

BACKGROUND & PURPOSE

- Physical, social, & attitudinal environmental factors affect participation of children & youth with disabilities in home, school, community [1,2].
 - The **Child & Adolescent Scale of Environment (CASE)** [3,4] has been identified as a promising measure of environmental factors [5,6].
 - 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 [7].
 - The CASE designed as part of the Child & Family Follow-up Survey (CFFS), a parent-report measure of outcomes & needs of children & youth with acquired brain injuries & their families [8]. Now it can be used separate from the CFFS & for children/youth with other conditions.
 - It has reported evidence of test-retest reliability (ICC = 0.75), internal consistency (Cronbach's α = 0.84 & 0.91) & construct validity [4,5]
 - Prior factor analyses identified 4 main factors (58% of the variance explained): 1) Home / community problems; 2) School-related problems; 3) Physical design problems; 4) Other family / neighborhood problems (family stress, inadequate finances, transportation & crime / violence) [5].
 - A key criticism is that most psychometric evidence comes from studies on children & youth with acquired brain injuries [4,6]
- 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 longitudinal study on quality of life of youth (ages 11-17) with disabilities from 8 rehabilitation centers in Ontario, Canada [9].
- CASE has 18 items that ask parents about impact of problems that child encounters with physical, social & attitudinal environment features of child's home, school, community.
- Items rated on **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 alphas); Convergent validity (Pearson correlations); Discriminant / known groups validity (Independent t-tests, Analysis of Variance, Scheffés Post-hoc comparison tests)

PARTICIPANTS (n= 430)

- 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 Condition
- 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

<u>Exploratory Factor Analysis</u>	<u>Factor 1</u>	<u>Factor 2</u>	<u>Factor 3</u>
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 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	0.315	0.653	0.106
13. Community: Programs	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%

Internal Consistency

- Cronbach's alphas moderate to high: **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	CASP: Advance Daily Living	CASP Basic Daily & 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 [8, 10]);

* Correlations all significant ($p \leq 0.001$)

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Information about the CASE: <http://sites.tufts.edu/garybedell/measurement-tools/>

Discriminant Validity

- No significant score differences for age ($p=0.68$) or sex ($p=0.15$)
 - Significant score differences ($p \leq 0.004$) for cognitive, physical & psychological impairment severity, but not for CASE Physical Design/Access factor score related to cognitive ($p=0.153$) & psychological ($p=0.019$) impairment*
 - Significant score differences for condition ($p \leq 0.001$), but not for School Resources Factor Subscore ($p=0.037$)*
 - Youth with cleft lip / palate & amputation had lower CASE scores than youth with Cerebral Palsy, Autism Spectrum Disorder, Spina Bifida & Developmental Delay
- * Bonferroni correction set at $p \leq 0.0125$ (due to multiple comparisons)

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 scores from CAFI & CASP 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 discriminate for condition & impairment type/ severity**, but not age or sex.
- Youth expected to have greater physical & social environmental problems had higher CASE scores than youth expected to have less problems.**
- Limitations reduced generalizability & statistical conclusion validity (unequal representation of conditions; lack of data on race, ethnicity & socio-economic status; most youth had cerebral palsy & from English-speaking families in Ontario, CAN).**
- Further psychometric testing needed (larger, more diverse samples; confirmation of 3 factor scale solution; responsiveness)**

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