

BACKGROUND & PURPOSE

- Physical, social, & attitudinal environmental factors affect participation of children & youth with disabilities in home, school & community contexts [1-5].
- The Child & Adolescent Scale of Environment (CASE) [6] has been identified as a promising measure of environmental factors [7, 8].
- The CASE is an adaptation of the Craig Hospital Inventory of Environmental Factors (CHIEF), an instrument initially designed to assess environmental barriers experienced by adults with disabilities [9].
- The CASE was designed as part of the Child & Family Follow-up Survey (CFFS), a parent-report measure to assess outcomes & needs of children & youth with acquired brain injuries & their families. Now it can be used separate from the CFFS & for children/youth with other conditions [10, 11].
- The CASE is brief but has good coverage of environmental domains in the International Classification of Functioning [12] & is free, publically available & requires no formal training to use [6-8].
- It has reported evidence of test-retest reliability (ICC = 0.75), internal consistency (Cronbach's $\alpha = 0.84$ & 0.91) & construct validity [2,6-8; 13-16]
- Prior factor analyses identified 4 main factors (58% of the variance explained):
 - Problems associated with home / community (includes inadequate information, problems with government policies);
 - School-related problems (support, assistance, services, equipment, attitudes);
 - Problems with physical design of school, home & community;
 - Other family / neighborhood problems (family stress, problems with finances, inadequate transportation, & neighborhood crime / violence) [6].
- A key criticism of the CASE is that most psychometric evidence comes from studies on children & youth with acquired brain injuries.
- The purpose of this study** was to further examine the validity of the CASE for Canadian youth ages 11 to 17 years with a broad range of chronic conditions and disabilities.

METHODS

- Baseline data examined from large longitudinal study on predictors of changes in quality of life of youth (ages 11-17) with disabilities from 8 children's rehabilitation centers in Ontario, Canada [11, 17,18].
- The CASE includes 18 items that ask parents/guardians about the impact of problems that their child directly or indirectly encounters with physical, social & attitudinal environment features of the child's home, school & community.
- Items rated on a 3-point scale (1=no problem; 2=little problem; 3= big problem)
- Higher CASE scores indicate greater impact of environmental problems
- Data analyses:** Internal scale structure & consistency (*Exploratory factor analyses & Cronbach's α*); Convergent validity (*Pearson correlations*); Discriminant / known groups validity (*Independent t-tests, Analysis of Variance, Scheffé's Post-hoc comparison tests*)

PARTICIPANTS (n= 430 youth with disabilities)

- Youth mean age was **14 years** (SD=2.2); **55%** were male
- 35%** had cerebral palsy, **14%** acquired brain injury, **9%** autism spectrum disorder, **8%** spina bifida, **8%** cleft lip/palate, **8%** developmental delay **4%** amputation, **3%** communication disorders & **13%** other conditions
- Parents' mean age was **45 years** (SD = 6.5); **88%** were female
- English spoken in 90% of families' homes**, French in 2%, Others in 8%

RESULTS: Internal Structure & Consistency

Exploratory Factor Analysis	Factor 1	Factor 2	Factor 3
CASE items	Community / Home Resources	School Resources	Physical Design / Access
1. Home: Physical design	0.105	-0.015	0.782
2. Community: Physical design	0.103	0.017	0.846
3. School: Physical design	-0.049	0.389	0.631
4. Community/Home: Support	0.613	0.430	0.199
5. School: Support	0.207	0.852	0.073
6. School: Attitudes	0.195	0.791	0.129
7. Community: Attitudes	0.445	0.475	0.148
8. Assistive Devices/Equipment	0.381	0.232	0.479
9. Community/Home: Assistance	0.654	0.311	0.099
10. School: Assistance	0.202	0.815	0.111
11. Transportation	0.265	0.122	0.576
12. School: Programs/services	0.315	0.653	0.106
13. Community: Programs/services	0.622	0.221	0.264
14. Family Finances	0.750	0.078	0.209
15. Family Stress	0.683	0.167	0.210
16. Community: Crime & Violence	0.428	0.088	-0.021
17. Government agencies/policies	0.709	0.107	0.207
18. Information	0.611	0.292	-0.084
Variance explained (total = 55.02%)	21.87%	18.64%	14.51%

- Color-coded factor loadings indicate items used to create factor subscales
- Internal Consistency:** Cronbach's alphas were moderate to high for the CASE (**0.89**); & factor subscales: **Community / Home Resources (0.85)**; **School Resources (0.85)**; **Physical Design / Access (0.76)**

Convergent Validity

CASE & Factor subscale Scores	CAFI	CASP: Total Score	CASP: Social, Leisure, Communication	CASP: Advanced Daily Living	CASP: Basic Daily Living/ Mobility
• CASE: Total	0.52	- 0.61	- 0.54	- 0.57	- 0.55
• CASE: Community / Home Resources	0.56	- 0.62	- 0.57	- 0.60	- 0.51
• CASE: School Resources	0.37	- 0.37	- 0.36	- 0.37	- 0.26
• CASE: Physical Design / Access	0.28	- 0.45	- 0.31	- 0.37	- 0.58

CAFI = Child and Adolescent Factors Inventory (Impairment); CASP = Child & Adolescent Scale of Participation (total & 3 factor scores [17])

* Pearson correlation coefficients all significant ($p \leq 0.001$)

Discriminant Validity

- No significant CASE score differences for age category ($p = 0.68$) or sex ($p = 0.15$)
- Significant CASE score differences ($p \leq 0.004$) for cognitive, physical & psychological impairment severity, but not for the CASE Physical Design/Access factor score for cognitive ($p = 0.153$) & psychological ($p = 0.019$) impairment
- Significant CASE score differences for condition ($p \leq 0.001$), but not for School Resources Factor Subscore ($p = 0.037$) [*Bonferroni Correction set at $p \leq 0.0125$ due to multiple comparisons*]
- Overall, youth with cleft lip / palate & amputation had lower CASE scores than youth with cerebral palsy, autism spectrum disorder, spina bifida & developmental delay

DISCUSSION

- 3-factor scale solution similar to previous 4-factor solution & accounted for large proportion of variance.
- 3 factor subscales had moderate to high internal consistency suggesting they might be good estimates of 3 CASE environment dimensions.
- CASE scores significantly correlated with CAFI & CASP scores in expected directions & magnitudes (convergent validity evidence).
- Similar to other studies, youth with higher CASE scores (*more problematic environment*) had lower CASP scores (*less extent or more restricted participation*) & higher CAFI scores (*more severe impairment*) [2, 7,13-16].
- Scores appear to discriminate for condition & impairment type/ severity, but not for age or sex.
- Youth expected to have greater physical & social environmental problems (e.g., cerebral palsy, autism spectrum disorder, spina bifida), had higher CASE scores than youth expected to have less environmental problems (e.g., cleft lip/palate, amputation).
- Study design features limited generalizability & statistical conclusion validity (i.e., unequal representation of conditions; lack of data on race, ethnicity & socio-economic status; most youth had cerebral palsy & were from English-speaking families living in Ontario, Canada).
- Further CASE psychometric testing needed using larger, more diverse samples to include confirmation of 3 factor scale solution & examination of responsiveness to change in scores over time.

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