# Effectiveness of a Cognitive–Functional Group Intervention Among Preschoolers With Attention Deficit Hyperactivity Disorder: A Pilot Study

Lori Rosenberg, Adina Maeir, Aviva Yochman, Idit Dahan, Idit Hirsch

#### MeSH TERMS

- · activities of daily living
- attention deficit disorder with hyperactivity
- executive function
- children, preschool
- social participation

Lori Rosenberg, MSc, OT, is Head of Occupational Therapy, Ilanot School, Jerusalem, Israel, and Lecturer, School of Occupational Therapy, Faculty of Medicine, Hadassah and the Hebrew University of Jerusalem, Mount Scopus, Jerusalem, Israel; Iori66@gmail.com

Adina Maeir, PhD, OT, is Head, School of Occupational Therapy, Faculty of Medicine, Hadassah and the Hebrew University of Jerusalem, Mount Scopus, Jerusalem, Israel.

**Aviva Yochman, PhD, OT,** is Lecturer and Researcher, School of Occupational Therapy, Faculty of Medicine, Hadassah and the Hebrew University of Jerusalem, Mount Scopus, Jerusalem, Israel.

**Idit Dahan, MSc, OT,** is Head, Pediatric Occupational Therapy, Maccabi Health Service, Jerusalem, Israel.

**Idit Hirsch, MSc, OT,** is Occupational Therapist, Maccabi Health Service, Jerusalem, Israel. **OBJECTIVE.** To test functional improvement after a group cognitive-functional occupational therapy intervention for preschoolers with attention deficit hyperactivity disorder (ADHD).

**METHOD.** Seventeen preschooler–parent dyads attended 11 weekly group sessions focused on acquiring executive strategies through occupational performance. Functional improvement was measured using the Canadian Occupational Performance Measure (COPM) and Goal Attainment Scaling (GAS); executive function, using the Behavior Rating Inventory of Executive Function–Pediatric; ADHD symptomatology, using Conners' Parent Rating Scale–Revised and Conners' Teacher Rating Scale–Revised; and social functioning, using the Social Participation scale of the Sensory Processing Measure.

**RESULTS.** Significant improvement was found on the COPM and GAS measures, whereas mixed results were found on the other measures, with improvements found in children whose scores indicated impairment at baseline.

**CONCLUSIONS.** Cognitive–functional group intervention appears to significantly improve daily functioning, executive function, and social functioning for children who demonstrate clinical impairment. Further research with a larger sample, a control group, and follow-up is required.

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Attention deficit hyperactivity disorder (ADHD) is a neurological condition that emerges during the preschool years (American Psychiatric Association, 2013) and has three main subtypes: predominantly inattentive, predominantly hyperactive-impulsive, and combined. It typically involves not being able to inhibit oneself, despite knowing what one should do (Barkley, 2006). Inattentive ADHD has a prevalence of 2.8% in 2- to 6 yr-olds, and hyperactiveimpulsive or combined ADHD is seen in 5.6%–5.7% of this population (Egger & Angold, 2006).

Preschoolers with ADHD often exhibit difficulties paying attention and continually shift attention. They are easily distracted, forgetful, and impulsive; have difficulty waiting their turn; interrupt others; or say tactless things (Cermak & Maeir, 2011). These preschoolers show a particular tendency to safety risks, aggression, expulsion from their preschool setting, and high injury rates (La-Forett, Murray, & Kollins, 2008). They have poorer performance of everyday activities (Gol & Jarus, 2005); salient difficulties in social skills (DuPaul, McGoey, Eckert, & Van Brakle, 2001; Thomas, Shapiro, DuPaul, Lutz, & Kern, 2011); and greater propensity to complain, tease, interrupt, lie, show aggression, not help others or share, and not contribute in group discussions than typically developing children (Mrug, Hoza, Pelham, Gnagy, & Greiner, 2007; Murray-Close et al., 2010). The social implications of ADHD seem to

develop in a cyclical pattern of reduced positive participation causing and being made worse by impaired development of social skills and poor peer-based behavior (Mrug et al., 2007; Murray-Close et al., 2010).

Children with ADHD have been found to have significant difficulty with executive function (EF; Brocki, Eninger, Thorell, & Bohlin, 2010; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). Impairments in attention, inhibition, shifting, and adapting to new behavior shown by 3- to 5-yr-olds with ADHD can be seen as EF deficits (Josman & Rosenblum, 2011). Barkley and Fischer (2010) theorized that emotional impulsiveness is a central feature of ADHD, leading to the multiple impairments seen in adulthood and various life domains. Studies on preschoolers with ADHD have suggested that simple inhibition and selective attention are predictors for complex inhibition and working memory in later years (Brocki et al., 2010). If executive control (including emotional impulsiveness) is indeed the core of ADHD, intervention aimed at improving EF at an early age may well affect the disorder's trajectory.

The use of psychopharmacological agents with preschoolers has been widely debated because of the possible adverse effects on children's developing brains. Clinicians, caregivers, and other professionals prefer psychosocial intervention as the first line of treatment (Daley, Jones, Hutchings, & Thompson, 2009; Ghuman, Arnold, & Anthony, 2008). Sonuga-Barke, Koerting, Smith, McCann, and Thompson (2011) believed that early identification and intervention strategies, including parent training programs, may have the potential to alter underlying bases of negative developmental pathways. Preschoolers with ADHD have shown significant improvements in several variations of parent training programs (Daley et al., 2009; Jones, Daley, Hutchings, Bywater, & Eames, 2007; LaForett et al., 2008; Thompson et al., 2009). Results of a preschool program using play to promote EFs were encouraging (Halperin et al., 2012).

An occupational therapy approach to improving underlying executive deficits in occupational context, the Cognitive–Functional (Cog–Fun) intervention (Maeir, Hahn-Markowitz, Fisher, & Traub Bar Ilan, 2012), has proved effective for school-age children with ADHD (Hahn-Markowitz, Manor, & Maeir, 2011). Recently, the Cog–Fun has been adapted to preschool children with ADHD, who have shown improvements in occupational goals as well as underlying EF (Maeir et al., 2014). The Cog–Fun is administered individually to parent–child dyads but has not been adapted for group intervention. In this study, we examined the efficacy of a group treatment approach based on Cog–Fun designed to engage both preschool-age children and their parents in functional goals relevant to daily life. We also examined whether the intervention could bring about an improvement in EFs and social skills and a concomitant decrease in the underlying ADHD symptoms.

## Method

## Research Design

This pilot pretest-posttest intervention study was designed to assess the effects of a group treatment on preschoolers with ADHD.

## Instruments

The instruments described in this section were chosen because they provided functional measures of change, were appropriate for preschool-age children, and were translated into Hebrew so parents could easily complete them.

The Canadian Occupational Performance Measure (COPM; Law, Baptiste, Carswell, McColl, & Polatajko, 2005) is a semistructured, individualized interview to choose functional goals and monitor changes in performance and satisfaction (all graded on a scale ranging from 1 to 10). Its interrater agreement on prioritized goals, when administered to parents of children with special needs, is considered adequate for client-centered occupational therapy, and performance and satisfaction scores have moderate reproducibility (Verkerk, Wolf, Louwers, Meester-Delver, & Nollet, 2006).

Goal Attainment Scaling (GAS; McDougall & Wright, 2009) is a criterion-referenced technique to evaluate the efficiency of an intervention. The client-in this case, the parent-and the therapist create and assess relevant, understandable, measurable, behavioral, attainable, and timerelated goals (McDougall & Wright, 2009), rated on a scale ranging from -2 (present level) to 2 (above the expected outcome), in which 0 represents achievement of the goal. It is considered sensitive to change, has excellent interrater reliability intraclass correlations of ≥.90, reasonable construct validity, and ecological validity (Malec, 1999). In pediatric rehabilitation, it has shown an interrater reliability of .82 and an interrater reliability by independent raters of .64 (Steenbeek, Ketelaar, Lindeman, Galama, & Gorter, 2010). Parents in this study chose goals to work on at home with their child, which were discussed at the start of the sessions, but these goals did not guide the intervention.

The Social Participation scale of the Sensory Processing Measure (SPM; Parham, Ecker, Miller Kuhaneck, Henry, & Glennon, 2007) is a standardized sensory processing evaluation in which parents rate their children's social participation on a scale ranging from 1 (al*ways*) to 4 (*never*). Internal consistency (Cronbach's  $\alpha$ ) is .90 for the 5- to 6-yr age group, and the 2-wk test-retest correlation is .94 (Parham et al., 2007). In this study, we used only the Social Participation scale of the SPM. We chose it to measure social participation, although its psychometrics have not been tested in the population with ADHD who do not have a diagnosis of concurrent sensory difficulties. It has excellent internal consistency and test-retest results, is short and not too cumbersome for parents to fill out, and was translated into Hebrew by a person fluent in both English and Hebrew with the authors' permission. The translation was done before the research, is in common use, and was not connected to the research.

The Behavior Rating Inventory of Executive Function-Pediatric (BRIEF-P; Gioia, Epsy, & Isquith, 2003) contains parent and teacher questionnaires used to rate preschoolers' EF in their natural surroundings. It divides EF into scales (Inhibit, Shift, Emotional Control, Working Memory, and Plan/Organize) and indexes (Inhibitory Self-Control, Flexibility, Emergent Metacognition), providing a global executive composite (GEC) score. T scores and percentiles can be calculated from raw scores. Its internal consistency (Cronbach's  $\alpha$ ) ranges from .80 to .97 for parents and teachers; the correlation between the two forms ranges from .06 to .28, and testretest stability coefficients range from .78 to .94 (average interval of 4.5 wk; Gioia et al., 2003). Translated into Hebrew with the authors' approval by Ariella Evan and Miriam Levav, the BRIEF-P proved valid and reliable for Israeli children with ADHD, with moderate to high internal reliability (Cronbach's  $\alpha s = .76-.91$ ) and a significant and large main group effect for the subscales,  $F(8, 145) = 28.07, p < .001, \eta^2 = .608$  (Linder, Kroyzer, Maeir, Wertman-Elad, & Pollak, 2010).

Conners' Rating Scales–Revised (Conners, 1997) includes questionnaires for parents and teachers (Conners' Parent Rating Scale–Revised [CPRS–R] and Conners' Teacher Rating Scale–Revised [CTRS–R], respectively) to assess ADHD and related problematic behavior. Its scales include Oppositional, Cognitive, Hyperactivity, Anxious–Shy, Perfectionism, and Social and Psychosomatic Problems and seven indexes. T scores show excellent reliability; internal consistency coefficients range from .75 to .90, and test–retest reliability coefficients range from .60 to .90 for a 6- to 8-wk interval. Convergent and divergent validity have been studied, as well as discriminant validity, and the scales can differentiate children with ADHD from nonclinical children and other clinical groups (Conners, 1997). We used the Hebrew version, translated by Lisa Grossman with the author's permission and in wide clinical use unrelated to this research, in this study.

#### Participants

The intervention included 24 preschooler–parent dyads. The children were ages 4 yr, 10 mo–6 yr, 4 mo, who were diagnosed with ADHD by a physician and referred to occupational therapy services in a public community health center in Jerusalem for intervention for ADHD-related functional difficulties. The request for occupational therapy intervention came from either the parent or the preschool teacher. Inclusion criteria were being a mainstreamed pre-kindergarten or kindergarten student with medically diagnosed ADHD who had not received occupational therapy intervention for ADHD and parents giving written consent to participate and being willing to attend 13 sessions. We excluded children receiving other nonpharmacological treatments and those with central neurological deficits or peripheral impairments.

Two parents decided not to start the group intervention after the preliminary interview, and 4 other preschooler-parent dyads discontinued partway through. One dyad completed the treatment but was removed from the statistical analysis because of behaviors that indicated that the child might have autism spectrumdisorder. Two more dyads completed the intervention, including the COPM and GAS measures postintervention, but did not complete all the questionnaires, and 1 additional parent filled in a questionnaire incompletely. Thus, statistical analysis ranged from 14 to 17 results, accounting for the data of those who completed only some of the questionnaires. Details of the participants' initial measures can be seen in Table 1. The final sample included 17 children (mean age = 5.6 yr, standard deviation = 0.4), and the male: female ratio was 12:5.

#### Procedures

A group protocol (see the next section) was adapted from the Cog–Fun treatment approach and approved by the Helsinki ethical committee. Parents who had contacted the community service for intervention and met all inclusion criteria were contacted. These parents received a telephone call to explain the purpose of the project and at the initial meeting completed the COPM and built GAS goals (Figure 1) with the researcher (Lori Rosenberg) in the presence of at least one group leader (Idit Dahan or Idit Hirsch). Parents received questionnaires for themselves

Participant	Age, yr	SPM Social Participation Scale Score (Final Score)	Conners' Scale Score (Final Score)		BRIEF–P GEC Score (Final Score)	
			Teacher	Parent	Teacher	Parent
1	5.25	63 (62)	64 (68)	44 (55)	58 ( <sup>a</sup> )	50 (49)
2	5.25	47 (51)	80 (90)	59 (56)	а	50 (49)
3	5.50	66 (65)	79 (73)	83 (85)	69 (62)	84 (73)
4	5.42	60 (56)	80 (78)	53 (76)	а	61 (72)
5	5.00	65 (65)	65 (63)	65 (66)	69 (72)	74 (73)
6	5.50	65 ( <sup>a</sup> )	57 ( <sup>a</sup> )	69 ( <sup>a</sup> )	72 (68)	64 (62)
7	6.00	67 (65)	66 (65)	69 (68)	53 ( <sup>a</sup> )	53 (69)
8	5.00	67 (62)	71 (76)	81 (66)	74 (68)	72 (66)
9	5.50	а	76 ( <sup>a</sup> )	78 ( <sup>a</sup> )	а	а
10	6.50	64 (55)	49 ( <sup>a</sup> )	70 (60)	а	67 (53)
11	5.75	53 (60)	66 ( <sup>a</sup> )	68 (68)	55 ( <sup>a</sup> )	51 (55)
12	6.17	51 (56)	68 ( <sup>a</sup> )	51 (52)	a	52 (46)
13	5.50	66 ( <sup>a</sup> )	а	73 ( <sup>a</sup> )	75 ( <sup>a</sup> )	77 ( <sup>a</sup> )
14	5.75	69 (65)	82 (77)	90 (81)	68 (61)	76 (64)
15	5.50	56 ( <sup>a</sup> )	64 (71)	42 (52)	52 (50)	41 ( <sup>a</sup> )
16	5.50	66 (62)	84 ( <sup>a</sup> )	74 (79)	54 ( <sup>a</sup> )	73 (67)
17	6.00	38 (49)	a	68 (63)	a	53 (53)
Average	5.59	60 (59)	70 (73)	67 (66)	63 (61)	62 (61)

*Note.* <sup>a</sup> = missing data; BRIEF-P = Behavior Rating Inventory of Executive Function-Preschool version; GEC = Global Executive Composite; SPM = Sensory Processing Measure.

(SPM, BRIEF–P, and CPRS–R) and for the kindergarten preschool teacher (BRIEF–P and CTRS–R).

The preschooler-parent dyads then participated in 11 weekly 45-min group treatment sessions conducted by the two occupational therapist group leaders (Dahan or Hirsch) in addition to the pre- and posttreatment assessments (13 sessions total). Parents alternated weekly between participating in the group with their children or participating in a group session with the center's social worker and joining the children for the last 5 min. Parents were given a form to monitor their child's progress on personal goals at home; results were discussed at the start of each group to strengthen desired changes. At the last session, questionnaires were distributed to parents. The next week, parents met with the researcher without their children to reevaluate the COPM and GAS goals and to analyze the changes seen in their child over the intervention.

#### Occupational Therapy Group Intervention

The intervention was based on the Cog–Fun intervention, which focuses on acquiring executive strategies in the context of occupational performance, including play, selfcare, and social participation. It differed from Cog– Fun because it expanded the intervention into the group setting. The intervention encouraged participation by teaching six specific executive strategies (*I listened, I waited for my turn, I asked for help, I have an idea, I made an effort*, and *I helped a friend*) in a group context. Games and activities that challenge executive components were used, and emphasis was placed on transferring strategies to the various games. Children also worked at home on the functional goals their parent had chosen (see Figure 1). The parent-set goals demonstrated the broad array of occupational concerns in these families. Transfer was encouraged by having parents report progress at the beginning of each group, although the intervention itself was not centered on these home goals. Parents were shown how to challenge their child and were encouraged to use similar games and strategies at home.

#### Data Analysis

Descriptive data provide mean scores and standard deviations for demographics as well as pre- and posttreatment comparisons. Because of the small sample size, the withingroup analysis comparisons between pre- and posttreatment were computed with nonparametric statistics (Wilcoxon

• I ask permission before touching new and interesting objects.

- I manage to discuss disagreements with a friend when playing together.
- I play with my dog for 5 min without hurting him.
- When I'm bored I ask Mom for ideas of what to do.
- I put on pajamas and get into bed by myself, when Mom is in the room.
- I dress myself in the mornings, with up to 2 reminders.
- When playing by the table with friends I can wait for my turn, with an adult's help.
- I continue to play, even when I lose, without saying nasty words.
- When I am angry I can say in words what is bothering me.
- I sit and eat for 10 min without standing up.
- I can wait 3 min when asked to wait.
- I wait till Mommy finishes to speak before I talk, with a reminder.

Figure 1. Examples of occupational goals set by parents.

<sup>•</sup> I manage to stay tidy at lunch.

signed ranks tests) using IBM SPSS Statistics Version 19 (IBM Corporation, Armonk, NY). We set statistical significance at .05, one-tailed, because we hypothesized that the children would improve in functional measures as a result of the intervention.

## Results

#### Changes in Occupational Performance

We analyzed 45 individual COPM and GAS scores for the two or three functional goals that the parents chose to work on with their child at home. Significant changes in occupational performance, as seen in COPM measures, were found in both performance outcome and parental satisfaction with the outcome (performance, z = -5.2; satisfaction, z = -5.3, both *ps* < .001). A 2-point change on the COPM is considered clinically significant. When we compared preintervention and postintervention for the 45 COPM goals, we saw an improvement of 3 points in the median performance score and of 5 points in the median satisfaction score (Table 2). A frequency analysis of COPM goals revealed that 66% of the goals improved with clinical significance. The median final GAS score was 0, which represents the child reaching his or her goal. Scores above 0 represent results above the expected outcome. Scores on 16% of the goals remained at the baseline level, 18% improved slightly but did not reach the set goal, and 66% of the goals were reached (scores 0-2).

## Changes in Executive Function

We examined changes in EF with the BRIEF–P parent and teacher questionnaires. We found no significant change in median T scores on the parents' GEC (median = 63 before and after intervention) or on any of the BRIEF–P indexes (p > .05), indicating that the intervention did not improve EF. A frequency analysis of clinical change scores (5 points on the BRIEF–P) can be seen in Table 3; 21%–50% of the sample showed clinically significant improvement, but 14%–29% showed significant clinical decline on the BRIEF–P indexes. To allow for the possible

	Median		
Measure of Chosen Goal	Before	After	Z (p)
COPM Performance	4 (1, 8)	7 (1, 10)	-5.16 (.000)
COPM Satisfaction	3 (1, 9)	8 (1, 10)	-5.31 (.000)
GAS final score	—	0 (-2, 2)	—

*Note.* — = not applicable because GAS baseline is always -2; therefore, there is no "before" median and, consequently, no *Z*. COPM = Canadian Occupational Performance Measure; GAS = Goal Attainment Scaling.

ceiling effect of the measure, we conducted a separate analysis for children who scored in the clinically impaired range ( $T \ge 65$ ) on the GEC before the intervention (n = 6). This analysis revealed a significant improvement in the median GEC scores, which decreased from 74 to 63 (z = -2.2, p < .05). We discuss the ceiling effect (i.e., children who have no clinical impairment in a certain area would not be expected to significantly improve) in the Discussion section.

On the teachers' questionnaires, data were available for only 7 children because one set (two groups) participated in the fall–winter and the second set (also two groups) participated in the spring and as a result finished after school vacation had begun, resulting in many postintervention teacher questionnaires not being returned. Despite the small number of questionnaires for analysis, the teachers' GEC showed significant improvement after the intervention (z = -1.8, p < .05), with a median *T* score of 68 before the intervention and 62 after it.

#### Changes in Attention Deficit Hyperactivity Disorder Symptomatology

When analyzing scores on the CPRS–R and CTRS–R, we saw no significant improvement after the intervention in both parents' and teachers' ratings, indicating that the intervention did not improve ADHD symptomatology. Median scores for the ADHD index were 68 before the intervention and 66 after it for parents (n = 14) and 70 before versus 73 after (n = 9) for teachers. Analysis of children who scored in the clinically impaired range also revealed no significant change in ADHD symptomatology.

## Changes in Social Functioning

We found no significant change on the SPM Social Participation scale for the entire group (median = 60 before and 59 after), indicating that the intervention did not improve social function overall. However, when analyzing only children who had deficits at the start, in keeping with the ceiling effect, we found significant improvement among the children whose original score was in the deficit range (n = 9; z = -2.5, p < .05). In these cases, the median *T* score changed from 66 before the intervention to 62 after intervention (z = -2.5, p < .05). This group of 9 children with deficits on the SPM included the 6 children with deficits on the BRIEF.

# Discussion

The purpose of this research was to study the effectiveness of a group intervention for preschoolers with ADHD that aims to improve occupational performance by providing

Table 3. Frequenc	y Analysis of Change	Scores on BRIEF-P I	Parents Questionnaire	N = 14)
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BRIEF–P Measure	Clinical Decline, Frequency (%)	No Clinical Change, Frequency (%)	Clinical Improvement, Frequency (%)
Inhibitory Self-Control Index	4 (28.6)	3 (21.4)	7 (50.0)
Flexibility Index	3 (21.4)	8 (57.1)	3 (21.4)
Emergent Metacognition Index	3 (21.4)	4 (28.6)	7 (50.0)
Global Executive Composite	2 (14.3)	6 (35.3)	6 (35.3)

*Note.* BRIEF-P = Behavior Rating Inventory of Executive Function-Pediatric.

both children and parents with strategies to improve EF. The theoretical basis was proposed by Sonuga-Barke et al. (2011) and Wehmeier, Schacht, and Barkley (2010), among others, who suggested that early identification and intervention strategies targeting underlying pathophysiological processes and deficits may have the potential to alter the bases of negative developmental pathways. The findings show significant improvement in occupational performance but mixed results on other measures. These are similar to the findings of McGoey, DuPaul, Eckert, Volpe, and Van Brakle (2005), who found mixed results in a multicomponent intervention with preschoolers and control participants.

Clinical improvement was shown in daily activities chosen as goals by the parents, and parental satisfaction with performance similarly increased. These significant improvements in COPM and GAS scores are in line with findings of studies on the Cog–Fun individual intervention for school-age children with ADHD (Hahn-Markowitz et al., 2011) and for preschoolers (Maeir et al., 2014). These results demonstrate the potential of the group Cog–Fun intervention as an effective occupational therapy model of intervention. In future research, it may be interesting to see which component of the intervention was key to significant change: the activities with the children, the parent modeling (watching half the groups and functional goals at home), or the synthesis of the two.

Measures of EF and ADHD symptoms produced varying results and did not replicate the positive findings in previous studies of individual Cog-Fun treatment (Hahn-Markowitz et al., 2011; Maeir et al., 2014). This may be attributable to the group setting or the partial parental accompaniment. Perhaps this group intervention was less effective in introducing change in the underlying mechanisms because parents attended only half of the treatment groups (for half of the sessions, they attended parenting counseling and joined the children for the final 5 min). Research has shown that parents are the key agents of transfer, especially with young children, as seen in the many parent training approaches (Daley et al., 2009; Jones et al., 2007; LaForett et al., 2008; Thompson et al., 2009), and their partial attendance may have hindered this process.

Another possibility is that group intervention is less effective than individual dyad treatment. However, the analysis of the BRIEF-P data for those children who had impaired EF GEC scores at the outset did show significant improvement. This result is important because many children did not have difficulties in specific measures at the outset and therefore could not be expected to change. This phenomenon, known as the ceiling effect, might be a key to understanding the results. The take-home message of this research may be the importance of selecting only children with impaired EF, because they seem to be the children with ADHD who gain from this intervention. In previous studies, inclusion criteria specified impaired scores on at least one scale of the BRIEF-P, which may be why they showed significant results. This was one of the major limitations of the study.

One of the aims of the intervention was to target social skills in a group setting, which would allow these deficits to surface and then be addressed. No significant change was seen at the group level on the SPM Social Participation scale, although when analyzing only those children who had difficulties at the outset, a significant improvement was detected. This result may also be attributed to the ceiling effect. It may well be that the intervention provides participants with social skills difficulties with the confidence to start reversing the negative social cycle and increase peer interaction and participation. The results of this study are similar to those of Gol and Jarus (2005), who showed that occupational performance improved when social skills were addressed in an ADHD group intervention.

## Limitations of the Study

This study had a number of serious limitations. The sample was small and recruited from one clinical center, which limits its applicability to a wider population. Further research should aim to test larger, more representative samples, in a controlled design and with a follow-up, to examine the stability of gains and investigate the issue of EF change and ADHD symptoms over time. We would also recommend excluding from the study children whose EF measures are in the normal range because this method focuses on improving those skills. A further serious limitation of the study is that most of the measures relied on parental questionnaires (the exception being teacher questionnaires, although unfortunately they were fewer than planned). In future studies, we would recommend adding an objective measure to prevent the Hawthorne effect, in which parents see improvement because of their involvement in the process.

# Implications for Occupational Therapy Practice

The results of this study have the following implications for occupational therapy practice:

- A group intervention with guided parent involvement and training that focuses on executive strategies through games and activities as well as personal occupational goals is effective in meeting occupational goals and improving parents' satisfaction with their child's performance.
- Children who have EF difficulties may improve when participating with their parents in a group occupational therapy program geared to improve EF.

# Conclusion

This study demonstrated improvements in occupational performance and mixed results in EF and social participation. The results provide some initial evidence that the Cog–Fun intervention, with its emphasis on parental involvement, parent-set goals, and strategy training through an occupational approach, may be effective as a group intervention for improving daily activities for children with ADHD, especially those with impaired EF. Because of the many limitations of this study, further research should examine the intervention protocol against a control group and include a suitable follow-up, limit inclusion to children with deficits in EF, and include measures that do not relate to parents' perspectives. We also suggest that future research include an initial measure that would capture the uniformity of the group. ▲

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