Title: Exploring environmental restrictions on participation of children with developmental disabilities

Running Title: Environmental restrictions on participation

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Exploring environmental restrictions on participation of children with developmental disabilities

Abstract

Background: Environments are important to children's participation, but little is known about which environmental factors restrict their participation, particularly in children with moderate to severe developmental disabilities.

Method: Parents of 64 children attending special schools completed an Environmental Restriction Questionnaire (ERQ). Two researchers also classified item contents of the ERQ with the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) to enable a uniform interpretation.

Results: At home the children experienced environmental restrictions related to *Products and technology* within the ICF-CY. The environment restrictions in the community ranged three varied areas of *Products and technology*, *Support and relationships*, and *Services, systems and policies*. The environmental restrictions on children's educational participation originated from *Support and relationships* and *Attitudes* of the parents.

Conclusions: The findings offer important insights about critical environmental restrictions and their classification with the ICF-CY for promoting participation of children with developmental disabilities.

Keywords: Environmental restrictions; Participation; Children; ICF-CY; Linking rules

Introduction

Participation in everyday life provides children with opportunities to develop fundamental skills, socialise with others and establish adaptive behaviours (Hoogsteen & Woodgate, 2010; Law, Finkelman, Hurley, Rosenbaum, King, King, & Hanna, 2004). Yet, restrictions to children's participation may occur due to child and/or family factors within their environments. In particular, children with disabilities have been found to be at risk of limited participation more than their typically developing peers (Bedell, Coster, Law, Liljenquist, Kao, Teplicky, Anaby, & Khetani, 2013; Coster, Law, Bedell, Liljenquist, Kao, Khetani, & Teplicky, 2013; Engel-Yeger, Jarus, Anaby, & Law, 2009; Sylvestre, Nadeau, Charron, Larose, & Lepage, 2013; Ullenhag, Krumlinde-Sundholm, Granlund, & Almqvist, 2013). Understanding the factors that hinder participation can assist healthcare professionals to promote participation of children with disabilities (Bult, Verschuren, Lindeman, Jongmans, Westers, Claassen, & Ketelaar, 2013; King, Law, King, Rosenbaum, Kertoy, & Young, 2003; Palisano, Chiarello, Orlin, Oeffinger, Polansky, Maggs, Bagley, & Gorton, 2010).

The impact of environments on children's participation has been documented in the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) (World Health Organisation, 2007). The ICF-CY is grounded on a social model of disability which considers the impact disability has on the lives of children in society, rather than the cause of the disability (Harding, Harding, Jamieson, Mullally, Politi, Wong-Sing, Law, & Petrenchik, 2009). In the ICF-CY, therefore, participation is defined as a child's involvement in life situations, which is influenced by his/her health conditions, body functions and structures, activities, and contextual factors. Health conditions are diseases or disorders that impact in functioning. Body functions refer to physiological and psychological functions of body systems. Body structures refer to anatomical parts of the body. Activity is the execution of a task or action by a child. Contextual factors represent the backgrounds of a child's life and living, which include personal and environmental factors. While many studies

were conducted to understand the role of children's body functions/structures, activities, or personal characteristics on their participation (Brown, O'Keefe, & Stagnitti, 2011; Fong, Lee, Chan, Chan, Chak, & Pang, 2011; Forsyth, Colver, Alvanides, Woolley, & Lowe, 2007; Gee Kee, Chien, Rodger, & Copley, 2014; Reynolds, Bendixen, Lawrence, & Lane, 2011), environmental factors in relation to children's participation have been rarely investigated.

Environmental factors are categorised into five areas (or also known as chapters) in the ICF-CY (World Health Organisation, 2007). The five chapters includes: (1) Products and technology; (2) Natural environment and human-made changes to environment; (3) Support and relationships; (4) Attitudes; and (5) Services, systems and policies. Each chapter includes further categories that are organised hierarchically at different levels and are given a unique alphabet label followed by numeric codes. For instance, e1 (Products and technology) is the first level, e115 (Products and technology for personal use in daily living) is the second level, e1152 (Products and technology used for play) is the third level, and e11520 (General products and technology for play) is the fourth level. Such the ICF-CY classification system has been used to facilitate content comparison of instruments assessing environmental factors (Alvarelhao, Silva, Martins, Queiros, Amaro, Rocha, & Lains, 2012) or environmental research outcome (Hwang, Liao, Granlund, Simeonsson, Kang, & Pan, 2014). It can be also used as a potential framework to classify environmental restrictions in a universal way that facilitates the understanding of their attributes for multidisciplinary communication. The need for a uniform classification of environmental restrictions has been highlighted by Hemmingson and Borell (2002) to eliminate the difference in interpretation that may arise from different professionals. For example, Dickinson and Colver (2010) identified the absence of suitable leisure facilities in community as a "social support" barrier for children with cerebral palsy, whereas others may consider it as "physical environmental barrier". Therefore, the ICF-CY application in consistently interpreting environmental restrictions experienced by children with disabilities is promising.

Previous studies and reviews have identified environmental restrictions and, particularly, most of these focused on children with physical disabilities (Bult, Verschuren, Jongmans, Lindeman, & Ketelaar, 2011; Dickinson & Colver, 2010; Galvin, Froude, & McAleer, 2010; Hemmingson & Borell, 2002; Law, Petrenchik, King, & Hurley, 2007; Mihaylov, Jarvis, Colver, & Beresford, 2004). However, attention on environmental restrictions of children with intellectual and/or developmental disabilities has not been equally received until appropriate measures have been made available recently (Bedell et al., 2013; Coster et al., 2013; Rosenberg, Ratzon, Jarus, & Bart, 2010). The Environmental Restriction Questionnaire (ERQ) (Rosenberg et al., 2010) is one of the few newly-developed measures that are designed for children with a range of disabilities. It also captures most of the environmental areas related to children's participation (e.g., home, education, and community). Rosenberg et al. (2012) has used the ERQ to explore environment restrictions for children with mild developmental disabilities, but no studies were conducted in children with severer levels of developmental disabilities who would rely more heavily on environmental supports for participation due to their very limited functional abilities.

The primary aim of this study was to investigate which environmental factors restricted participation of children with moderate to severe developmental disabilities by using the ERQ. The second aim included the classification of the ERQ contents into the ICF-CY framework in order to facilitate a uniform interpretation for the environmental restrictions. In addition, whether the environmental restrictions differed by child or family characteristics was examined. Based on previous studies (Law et al., 2007; Rosenberg et al., 2010) and theoretical propositions (King et al., 2003), we expected some of the environmental restrictions to vary according to children's age and gender or their parents' socioeconomic status (e.g., household income).

Methods

Identifying Environmental Restrictions for Children

Participants

This study is a secondary data analysis in which the data were retrieved from a larger research study investigating factors supporting children's hand-skill life participation (Chien, Rodger, & Copley, in press). Initially 82 parents provided written consent for research participation, and 64 (78.0%) of them completed the research questionnaires that were mailed to their homes. Ethical approval for the study was granted by the Department of Education, Training and Employment (file number: 550/27/1126) and ethical review committee at The University of Queensland (project number: 2011000600).

Table 1 summarises the demographics of the children whose parents did or did not return research questionnaires. In the sample returning research questionnaires, there are 42 boys and 22 girls. Their average age is 8 years 6 months (with a standard deviation of 31.5 months). The parents reported that they had an average of 2.6 diagnoses/disabilities, 48.4% of which was intellectual disability, 35.9% Autism, and 34.4% developmental delay. Such multiple-disabled characteristic indicated that the children in the sample had moderate to severe disabilities, which also conformed with the criteria for enrollment in special schools (Queensland Government, 2006). By comparison, there were no significant differences in gender ($\chi^2 = 0.26$, $p = 0.61$), age ($t = 0.52$, $p = 0.60$), and number of diagnoses/disabilities ($t = 0.48$, $p = 0.63$) between the children who returned research questionnaires and those who did not return.

Insert Table 1 about here

Measures

Demographic variables

A parent-report demographic questionnaire was designed in the study to obtain children's age, gender, and types of diagnoses/disabilities. The household incomes (weekly before tax) of the children's parents were also obtained. According to the Australian Bureau of Statistics (2011), the average weekly household income was approximately $1,400 Australian dollars within the Brisbane region, at the time of the study being conducted. This was used to classify the participants into two household income levels (e.g., ≥ average and < average).

Environmental Restriction Questionnaire (ERQ)

The ERQ is developed to measure parental perception of environmental aspects that restrict their children's participation (Rosenberg et al., 2010). It consists of 35 items that cover a range of physical and human environmental aspects. Particularly 33 of the items can be further grouped into three domains: (1) *Home* including eight items assessing physical environment at home; (2) *Community* including 12 items assessing physical and non-physical accessibility in the community; and (3) *Education* including 13 items assessing educational environment at home and at school, according to the confirmatory factor analysis conducted by Rosenberg et al. (2010). For each ERQ item, parents are asked to rate to the extent to which, in their opinion, the item restricts their child's participation. All ERQ items are scored on the same 6-level Likert scale, where 1 indicates '*does not at all limit*' and 6 indicates '*limits to a great degree*'. Parents can also mark the '*not applicable*' column if they perceive any item as non-relevant to their child (Rosenberg et al., 2010). The scores of all items in each domain can be averaged as a domain score (ranging from 1 to 6), and higher scores indicate higher levels of participation restriction.

The ERQ was originally developed in Israel with an English translation available, and was intended to be used with younger children aged 4−6 years (Rosenberg et al., 2010). For

this study, we considered that it could also be applicable for children with moderate to severe disabilities aged between 2−12 years. Accordingly, we slightly modified/revised its item descriptions in a way that extends to children between our intended age range (e.g., replacing 'preschool' to 'kindergarten/preschool/school'), and within the Australian cultural context (e.g., relating 'community centre' to 'the place where the child does extracurricular activities'). All of the revisions/additions have been approved by the original author of the ERQ (L Rosenberg, personal communication, May 2, 2012) who also supported the use of the ERQ in wider age groups.

The ERQ has demonstrated good internal consistency and construct validity based on known group differences (Rosenberg et al., 2010). Its convergent validity was also confirmed by its ability to predict children's participation, as measured by Children's Participation Questionnaire (Rosenberg, Jarus, Bart, & Ratzon, 2011).

Classifying the ERQ into ICF-CY

To classify the ERQ item contents with ICF-CY environmental factor categories, two raters were involved and the linking rules developed by Cieza and colleagues (2002, 2005) were used. The first rater is an occupational therapy researcher who had ICF-CY linking training and corresponding experience (Chien, Rodger, Copley, & Skorka, 2014). The second rater is a third-year occupational therapy student who was trained by the first rater in using the ICF-CY linking rules. Practice was conducted to familiarise both raters with the classification of a similar measure assessing environmental factors, such as the Craig Hospital Inventory of Environmental Factors (Whiteneck, Harrison-Felix, Mellick, Brooks, Charlifue, & Gerhart, 2004).

In the formal classification, the two raters coded all the ERQ items independently. The classification process started with identification of 'meaningful concepts' from each item (Cieza et al., 2005). The meaningful concepts could be a certain word/phrase/sentence from item content of the ERQ that presents concrete meanings to be captured by the item.

Identification of the meaningful concepts was based on each rater's perceptions and interpretations of the item content. If the items contained multiple examples that included meaningful concepts, these were also considered for classification (Cieza et al., 2005). Each of the identified meaningful concepts was classified by assigning an ICF-CY code at the most precise level. If the information of a meaningful concept was insufficient for deciding which ICF-CY code best represented it, the meaningful concept was coded as 'not definable'.

Additional linking rules were used in the present study. For example, the specification of a certain time (e.g., in the afternoon) or personal factors that were included in certain items were not classified. All of the item contents were also coded without over-interpretation of their meanings/purposes, beyond what the items intended to capture. For example, asking whether a variety of toys is available for a child may imply his/her engagement in play with those toys, which could be related to the coding of d880 (Engagement in play); but this item is more directly linked to the category of e1152 (Products and technology used for play), based on the words that get their meaning from the context in which the item is used.

The overall agreement between the two raters in classifying the ERQ items to ICF-CY categories was 64.1% in this study. In cases of disagreement between the two raters' classification results, one additional researcher who is a pediatric occupational therapist and researcher with more than 30 years of experience was consulted and consensus was reached based on group discussion.

Data Analysis

The data analysis for this study was divided into three parts. The first part involved a descriptive analysis of environmental restrictions by calculating the mean scores of each ERQ item. The top five environmental restrictions perceived by the parents of children with developmental disabilities were further determined at each ERQ domain of home, community, and education. In addition, the percentage of no limitation (rating=1) and different levels (mild=2−3, moderate=4−5, and large=6) of limitations in each ERQ item was reported to

present detailed patterns of environmental restrictions.

In the second part, a descriptive analysis was conducted to summarise the total number of meaningful concepts within the ERQ that were classified or not classified to the ICF-CY categories. Bandwidth of the classified categories within ICF-CY environmental factors was also reported. The analysis of the classification was based on the second-level codings of the ICF-CY (e.g., rounding up the third and fourth-level categories), as suggested elsewhere (Fayed, Cieza, & Bickenbach, 2011).

For the third part, the relationship between the top environmental restrictions and ICF-CY environmental factor categories was explored using the results of the first part. Additionally, Mann-Whitney U-tests or the Kruskal-Wallis Test were used to examine whether differences in the top environmental restrictions existed between gender (boys and girls), age (>7, 8−10, and <11 years), or household income (≥ average and < average). All analyses were performed using the Statistical Package for Social Sciences (SPSS) Version 17.0.

Results

Environmental Restrictions as Identified by the ERQ

Of the 64 participants involved in this study, only eight (12.5%), five (7.8%), and three (4.7%) participants reported no environmental restrictions in any items of the home, community, and educational domains, respectively. The parents reported that their children encountered greatest overall environmental restrictions in ERQ community domain (mean scores=2.29 ± 1.07), followed by the educational (2.07 ± 0.91) and home (1.90 ± 0.84) domains.

Table 2 shows mean scores, rank orders, and distributions of perceived environmental restrictions at individual item levels. In the home domain, the top five restrictions were: *My family's income*, *Location of craft*, *Location of paints and paper*, *Location of toys and games*,

and *Height of water taps*. The first two environmental areas were perceived as a limitation by more than half of the parents. In the community domain, the top five restrictions were: *Distance of my child's friends' houses*, *Distance of school*, *Roads and traffic in neighborhood*, *Nanny/housekeeping services*, and *Level of safety in neighborhood*. While no limitation was perceived by a substantial percentage (38−55%) of the parents in these five areas, approximately a quarter of other parents reported a moderate or large level of limitation in all of the five items. In the educational domain, the top five restrictions were: *My partner's job*, *My parental habits*, *My involvement in school*, *Habits of TV watching in family*, and *Time at which my child returns home from school*. The first two areas were perceived as a limitation by more than half of the parents, and particularly 28.1−45.2% of parents further rated the limitation at the moderate or large degree.

Insert Table 2 about here

In addition, there were five items identified as 'not applicable' by more than 20% of the parents. Three of these items appeared in the community domain, one in the educational domain, and one in the unspecified domain (Table 2). This implies that the children may lack friends to visit, access to nanny/housekeeping services, places for their child's engagement in extracurricular activities, or people caring for them in out-of-school hours, and that the main respondents (mainly the children's mothers) may not have jobs.

ICF-CY classification of the ERQ

A total of 50 meaningful concepts were identified in the ERQ, and 5 (10.0%) of these were classified into the ICF-CY Activities and Participation component. The remaining 45 (90.0%) meaningful concepts were coded within environmental factor categories specifically (see Table 3). Those classified categories were ranged across the five environmental factor chapters in varying numbers, where 18 were in the chapter of e1 (Products and technology),

only one in e2 (Natural environment and human-made changes to environment), 14 in e3 (Support and relationships), four in e4 (Attitudes), and eight in e5 (Services, system and policies).

Insert Table 3 about here

In further analysis of the bandwidth of the meaningful concepts classified into the second-level ICF-CF codings, there were 22 environmental factor categories among the ERQ items. Particularly the category of e310 (Immediate family) were the most classified with five times. Three categories of e115 (Products and technology for personal use in daily living), e340 (Personal care providers and personal assistants), and e410 (Individual attitudes of immediate family members) were the second most classified with four times. However, it is noted that there were ten ERQ items that could not be successfully classified into any ICF-CY environmental factor categories (refer to Table 3). These items were related to the location of certain objects, the distance or maintenance of certain places, and the time spent on transportation.

Exploration of the Top Environmental Restrictions

By applying the ICF-CY classification results of the ERQ, the identified top environmental restrictions in the home domain are related to the Products and technology chapter, and specifically to the categories e155 and e165 (see Table 3). The classified categories for the top community restrictions are varied at three chapters of Products and technology (i.e., e150 and e160), Support and relationships (i.e., e340), and Services, systems and policies (i.e., e545 and e575). All of the classified categories for the top environmental restrictions in the educational domain are Support and relationships (e310) and/or Attitudes (e410) of immediate family members.

No significant gender differences were found for those identified top environmental restrictions (see Table 4). However, significant age differences were found for *Height of water taps* (in the home domain) and *Distance of my child's friends' houses* and *school* (in the community domain). Furthermore, the parents with a household income below average perceived their *family income* as a limitation for their child's participation, more than those having average or above average income levels.

Insert Table 4 about here

Discussion

This study is the first to explore environmental restrictions on participation of children with moderate to severe developmental disabilities and to further interpret the results using the ICF-CY which includes a systematic classification of environmental factor categories and chapters. The findings suggest that, at home, the children experienced environmental restrictions related to socioeconomic status and locations of various objects, which were classified as *Products and technology* within the ICF-CY. The environment restrictions in the community included the geographical location, traffic, safety and availability of caring services, which were related to three varied areas of *Products and technology*, *Support and relationships*, and *Services, systems and policies*. The environmental restrictions on children's educational participation originated from *Support and relationships* and *Attitudes* of the parents (including their jobs, habits, and involvement in school). In addition, most of those top environmental restrictions did not differ across children's gender or age and household income. The findings provide insights into key environmental restrictions that can be related to the ICF-CY environmental factors, for understanding in participation of children with moderate to severe developmental disabilities. Considering that the ICF-CY is a universally acknowledged framework across health professionals, the findings of this study

could facilitate multidisciplinary communication and development of strategies/policies for promoting children's participation by eliminating barriers or increasing environmental supports.

In this study, parental perceptions of environmental restrictions to participation of children with developmental disabilities revealed that the highest overall environmental restrictions were associated with community contexts, consistent with previous studies (Bedell et al., 2013; Law et al., 2007; Rosenberg et al., 2010, 2012). The top two community restrictions are the distance of the home to the school or to the child's friends' houses. Such distance factors, although not able to be classified to ICF-CY environmental factors, may imply traveling time or inconvenience that prevents the children from visiting their friends and engaging in out-of-school activities around the community. These two environmental restrictions also differed by children's age, where children older than 8 years experienced higher restrictions than younger children. This is developmentally logical that children moving into higher school-age need to attend school more often and start to make friends (Rodger & Ziviani, 2006), thus having a decisive impact on their community participation if the geographical location between the child's home and the school or friends' houses are too far.

It is not surprising that the other top community restrictions are related to traffic and safety in the neighborhood, given the nature of the participants who all lived within metropolitan regions. These issues were also rated as the highest environmental restrictions by the parents of children with mild developmental disabilities in Rosenberg et al.'s study (2012). Likewise, we were not surprised that nanny/housekeeping services presented as one of the top environmental restrictions for children's community participation in the present study. Given that most of the respondents were mothers in this study, they may have had stronger desires for nanny/housekeeping services to enhance their children's participation, particularly for those with severe disabilities.

Educational environmental features that were reported as top restrictions to the children in this study included the job, habits, and school involvement of the parents, which are all related to supports and attitudes of the immediate family (rather than the school itself or associated members). This finding suggests that the role of the parents may be more likely to hinder children's participation in the educational environment. These environmental restrictions are similar to Rosenberg et al.'s findings (2012) but different from those of Law et al. (2007) and Hemmingson and Borell (2002) who found that school environments were the barrier to children's educational participation. Such differences may be attributable to dissimilar populations and school contexts between those studies and the present study. In previous studies (Hemmingson & Borell, 2002; Law et al., 2007), children with physical disabilities from mainstream schools were involved, and they may be vulnerable to peer bullying due to physical deficits or insufficient special assistance provided by teachers. In contrast, the target population of this study was children with developmental disabilities attending special schools. The parents may perceive that their children are more socially included as all other students have similar significant disabilities and the teachers are experienced in accommodating their children's learning needs. For the children attending special schools, therefore, provision of proper education and supports for the parents may promote their children's educational participation.

With regard to environmental restrictions at home, this study found that these factors were least restrictive to children's participation, consistent with Rosenberg et al.'s study (2012). However, age or household income differences occurred in some top home restrictions, warranting further discussion. The age difference in the height of water taps may be reasonable as younger children are not tall enough to reach water taps. It also makes sense that the families with below average household income could perceive family income as a barrier (Rosenberg et al., 2010), because they may not be able to afford something (e.g., play-related or child-care facilities) for their children's participation in home. These suggest

that some home modifications or financial support may be additionally considered for specific children or family situations.

In addition, this study presented an informative and universal way to interpret the identified environmental restrictions by relating to the ICF-CY classification system of environmental factors. This was enabled due to the ICF-CY linking rules developed by Cieza et al. (2002, 2005). The linking rules have been largely used to classify children's participation or activity measures (Adolfsson, Malmqvist, Pless, & Granuld, 2011; Chien et al., 2014; Fayed et al., 2011; Gleason & Coster, 2012) but rarely for measures assessing environmental restrictions (Alvarelhao et al., 2012; Hwang et al., 2014). The present study found that most of the ERQ items did have one or more specific environmental factor categories in the ICF-CY, serving as its content validity evidence for assessing environmental restrictions. It is also worth noting the insufficiency of the ICF-CY environmental factors to classify assessment concepts (e.g., location, distance or time spent on transportation) in some ERQ items. While classifying those concepts to the categories of 'other specified' and 'unspecified' in the ICF-CY may be a solution, this was not suggested in the existing linking rules (Cieza et al., 2005). In agreement with other researchers (Hwang et al., 2014), there could be a need for future expansion of the ICF-CY environmental factors categories to better include those non-classified concepts. For now, professionals working with children are encouraged to familiarise themselves with ICF-CY environmental factors and linking rules. This could facilitate a uniform classification of environmental restrictions faced by their clients and communications among different professionals towards the goal to promote children's participation by eliminating environmental barriers or increasing supports at home, school, or community.

One limitation of this study is the heterogeneous sample of children with developmental disabilities and their parents. Although this reflected the multiple-disabled nature of children attending special schools, limited generalisability of the study's findings to children with

specific disabilities and those who are enrolled in mainstream schools is noted. Furthermore, the parents and children with disabilities were recruited from a metropolitan region in Australia. Future studies that recruit children with homogeneous characteristics or from other geographical contexts are needed to confirm the findings of the current study.

Conclusions

This study suggests that children with moderate to severe developmental disabilities experienced environmental restrictions on their participation across home, education, and community. Several critical environmental restrictions were also identified. Most of the identified environmental restrictions were further classified to ICF-CY environmental factor categories for uniform interpretations, as well as were found to be similar across children's gender or age and household income. This information can be used to facilitate communication among different professionals and assist in promoting children's participation, by eliminating barriers and also increasing environmental supports.

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References

Adolfsson, M., Malmqvist, J., Pless, M., & Granuld, M. (2011). Identifying child functioning from an ICF-CY perspective: Everyday life situations explored in measures of participation. *Disability & Rehabilitation, 33*, 1230-1244. doi: 10.3109/09638288.2010.526163

Alvarelhao, J., Silva, A., Martins, A., Queiros, A., Amaro, A., Rocha, N., … Lains, J. (2012). Comparing the content of instruments assessing environmental factors using the International Classification of Functioning, Disability and Health. *Journal of Rehabilitation Medicine, 44*, 1-6. doi: 10.2340/16501977-0905

Australian Bureau of Statistics. (2011). Census of Population and Housing: Time Series Profile DataPack, Second Release. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/0/6F560863462F0707CA25734100166CC7?OpenDocument

Bedell, G., Coster, W., Law, M., Liljenquist, K., Kao, Y. C., Teplicky, R., … Khetani, M. A. (2013). Community participation, supports, and barriers of school-age children with and without disabilities. *Archives of Physical Medicine and Rehabilitation, 94*, 315-323. doi: 10.1016/j.apmr.2012.09.024

Brown, T., O'Keefe, S., & Stagnitti, K. (2011). Activity preferences and participation of school-age children living in urban and rural environments. *Occupational Therapy in Health Care, 25*, 225-239. doi:10.3109/07380577.2011.589889

Bult, M. K., Verschuren, O., Jongmans, M. J., Lindeman, E., & Ketelaar, M. (2011). What influences participation in leisure activities of children and youth with physical disabilities? A systematic review. *Research in Developmental Disabilities, 32*, 1521-1529. doi: 10.1016/j.ridd.2011.01.045

Bult, M. K., Verschuren, O., Lindeman, E., Jongmans, M. J., Westers, P., Claassen, A., … Ketelaar, M. (2013). Predicting leisure participation of school-aged children with cerebral palsy: Longitudinal evidence of child, family and environmental factors. *Child: Care, Health and Development, 39*, 374-380. doi: 10.1111/j.1365-2214.2012.01391.x

Chien, C. W., Rodger, S., & Copley, J. (in press). Development and psychometric evaluation of a new measure for children's participation in hand-use life situations. *Archives of Physical Medicine and Rehabilitation*. doi: 10.1016/j.apmr.2014.11.013

Chien, C. W., Rodger, S., Copley, J., & Skorka, K. (2014). Comparative content review of children's participation measures using the International Classification of Functioning, Disability and Health-Children and Youth. *Archives of Physical Medicine and Rehabilitation, 95*, 141-152. doi: 10.1016/j.apmr.2013.06.027

Cieza, A., Brockow, T., Ewert, T., Amman, E., Kollerits, B., Chatterji, S., … Stucki, G. (2002). Linking health-status measurements to the international classification of functioning, disability and health. *Journal of Rehabilitation Medicine, 34*, 205-210. doi: 10.1080/165019702760279189

Cieza, A., Geyh, S., Chatterji, S., Kostanjsek, N., Ustun, B., & Stucki, G. (2005). ICF linking rules: An update based on lessons learned. *Journal of Rehabilitation Medicine, 37*, 212-218. doi:10.1080/16501970510040263

Coster, W., Law, M., Bedell, G., Liljenquist, K., Kao, Y. C., Khetani, M., … Teplicky, R. (2013). School participation, supports and barriers of students with and without disabilities. *Child: Care, Health and Development, 39*, 535-543. doi: 10.1111/cch.12046

Dickinson, H. O., & Colver, A. (2010). Quantifying the physical, social and attitudinal

environment of children with cerebral palsy. *Disability & Rehabilitation, 33*, 36-50. doi: 10.3109/09638288.2010.485668

Engel-Yeger, B., Jarus, T., Anaby, D., & Law, M. (2009). Differences in patterns of participation between youths with cerebral palsy and typically developing peers. *American Journal of Occupational Therapy, 63*, 96-104. doi:10.5014/ajot.63.1.96

Fayed, N., Cieza, A., & Bickenbach, J. E. (2011). Linking health and health-related information to the ICF: A systematic review of the literature from 2001 to 2008. *Disability & Rehabilitation, 33*, 1941-1951. doi: 10.3109/09638288.2011.553704

Fong, S. S., Lee, V. Y., Chan, N. N., Chan, R. S., Chak, W. K., & Pang, M. Y. (2011). Motor ability and weight status are determinants of out-of-school activity participation for children with developmental coordination disorder. *Research in Developmental Disabilities, 32*, 2614-2623. doi: 10.1016/j.ridd.2011.06.013

Forsyth, R., Colver, A., Alvanides, S., Woolley, M., & Lowe, M. (2007). Participation of young severely disabled children is influenced by their intrinsic impairments and environment. *Developmental Medicine and Child Neurology, 49*, 345-349. doi: 10.1111/j.1469-8749.2007.00345.x

Galvin, J., Froude, E. H., & McAleer, J. (2010). Children's participation in home, school and community life after acquired brain injury. *Australian Occupational Therapy Journal, 57*, 118-126. doi: 10.1111/j.1440-1630.2009.00822.x

Gee Kee, E., Chien, C. W., Rodger, S., & Copley, J. (2014). Examining the association between children's hand skill performance and participation in everyday life. *Journal of Occupational Therapy, Schools, and Early Intervention, 7*, 246-259. doi: 10.1080/19411243.2014.979598

Gleason, K., & Coster, W. (2012). An ICF-CY-based content analysis of the Vineland

Adaptive Behavior Scales-II. *Journal of Intellectual and Developmental Disability, 37*, 285-293. doi: 10.3109/13668250.2012.720675

Harding, J., Harding, K., Jamieson, P., Mullally, M., Politi, C., Wong-Sing, E., ... Petrenchik, T. M. (2009). Children with disabilities' perceptions of activity participation and environments: A pilot study. *Canadian Journal of Occupational Therapy, 76*, 133-144. doi:10.1177/000841740907600302

Hemmingson, H., & Borell, L. (2002). Environmental barriers in mainstream schools. *Child: Care, Health and Development, 28*, 57-63. doi: 10.1046/j.1365-2214.2002.00240.x

Hoogsteen, L., & Woodgate, R. L. (2010). Can I play? A concept analysis of participation in children with disabilities. *Physical and Occupational Therapy in Pediatrics, 30*, 325-339. doi: 10.3109/01942638.2010.481661

Hwang, A. W., Liao, H. F., Granlund, M., Simeonsson, R. J., Kang, L. J., & Pan, Y. L. (2014). Linkage of ICF-CY codes with environmental factors in studies of developmental outcomes of infants and toddlers with or at risk for motor delays. *Disability & Rehabilitation, 36*, 89-104. doi: 10.3109/09638288.2013.777805

King, G., Law, M., King, S., Rosenbaum, P., Kertoy, M. K., & Young, N. L. (2003). A conceptual model of the factors affecting the recreation and leisure participation of children with disabilities. *Physical and Occupational Therapy in Pediatrics, 23*, 63-90. doi: 10.1080/J006v23n01_05

Law, M., Finkelman, S., Hurley, P., Rosenbaum, P., King, S., King, G., ... Hanna, S. (2004). Participation of children with physical disabilities: Relationship with diagnosis, physical function, and demographic variables. *Scandinavian Journal of Occupational Therapy, 11*, 156-162. doi:10.1080/11038120410020755

Law, M., Petrenchik, T., King, G., & Hurley, P. (2007). Perceived environmental barriers to

recreational, community, and school participation for children and youth with physical disabilities. *Archives of Physical Medicine and Rehabilitation, 88*, 1636-1642. doi: 10.1016/j.apmr.2007.07.035

Mihaylov, S. I., Jarvis, S. N., Colver, A. F., & Beresford, B. (2004). Identification and description of environmental factors that influence participation of children with cerebral palsy. *Developmental Medicine and Child Neurology, 46*, 299-304. doi: 10.1017/S0012162204000490

Palisano, R. J., Chiarello, L. A., Orlin, M., Oeffinger, D., Polansky, M., Maggs, J., ... Gorton, G. (2011). Determinants of intensity of participation in leisure and recreational activities by children with cerebral palsy. *Developmental Medicine and Child Neurology, 53*, 142-149. doi: 10.1111/j.1469-8749.2010.03819.x

Queensland Government. (2006). Minister's policy: Criteria to decide a person is a "Person with a Disability" for the purpose of enrolment in state special schools. Retrieved from http://education.qld.gov.au/schools/disability/ministers-policy.html

Reynolds, S., Bendixen, R. M., Lawrence, T., & Lane, S. J. (2011). A pilot study examining activity participation, sensory responsiveness, and competence in children with high functioning Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders, 41*, 1496-1506. doi: 10.1007/s10803-010-1173-x

Rodger, S., & Ziviani, J. (Eds.). (2006). *Occupational therapy with children: Understanding children's occupations and enabling participation*. Malden, MA: Blackwell Publishing Ltd.

Rosenberg, L., Jarus, T., Bart, O., & Ratzon, N. Z. (2011). Can personal and environmental factors explain dimensions of child participation? *Child: Care, Health and Development, 37*, 266-275. doi: 10.1111/j.1365-2214.2010.01132.x

Rosenberg, L., Ratzon, N. Z., Jarus, T., & Bart, O. (2010). Development and initial validation of the Environmental Restriction Questionnaire (ERQ). *Research in Developmental Disabilities, 31*, 1323-1331. doi: 10.1016/j.ridd.2010.07.009

Rosenberg, L., Ratzon, N. Z., Jarus, T., & Bart, O. (2012). Perceived environmental restrictions for the participation of children with mild developmental disabilities. *Child: Care, Health and Development, 38*, 836-843. doi: 10.1111/j.1365-2214.2011.01303.x

Sylvestre, A., Nadeau, L., Charron, L., Larose, N., & Lepage, C. (2013). Social participation by children with developmental coordination disorder compared to their peers. *Disability & Rehabilitation, 35*, 1814-1820. doi: 10.3109/09638288.2012.756943

Ullenhag, A., Krumlinde-Sundholm, L., Granlund, M., & Almqvist, L. (2014). Differences in patterns of participation in leisure activities in Swedish children with and without disabilities. *Disability & Rehabilitation, 36*, 464-471. doi: 10.3109/09638288.2013.798360

Whiteneck, G. G., Harrison-Felix, C. L., Mellick, D. C., Brooks, C. A., Charlifue, S. B., & Gerhart, K. A. (2004). Quantifying environmental factors: A measure of physical, attitudinal, service, productivity, and policy barriers. *Archives of Physical Medicine and Rehabilitation Medicine, 85*, 1324-1335. doi: 10.1016/j.apmr.2003.09.027

World Health Organisation. (2007). *International Classification of Functioning, Disability and Health: Version of Children and Youth*. Geneva: World Health Organisation.

Table 1. Demographic characteristics of the children

Characteristics	Children who returned ERQ (n = 64)	Children who did not return ERQ (n = 18)
Gender, n (%)		
Male	42 (65.6)	10 (55.6)
Female	22 (34.4)	8 (44.4)
Average age in months	102.1 ± 31.5	106.4 ± 26.9
Age in years, n (%)		
2−4	1 (1.6)	0 (0)
5−7	19 (29.7)	6 (33.3)
8−10	21 (32.8)	5 (27.8)
11−12	23 (35.9)	7 (38.9)
Diagnosis/disability, n (%)*		
Down Syndrome	9 (14.1)	0 (0)
Fragile X	1 (1.6)	0 (0)
Autism	23 (35.9)	10 (55.6)
Cerebral Palsy	6 (9.4)	1 (5.6)
Muscular Dystrophy	0 (0)	1 (5.6)
Physical Disability	8 (12.5)	1 (5.6)
Intellectual Disability	31 (48.4)	6 (33.3)
Speech Delay	22 (34.4)	6 (33.3)
Developmental Delay	22 (34.4)	6 (33.3)
Pervasive Developmental Delay	3 (4.7)	0 (0)
Learning Disability	11 (17.2)	5 (27.8)
Hearing Impairment	0 (0)	1 (5.6)
Visual Impairment	3 (4.6)	2 (11.1)
Others	22 (34.4)	2 (16.7)
Respondents, n (%)		
Mother	54 (84.4)	13 (72.2)
Father	6 (9.4)	4 (22.2)
Caregiver	4 (6.3)	1 (5.6)
Household weekly income, n (%)		
≥ average	27 (42.2)	6 (33.3)
< average	22 (34.4)	8 (44.5)
Not reported	15 (23.4)	4 (22.2)

***** Parents can report multiple diagnoses/disabilities which their children have.

Table 2. Environmental restrictions for children with disabilities as reported by the ERQ items

Items*	Rank	Mean (SD)	Levels of limitation† (% based on applicable cases)				NA (%)
			No	Mild	Moderate	Large	
Home domain							
My family's income	1	2.90 (1.90)	23 (37.7)	16 (26.2)	12 (19.7)	10 (16.4)	3 (4.7)
Location of craft	2	2.56 (1.70)	24 (38.7)	21 (33.9)	10 (16.1)	7 (11.3)	2 (3.1)
Location of paints and paper	3	2.02 (1.54)	33 (53.2)	20 (32.3)	3 (4.8)	6 (9.7)	2 (3.1)
Location of toys and games	4	1.68 (1.16)	43 (68.3)	12 (19.0)	8 (12.7)	0 (0)	1 (1.6)
Height of water taps	5	1.68 (1.17)	41 (66.1)	14 (22.6)	6 (9.7)	1 (1.6)	2 (3.1)
Types of games and toys	6	1.67 (1.21)	42 (66.7)	16 (25.4)	3 (4.8)	2 (3.2)	1 (1.6)
Height of table and chair for eating	7	1.35 (0.81)	50 (79.4)	11 (17.5)	2 (3.2)	0 (0)	1 (1.6)
Height of table and chair for drawing	8	1.30 (0.72)	49 (80.3)	11 (18.0)	1 (1.6)	0 (0)	3 (4.7)
Community domain							
Distance of my child's friends' houses	1	3.02 (1.94)	19 (38.0)	9 (18.0)	14 (28.0)	8 (16.0)	14 (21.9)
Distance of school	2	2.48 (1.83)	31 (50.8)	12 (19.7)	12 (19.7)	6 (9.8)	3 (4.7)
Roads and traffic in neighborhood	3	2.45 (1.68)	26 (41.9)	20 (32.3)	12 (19.4)	4 (6.5)	2 (3.1)
Nanny/housekeeping services	4	2.45 (1.91)	11 (55.0)	3 (15.0)	3 (15.0)	3 (15.0)	44 (68.8)
Level of safety in neighborhood	5	2.38 (1.74)	31 (50.8)	14 (23.0)	11 (18.0)	5 (8.2)	3 (4.7)
Location of community centre	6	2.34 (1.71)	21 (47.7)	14 (31.8)	5 (11.4)	4 (9.1)	20 (31.3)
My preferences for spending free time	7	2.21 (1.56)	31 (49.2)	21 (33.3)	7 (11.1)	4 (6.3)	1 (1.6)
My accessibility to resources and consultation	8	2.16 (1.61)	34 (53.1)	17 (26.6)	9 (14.1)	4 (6.3)	0 (0)
Distance of shopping centre	9	2.05 (1.57)	35 (55.6)	17 (27.0)	6 (9.5)	5 (7.9)	1 (1.6)
Distance of public park	10	1.92 (1.41)	37 (58.7)	16 (25.4)	7 (11.1)	3 (4.8)	1 (1.6)
Type of community	11	1.90 (1.55)	41 (66.1)	11 (17.7)	6 (9.7)	4 (6.5)	2 (3.1)
Structure and plan of house	12	1.85 (1.33)	39 (62.9)	14 (22.6)	8 (12.9)	1 (1.6)	2 (3.1)

Items*	Rank	Mean (SD)	Levels of limitation† (% based on applicable cases)				NA (%)
			No	Mild	Moderate	Large	
Educational domain							
My partner's job	1	3.04 (1.81)	17 (32.1)	12 (22.6)	19 (35.8)	5 (9.4)	11 (17.2)
My parental habits	2	2.70 (1.51)	18 (31.6)	23 (40.4)	14 (24.6)	2 (3.5)	7 (10.9)
My involvement in school	3	2.25 (1.58)	31 (50.8)	17 (27.9)	10 (16.4)	3 (4.9)	3 (4.7)
Habits of TV watching in family	4	2.16 (1.50)	33 (52.4)	18 (28.6)	9 (14.3)	3 (4.8)	1 (1.6)
Time at which my child returns home from school	5	2.08 (1.41)	29 (45.3)	27 (42.2)	5 (7.8)	3 (4.7)	0 (0)
My educational views	6	2.02 (1.47)	36 (58.1)	15 (24.2)	9 (14.5)	2 (3.2)	2 (3.1)
Treatment child receives from school	7	1.98 (1.32)	31 (51.7)	21 (35.0)	7 (11.7)	1 (1.7)	4 (6.3)
People caring for child in the afternoon	8	1.98 (1.44)	24 (60.0)	10 (25.0)	5 (12.5)	1 (2.5)	24 (37.5)
Maintenance of home cleanliness	9	1.92 (1.47)	39 (61.9)	14 (22.2)	7 (11.1)	3 (4.8)	1 (1.6)
Equipment and games in school	10	1.72 (1.12)	35 (58.3)	20 (33.3)	5 (8.3)	0 (0)	4 (6.3)
Number of staff members in school	11	1.67 (1.15)	39 (65.0)	15 (25.0)	5 (8.3)	1 (1.7)	4 (6.3)
Number of children in school	12	1.64 (1.11)	37 (62.7)	18 (30.5)	3 (5.1)	1 (1.7)	5 (7.8)
Computer employed by the family	13	1.59 (1.30)	49 (77.8)	8 (12.7)	4 (6.3)	2 (3.2)	1 (1.6)
Unspecified domain							
My job	1	2.44 (1.64)	23 (46.0)	13 (26.0)	11 (22.0)	3 (6.0)	14 (21.9)
The mobility of the family	2	1.69 (1.30)	44 (68.8)	14 (21.9)	4 (6.3)	2 (3.1)	0 (0)

* The item contents are abbreviated and these items are ordered by the magnitude of mean scores.

† Levels of limitation are categorised by the ERQ item scores, 1 of which is classified as no limitation, 2−3 as mild limitation, 4−5 as moderate limitation, and 6 as large limitation.

NA: Not applicable.

Table 3. Classification of the ERQ item contents into ICF-CY categories

ERQ items*	ICF-CY categories
Home domain	
Types of games and toys	e115, e130, e140
Location of toys and games†	not definable
Location of paints and papers†	not definable
Location of crafts†	not definable
Height of water taps†	e155
Height of table and chair for eating	e115, d415, d550
Height of table and chair for drawing	e115, d440
My family's income†	e165
Community domain	
Type of community	e160, e215
Distance of public park	not definable
Distance of school†	not definable
Distance of shopping centre	not definable
Distance of my child's friends' houses†	not definable
Location of community centre	not definable
Roads and traffic in neighbourhood†	e160
Level of safety in neighbourhood†	e150, e545
Structure and plan of house	e155
My preferences for spending free time	e410, d920
Nanny/housekeeping services†	e340, e575
My accessibility to resources and consultation	e555, e575, e580
Educational domain	
Maintenance of home cleanliness	not definable
My partner's job†	e310
Time at which my child returns home from school†	not definable
Treatment child receives from school	e330, e340, e355
Number of staff members in school	e330, e340, e355
Number of children in school	e585
Equipment and games in school	e115, e130
My involvement in school†	e310
Computers employed by the family	e125, e130, e140
Habits of TV watching in the family†	e410
My educational views	e410
People caring for child in the afternoon	e310, e325, e340, e575
My parental habits†	e310, e410, d660
Unspecified domain	
My job	e310
Mobility of the family	e120, e540

* The item contents are abbreviated.

† indicates top five environmental restrictions identified by the parents of children with developmental disabilities.

Codes for ICF-CY categories are: e115 (Products and technology for personal use in daily living); e120 (Products and technology for personal indoor and outdoor mobility and transportation); e125 (Products and technology for communication); e130 (Products and technology for education); e140 (Products and technology for culture, recreation and sport); e150 (Design, construction and building products and technology of buildings for public use); e155 (Design, construction and building products and technology of buildings for private use); e160 (Products and technology of land development); e165 (Assets); e215 (Population); e310 (Immediate family); e325 (Acquaintances, peers colleagues, neighbours and community members); e330 (People in positions of authority); e340 (Personal care providers and personal assistants); e355 (Health professionals); e410 (Individual attitudes of immediate family members); e545 (Civil protection services, systems and policies); e555 (Associations and organisational services, systems and policies); e575 (General social support services, systems and policies); e580 (Health services, systems and policies); e585 (Education and training services, systems and policies); d415 (Maintaining a body position); d440 (Fine hand use); d550 (Eating); d660 (Assisting others); and d920 (Recreation and leisure).

Table 4. Means and standard deviations of identified top five environmental restrictions by gender, age and household income

	Children's gender			Children's age				Household income		
Items†	Boys	Girls	*p*‡	>7 years	8−10 years	<11 years	*p*‡	≥ average	< average	*p*‡
Home domain										
My family's income	2.63 (1.91)	3.45 (1.79)	.081	2.65 (1.95)	3.32 (1.83)	2.77 (1.90)	.394	3.58 (2.06)	1.81 (1.03)	.004*
Location of craft	2.46 (1.61)	2.76 (1.87)	.573	2.81 (1.47)	2.63 (1.86)	2.27 (1.78)	.371	2.44 (1.87)	2.59 (1.59)	.521
Location of paints and paper	1.85 (1.39)	2.33 (1.80)	.361	2.05 (1.20)	2.37 (1.89)	1.68 (1.49)	.114	2.11 (1.76)	1.95 (1.40)	.982
Location of toys and games	1.69 (1.18)	1.67 (1.16)	.944	2.00 (1.34)	1.78 (1.31)	1.33 (0.76)	.200	1.63 (1.08)	1.55 (0.93)	.980
Height of water taps	1.67 (1.12)	1.70 (1.30)	.964	1.95 (1.28)	1.89 (1.37)	1.23 (0.69)	.034*	1.81 (1.23)	1.64 (1.14)	.351
Community domain										
Distance of my child's friends' houses	3.00 (1.98)	3.05 (1.93)	.812	1.94 (1.55)	3.62 (1.66)	3.63 (2.08)	.009*	3.29 (2.05)	3.00 (1.94)	.520
Distance of school	2.36 (1.68)	2.68 (2.10)	.796	1.71 (1.45)	2.94 (1.92)	2.83 (1.92)	.048*	2.88 (1.99)	2.19 (1.75)	.279
Roads and traffic in neighborhood	2.24 (1.59)	2.86 (1.80)	.185	2.14 (1.71)	3.12 (1.80)	2.25 (1.48)	.117	2.41 (1.80)	2.67 (1.68)	.447
Nanny/housekeeping services	2.36 (1.91)	2.67 (2.07)	.779	1.67 (1.16)	3.80 (1.79)	2.08 (1.93)	.141	2.75 (2.36)	2.00 (1.67)	.661
Level of safety in neighborhood	2.15 (1.54)	2.85 (2.06)	.241	1.95 (1.40)	3.06 (1.95)	2.26 (1.79)	.122	2.52 (1.89)	2.35 (1.63)	.973
Educational domain										
My partner's job	3.00 (1.81)	3.13 (1.86)	.866	2.56 (1.75)	3.41 (2.00)	3.10 (1.68)	.408	2.68 (1.92)	3.24 (1.58)	.258
My parental habits	2.74 (1.57)	2.61 (1.42)	.784	2.65 (1.60)	2.76 (1.35)	2.70 (1.63)	.926	2.83 (1.67)	2.19 (1.03)	.243
My involvement in school	2.20 (1.59)	2.33 (1.59)	.595	2.00 (1.55)	2.39 (1.54)	2.36 (1.68)	.555	2.36 (1.78)	2.00 (1.23)	.685
Habits of TV watching in family	2.24 (1.56)	2.00 (1.41)	.622	2.00 (1.56)	2.68 (1.70)	1.88 (1.23)	.199	2.27 (1.59)	2.00 (1.27)	.622
Time at which my child returns home from school	2.14 (1.48)	1.95 (1.29)	.598	2.00 (1.00)	2.00 (1.60)	2.21 (1.59)	.606	1.96 (1.40)	2.05 (1.25)	.636

* p value < .05.

† The identified environmental restrictions are placed in a descending order and are abbreviated.

‡ The Mann-Whitney U-tests or Kruskal-Wallis Test was used to examine the differences between the groups.