



**HAL**  
open science

## Assessment of everyday executive functioning using the BRIEF in children and adolescents treated for brain tumor

Jeanne Roche, Hugo Câmara-Costa, J. L. Roulin, Mathilde P. Chevignard, Didier Frappaz, Karine Guichardet, Ouarda Benkhaled, Bernadette Kerrouche, Julie Prodhomme, Virginie Kieffer-Renaux, et al.

### ► To cite this version:

Jeanne Roche, Hugo Câmara-Costa, J. L. Roulin, Mathilde P. Chevignard, Didier Frappaz, et al.. Assessment of everyday executive functioning using the BRIEF in children and adolescents treated for brain tumor. *Brain Injury*, 2020, 34 (4), pp.583-590. 10.1080/02699052.2020.1725982 . hal-03227867

**HAL Id: hal-03227867**

**<https://hal.science/hal-03227867v1>**

Submitted on 7 Feb 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## Assessment of Everyday Executive Functioning Using the BRIEF in Children and Adolescents Treated for Brain Tumor

Jeanne Roche<sup>1</sup>; Mathilde Chevignard<sup>2-4</sup>; Jean-Luc Roulin<sup>5</sup>; Hugo Câmara-Costa<sup>3,6</sup>; Arnaud Roy<sup>7,8</sup>

<sup>1</sup> SMAEC, Miribel, France;

<sup>2</sup> Rehabilitation Department for Children With Acquired Neurological Injury, and Outreach Team for Children and Adolescents With Acquired Brain Injury, Saint Maurice Hospitals, Saint-Maurice, France;

<sup>3</sup> Laboratoire d'Imagerie Biomédicale, LIB, Sorbonne Université, Paris, France;

<sup>4</sup> GRC 24 HaMCRé, Handicap Moteur et Cognitif et Réadaptation, Sorbonne Université, Paris, France;

<sup>5</sup> University Grenoble Alpes, University Savoie Mont Blanc, CNRS, LPNC, Grenoble, France;

<sup>6</sup> Université Paris-Saclay, Université Paris-Sud, UVSQ, CESP, INSERM, Villejuif, France;

<sup>7</sup> Laboratory of Psychology Pays de la Loire, EA4638, UBL, Angers University, Angers, France;

<sup>8</sup> Centre Référent des Troubles d'Apprentissage, Centre de Compétence Nantais de Neurofibromatose, Hôpital Femme-Enfant-Adolescent, CHU de Nantes, Nantes, France

### Objective

Childhood brain tumors and their treatment often negatively affect development of executive functions (EFs) during childhood. Previous studies have reported EF deficits, associated with the most frequent pediatric brain tumors, mostly using performance-based neuropsychological assessments or, more recently, from questionnaires assessing EFs in everyday life. This study aimed to assess everyday life EFs following pediatric brain tumor in a larger and more histologically diverse sample than previously reported and to study clinical and demographic factors influencing outcome.

### Methods

An assessment of executive functioning was undertaken using parent ratings of the Behavior Rating Inventory of Executive Function (BRIEF) in a large sample of children treated for various brain tumors ( $n = 153$ ). A systematic analysis of all subscales and composite indices of the BRIEF questionnaire was performed. Mean T-scores and percentages of participants exhibiting significantly elevated T-scores ( $T \geq 65$ ) were considered. The following clinical and demographic factors were collected: age at diagnosis, age at assessment, parental education level, and use of cranial radiation therapy. The association between each of these factors and parent-reported executive functioning was investigated.

### Results

Among the sample (56% boys; age at diagnosis: mean = 6,  $SD = 3.61$ ); age at assessment: mean = 11.8,  $SD = 3.39$ ), significant difficulties were found in the 3 composite indices and in 6 of the 8 BRIEF subscales ( $T$ -scores  $\geq 65$ ;  $p < .001$  in all cases), with a high frequency of complaints. The highest level of difficulties was observed in the Working Memory subscale (mean  $T$ -score = 61.82;  $p < .001$ ; 37% of participants exhibiting clinically significant scores vs 4%-8% in the reference population), whereas hardly any deficit was found for the Inhibition and Organization of Materials subscales. Both older age at assessment and younger age at diagnosis were significantly associated with higher levels of parent-reported difficulties, particularly for metacognition ( $R^2 = 0.085$ ;  $p < .05$ ).

### Conclusions

Parents of children treated for brain tumors report widespread and persistent deficits in EFs that negatively affect their everyday functioning. These difficulties vary from patient to patient. Including analysis of all clinical scales and composite indices allows a more comprehensive approach and enables to specify the patients' executive profile. This study focused on the consequences of EF deficits on everyday life functioning, but a comprehensive approach of EFs requires the combined use of performance-based measures and questionnaires.