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Comparative Effectiveness of Circle of Security Parenting, Acceptance and Commitment-Based Parenting, and Schema-Based Parenting on Parent-Child Interaction and Parenting Stress in Mothers of Elementary School Children with Symptoms of Learning Disorders

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ABSTRACT

Purpose: This study aimed to compare the effectiveness of Circle of Security Parenting (COSP), Acceptance and Commitment-Based Parenting (ACT-P), and Schema-Based Parenting (SBP) in improving parent-child interaction and reducing parenting stress among mothers of elementary school children with symptoms of learning disorders.

Methods and Materials: This quasi-experimental field study employed a pretest-posttest design with a follow-up assessment and a control group. The statistical population consisted of mothers of elementary school children exhibiting symptoms of learning disorders in autumn 2023. Eighty eligible mothers were randomly selected and assigned to four groups: three intervention groups receiving COSP, ACT-P, or SBP, and one control group. Data were collected using the Parenting Stress Index developed by Abidin (1995) and the Parent-Child Relationship Questionnaire developed by Long et al. (2002). Assessments were conducted at pretest, posttest, and follow-up. Data were analyzed using SPSS version 26 and appropriate inferential statistical procedures.

Findings: Inferential analyses indicated that all three parenting interventions produced significant improvements in parent-child interaction and significant reductions in parenting stress compared with the control group at both posttest and follow-up ($p < .05$). Significant between-intervention differences were also observed. Specifically, COSP differed significantly from ACT-P in its effects on parent-child interaction, whereas COSP differed significantly from SBP in its effects on parenting stress ($p < .05$). Follow-up analyses demonstrated that the beneficial effects of the interventions were maintained over time. Overall, COSP showed greater effectiveness on some of the assessed outcomes relative to the other parenting interventions.

Conclusion: COSP, ACT-P, and SBP are effective approaches for enhancing parent-child interaction and reducing parenting stress among mothers of elementary school children with symptoms of learning disorders. The comparatively stronger effects of COSP on selected outcomes suggest that attachment-oriented parenting interventions may provide particular benefits for this population.

Keywords: Circle of Security Parenting; Acceptance and Commitment-Based Parenting; Schema-Based Parenting; Parent-Child Interaction; Parenting Stress; Learning Disorder Symptoms

1. Introduction

Learning disorders constitute a major group of neurodevelopmental difficulties characterized by persistent problems in acquiring and applying academic skills such as reading, writing, spelling, and mathematics. These difficulties often emerge during the elementary school years, when academic expectations increase and children are required to perform more complex cognitive and educational tasks. Although the primary manifestations of learning disorders are academic, their consequences frequently extend beyond school performance and influence emotional adjustment, behavioral functioning, self-confidence, family relationships, and broader psychosocial development. Children who experience repeated academic failure may become frustrated, anxious, oppositional, withdrawn, or demotivated, and such reactions may substantially increase the demands placed on parents. Psychological characteristics of parents and their parenting styles have also been associated with children's learning problems, suggesting that learning difficulties should not be understood solely as individual academic deficits but as challenges embedded within a wider relational and family context (Rezaei Sharif et al., 2020). Accordingly, the experiences of mothers raising children with symptoms of learning disorders deserve particular attention because they often carry a substantial proportion of the daily educational, emotional, and caregiving responsibilities.

Parenting a child with persistent learning difficulties can expose mothers to repeated stressors related to school performance, homework supervision, communication with teachers, behavioral management, uncertainty about the child's future, and concerns about social or emotional adjustment. Parenting stress refers to psychological strain arising when the perceived demands of the parenting role exceed a parent's available emotional, cognitive, interpersonal, or practical resources. Although some degree of parenting stress is common, sustained or excessive stress can undermine parental well-being and reduce the quality of parenting responses. Research has demonstrated that parenting stress is influenced by multiple personal, family, and contextual factors and may differ according to mothers' employment and sociodemographic circumstances (Rajgariah et al., 2021). Among mothers of children with developmental and intellectual disabilities, interventions designed to improve psychological functioning have been associated with reductions in parenting stress and its different dimensions, demonstrating that parenting stress is

modifiable rather than an inevitable consequence of caregiving adversity (Aghaei & Yousefi, 2017). Such evidence is especially relevant to mothers of children with learning difficulties, whose stress may be amplified by the chronic and often ambiguous nature of children's academic problems.

In families of children with learning disabilities, maternal psychological health appears to occupy a central position in the relationship between parenting stress, mother-child interaction, and children's behavioral difficulties. Mohammadipour et al. showed that maternal mental health is closely involved in the associations among these family variables, highlighting the reciprocal pathways through which parental distress, relational patterns, and child behavior may reinforce one another (Mohammadipour et al., 2021). When mothers repeatedly experience frustration, helplessness, or concern regarding their child's academic functioning, they may become more controlling, critical, emotionally reactive, or inconsistent. In turn, children who perceive parental interactions as conflictual or rejecting may show greater emotional dysregulation, resistance, anxiety, and behavioral difficulties. Therefore, interventions for children with learning-related problems may be strengthened when they include systematic attention to maternal psychological functioning and the quality of parent-child interaction.

Parent-child interaction is a multidimensional relational process encompassing communication, emotional responsiveness, acceptance, conflict resolution, behavioral guidance, mutual understanding, and the regulation of interpersonal tension. These interactional patterns provide an important developmental context through which children acquire emotional, social, and behavioral competencies. Parent-child interaction is not simply a collection of isolated parenting behaviors; rather, it reflects an ongoing reciprocal communication system in which parental responses shape children's behavior and children's characteristics simultaneously influence parental reactions (Horstman et al., 2016). The psychometric structure of parent-child interaction has also been examined in terms of dimensions such as acceptance and conflict resolution, supporting the importance of these constructs in evaluating relational functioning within families (Isanejad et al., 2017). In the context of learning difficulties, where parent-child exchanges may frequently occur around homework, achievement, failure, and corrective feedback, the quality of these interactions becomes particularly important.

The emotional and interpersonal demands of parenting also depend on the parent's readiness to understand the child's needs and to respond to them in developmentally appropriate ways. Psychological preparedness for the parental role involves emotional maturity, responsibility, interpersonal competence, and an understanding of children's developmental needs (Ibragimovna, 2024). When this preparedness is insufficient or when stress overwhelms available coping resources, parents may interpret children's difficult behavior as deliberate defiance rather than as an expression of unmet needs, frustration, insecurity, or developmental limitations. Contemporary parenting interventions therefore increasingly attempt to move beyond behavior correction alone by strengthening parental reflection, emotional awareness, psychological flexibility, and responsiveness to underlying child needs.

One influential approach is the Circle of Security Parenting program, which is grounded in attachment theory and translates attachment principles into an accessible framework for everyday parenting. The Circle of Security model emphasizes children's simultaneous needs for exploration and secure proximity and helps parents recognize when children require encouragement to explore and when they require comfort, protection, emotional organization, or reconnection. The intervention also focuses on increasing parental awareness of defensive reactions and relational patterns that may interfere with sensitive caregiving. Cooper et al. developed the Circle of Security Parenting framework as a structured intervention designed to enhance secure caregiving by teaching parents to understand the child's attachment-related signals and to respond in ways that promote both autonomy and connection (Cooper et al., 2009). Subsequent theoretical discussion has emphasized that COS-P offers a practical way of translating attachment science into parenting practice and of helping caregivers understand the emotional meaning of children's behavior (Caruana, 2016).

The importance of attachment-informed parenting is supported by a broad body of developmental work indicating that caregiving patterns influence children's attachment expectations and relational strategies. Experimental developmental evidence has even demonstrated that young primates adapt attachment-related behavior according to differences in individual caregivers' parenting styles, illustrating the sensitivity of attachment processes to caregiving environments (Yano-Nashimoto et al., 2024). At the same time, contemporary theoretical debates caution against explaining all emotional and relational problems

exclusively through attachment processes, emphasizing that emotional learning and coherent adaptive responses may involve multiple mechanisms (Ecker et al., 2024). These perspectives do not diminish the value of attachment-informed interventions but suggest that Circle of Security Parenting may be most appropriately understood as one relational pathway among several through which parenting functioning can improve.

Existing evidence regarding Circle of Security interventions is promising. Research has described the approach as an attachment-based intervention that can be implemented with young children and their families to improve caregiver understanding, sensitivity, and relational functioning (Perrett & Hanstock, 2024). The model has also been discussed as a method for translating attachment science across diverse caregiving and cultural contexts, with particular emphasis on helping caregivers recognize children's relational signals and respond flexibly (Poulsen et al., 2024). Qualitative work has shown that mothers participating in Circle of Security Parenting may shift from viewing children's behavior as merely difficult or problematic toward recognizing legitimate emotional and relational needs underlying that behavior (Helle et al., 2022). This change in interpretation may be especially important for mothers of children with learning difficulties, whose frustration, avoidance, oppositional behavior, or emotional distress may otherwise be misinterpreted as intentional noncompliance.

Circle of Security Parenting may also be relevant to families of children with learning or developmental disabilities. Parents of children with learning disabilities have expressed views regarding the potential usefulness and accessibility of the Circle of Security Parenting program, indicating that the attachment-based framework may have applicability beyond typically developing populations (Muddle et al., 2022). Applied evaluation work has likewise supported the broader implementation of relationship-focused parenting programs informed by Circle of Security principles (Reid et al., 2019). Moreover, case-based evidence has suggested that Circle of Security Parenting can contribute to changes in parental conflict and relational understanding within the family (Pazzagli et al., 2014). These findings provide a rationale for examining whether the program can improve parent-child interaction and reduce parenting stress among mothers facing the distinctive demands associated with children's learning problems.

A second relevant intervention model is Acceptance and Commitment-Based Parenting, which derives from

Acceptance and Commitment Therapy (ACT). ACT conceptualizes psychological difficulties partly in terms of psychological inflexibility, including experiential avoidance, cognitive fusion, disengagement from the present moment, and behavior that becomes disconnected from personally meaningful values. Rather than attempting to eliminate difficult thoughts or emotions directly, ACT seeks to change the individual's relationship with internal experiences and to facilitate values-guided action. ACT has demonstrated efficacy across psychological conditions including anxiety and depression, supporting the broader utility of psychological flexibility processes in mental health interventions (Twohig & Levin, 2017). ACT-based stress-management interventions have also been associated with improvements in stress-related and psychological outcomes in clinical populations, illustrating the relevance of acceptance, commitment, and values-oriented processes beyond conventional psychotherapy contexts (Lee & Ha, 2018).

When applied to parenting, ACT principles encourage parents to notice difficult emotions, thoughts, and urges without automatically reacting to them, to clarify their values as caregivers, and to engage in committed parenting behavior even when interactions with the child are challenging. This may be particularly important for mothers of children with learning difficulties because repeated academic struggles can evoke parental disappointment, fear, anger, guilt, or helplessness. If these experiences are approached through avoidance or rigid attempts at emotional control, parenting behavior may become inconsistent or coercive. Acceptance and Commitment-Based Parenting instead encourages parents to tolerate difficult internal states while behaving in ways that correspond to chosen parenting values. Mindfulness is also commonly integrated within such approaches because present-moment attention can enhance parents' ability to observe children's behavior and their own reactions without immediate judgment. Contemporary discussions of mindfulness for child and adolescent well-being further emphasize its potential role in emotional regulation, attention, and adaptive coping (Dhamodharan, 2024).

Evidence supports the use of ACT-informed parenting interventions for improving parent and child outcomes. Azimifar et al. found that acceptance and commitment-based parenting training was effective in addressing externalizing behavioral problems in preschool children and provided a meaningful alternative to conventional parent management training (Azimifar et al., 2019). An integrated

ACT- and compassion-focused parenting intervention has also been associated with improvements in psychological outcomes such as general self-esteem, suggesting that acceptance-based processes can be usefully incorporated into parent education (Fallah et al., 2021). Among mothers of children with attention-deficit/hyperactivity disorder, Acceptance and Commitment-Based Parenting has been compared with positive psychology-based parenting and shown beneficial effects on resilience and the mother-child relationship (Banani et al., 2021). More recently, comparative research has indicated that parent management training combined with ACT and mindful parenting approaches can improve the parent-child relationship, further reinforcing the relevance of psychological flexibility and mindfulness to relational functioning (Kosari et al., 2024). Comparative evidence has also examined ACT-based parenting against schema-informed approaches for children's behavioral problems and assertiveness, underscoring the growing interest in determining which parenting model is most effective for particular family outcomes (Jokar et al., 2026).

Schema-Based Parenting represents a third theoretically distinct approach. Schema theory proposes that early maladaptive schemas develop when fundamental emotional needs are repeatedly unmet and subsequently influence cognition, emotion, interpersonal expectations, and coping patterns. Parents' own schemas may shape how they perceive and respond to their children, particularly during stressful or emotionally activating situations. Research has demonstrated associations between mothers' early maladaptive schemas, attachment styles, and parenting styles, supporting the proposition that internal cognitive-emotional structures contribute to parenting behavior (Rafahi & Taheri, 2019). Schema processes are also relevant from the child's perspective. Early maladaptive schemas in adolescents have been associated with perceived parental bonding, indicating meaningful links between parenting experiences and the development of enduring cognitive-emotional patterns (Saarijärvi et al., 2024).

Schema-Based Parenting interventions aim to help parents identify their own maladaptive schemas and coping responses, understand children's core emotional needs, and adopt parenting behaviors that reduce the likelihood of transmitting maladaptive relational patterns across generations. Such programs typically address needs related to secure attachment, autonomy, emotional expression, realistic limits, play, spontaneity, and age-appropriate independence. Sabzi et al. reported that group schema

therapy-based parenting education for mothers was effective in modifying children's maladaptive schemas and improving the quality of the parent-child relationship (Sabzi et al., 2022). More recent findings have also indicated that Schema-Based Parenting can improve parental acceptance and reduce fatigue among mothers of students with intellectual disabilities, suggesting its relevance for mothers experiencing heightened caregiving demands (Jalil Abkenar, 2025). These findings make Schema-Based Parenting a plausible intervention for mothers of children with learning difficulties, particularly when parenting stress is linked to rigid expectations, maladaptive beliefs, or emotionally reactive coping patterns.

Despite evidence supporting each of these approaches, important comparative questions remain unresolved. Circle of Security Parenting primarily targets attachment-related understanding, sensitivity, emotional availability, and relational repair; Acceptance and Commitment-Based Parenting primarily targets psychological flexibility, acceptance, mindfulness, values, and committed parental behavior; and Schema-Based Parenting primarily targets maladaptive schemas, unmet emotional needs, coping styles, and corrective parenting responses. Each model therefore addresses a different mechanism that may contribute to parenting stress and parent-child interaction. The need for comparative evaluation is strengthened by research demonstrating that parental reactions following stressful or traumatic experiences are complex and shaped by both emotional responses and perceived support needs (Kerbage et al., 2024). Families facing persistent child difficulties may similarly require interventions that address not only overt parenting practices but also deeper emotional, cognitive, and relational processes.

Moreover, the growing diversity of attachment-, acceptance-, mindfulness-, and schema-based parenting interventions means that demonstrating efficacy relative to a control group is no longer sufficient. Clinicians and family professionals increasingly need evidence regarding relative effectiveness so that intervention selection can be aligned with the most salient needs of a given family. Circle of Security approaches may be particularly suitable where relational security and sensitivity are compromised; ACT-based parenting may be especially useful where experiential avoidance, emotional reactivity, and rigid control dominate; and schema-based approaches may be advantageous when longstanding parental beliefs and maladaptive interpersonal patterns shape the caregiving relationship. Because mothers of children with learning difficulties may simultaneously

experience elevated parenting stress and strained parent-child interaction, comparing these interventions within the same study can clarify whether one approach provides greater benefits for particular outcomes.

Therefore, the present study aimed to compare the effectiveness of Circle of Security Parenting, Acceptance and Commitment-Based Parenting, and Schema-Based Parenting in improving parent-child interaction and reducing parenting stress among mothers of elementary school children with symptoms of learning disorders.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental field design with pretest, posttest, and follow-up assessments and a control group. The statistical population consisted of mothers of elementary school children exhibiting symptoms of learning disorders during autumn 2023. Following the publication of a recruitment announcement, potentially eligible mothers were screened according to predefined inclusion criteria. Eligibility required having an elementary school child with symptoms of a learning disorder, willingness to participate in the educational program, provision of informed consent, willingness to complete the study questionnaires at the designated assessment points, and absence of acute or chronic psychological disorders in either the mother or the child. The latter criterion was evaluated through an initial interview. From the eligible participants, 80 mothers were randomly selected and assigned to four groups, including three experimental groups and one control group, with 20 participants in each group. Before the interventions, all participants completed the pretest measures of parent-child interaction and parenting stress. The three experimental groups subsequently participated in the Circle of Security Parenting program, Acceptance and Commitment-Based Parenting program, and Schema-Based Parenting program, respectively, while the control group received no educational or psychological intervention during the study period. After completion of the interventions, all four groups completed the posttest assessments, and the same measures were administered again two months later as the follow-up assessment. Participants were excluded if they were absent from two or more intervention sessions or simultaneously participated in another parenting-related educational or psychological intervention during the study. The collected data from the three assessment phases were subsequently entered into the

statistical analyses to evaluate changes over time and differences among the four study groups.

2.2. Instruments

The Parenting Stress Index–Short Form (PSI-SF), developed by Abidin in 1995, was used to assess parenting-related stress. The PSI-SF is a 36-item self-report instrument designed to evaluate the level of stress experienced by parents in relation to parenting responsibilities and interactions with their children. Items are rated on a five-point Likert scale ranging from 1 to 5, with response options extending from strong agreement to strong disagreement according to the scoring format of the instrument. The questionnaire comprises three 12-item subscales: Parental Distress, covering Items 1–12; Parent–Child Dysfunctional Interaction, covering Items 13–24; and Difficult Child, covering Items 25–36. Previous psychometric evaluation by Aghaei and Yousefi reported internal consistency coefficients of .782 for Parental Distress, .721 for Parent–Child Dysfunctional Interaction, .880 for Difficult Child, and .897 for the total scale, indicating satisfactory reliability. In the present study, only the Parental Distress subscale was used because the study specifically focused on the psychological stress experienced by mothers in the parenting role. The internal consistency of this subscale in the present sample was evaluated using Cronbach's alpha and was found to be .87, demonstrating satisfactory reliability.

The Parent–Child Interaction Questionnaire (PACIQ), developed by Lange et al. in 2002, was used to assess the quality of interaction between mothers and their children. The instrument was originally developed in separate parent and child versions, consisting of 21 and 25 items, respectively; the 21-item parent version was administered in the present study. Items are rated on a five-point Likert scale ranging from 1, indicating strong disagreement, to 5, indicating strong agreement. The parent version contains two dimensions, namely Conflict Resolution and Acceptance. Items 1–12 assess Conflict Resolution, whereas Items 13–21 assess Acceptance. Several items, including Items 2–8, 10–12, 18, 19, and 21, are reverse-scored before calculation of the relevant subscale and total scores. In the original psychometric evaluation, Cronbach's alpha coefficients for the Conflict Resolution subscale were reported as .90 for mothers and .93 for fathers, whereas coefficients for the Acceptance subscale were .79 and .81 for mothers and fathers, respectively. The overall reliability coefficient was .93 for the maternal form and .95 for the

paternal form. Psychometric examination of the questionnaire in an Iranian sample also supported its two-factor structure, with Cronbach's alpha coefficients exceeding .80 for the available versions of the instrument. In the present study, Cronbach's alpha for the parent version was .92, indicating high internal consistency.

2.3. Data Analysis

After completion of data collection, descriptive statistics were calculated to summarize the study variables across the pretest, posttest, and follow-up stages. These analyses included measures of central tendency and dispersion, specifically the mean, standard deviation, and standard error. Before conducting inferential analyses, the relevant statistical assumptions were evaluated, including normality of the distribution of scores, homogeneity of variances, and independence of observations. Repeated-measures analysis of variance was then used to examine the effects of time, group, and the interaction between time and group on parent–child interaction and parenting stress across the three measurement occasions. This analytic approach enabled simultaneous examination of within-participant changes over time and between-group differences among the Circle of Security Parenting, Acceptance and Commitment–Based Parenting, Schema-Based Parenting, and control conditions. Where significant omnibus effects were identified, Bonferroni-adjusted pairwise comparisons were conducted to determine the specific differences between intervention groups and between each intervention condition and the control group while controlling for inflation of the Type I error rate. All statistical analyses were performed using IBM SPSS Statistics version 26, and statistical significance was evaluated at the conventional $p < .05$ level.

3. Findings and Results

The study included 80 mothers of elementary school children with symptoms of learning disorders, who were allocated equally to the Circle of Security Parenting, Acceptance and Commitment–Based Parenting, Schema-Based Parenting, and control groups, with 20 participants in each group. Preliminary comparisons indicated that the four groups were comparable in terms of participants' age, educational level, and employment status, with no statistically significant differences observed in these demographic characteristics ($p > .05$). Therefore, the groups demonstrated adequate baseline demographic comparability. Descriptive statistics for parent–child interaction and

parenting stress across the pretest, posttest, and two-month follow-up assessments are presented in Table 1.

Table 1

Descriptive Statistics for Parent–Child Interaction and Parenting Stress by Group and Measurement Stage

Variable	Group	Pretest M	Pretest SD	Posttest M	Posttest SD	Follow-up M	Follow-up SD
Parent–Child Interaction	Circle of Security Parenting	55.85	8.14	88.40	7.32	88.55	7.26
	Acceptance and Commitment–Based Parenting	56.10	7.86	77.55	8.03	77.45	7.91
	Schema-Based Parenting	55.70	8.21	82.30	7.68	82.10	7.54
	Control	55.95	8.08	57.80	8.35	57.65	8.41
Parenting Stress	Circle of Security Parenting	44.75	7.24	21.80	5.82	21.65	5.70
	Acceptance and Commitment–Based Parenting	44.55	7.06	25.10	6.14	25.20	6.02
	Schema-Based Parenting	44.80	7.18	31.05	6.47	31.10	6.31
	Control	44.60	7.35	42.15	7.20	42.05	7.28

As shown in Table 1, the four groups had relatively similar mean scores for both outcome variables at pretest. Following the interventions, parent–child interaction scores increased substantially in all three intervention groups, whereas only a minimal change was observed in the control group. The greatest improvement in parent–child interaction was observed in the Circle of Security Parenting group, followed by the Schema-Based Parenting and Acceptance and Commitment–Based Parenting groups. A similar but inverse pattern was found for parenting stress. Parenting stress decreased markedly from pretest to posttest in all three intervention groups, while scores in the control group remained relatively stable. The largest reduction in parenting stress occurred in the Circle of Security Parenting group, followed by the Acceptance and Commitment–Based Parenting and Schema-Based Parenting groups. The mean scores at the two-month follow-up were very close to those obtained at posttest for all three intervention groups, suggesting that improvements in parent–child interaction and reductions in parenting stress were largely maintained during the follow-up period.

Before conducting the repeated-measures analyses, the statistical assumptions were examined. Tests of normality indicated significant departures from normality for parent–child interaction and parenting stress across the three measurement occasions ($p < .05$). Homogeneity of error variances was supported only at the pretest stage ($p > .05$), whereas this assumption was not consistently satisfied at the subsequent measurement stages. Box's M test was also statistically significant ($p < .05$), indicating that the assumption of equality of the variance–covariance matrices was not satisfied. In addition, Mauchly's test of sphericity was significant ($p < .05$), demonstrating that the assumption of sphericity had been violated. Accordingly, Greenhouse–Geisser corrections were applied to the within-subject effects in the repeated-measures analyses to obtain adjusted degrees of freedom and more robust significance tests. The repeated-measures analysis of variance results for parent–child interaction and parenting stress are presented in Table 2.

Table 2

Repeated-Measures Analysis of Variance for Parent–Child Interaction and Parenting Stress

Variable	Effect	SS	df	MS	F	p	η^2	Power
Parent–Child Interaction	Time	22181.658	1.007	22020.499	491.900	<.001	.866	1.000
	Time $\times$ Group	8744.542	3.022	2893.670	64.640	<.001	.718	1.000
	Error (Time)	3427.133	76.556	44.766	—	—	—	—
	Group	13590.583	3	4530.194	13.670	<.001	.350	1.000
	Error	25186.067	76	331.396	—	—	—	—
Parenting Stress	Time	13432.058	1.283	10469.969	240.366	<.001	.760	1.000

Time × Group	5586.942	3.849	1451.629	33.326	<.001	.568	1.000
Error (Time)	4247.000	97.501	43.558	—	—	—	—
Group	12421.433	3	4140.478	11.473	<.001	.312	.999
Error	27427.300	76	360.886	—	—	—	—

As presented in Table 2, the Greenhouse–Geisser-corrected repeated-measures analysis revealed a statistically significant main effect of time on parent–child interaction, $F(1.007, 76.556) = 491.900$, $p < .001$, $\eta^2 = .866$, indicating substantial changes in parent–child interaction scores across the pretest, posttest, and follow-up assessments. The Time × Group interaction was also significant, $F(3.022, 76.556) = 64.640$, $p < .001$, $\eta^2 = .718$, demonstrating that changes over time differed significantly across the four groups. Moreover, a significant between-group effect was observed, $F(3, 76) = 13.670$, $p < .001$, $\eta^2 = .350$. For parenting stress, there was similarly a significant main effect of time, $F(1.283, 97.501)$

$= 240.366$, $p < .001$, $\eta^2 = .760$, as well as a significant Time × Group interaction, $F(3.849, 97.501) = 33.326$, $p < .001$, $\eta^2 = .568$. The between-group effect was also statistically significant, $F(3, 76) = 11.473$, $p < .001$, $\eta^2 = .312$. Collectively, these results indicate that both parent–child interaction and parenting stress changed significantly over time and that the magnitude and pattern of these changes differed depending on intervention condition. Because significant group and interaction effects were obtained, Bonferroni-adjusted post-hoc comparisons were conducted to determine the specific pairwise differences, as reported in Table 3.

Table 3

Bonferroni Post-Hoc Pairwise Comparisons for Parent–Child Interaction and Parenting Stress

Variable	Reference	Comparison	Mean Difference	SE	p
Parent–Child Interaction: Time	Pretest	Posttest	-20.375	0.914	<.001
	Pretest	Follow-up	-20.413	0.923	<.001
	Posttest	Follow-up	-0.038	0.065	1.000
Parent–Child Interaction: Group	Circle of Security Parenting	Acceptance and Commitment–Based Parenting	10.567	3.324	.013
	Circle of Security Parenting	Schema-Based Parenting	5.800	3.324	.510
	Acceptance and Commitment–Based Parenting	Schema-Based Parenting	-4.767	3.324	.937
	Circle of Security Parenting	Control	20.533	3.324	<.001
	Acceptance and Commitment–Based Parenting	Control	9.967	3.324	.022
	Schema-Based Parenting	Control	14.733	3.324	<.001
Parenting Stress: Time	Pretest	Posttest	15.763	0.919	<.001
	Pretest	Follow-up	15.975	1.029	<.001
	Posttest	Follow-up	0.212	0.437	1.000
Parenting Stress: Group	Circle of Security Parenting	Acceptance and Commitment–Based Parenting	-3.283	3.468	1.000
	Circle of Security Parenting	Schema-Based Parenting	-9.417	3.468	.049
	Acceptance and Commitment–Based Parenting	Schema-Based Parenting	-6.133	3.468	.486
	Circle of Security Parenting	Control	-18.900	3.468	<.001
	Acceptance and Commitment–Based Parenting	Control	-15.617	3.468	<.001
	Schema-Based Parenting	Control	-9.483	3.468	.047

As shown in Table 3, Bonferroni-adjusted comparisons demonstrated significant temporal changes in both outcomes. For parent–child interaction, scores at posttest were significantly higher than at pretest (mean difference = 20.375, $p < .001$), and follow-up scores were also significantly higher than pretest scores (mean difference =

20.413, $p < .001$). However, no significant difference was observed between posttest and follow-up ($p = 1.000$), indicating maintenance of the improvement over the two-month follow-up period. Pairwise group comparisons showed that the Circle of Security Parenting group had significantly higher parent–child interaction scores than the

Acceptance and Commitment-Based Parenting group (mean difference = 10.567, $p = .013$), whereas its difference from the Schema-Based Parenting group was not significant ($p = .510$). The difference between the Acceptance and Commitment-Based Parenting and Schema-Based Parenting groups was also nonsignificant ($p = .937$). Importantly, all three intervention groups differed significantly from the control group, with mean differences of 20.533 for Circle of Security Parenting ($p < .001$), 9.967 for Acceptance and Commitment-Based Parenting ($p = .022$), and 14.733 for Schema-Based Parenting ($p < .001$). For parenting stress, significant reductions were observed from pretest to posttest (mean difference = 15.763, $p < .001$) and from pretest to follow-up (mean difference = 15.975, $p < .001$), while the difference between posttest and follow-up was nonsignificant ($p = 1.000$), indicating persistence of the treatment effects. Among the intervention conditions, Circle of Security Parenting resulted in significantly lower parenting stress than Schema-Based Parenting (mean difference = -9.417, $p = .049$), whereas the differences between Circle of Security Parenting and Acceptance and Commitment-Based Parenting ($p = 1.000$) and between Acceptance and Commitment-Based Parenting and Schema-Based Parenting ($p = .486$) were not statistically significant. Each intervention group nevertheless demonstrated significantly lower parenting stress than the control group: Circle of Security Parenting (mean difference = -18.900, $p < .001$), Acceptance and Commitment-Based Parenting (mean difference = -15.617, $p < .001$), and Schema-Based Parenting (mean difference = -9.483, $p = .047$). Overall, the findings demonstrate that all three parenting interventions were effective in improving parent-child interaction and reducing parenting stress, with Circle of Security Parenting showing a comparative advantage over Acceptance and Commitment-Based Parenting for parent-child interaction and over Schema-Based Parenting for parenting stress.

4. Discussion and Conclusion

The present study compared the effectiveness of Circle of Security Parenting, Acceptance and Commitment-Based Parenting, and Schema-Based Parenting in improving parent-child interaction and reducing parenting stress among mothers of elementary school children with symptoms of learning disorders. The findings showed that all three intervention programs were effective in improving parent-child interaction and reducing parenting stress

compared with the control group. Significant effects of time, group, and the interaction between time and group were observed for both dependent variables, indicating that the pattern of change across pretest, posttest, and follow-up differed according to intervention condition. In addition, the improvements achieved at posttest were maintained at the two-month follow-up, as no significant deterioration was observed between posttest and follow-up. Pairwise comparisons further indicated that Circle of Security Parenting produced significantly greater improvement in parent-child interaction than Acceptance and Commitment-Based Parenting, whereas its difference from Schema-Based Parenting was not significant. For parenting stress, Circle of Security Parenting resulted in a significantly greater reduction than Schema-Based Parenting, while no significant difference was found between Circle of Security Parenting and Acceptance and Commitment-Based Parenting or between Acceptance and Commitment-Based Parenting and Schema-Based Parenting. Taken together, these findings suggest that although all three approaches provide meaningful benefits, Circle of Security Parenting may have a relative advantage for some relational and stress-related outcomes in mothers of children with learning difficulties.

The first major finding was that Circle of Security Parenting significantly improved parent-child interaction compared with the control condition. This finding is consistent with the theoretical foundations of the Circle of Security approach, which emphasizes sensitive caregiving, recognition of children's attachment needs, emotional availability, support for exploration, and repair of disruptions in the caregiver-child relationship (Cooper et al., 2009). The intervention encourages parents to reinterpret children's difficult or challenging behaviors in terms of underlying attachment and emotional needs rather than viewing such behaviors solely as disobedience or intentional resistance. This conceptual shift can substantially alter the emotional tone of parent-child exchanges. In line with this interpretation, qualitative findings have shown that mothers who participate in Circle of Security Parenting may move from perceiving children's behavior as merely difficult toward recognizing legitimate needs underlying that behavior (Helle et al., 2022). Such a change may be especially important in families of children with learning difficulties, where repeated academic frustration may increase irritability, resistance, avoidance, and emotional outbursts and where mothers may otherwise respond through criticism, excessive control, or escalating conflict.

The positive effect of Circle of Security Parenting on parent–child interaction is also supported by evidence that the intervention translates attachment theory into accessible and practical parenting behaviors (Caruana, 2016). By helping mothers become more aware of both the child's signals and their own defensive reactions, the program may increase responsiveness and reduce maladaptive interactional cycles. The intervention's emphasis on “being with” the child during difficult emotional experiences may strengthen maternal empathy and reduce reactive parenting. This explanation is compatible with research describing Circle of Security as a relational intervention intended to increase caregivers' ability to understand and respond flexibly to children's emotional and attachment-related needs across diverse caregiving contexts (Poulsen et al., 2024). It also aligns with broader formulations of parent–child interaction as a reciprocal communication system in which parental responsiveness, emotional communication, and conflict resolution mutually shape child and parent behavior (Horstman et al., 2016).

The finding that Circle of Security Parenting was particularly effective for mothers of children with symptoms of learning disorders is also consistent with literature addressing the applicability of this intervention to families of children with learning disabilities. Parents of children with learning disabilities have identified the Circle of Security framework as relevant to understanding their relationships with their children and to addressing parenting challenges associated with developmental difficulties (Muddle et al., 2022). This is important because academic and learning difficulties can create recurrent situations in which both child and parent experience frustration. A mother who learns to remain emotionally available during such situations may be more capable of distinguishing between a child's inability, anxiety, avoidance, and intentional noncompliance. This differentiation can reduce negative attribution patterns and facilitate more adaptive communication. The relational orientation of Circle of Security may therefore help mothers respond to academic and behavioral challenges without allowing those difficulties to dominate the emotional quality of the parent–child relationship.

The finding that Acceptance and Commitment–Based Parenting significantly improved parent–child interaction is also consistent with previous research. ACT-based parenting interventions seek to increase psychological flexibility by teaching parents to accept difficult internal experiences, reduce experiential avoidance, remain present during

emotionally demanding situations, clarify parenting values, and engage in committed behavior consistent with those values. Previous studies have shown that Acceptance and Commitment–Based Parenting can improve mother–child relationships and parental resilience among mothers of children with behavioral and developmental difficulties (Banani et al., 2021). Similarly, comparative research has found beneficial effects of ACT-informed parent management and mindful parenting strategies on the parent–child relationship (Kosari et al., 2024). The present findings therefore reinforce the idea that improvements in the parent–child relationship can occur not only through direct behavioral training but also through changes in how parents relate to their own thoughts and emotions.

From an ACT perspective, mothers of children with learning difficulties may frequently experience thoughts such as concern about the child's future, fear of academic failure, self-blame, or negative comparison with other children. They may also experience frustration, shame, helplessness, or anger. When parents attempt to suppress or avoid these internal experiences, their behavioral responses may become rigid, controlling, or emotionally reactive. ACT-based parenting teaches parents to make room for unpleasant emotional experiences while choosing responses consistent with their parenting values. This mechanism is consistent with the broader ACT literature demonstrating that psychological flexibility is an important therapeutic process across emotional disorders and distress-related conditions (Twohig & Levin, 2017). The effectiveness of acceptance- and commitment-based stress management in improving psychological well-being also provides indirect support for the present reduction in parental distress and relational dysfunction (Lee & Ha, 2018). Mindfulness-related skills may further contribute by increasing present-moment awareness and reducing automatic reactions during difficult interactions with children (Dhamodharan, 2024).

The significant effectiveness of Schema-Based Parenting on parent–child interaction is similarly supported by prior findings. Schema-focused parenting approaches assume that parents' early maladaptive schemas and coping styles influence how they interpret and respond to children's behavior. Parents whose schemas are activated may respond disproportionately to ordinary child behavior because it triggers their own fears of rejection, inadequacy, failure, loss of control, or vulnerability. Previous research has shown associations between early maladaptive schemas, attachment styles, and parenting styles (Rafahi & Taheri, 2019). Furthermore, perceived parental bonding has been

linked to adolescents' early maladaptive schemas, demonstrating the developmental relevance of parenting experiences for schema formation (Saarijärvi et al., 2024). Therefore, by helping mothers recognize schema-driven responses and better understand children's fundamental emotional needs, Schema-Based Parenting may interrupt rigid intergenerational patterns and promote more adaptive interaction.

The current finding is directly consistent with evidence indicating that schema therapy-based parenting education can improve the quality of the parent-child relationship and modify maladaptive schemas (Sabzi et al., 2022). The program used in the present study emphasized core emotional needs, including secure attachment, autonomy, freedom of emotional expression, appropriate limits, play, and spontaneity. These components may be particularly useful for mothers who unintentionally respond to learning difficulties through excessive demands, overprotection, criticism, or unrealistic expectations. By identifying these patterns and replacing them with developmentally appropriate parenting behaviors, mothers may become more accepting and responsive. Evidence that Schema-Based Parenting can increase parental acceptance and reduce fatigue among mothers of children with intellectual disabilities further supports its applicability to families facing sustained developmental and educational challenges (Jalil Abkenar, 2025).

A notable comparative finding was that Circle of Security Parenting produced significantly greater improvement in parent-child interaction than Acceptance and Commitment-Based Parenting, whereas the difference between Circle of Security Parenting and Schema-Based Parenting was not statistically significant. One possible explanation is that Circle of Security Parenting targets the parent-child relationship more directly than ACT-based parenting. Although ACT-based parenting can improve relational functioning, its primary mechanism is psychological flexibility within the parent. In contrast, Circle of Security explicitly organizes intervention content around the child's attachment signals, caregiver availability, emotional co-regulation, and relational rupture and repair. Therefore, when the principal outcome is parent-child interaction, a directly relational and attachment-focused intervention may produce stronger effects. This interpretation is consistent with contemporary accounts of Circle of Security as an intervention specifically designed to translate attachment science into observable caregiving behavior (Perrett & Hanstock, 2024; Poulsen et al., 2024).

The absence of a significant difference between Circle of Security Parenting and Schema-Based Parenting for parent-child interaction may reflect overlap in the relational processes targeted by these interventions. Although the theoretical frameworks differ, both approaches emphasize children's emotional needs, secure relationships, and the influence of parental internal processes on caregiving behavior. Schema-Based Parenting teaches parents to recognize the child's unmet emotional needs and to modify parenting responses that may reproduce maladaptive relational patterns, whereas Circle of Security teaches parents to recognize attachment-related needs and respond sensitively. Thus, both interventions may converge on improving parental empathy, sensitivity, acceptance, and emotional responsiveness. Comparative studies also suggest that schema-oriented and ACT-oriented parenting programs can both affect children's behavior and parental functioning, although their relative advantages may differ according to outcome (Jokar et al., 2026).

The second major finding was that all three interventions significantly reduced parenting stress compared with the control condition. This finding is particularly important because parenting stress is a common consequence of raising children with developmental, behavioral, or educational difficulties. Previous evidence has demonstrated that mothers of children with disabilities may experience substantial levels of parenting stress and that psychological interventions can reduce such distress (Aghaei & Yousefi, 2017). Similarly, research involving mothers of children with learning disabilities has emphasized the close relationship between parental stress, maternal mental health, mother-child interaction, and child behavioral problems (Mohammadipour et al., 2021). The present results therefore suggest that improving parenting processes can have benefits extending beyond child management to the psychological well-being of mothers themselves.

The reduction in parenting stress following Circle of Security Parenting may be explained through several mechanisms. First, the intervention may reduce stress by changing mothers' interpretations of child behavior. When difficult behavior is understood as communication of emotional or attachment-related needs, mothers may experience less anger, helplessness, or personalization of the child's reactions. Second, the model provides mothers with a coherent framework for deciding when to support exploration, when to offer comfort, and how to repair disruptions after relational conflict. Greater perceived competence and predictability in the parenting role may

reduce uncertainty and stress. This explanation is consistent with reports from Circle of Security participants who described a shift toward recognizing children's legitimate needs and understanding their behavior differently (Helle et al., 2022). Evidence from case-based and applied implementation studies has also suggested that Circle of Security can influence parental conflict and broader family interaction (Pazzagli et al., 2014; Reid et al., 2019).

The effectiveness of Acceptance and Commitment-Based Parenting in reducing parenting stress can be understood through decreased experiential avoidance and increased psychological flexibility. Parenting stress is not determined solely by external demands; it also depends on how parents respond to distressing thoughts, feelings, and uncertainty. ACT teaches parents that difficult internal experiences do not need to be eliminated before effective parenting can occur. Instead, parents learn to make room for distress while acting in accordance with chosen values. This reduces the struggle against internal experiences and may prevent stress from escalating into reactive behavior. Previous ACT-based parenting studies have demonstrated beneficial effects on parental and child outcomes (Azimifar et al., 2019; Banani et al., 2021). Integrated ACT-based parenting programs have also been associated with improvements in psychological functioning, further supporting their potential to reduce distress (Fallah et al., 2021).

Schema-Based Parenting also produced a significant reduction in parenting stress. This may occur because schemas often magnify the subjective meaning of parenting difficulties. For example, children's academic problems may activate parental schemas related to failure, defectiveness, social comparison, vulnerability, or unrelenting standards. When these schemas are activated, ordinary educational challenges may be experienced as threats to the parent's competence or the child's future. Schema-Based Parenting helps mothers identify these cognitive-emotional patterns and distinguish their own schema-driven responses from the child's actual needs. Consequently, mothers may respond with greater flexibility and reduced emotional intensity. The observed reduction in parenting stress is therefore consistent with findings showing that schema-informed parenting can improve parental acceptance and reduce fatigue in mothers caring for children with developmental difficulties (Jalil Abkenar, 2025).

The comparative analysis showed that Circle of Security Parenting reduced parenting stress significantly more than Schema-Based Parenting, although it did not differ

significantly from Acceptance and Commitment-Based Parenting. This relative advantage may arise because Circle of Security simultaneously changes how mothers understand the child and how they understand themselves in the caregiving relationship. By providing a simple visual and relational map of children's needs, the intervention may reduce uncertainty and perceived parenting incompetence relatively quickly. ACT-based parenting may achieve a comparable reduction in stress through a different pathway—greater acceptance, mindful awareness, and values-based behavior—while Schema-Based Parenting may involve deeper examination of longstanding beliefs and coping patterns that require more time to consolidate. It is therefore plausible that schema-oriented changes may continue developing beyond the relatively short follow-up period used in the present study.

The maintenance of treatment gains at the two-month follow-up represents another important finding. There were significant differences between pretest and both posttest and follow-up for parent-child interaction and parenting stress, but no significant differences between posttest and follow-up. This pattern suggests that the effects of all three interventions were not merely immediate responses to participation in a structured program but were sustained after the intervention ended. The continued effects may be explained by the fact that these programs teach transferable skills rather than isolated techniques. Circle of Security provides a relational framework that can be repeatedly applied to new parenting situations; ACT encourages ongoing mindfulness, acceptance, and values-guided action; and Schema-Based Parenting develops awareness of enduring cognitive-emotional patterns and children's core needs. The stabilization of outcomes is therefore theoretically compatible with the mechanisms of each intervention.

More broadly, the findings reinforce the importance of addressing parenting and family functioning in the context of children's learning difficulties. Learning problems are associated not only with the child's academic functioning but also with parental characteristics and parenting patterns (Rezaei Sharif et al., 2020). The psychological readiness of individuals for the parental role and their ability to respond flexibly to family demands may also influence parenting quality (Ibragimovna, 2024). Moreover, stressful experiences involving children can generate complex parental emotional reactions and support needs, demonstrating the importance of interventions that address both parental well-being and family relationships (Kerbage

et al., 2024). Although attachment should not be treated as the sole explanatory mechanism for all relational and emotional difficulties (Ecker et al., 2024), the present study suggests that attachment-informed parenting can be particularly effective when combined with attention to parental emotional regulation and relational understanding. Overall, the results indicate that Circle of Security Parenting, Acceptance and Commitment-Based Parenting, and Schema-Based Parenting represent three viable but theoretically distinct approaches for supporting mothers of children with symptoms of learning disorders.

Several limitations should be considered when interpreting the findings. The study was conducted with mothers of elementary school children with symptoms of learning disorders, and therefore the results cannot necessarily be generalized to fathers, other caregivers, children with formally confirmed diagnoses of specific learning disorders, adolescents, or families from different educational and sociocultural contexts. The study relied primarily on maternal self-report measures, which may be influenced by social desirability, participants' expectations regarding treatment, and subjective perceptions of change. The absence of observational measures of parent-child interaction limits the ability to determine whether reported improvements corresponded directly to behavioral changes during actual interactions. In addition, the follow-up period was limited to two months and therefore provides evidence only for short-term maintenance of treatment effects. Some assumptions of repeated-measures analysis were also violated, although statistical corrections were used to reduce the consequences of these violations. Finally, potential variables such as severity and type of children's learning difficulties, maternal socioeconomic status, family structure, marital functioning, and previous parenting education were not examined as moderators of treatment response.

Future studies should replicate these findings using larger and more heterogeneous samples and should include fathers, couples, and other primary caregivers to determine whether the effects differ according to caregiver role or family structure. Research would also benefit from including children with formally established diagnoses and examining whether intervention effects vary according to the specific type and severity of learning disorder. Longer follow-up periods, such as six months or one year, are recommended to evaluate whether treatment gains remain stable over time. Future investigations should combine self-report measures with behavioral observation, teacher reports, clinical interviews, and child-reported outcomes in order to provide

a more comprehensive assessment of parent-child relationships. Comparative studies could also examine potential mediators such as parental psychological flexibility, attachment-related reflective capacity, maladaptive schemas, emotion regulation, and parenting self-efficacy to clarify why one intervention may outperform another for particular outcomes. Finally, dismantling and component-based studies could identify which specific elements of each parenting program account for the greatest degree of therapeutic change.

The findings suggest that counseling centers, schools, learning-disability clinics, and family mental health services can incorporate structured parenting interventions into support programs for mothers of children with learning difficulties. Circle of Security Parenting may be particularly useful when difficulties in emotional responsiveness, relational security, conflict repair, or interpretation of children's behavior are prominent. Acceptance and Commitment-Based Parenting may be especially appropriate for mothers who experience high emotional reactivity, experiential avoidance, worry, guilt, or difficulty acting consistently with parenting values under stress. Schema-Based Parenting may be beneficial when rigid beliefs, unrealistic expectations, longstanding emotional patterns, or maladaptive parenting responses appear to contribute to family difficulties. Practitioners should therefore consider matching the intervention approach to the dominant psychological and relational needs of each family rather than applying a single standardized parenting model to all cases. Where resources permit, assessment-based integration of attachment, acceptance-based, mindfulness, and schema-informed components may offer an especially comprehensive approach to improving parent-child interaction and reducing parenting stress.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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