



The Child and Adolescent Scale of Environment (CASE)[©]

Administration and
Scoring Guidelines

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ABOUT THE AUTHOR

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INTRODUCTION

The Child and Adolescent Scale of Environment (CASE) was initially developed as part of the *Child and Family Follow-up Survey (CFFS)* to monitor outcomes and needs of children with traumatic and other acquired brain injuries (ABI) (Bedell, 2004; Bedell & Dumas, 2004, Galvin, Froude, & McAleer, 2010; Wells, Minnes, & Phillips, 2009). The CASE can be used separately from the CFFS, but is most often used as part of the CFFS or along with two other measures that are included in the CFFS: The Child and Adolescent Scale of Participation (CASP) and Child and Adolescent Factors Inventory (CAFI).

The content and methods used to develop the CASE and other CFFS measures were informed by the International Classification of Functioning (ICF, WHO, 2001), research addressing participation of children and youth with a range of disabilities and

factors related to the child, family and physical and social environment that support and/or hinder participation. As well, feedback was obtained by parents of children and youth with ABI and clinical and measurement experts (Bedell, 2004; Bedell, Cohn, & Dumas, 2005; Dumas, Bedell, & Hamill, 2004).

The CASE and larger CFFS have been used to assess children with other diagnoses (Bedell, 2009; McDougall, Wright, Schmidt, Miller, & Lowry, 2011; Weintraub, Rot, Shoshani, Pe'er, & Weintraub, 2011). The CASE also has been reviewed and described by others as a potential measure of environment for use with children and youth with acquired brain injuries and other disabling conditions (Khetani, Bedell, Coster, Law, & Cousins, in press; MacCauley et al., in press; Sherwin, et al., 2006; Ziviani, Desha, Feeney, & Boyd, 2010).

CASE: Description

The CASE is a modification of the *Craig Hospital Inventory of Environmental Factors (CHIEF)*, (Whiteneck, et al., 2004), an existing instrument designed to assess the frequency (how often) and impact (how much of a problem) of environmental barriers experienced by adults with disabilities. To develop the CASE, items from the CHIEF were modified and additional items were created based on review of existing literature and feedback from families and clinical and measurement experts.

The CASE consists of 18 items that ask parents/guardians only about the impact (*not frequency*) of problems experienced with physical, social and attitudinal environment features of the child's home, school and community and problems related to the quality or availability of services or assistance that the child receives or might

need. Each CASE item or problem is rated on a 3-point ordinal scale: 1) No problem; 2) Little problem; 3) Big problem. There is a “non applicable” response as well. For example, the items referring to school or work would not be applicable for those not attending school, or a structured program or work setting). When the CASE is used separately from the CFFS, parents/guardians also are asked to identify the physical or social aspects of the environment or qualities about the services that their child receives that are supportive or helpful to their child.

CASE: ADMINISTRATION

The CASE can be administered in 5 minutes when completed separately from the CFFS. There is no specific training to administer the CASE or larger CFFS. Those using the CASE or CFFS should be knowledgeable about the content and rating scales used, the key concepts being measured (particularly, “participation,” and “environmental factors”) as defined in the International Classification of Functioning (WHO, 2001; 2007) and the conceptual, descriptive and psychometric information reported in three published articles and summarized in these guidelines (Bedell, 2004; 2009; Bedell & Dumas, 2004).

There are two ways to administer the parent/guardian - report version of the CASE (and larger CFFS). Consistency between the two modes of administration has not been examined.

Self-Administered (in person or mail survey): The parent or guardian is provided with the CASE in person or via postal mail (or e-mail attachment), asked to

complete it on his or her own and then return it to the specific contact person responsible for data coordination (in person or via postal mail). Parents/guardians should be provided with a description of the specific purposes of the project or research being conducted in person or via a cover letter if the CASE is sent via postal mail or e-mail. Each institution is responsible for adhering to guidelines for research ethics with human participants (e.g., informed consent procedures) if the CASE is used for research purposes.

Interviewer administered (in-person or by telephone): The parent or guardian would be administered the CASE in person or by phone using the same version used for self-administration. The interviewer essentially asks the same questions along with the examples provided as they are described in the order in which they are asked on the CASE protocol. Respondents and interviewers are allowed to ask for and provide clarification or further explanation, if needed.

CASE: SCORING

There are a number of ways to score the CASE depending on the purpose of the project or research being conducted:

CASE Total Summary Scores: This score is created by summing the item responses for applicable items, dividing this number by the maximum possible score, and multiplying this number by 100 to conform to a 100-point scale. The maximum possible score if all CASE items were applicable would be: 18 items X 3 = **54**. For example, let's say the sum of all 18 item ratings was 40. This sum (40) would be

divided by 54 (which would equal 0.741) and then multiplied by 100 to obtain a CASE total summary score of 74.1. Higher scores indicate a greater extent of environment problem.

NOTE: Most CASE items are applicable for school-age children (ages 5-17). The current method of handling not applicable items is to not consider them in the scoring of the CASE total summary score. For example, if a child was not attending school or a structured program or work setting, items related to school/work would not be scored (items 3, 5, 6, 10, 12) and scoring would only include the remaining 13 applicable item ratings. In this instance, the maximum possible score would be 13 items x 3 = **39**. If the sum of these 13 applicable item ratings was 20. This sum (20) would be divided by 39 (which would equal 0.513) and then multiplied by 100 to obtain a modified CASE total summary score of 51.3. Because this score is based on a substantially reduced number of items, it would be imprecise to compare these scores with CASE total summary scores that included the full 18-item set.

Also, for four CASE items (3, 5, 6, 10) that pertain to either school or work, parents/guardians are asked to circle the primary setting where the child spends most of his/her time. As a general rule, these items should always refer to school when the child is in elementary or secondary school or when the younger child attends some type of structured school or program (e.g., pre-school, day care). Parents/guardians only need to select school or work for the older youth transitioning to adulthood and young adult (18 years and older) who both attends school (i.e., college or a vocational program) AND works. It is important for all four of these items to pertain to the same setting. Again, it would be imprecise to compare CASE Total scores if the ratings to these items refer to different settings (i.e., school or work).

To address these two issues (when scoring non-applicable items and when items refer to school or work), it is recommended that item-level scores (described below) are used or composite (or subsection) scores are created so that the same scores can be used when comparing different children/youth OR when comparing scores over time for the same children/youth. For example, *one composite / subsection* could be created for the four or five school/work items and *another composite score* could be created for the 13 remaining items that were applicable for all children. Scores on the 13-item set could be compared among all children and over time for the same children. Scores on the 5-item set (3, 5, 6, 10, 12) could be used only for the children attending school and scores on the 4-item set (3, 5, 6, 10) could be used only for youth transitioning to adulthood who attend work.

These issues related to CASE scoring will require future inquiry as additional data are analyzed. Additional factor analyses will determine whether CASE subscores can be created and used in research and/or practice.

CASE Item-level Scores: Item-level scores can be used if interested in responses to or change in specific items (i.e., specific types of environment problems) or for comparing item-level responses or change among all or selected CASE items. This score is the rating provided for each item (e.g., 1=No problem; 2=Little problem; 3=Big problem).

CASE: Overview of Psychometric Findings

The CASE has reported evidence of test re-test reliability (Intraclass Correlation Coefficient = .75) and internal consistency ($\alpha = 0.91$; Bedell, 2004; $\alpha = 0.84$, recent

analyses) and construct / discriminant validity (Bedell, 2004). Higher CASE scores (greater extent of environmental problem) were significantly associated with lower scores on the Child Adolescent Scale of Participation (CASP, more restricted participation, $r = -0.57$, Bedell & Dumas, 2004; $r = -0.43$, Bedell, 2009) and Pediatric Evaluation of Disability Index (PEDI, Haley, et al., 1992, more limited functional skills) mobility ($r = -0.28$) and social function ($r = -0.31$) subscales, and higher scores on the Child Adolescent Factors Inventory (CAFI, greater extent of impairment, $r = 0.36$, Bedell & Dumas, 2004; $r = 0.55$, recent analyses). Recent analyses (unpublished data) demonstrated that as a group, children with disabilities had significantly ($p < 0.02$) higher CASE scores (greater extent of environment problems) than children without disabilities.

Results from initial factor analyses and Rasch analyses suggested that the CASE is best viewed as an inventory of environmental factors or a multidimensional scale rather than a unidimensional scale (Bedell, 2004). Recent factor analyses identified four main factors explaining 58% of the variance: 1) Problems associated with home / community (includes inadequate information, problems with government policies); 2) Problems related to school (support, assistance, services, equipment, attitudes); 3) Problems with physical design of school, home and community; 4) Other family / neighborhood problems (family stress, problems with finances, inadequate transportation, and neighborhood crime / violence (Khetani, et al., in press).

It is important to note that additional CASE and CFFS data are still being collected and will achieve the goal of obtaining a much larger and more diverse sample. Findings from these data will be analyzed and results will be reported in the future.

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The larger Child and Family Follow-up Survey (CFFS) that includes the CASE and other measures (CASP and CAFI) was initially developed in collaboration with Ms. Helene Dumas, MA, PT, Research Center for Children with Special Health Care Needs, Franciscan Hospital for Children, Boston, MA, USA. Initial funding was provided by a grant from the Deborah Munroe Noonan Memorial Fund awarded to Ms. Dumas and Dr. Bedell. Additional support to develop the CFFS was received from the United States Department of Education – National Institute on Disability and Rehabilitation Research which funded Dr. Bedell’s post-doctoral research fellowship at Boston University. In addition, a faculty research grant from Tufts University was awarded to Dr. Bedell to further develop the CFFS and inclusive measures.

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APPENDIX: Child & Adolescent Scale of Environment (CASE)

Child's name _____

**Child & Adolescent
Scale of Environment
(CASE)**

- Instructions -

1. This scale asks questions about physical or social aspects of the home and community environment with which your child may experience problems OR that are supportive or helpful to your child.
2. There are no right or wrong answers. You will have to choose, and in some cases write, the answer that best describes the impact that each aspect of the environment has on your child. If you are not sure about how to answer a question, give your best guess.

Thank you

Your name _____

Your relationship to child _____

Date you completed survey _____

(Month / Day / Year)

The following is a list of possible problems your child may be experiencing with the physical or social aspects of the home and other places in the community OR with the quality or availability of services or assistance that he or she needs. Please put an in the box under the appropriate column next to each problem listed below.

<u>Possible Problem:</u>	<u>No Problem</u>	<u>Little Problem</u>	<u>Big Problem</u>	<u>Not Applicable</u>
1. Problem with design and layout of <u>home</u> <i>(Hard to get to places and things, or hard to see or hear important information)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Problem with design and layout of buildings and places your child uses in the <u>community or neighborhood</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Problem with design and layout of <u>school or work setting</u> <i>(Circle <u>school</u> or <u>work</u>)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Lack of support and encouragement for your child in the <u>community or neighborhood</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Lack of support and encouragement for your child at <u>school or work</u> <i>(Circle <u>school</u> or <u>work</u>)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Problems with people's attitudes toward your child at <u>school or work</u> <i>(Circle <u>school</u> or <u>work</u>)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Problems with people's attitudes toward your child in the <u>community or neighborhood</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Inadequate or lack of assistive devices or equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Inadequate or lack of assistance from people at <u>home</u> or in the <u>community or neighborhood</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Inadequate or lack of assistance from people at <u>school or work</u> <i>(Circle <u>school</u> or <u>work</u>)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Inadequate or lack of transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Inadequate or lack of programs and services at <u>school</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Inadequate or lack of programs and services in the <u>community or neighborhood</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Inadequate or lack of family finances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Family stress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Crime or violence in the <u>community or neighborhood</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Possible Problem (Continued):</u>	<u>No</u> <u>Problem</u>	<u>Little</u> <u>Problem</u>	<u>Big</u> <u>Problem</u>	<u>Not</u> <u>Applicable</u>
17. Problems with government agencies and policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Inadequate or lack of information about your child's diagnosis or condition or intervention approaches (e.g., educational, rehabilitation or medical)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> • Other problems or comments (<i>please specify</i> →): 				

B. Please identify the physical or social aspects of the environment or qualities about the services that your child receives that are supportive or helpful to your child:

*The Child and Adolescent Scale of Environment (CASE) is a modification of the
Craig Hospital Inventory of Environmental Factors (CHIEF)*

*The CASE was initially developed as part of the Child and Family Follow-up
Survey (CFFS) created by Gary Bedell, Ph.D., OTR, FAOTA
at the Center for Rehabilitation Effectiveness at
Sargent College of Health and Rehabilitation Sciences,
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