

Assessing Executive Functioning in ADHD Evaluations for Individuals with Down Syndrome

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Background

Executive functioning (EF) comprises higher-order cognitive and self-regulatory processes that support goal-directed behavior, emotional and behavioral regulation, and adaptive functioning (Diamond, 2013). EF impairments are a central neuropsychological feature of attention-deficit/hyperactivity disorder (ADHD) and contribute substantially to functional difficulties (Willcutt et al., 2005). Consequently, assessment of EF has become an essential component of comprehensive ADHD evaluations, supporting differential diagnosis and intervention planning.

Individuals with Down syndrome (DS) demonstrate persistent difficulties with EF in the literature, though strengths are present as well. A recent scoping review of EF in individuals with DS (Miezah et al., 2026) identified patterns of strengths and weaknesses among children and adults (see Figure 1).

Figure 1. Executive Function Profile in Down Syndrome Across the Life Span

Executive function domain	Children/adolescents	Adults
Emerging metacognition	Weakness	N/A
Emotional control	Strength	Strength
Inhibitory control	Weakness	Strength
Monitoring	Weakness	Weakness
Organization of materials	Strength	Strength
Planning/organizing	Weakness	Weakness
Shifting	Variable ^a	Weakness
Working memory	Weakness	Weakness

^aSometimes a strength and sometimes a weakness in reviewed studies.
Adapted from “A Scoping Review on Everyday Executive Functioning in People With Down Syndrome: Profile, Correlates, and Interventions,” by D. Miezah, D. N. Nkansah, M. B. Bawilina, A. Moustafa, and P. Obeng, 2026, *Discover Psychology*, 6, Article 44 (<https://doi.org/10.1007/s44202-026-00582-1>). CC BY-NC.

EF is associated with a variety of outcomes, including learning, language, adaptive behavior, and physical health (e.g., Miezah et al., 2026; Will et al., 2021). Overlap between EF challenges characteristic of DS and core features of ADHD, alongside consideration of developmental profiles of individuals with DS, can complicate diagnostic clarity, underscoring the need for valid and developmentally sensitive assessment tools.

Study Purpose

This presentation (1) reviews research on EF assessment in individuals with DS with a focus on the Behavior Rating Inventory of Executive Function (BRIEF) family of instruments and (2) offers recommendations for EF assessment during ADHD evaluations for individuals with DS based on the literature.

EF Assessment

The BRIEF family of instruments assesses executive function behaviors in the school, home, and everyday environments via self-report and various informant reports. These instruments have strong reliability and validity data. The BRIEF has been used extensively in research and clinical care to evaluate executive function in individuals with DS (e.g., Csumitta et al., 2022; Esbensen et al., 2019, 2024) and is therefore the focus of EF assessment in this poster.

Esbensen and colleagues (2019) evaluated the psychometric properties of the original BRIEF (Gioia et al., 2000) in a sample of 84 individuals with DS. They found a normal distribution of scores and that the BRIEF overall as well as its subscales performed in a psychometrically robust manner for children with DS. Csumitta and colleagues (2022) investigated the second edition of the BRIEF (BRIEF2; Gioia et al., 2015) and found the scales to be sensitive for describing EF skills in children with DS.

BRIEF Versions Across Age Groups

Researchers have employed both the BRIEF (Gioia et al., 2000)/BRIEF2 (Gioia et al., 2015) and the preschool version of the BRIEF (BRIEF-P; Gioia et al., 2003) to investigate EF in school-age children with DS. Studies using the BRIEF or BRIEF2 typically administer and score these according to participants’ chronological age (e.g., Csumitta et al., 2022). Given delays in development for individuals with DS, some researchers have used developmental age (estimated by age equivalent scores on cognitive or language tests) to score the BRIEF-P (e.g., Esbensen et al., 2024; Van Deusen et al., 2022).

To evaluate the appropriateness of scoring using developmental age, Esbensen and colleagues (2024) compared BRIEF-P scores based on age equivalents with BRIEF2 scores based on chronological age in a sample of 95 children with DS. The two instruments showed strong correspondence on most scales, but some meaningful differences emerged. Based on their findings, the authors recommended that, for children with DS, the BRIEF-P should be used for ages 2–5 years, the BRIEF2 with chronological-age scoring or the BRIEF-P with age-equivalent scoring (with caveats, such as excluding Plan/Organize) for research purposes with children ages 5–10 years, and the BRIEF2 for children 11 years and older (see Figure 2). Based on this work, as well as how the tests were standardized, clinicians are generally advised to use the chronological-age-appropriate version of the BRIEF unless tracking the same child longitudinally across the preschool-to-school-age transition, in which case continued use of the BRIEF-P is permissible with reduced confidence in certain subscales.

Figure 2. Recommended BRIEF Versions for Children with DS by Age and Setting

Age group	Recommended BRIEF version with age-based scoring type	Setting
2–5 years	BRIEF-P (chronological-age scoring)	Clinical and research
5–10 years	BRIEF2 (chronological-age scoring)	Clinical
	BRIEF2 (chronological-age scoring) or BRIEF-P (age-equivalent scoring, with caveats)	Research
11–18 years	BRIEF2 (chronological-age scoring)	Clinical and research

Note. BRIEF-P = Behavior Rating Inventory of Executive Function–Preschool Version (Gioia et al., 2003); BRIEF2 = Behavior Rating Inventory of Executive Function, Second Edition (Gioia et al., 2015).

Adapted from “Implications of Using the BRIEF–Preschool With School-Age Children With Down Syndrome,” by A. J. Esbensen, E. K. Schworer, N. R. Lee, E. K. Hoffman, K. Yamamoto, and D. Fidler, 2024, *American Journal on Intellectual and Developmental Disabilities*, 129(1), 41–55 (<https://doi.org/10.1352/1944-7558-129.1.41>). Copyright 2024 by the American Association on Intellectual and Developmental Disabilities.

Research on using different BRIEF versions with adults who have DS is more limited. However, a study with adults who have Williams Syndrome (Hocking et al., 2015) found the adult version of the BRIEF (BRIEF-A; Roth et al., 2005) more valid than the BRIEF for the 20 adults in their sample. This finding, along with how the test was standardized, suggests the latest edition of the BRIEF-A (BRIEF2A; Roth et al., 2024) may be the most appropriate choice.

REFERENCES

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DISCLOSURE: Use of AI Assistance

Portions of this poster were prepared with AI assistance (Claude by Anthropic) for drafting visuals, revising text, and formatting references. All AI-generated content was reviewed and verified against primary sources by the authors prior to publication.

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Considering EF in ADHD Evaluations

A comprehensive evaluation for ADHD generally includes (e.g., Cabral et al., 2020; Musullulu, 2025):

- (1) Record review and interviews with caregivers and the individual (as appropriate) to gather developmental, medical, family, and social history; history of ADHD symptoms; presenting behaviors and concerns; and functional impairment.
- (2) Objective ratings of ADHD symptoms and EF skills (from parents/caregivers, teachers, and self, as appropriate, such as those provided via the BRIEF; see Figures 3–4).
- (3) Direct observation of the individual.
- (4) Consideration of co-occurring conditions and factors that may explain or exacerbate ADHD symptoms (e.g., developmental level, medical concerns, sleep difficulties). Additional assessment may be indicated to best understand these factors and their relation to ADHD symptoms.

Figure 3. DSM-5-TR Inattentive Symptoms Aligned With BRIEF2 Items

Inattentive symptoms				
DSM-5 symptom	✓	Item	Response	✓
a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).	✓	29. Makes careless errors	Often	✓
b. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).	✓	12. Has a short attention span	Often	✓
c. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).	✓	46. Needs help from an adult to stay on task	Often	✓
d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).	✓	3. When given three things to do, remembers only the first or last	Often	✓
e. Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).	✓	25. Has trouble finishing tasks (chores, homework, etc.)	Often	✓
f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).	✓	7. Does not plan ahead for school assignments	Often	✓
g. Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).	✓	63. Leaves a trail of belongings wherever he/she goes	Sometimes	
h. Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).	✓	44. Becomes overwhelmed by large assignments	Often	✓
i. Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).	✓	45. Loses lunch box, lunch money, permission slips, homework, etc.	Often	✓
	✓	32. Has trouble concentrating on tasks, schoolwork, etc.	Often	✓
		41. Forgets what he/she was doing	Sometimes	

From *Behavior Rating Inventory of Executive Function, Second Edition (BRIEF2) Interpretive Report for Clinicians: Parent Form* (p. 18), by G. A. Gioia, P. K. Isquith, S. C. Guy, and L. Kenworthy, 2015, PAR. Copyright 2015 by PAR.

Figure 4. DSM-5-TR Hyperactive/Impulsive Symptoms Aligned With BRIEF2 Items

Hyperactive/impulsive symptoms				
DSM-5 symptom	✓	Item	Response	✓
a. Often fidgets with or taps hands or feet or squirms in seat.	✓	1. Is fidgety	Often	✓
b. Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).	✓	30. Gets out of seat at the wrong times	Often	✓
c. Often runs about or climbs in situations where it is inappropriate. (Note: In adolescents or adults, may be limited to feeling restless.)		39. Acts too wild or “out of control”	Sometimes	
d. Often unable to play or engage in leisure activities quietly.	✓	16. Gets out of control more than friends	Often	✓
e. Is often “on the go,” acting as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).	✓	48. Has trouble putting the brakes on his/her actions	Often	✓
f. Often talks excessively.		N/A		
g. Often blurts out an answer before a question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation).	✓	24. Talks at the wrong time	Often	✓
h. Often has difficulty waiting his or her turn (e.g., while waiting in line).		N/A		
i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).	✓	10. Does not think before doing (is impulsive)	Often	✓

From *Behavior Rating Inventory of Executive Function, Second Edition (BRIEF2) Interpretive Report for Clinicians: Parent Form* (p. 19), by G. A. Gioia, P. K. Isquith, S. C. Guy, and L. Kenworthy, 2015, PAR. Copyright 2015 by PAR.

A study (Esbensen et al., 2022) comparing individuals with DS and ADHD, individuals with DS but not ADHD, and individuals with ADHD but not DS found that although average ADHD symptom composite scores were not significantly different between the two DS groups, certain items on *parent report* did differentiate them (e.g., being distractible and on the go). On *teacher report*, children with DS and ADHD had higher overall inattention and hyperactivity than the other groups. Items differentiating the DS and ADHD group from the DS without ADHD group addressed task follow-through, task avoidance, leaving one’s seat, and excessive talking. Given these findings, it is important to assess ADHD symptoms in a robust way, including consideration of the individual’s whole profile and history in addition to their performance on specific EF and/or ADHD measures across environments.