**The Discrepancy Between Actual Performance and Self-Awareness Among Adolescents with Executive Function Deficits**

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# Abstract

**Objective.** Adolescents with executive function deficits (EFDs) struggle to perform complex daily activities and have difficulty self-awareness of their performance. This study aimed to characterize actual performance and self-awareness among adolescents with EFD pre and post a metacognitive intervention. **Method.** All participants performed the Children’s Cooking Task (CCT) and answered the Behavioral Rating Inventory Executive Function-Self-Report (BRIEF-SR) and an online awareness questionnaire before and after the CCT. Forty-one adolescents aged 10 to 14 with EFD have participated. **Results.** Significant positive differences were found in the CCT and three BRIEF-SR subscales pre and post-intervention, but no significant differences were found in online self-awareness of performance. **Conclusions.** The adolescents with EFD improved their actual performance on the CCT following the intervention, but their self-awareness stayed consistent. The results may imply that (1) EFD may inhibit self-awareness development (2) self-awareness may not depend on the task and have more other components that affect it.

*Keywords*: actual performance, executive function deficits, FITTED intervention, performance real-life assessment

# Introduction

Self-awareness is a complex, higher level cognitive function that reflects a person’s ability to self-monitor and recognize and correct errors during a task and may influence an individual’s ability to select appropriate task strategies (Zlotnik & Toglia, 2018).

Self-awareness develops gradually during childhood, starting with awareness of concrete attributes of behavior or physical characteristics and graduating into more abstract attributes (Rith-Najarian et al., 2014). Reports have shown that children’s self-awareness increases with age, which is consistent with the development of cognitive, memory, and language skills (Klimkeit et al., 2006). Self-awareness may have several components, including awareness of one’s own faults, awareness of impairment, and awareness of one’s ability to perform task, awareness of performance.

Adolescent struggling with executive function (EF) deficits (EFDs) also have difficulty with self-awareness. Adolescents with EFDs differ from their peers with typical development (TD) in their struggles with daily life tasks (Fogel et al., 2020), especially when changes in environmental demands require them to adjust their thinking and actions (Crone & Dahl, 2012).

Executive Function is a crucial aspect of the ability to perform daily tasks. An EF-deficit (EFD) profile characterizes a heterogeneous group of transdiagnostic problems. Adolescents with an EFD are characterized with disorganization, forgetfulness, and inability to multitask proficiently, and the EFDs can limit their ability to insightfully self-regulate their behavior (Steward et al., 2017). Thus, adolescents with EFD must cope with limitations in daily functioning at home (e.g., day-to-day organizing, planning, and shifting focus), at school (e.g., learning ability and prioritizing responsibilities), and in social environments (e.g., understanding social situations and making friends; Josman & Rosenblum, 2018; Otero et al., 2014). Daily tasks, such as managing time, meeting due dates, and prioritizing responsibilities can become major struggles.

Adolescents’ awareness of their deficit is important because awareness can contribute to a broad range of functional outcomes (Cermak & Toglia, 2018). Lack of awareness may negatively affect adolescents, who otherwise may have no coherent explanation for their functional difficulties and hence develop misattributions and negative beliefs about themselves (Levanon-Erez & Maeir, 2014).

*Aspects of self- awareness*

Self-awareness of impairment is usually evaluated by comparing participants’ performance on neuropsychological tests, self-ratings of cognitive skills, and family members’ or clinicians’ ratings of the participant actions. Most of the studies that assess impairment awareness use a questionnaire, such as the Behavior Rating Inventory Executive Function (BRIEF) and the corresponding self-report, the BRIEF-SR (Steward et al., 2017; Zlotnik & Toglia, 2018), or the Questionnaire of Executive Functioning (Geurten et al., 2016).

Assessing awareness of performance is more complicated because it requires evaluating the discrepancy between actual and estimated performance during a specific activity (Zlotnik & Toglia, 2018) and cannot rely on self-report alone. To the best of our knowledge, few studies have assessed self-awareness of performance of performance- based assessment among typical adolescents (Zlotnik & Toglia, 2018) and before and after cognitive tasks among typical students (Schoo et al., 2013).

This study is a secondary analysis of data from a larger study on the effectiveness of a unique intervention, the Functional Individualized Therapy for Teenagers with Executive Deficits (FITTED) to improve EF in adolescents with EFD profiles through an Occupational Therapy intervention. The FITTED is an 8-week, metacognitive, occupation-based program, aimed to assist adolescents, with or without formal EF diagnoses, to improved performance and satisfaction with everyday life goals. An expanded explanation of this study can be in Fogel et al., 2020).

This current study compared the actual performance of a cooking task (Chevignard et al, 2009, 2010) and awareness of performance before and after a cooking task and between pre and post Fitted intervention among adolescents with EFD. We expected that significant differences would be found between pre and post-intervention (1) in actual performance measured by the CCT assessment; (2) the awareness to the EF impairments as measured by the BRIEF-SR questionnaire, and (3) the awareness of performance in the CCT assessment.

# Material and Methods

## Participants

Study participants were recruited through community advertisements aimed toward young adoles­cents (10-14 years old), both with and without difficulty with daily functioning. We excluded volunteers with known psychiatric, emotional, or autistic spectrum disor­ders; physical disabilities; or neurological diseases. The current study present secondary analysis with 41 young adolescents (10–14 years) with EFD profiles who participated in the FITTED intervention (Fogel, et al., 2020). Participants were characterized as having an EFD profile if their parent-reported scores were outside normal range (65 or higher) on the BRIEF behavioral regulation index (BRI) or metacognition index (MI). The full detail regarding the participant is available in Fogel et al, 2020.

## Instruments

*BRIEF (Gioia et al., 2000).* We used scores of the parent-reported BRIEF as a criterion for division between the group with EFD and the control group (with TD). The BRIEF includes 86 questions in five cognitive subscales (initiation, working memory, plan-organize, organization of materials and monitoring) and three behavioural subscales (inhibit, shift and emotional control). These eight subscales form two composite indices (MI and BRI) and one composite score, the global executive composite. The results are expressed in *t*-scores (higher scored reflect more problematic behaviour). A *t*-score of 65 or higher is considered within the clinical range. Mean internal consistency ranges from .82 to .98, and test–retest correlation ranges from .72 to .84.

### BRIEF-SR

The BRIEF-SR, (Guy et al., 2004) is a valid and reliable self-report instrument used to assess EF in 11- to 18-year-olds. The 80 questions correlate to the BRIEF parent version in its four MI and four BRI subdomains. Adding the MI and BRI scores creates an overall global executive composite (GEC) score. Clinically significant *t* scores (*M* = 50, *SD* = 10) are those of 65 and above. The test–retest reliability of the BRI and MI were .84 and .87, respectively, and internal reliability in the standardized sample was α = 0.80–0.98. For the current study’s entire scale, the internal reliability was α = 0.95.

### CCT Hebrew Version

The CCT Hebrew version is a performance-based evaluation that Chevignard et al. (2009, 2010) developed to assess EF and multitasking abilities. It has high internal consistency (α = .81), moderate test–retest reliability for total number of errors (.65), and moderate concurrent validity with the BRIEF. And has been validated in Hebrew (Fogel, et al., 2020b).

In the CCT, each participant is asked to follow two easy recipes: a chocolate cake and fruit cocktail. Ingredients, utensils, and six recipes are laid on a table with an instruction sheet that shows the name of the dish, an ingredients list with illustrations, and numbered preparation steps with illustrations. Tasks are timed (in minutes), and the scores are classified into two error levels: descriptive and neuropsychological to assess EF and multitasking abilities. According to the CCT manual (Poncet et al., 2015), these levels determine the number of errors by error type (descriptive) without reference to how or why they occurred and total errors (neuropsychological) allowing description of the reasons each error occurred.

### Self-Awareness of Performance Questionnaire (SAP-Q)

This clinician administered questionnaire is based on an instrument to assess general awareness of performance Toglia (2011, 2018) and was modified Fogel (2016) to be specific to the cooking performance tasks. Prior to the task performance, the clinician asks the participants three questions that they must provide a rating 1 (*high estimation*) to 5 *(low estimation*). (How do you think you will do on the cooking task?), *performance* (Do you think you will have difficulty performing the cooking task?), *expected difficulty* and How long do you think it will take you to perform the cooking task? *estimated time* After the cooking task, participants are asked three more questions: on (How do you think you did on the cooking task?), *estimation of performance* (Are you satisfied with the way you performed the cooking task?), *satisfaction* and (How accurately do you think you performed the cooking task?). *accuracy* Each question is scored from

## Procedure

This study was approved by the University of Haifa, Faculty of Social Welfare and Health Sciences Ethics Committee (number 253/13), and all adolescents and their parents signed informed consent for participation. In the primary study, adolescents who met inclusion criteria for the FITTED intervention (Fogel et al., 2020) were invited to individual sessions to complete the CCT, which an expert occupational therapist administered and scored. Figure 1 presents the study design. In the pre-and post-intervention, the participant completed the BRIEF-SR questionnaire, performed the CCT assessment. All participants completed the SAP questionnaire before and after the CCT task pre and post-intervention.

[INSERT FIGURE 1 HERE]

## Data Analyses

The data were processed using SPSS 26. The sample did not distribute normally, so nonparametric tests were used. For the CCT and the BRIEF-SR, a Mann-Whitney test was conducted to examine pre- and post-intervention differences. Differences in the SAP-Q between before and after the CCT within pre and post-intervention phases and between pre and post-intervention phases were analyzed using the Wilcoxon test for two related samples. Cohen’s *d* was calculated for effect size (.10 was considered a small effect, .30 a medium effect, and .50 a large effect; Cohen, 1988).

Assessing awareness of performance is requires evaluating the discrepancy between actual and estimated performance during a specific activity, new variables were calculated for the estimation before and after the CCT assessment:

* *Time Estimation gap before and after =* estimated time after the CCT minus estimated time before the CCT
* *Time Estimation gap before and actual time duration in the CCT* = estimated time before the CCT minus actual time performing the CCT
* *Time Estimation gap after and actual time duration in the CCT* = estimated time after the CCT minus actual time performing the CCT

# Results

The research participant included 29 (70.7%) boys and 12 (29.3%) girls with a mean age of 11.88 ± 1.08 years. As an inclusion criterion, the parent reports in the BRIEF questionnaire were 65 and above (BRI: M = 67.70; SD 9.72) (MI: M=66.65; SD=6.34).

***Comparison of pre and post-intervention in the CCT assessment***

Significant differences were found between pre-and post-intervention and in the actual CCT performance, including time duration (Z = -4.30; p< .001), and the total number of errors in performance (Z=-4.93; p<.001) (Table 1).

[INSERT TABLE 1 HERE]

***Comparison of pre and post-intervention in the BRIEF-SR***

Significant differences were found between pre-and post-intervention in the awareness of impairment as measured by the BRIEF-SR GEC (Z=-2.29; p=.20) and in the MI indices (Z=-2.81; P=.005) and no significant differences in the BRI indices (Z=-1.42; p=.15). The result for each scale is presented in Table 2.

[INSERT TABLE 2 HERE]

***Comparison of pre and post-intervention in the SAP-Q***

Although significant differences were found in the CCT and the BRIEF-SR, only one item presented significant differences –"estimation pf performance" after the CCT (Z=-2.127; p=.03) and Time estimation (Z=-2.00; p=.04). No other significant differences were found in the SAP-Q item between the pre and post-intervention. Moreover, no significant differences were found in the variables of Time Estimation gap before and after the CCT (Z=-.28; p=.77); Time Estimation gap before and actual time duration in the CCT (Z=-1.33; p=.18); and Time Estimation gap after and actual time duration in the CCT (Z=-1.52; p=.13).

# Discussion

This study results characterize the discrepancy between actual performance and self-awareness among adolescents with EFD through pre and post a metacognitive intervention

As expected, significant differences were found in the CCT assessment, which indicated that the adolescents made a major improvement in the assessment post-intervention. Moreover, the awareness of impairment as measured by the BRIEF-SR shows significant improvement post-intervention in four scales, emotional control from the behavioral regulation indices and plan, organization, and task completion from the metacognitive indices. However, the self-awareness to the performance in the CCT remains consistent between pre and post-intervention.

***Comparison of pre and post-intervention in the CCT assessment***

Several studies have used the CCT to measure adolescents' various health conditions' differences. Fogel et al. (2020b) reported significant differences in CCT assessments between adolescents with an EFD and those with typical development. Other studies performed and rated the CCT demonstrated its feasibility for detecting and characterizing (even mild) EFD profiles in children with traumatic brain injury (Krasny-Pacini et al., 2015; Wechsler, 1998) and developmental coordination disorder (Toussaint-Thorin et al., 2013).

However, as far as we know, ours is only the second study to document the use of the CCT as an outcome measure after an intervention. Krasny-Pacini et al. (2015) studied interventions based on context-sensitive goal-management training in five children with ABI and severe dysexecutive syndrome. They used the CCT twice before the intervention to obtain two baselines for online awareness. Participants showed significant improvement in time duration, total number of errors, and all error types in our study. They made significantly fewer errors and performed the task in a shorter time. The FITTED intervention’s guiding principles can explain the improvement shown by these results. The FITTED incorporates self-monitoring techniques with structured experience to assist adolescents in rediscovering themselves and redefining their knowledge of their strengths and weaknesses. Such principles help adolescents form strategies for use before, during, and after activities in meaningful occupational situations. These strategies may improve adolescents’ ability to inhibit, self-regulate, and then respond and channel further self-directed executive actions. After the intervention, participants paid more attention to the recipes, collected information more efficiently, and inhibited actions and reactions before performing any step. They kept to the task sequence, added fewer unnecessary actions, succeeded in estimating amounts, and needed less help, as expressed by the decrease in the number of questions asked.

***Comparison of pre and post-intervention in the BRIEF-SR***

Although the BRIEF-SR scores did not show improved inhibition, shifting, working memory, or monitoring post-intervention, the results indicate a statistically significant improvement in emotional control, planning, organization, and task completion. To the best of our knowledge, this is the first time that the BRIEF-SR is used as an outcome measure pre and post-intervention in this population. Two previous studies documented no significant changes pre and post-intervention in Young Female Adolescents with Anorexia Nervosa Before and After Cognitive Remediation Therapy (Dahlgren et al, 2014) and among adolescents with autism spectrum disorder (Lamash et al, 2017). Also, a study in a similar population of adolescents with ADHD showed no significant improvement in the awareness to difficulties subscale of the Self-Regulation Skills Interview (SRSI) (Levanon-Erez et al, 2019).

***Comparison of pre and post-intervention in the SAP-Q***

The results revealed no significant differences between pre and post-intervention and highlighted the question: How, although the major improvement in the CCT (time duration and the number of errors) and receiving to take home an actual product after the assessment – the cake. Why were the adolescents’ self-awareness regarding the CCT task similar to pre-intervention? Are they unaware of their ability to perform the task better post-intervention? Are there other components that inhibit their ability to "see" their improvement?

To date, this is the first study that assesses self-awareness to performance in this specific population pre and post-intervention. We suggested three points of view to understand these results. First, the EF difficulties as an underlying mechanism, second, adolescence as a developmental stage, and the third from the environment point of view.

***The EF difficulties as an underline mechanism***

Adolescents with an EFD describes as impaired when performing complex daily living activities, struggling to achieve everyday life goals, requiring considerably more assistance from adults, needing substantially more time to complete tasks, and engaging in far more dangerous activities (Fogel et al., 2020 a,b). Those difficulties may cause adolescents to become more distanced from the feedback they receive. Their difficulty in executing inhibition, using memory efficiently, exercising mental flexibility, and exhibiting self-control may delay the development of self-awareness. They could pay little attention to feedback from the environment because of their characteristics and thus fail to integrate and update the self-knowledge necessary to develop self-awareness (Toglia & Maeir, 2018). Their neurological monitoring system, such as feedback, feedforward, and a comparative mechanism, may be damaged or impaired due to neurodevelopmental disorders or other health conditions that causes unawareness (Toglia & Maeir, 2018).

***Adolescence as a developmental stage***

Sebastian et al. (2008) proposed that adolescence represents a period in which the sense of self-identity undergoes profound development. The gradual improvement in metacognitive ability across the adolescence period reported here might relate to increasing egocentricity and sense of self and to developing self-awareness (Weil et al., 2013). Speculatively, this might lead adolescents to become more in tune with their task performance at a stage when they become more aware of and place more value on the judgments of others (Sebastian et al., 2008) and when they develop individual identities separate from their families (Lapsley et al., 1990; Zammitti et al., 2020).

Adolescents are in a challenging period with psychological consequences that include comparing themselves to others and developing self-identity. The combination of adolescence and living with EFDs may affect their ability to cope, progress, and become more self-aware. In their descriptions of their difficulties and desire for the environment to change, adolescents express their desire to be like everyone else. Levanon-Erez and Maeir (2014) interviewed 64 adolescents who regarded their occupational identity as the expression of human nature in interaction with the environmental dimensions of self-care, productivity, and leisure. They found significant differences between adolescents with and without ADHD, demonstrating a possible negative impact of ADHD, and highlighted the item “Felt effective (past).” This may illustrate that adolescents with ADHD have a diminished sense of self as occupational beings, impairing their volitional foundation for occupational performance.

This may lead to various forms of unawareness result from *psychologically motivated denial*, a coping mechanism people create as protection from painful reality or from recognizing distressing aspects of themselves in the face of adversity. Denial can prevent people from acquiring effective coping skills and developing realistic goals (Kortte & Wegener, 2004). It seems reasonable that these adolescents’ choices to deny their skills and challenges is understandable and may serve as a protective strategy from personal failure (Ohan & Johnston, 2002; Owens et al., 2009).

***The environment***

Adolescents with EFD profiles experience years of struggle, particularly to fill the gap between themselves and expectations from the environment. The literature indicated that this population feels from a young age that “something with me or my child is not the same as others” regarding their daily functional capabilities (Rosenblum et al., 2019). There is a discrepancy between what others see (i.e., the adolescents have intelligence that is average or above average) and what is happening to those adolescents (Josman & Rosenblum, 2018).

Adults tend to misunderstand EFD performance issues among adolescents and thus refer to their externalizing behavior as lazy, lacking motivation, or willfully misbehaving (Cramm et al., 2013). Those adolescents receive mostly harmful feedback, which may influence their self-awareness. According to Toglia and Kirk (2000), subjective cognitive abilities are based mainly on subjective feelings of effort and failure. Many times, adolescents with EFD feel they are “failures,” “disturbed,” “problematic,” “manipulative,” and especially “do not use their potential.” These statements affect their ability to develop a healthy and adaptive self-awareness.

## Conclusion

Self-awareness of EF impairment and performance is a complex and challenging factor for adolescents with EFDs. It is not an automatic process. First, from a clinical viewpoint, there is a need to view self-awareness as a significant component in therapy goals and to raise children’s awareness of their impairment, function, and performance. Second, improved awareness of a specific task’s performance may simply take longer to achieve compared to an actual improvement in performance. Thus, there is a need to train, practice, and build many experiences for children to help them gain more self-awareness.

This study highlights the complexity of gaining self-awareness among adolescents with EFDs, as expressed in Krasny-Pacini et al.’s (2015) online experience model. Those authors emphasized that to gain online awareness, a systematic process based on real experiences and adult mediation is needed after evaluating the child’s awareness level and advancing and gaining online awareness. Their model describes how task experience leads to gaining online awareness and a higher level of anticipatory awareness. They presented practical steps to assess the child in that process. According to Toglia (2018), as part of the multicontext (i.e., metacognitive and strategy-based) approach to interventions, each session should address and enhance self-monitoring and self-regulation. Using structured performance experiences helps participants rediscover themselves and redefine their knowledge of their strengths and weaknesses. Awareness training promotes self-efficacy and perceived self-control over performance (Toglia & Kirk, 2000).

Theoretically, the current study provides additional evidence highlighting this population’s complexity. Although we saw improved performance and achievement concerning daily function goals, the adolescents’ *self-awareness* of their performance stayed the same. These are invisible facets. These adolescents need continued follow-up, even after completing the treatment process. It may assume that their awareness is not always task-dependent on and more components are involved.

## Future Study and Limitations

This study leaves unanswered questions and underscores the need for further research. We tested self-awareness using questions before and after performing a CCT task. It is crucial to examine findings on other performance tasks related to adolescents’ daily functioning, such as writing, play, and social-participation activities, to understand whether self-awareness of performance is task-dependent and remains consistent even if the adolescent’s performance has improved. Further, we analyzed self-awareness of performance in only one way, although there are multiple tools to test awareness. It is necessary to assess self-awareness of performance using different tools to verify the reliability of the online self-awareness questionnaire.

Follow-up studies should examine adolescents’ self-awareness over time with and without therapeutic intervention. Additional components related to the adolescent’s environment should be examined, such as the parents’ attitudes and educational framework toward their child and the adolescent’s developmental and medical history and emotional elements that may be expressed and affect self-awareness.

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# Figure Caption

**Figure 1***Study Design*

# Tables

**Table 1**

*Comparison of Pre- and Post-Intervention Children’s Cooking Task Scores (Performance)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Pre-intervention | Postintervention | *Z* | *p* | *d* |
|  | *M* (*SD*) [min–max] |  |  |  |
| Task duration (min) | 27.87 (12.22) [11–75] | 20.24 (5.90) [11–37] | -4.30 | < .001 | 0.79 |
| Total number of errors | 75.98 (52.98) [15–290] | 41.22 (24.83) [6–202] | -4.93 | < .001 | 0.84 |
| Descriptive analysis |  |  |
| Omissions | 2.54 (1.88) [0–8] | 1.46 (1.25) [0–5] | -3.13 | .002 | 0.68 |
| Additions | 13.22 (9.15) [1–51] | 4.95 (3.97) [0–15] | -4.80 | < .001 | 1.17 |
| Substitutions-sequences | 5.32 (3.08) [0–11] | 3.12 (2.49) [0–9] | -3.04 | .002 | 0.78 |
| Estimation Errors | 5.63 (2.40) [0–10] | 2.98 (2.63) [0–10] | -4.27 | < .001 | 1.05 |
| Commentary-question | 18.88 (20.54) [0–113] | 4.83 (7.69) [0–33] | -4.34 | < .001 | 0.90 |
| Neuropsychological analysis |  |  |
| Control errors | 7.80 (4.56) [1–21] | 4.59 (3.26) [0–14] | -3.69 | < .001 | 0.81 |
| Context neglect | 31.27 (21.24) [8–120] | 12.27 (8.82) [1-37] | -4.89 | < .001 | 1.17 |
| Environmental adherence | 5.20 (3.87) [0–23] | 2.37 (1.70) [0–7] | -4.31 | < .001 | 0.95 |
| Purposeless action | 6.22 (5.65) [0–20] | 2.46 (2.30) [0–8] | -3.52 | < .001 | 0.87 |
| Dependency | 5.58 (4.18) [0–17] | 1.39 (1.98) [0–8] | -4.72 | < .001 | 1.28 |
| Inappropriate behavior | 0.63 (1.09) [0–4] | 0.34 (0.82) [0–8] | -1.16 | .246 | 0.30 |

**Table 2**

*Comparison of Pre- and Post-Intervention Self-Awareness of Executive Functions (Awareness of Impairment)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Scale | Pre-intervention | Postintervention | *Z* | *p* | *d* |
|  | *M* (*SD*) [min–max] |  |  |  |
| BRIEF-SR BRI | 51.08 (12.18) [37–84] | 56.82 (11.17) [35–84] | -1.42 | .150 | 0.49 |
| BRIEF-SR MI | 58.69 (10.83) [31–81] | 55.46 (9.52) [32–78] | -2.81 | .005 | 0.32 |
| BRIEF-SR GEC | 59.41 (11.24)[33–84] | 56.59 (10.86) [33–84] | -2.29 | .020 | 0.25 |
| BRIEF-SR scales |  |  |
| Inhibition | 55.69 (11.08) [34–86] | 54.28 (10.47) [34–79] | -0.78 | .440 | 0.32 |
| Shift | 58.59 (14.36) [32–91] | 57.33 (13.12) [34–97] | -0.74 | .46 | 0.10 |
| Emotional control | 61.18 (10.96) [38–83] | 57.74 (10.37) [38–82] | -2.31 | .020 | 0.32 |
| Monitor | 54.10 (10.10) [36–76] | 51.02 (10.70) [36–78] | -2.06 | .040 | 0.30 |
| Working memory | 56.05 (11.39) [34–86] | 55.41 (10.75) [34–81] | -5.01 | .610 | 0.06 |
| Plan/Org | 58.33 (10.89) [31–79] | 55.49 (9.81) [31–77] | -2.40 | .020 | 0.27 |
| Organization of materials | 55.23 (11.55) [33–76] | 51.64 (8.41) [33–75] | -2.38 | .020 | 0.35 |
| Task completion | 61.13 (11.00) [35–84] | 56.33 (8.60) [35–72] | -3.37 | .001 | 0.49 |

*Note*. BRIEF-SR = Behavioral Rating Inventory Executive Function Self-Report; BRI = behavioral regulation index; MRI = metacognition index; GEC = global executive composite.

**Table 1**

*Pre-Intervention Children’s Cooking Task (CCT) Scores (Comparison of Awareness of Performance between TD and EFD)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Pre-intervention | Postintervention | *Z* | *p* | *d* |
| *M* (*SD*) [min–max] |  |  |  |
| Before the CCT |  |  |
| Expected Performance | 3.32 (1.17) [1–5] | 3.46 (1.03) [1–5] | -.92 | .33 |  |
| Expected difficulty | 3.54 (0.98) [2–5] | 3.78 (0.941) [1–5] | -1.55 | .12 |  |
| Time estimation | 32.32 (20.40) [5–90] | 27.12 (11.71) [10–60] | -0.82 | .41 |  |
| After the CCT |  |  |
| Estimation of Performance | 3.29 (1.03) [1–5] | 3.76 (0.94) [1–5] | -2.13 | .03 |  |
| Estimated Accuracy | 3.78 (0.94) [1–5] | 4.10 (0.77) [2-5] | -1.71 | .09 |  |
| Time estimation | 26.78 (12.46) [10–60] | 21.83 (10.58) [5–60] | -2.00 | .04 |  |

# Figure 1

