible effect on participation in the presence of other factors and was therefore excluded from this model.

List of abbreviations:

CFI	**comparative fit index**
CI	**confidence interval**
HC	**health condition**
PEM-CY	**Participation and Environment Measure for Children and Youth**
RMSEA	**root mean square error of approximation**
SEM	**structural equation modeling**

Methods

Participants and procedures

Parents were recruited through community-based organizations and service groups for children and families in Canada and the United States (see appendix 1 for recruitment strategies). Eligible participants had to be parents or legal guardians of a child aged 5 to 17 years, with or without a disability, and able to read English. Parents were directed via a weblink to a secure website to provide informed consent and to complete the demographic questionnaire, followed by the PEM-CY. Parents were asked to complete these questionnaires in a single sitting, which is a potential respondent burden and may explain the missing data in some cases. The ethics board of each of the participating universities approved the study.

Measures

Participation frequency and involvement as well as environmental factors were measured using the PEM-CY. This parent-report assessment includes 25 sets of activities across 3 different settings: home (10 items), school (5 items), and community (10 items). For each setting, environmental aspects that impact the child's participation (eg, resources, attitudes, availability of programs, accessibility) are assessed separately: 13 environment-related items for home, 17 for school, and 16 for community. Parents indicated whether each item was an environmental barrier, a facilitator, or both, to their child's participation. Scales and scores of the PEM-CY are described in table 1. The PEM-CY has demonstrated sufficient reliability (internal consistency, .59−.91; test-retest reliability, .58−.95) and was able to distinguish between children with and without disabilities across all scales (effect size, .51−1.44), supporting its validity.[25]

A demographic questionnaire was completed by parents to gather information about child/family contexts, including whether their child has a disability and which of a list of 11 functional issues affected their child's daily functioning (eg, communication with others, moving around). Parents also reported specific conditions of the child using a list of 13 health conditions (eg, intellectual delay, attention-deficit disorder). A mean number of health conditions as well as a mean number of functional issues were calculated to represent the complexity of the condition.

Data analysis

This study is a comprehensive secondary analysis of data published elsewhere.[9] Initial examination of the distribution of the observed factors/indicators in each of the models was performed to assess assumptions of normality by using multivariate kurtosis; a result >1.96 indicated nonnormality. In addition, patterns of missing data were examined. Structure equation modeling (SEM) analysis was used to test the structural model of each setting (home, school, community), resulting in 3 models while accounting for the constructs of the latent variables of participation: frequency and