Maternal Depression and Self-Regulation in Preschool: The Moderating Role of Prematurity

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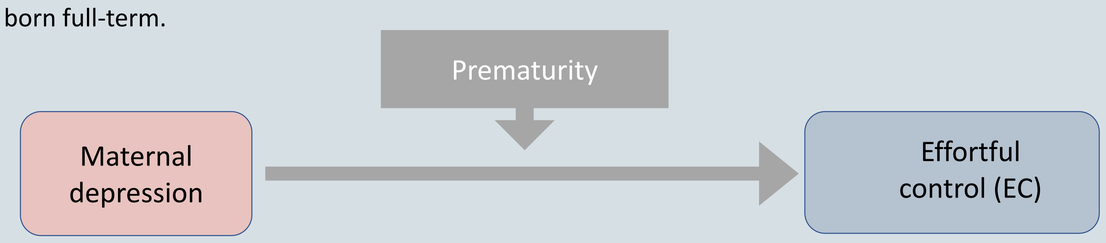
Introduction

- Effortful Control (EC) is a temperamental component of self-regulation, reflected in the ability to inhibit impulses and act in a goal-directed manner [1]. It develops rapidly during early childhood, a period strongly influenced by environmental factors and parenting style [2]. Harsh, unresponsive parenting is linked to lower levels of EC, which relates to negative behavioral and developmental outcomes [3,4].
- Maternal depression has been found to be negatively associated with children's EC. One possible explanation is that maternal depression may hinder essential parenting behaviors- especially cognitive guidance- which plays a key role in supporting the development of self-regulation during early childhood [5].
- Preterm birth creates a stressful context for the development of the mother- child bond and can affect the child's development throughout childhood, increasing the risk for emotional and behavioral difficulties[6]. Longitudinal studies show that preterm children have lower EC levels than full-term peers, even after controlling factors such as maternal depression and family risks, suggesting that prematurity is a biological factor reducing self-regulation abilities[7].
- The diathesis–stress model argues that certain children are more vulnerable to negative environments due to innate sensitivities. In contrast, the differential susceptibility model suggests that these same sensitivities can make children more responsive to both negative and positive influences. Preterm birth has been identified as a potential sensitivity factor, as studies have shown that preterm children tend to be more strongly affected by parenting quality and maternal emotional well-being[8].

Aims & Hypotheses

- Our aim is to **examine whether the association between maternal depression and children's EC varies as a function of prematurity**. We hypothesized that higher levels of maternal depression would be more strongly associated with lower EC among children born preterm compared to those born full-term.



Method

Sample

- Ninety mothers and their 5.5-year-old children (48 boys) who participated in the preterm development longitudinal study [6,8]. Fifty-four children were born preterm (28-34 weeks gestation), and 36 were born full-term (>37 weeks).

Measures

- **Maternal depressive symptoms** were measured using the Center for Epidemiologic Studies Depression Scale (CES-D; [9]), a widely used 20-item self-report questionnaire. Items were rated on a 4-point scale (0=none of the time to 3= most or all of the time) with higher scores indicating more severe depressive symptoms.
- **EC** was assessed using both observational and parent-report-measures:

  Parent-report: Mothers completed the EC subscale of Child Behavior Questionnaire (**CBQ;** α = .67) - Very Short Form [10] a standardized parent-report measure rated on a 7-point Likert scale (1 = extremely untrue to 7 = extremely true). **EC** was measured with 12 items (e.g., attention focusing, inhibitory control) representing cognitive self-regulation. Higher scores indicate higher cognitive control.

  Observation: two behavioral tasks from the Preschool Version of the Laboratory Temperament Assessment Battery (Lab-TAB;[11]) were used:

  a) The **Tower of Patience** task assesses inhibitory control by requiring the child to take turns with the experimenter in building a block tower, waiting patiently for their turn despite increasing delays.
  b) The **Snack Delay** task assesses delay of gratification by asking the child to wait before eating a visible treat placed in front of them, with waiting intervals gradually increasing across trials.

  Behavioral coding focused on three core indicators of self-regulation across the tasks: (1) turn-taking behavior (0 = yes, 1 = no), (2) task compliance (0 = yes, 1 = no), and (3) anticipatory behavior (was rated on a 4-point Likert scale (0 = none, 1 = low, 2 = moderate, 3 = high). Higher scores indicate more difficulties in EC. Scores were averaged across trials for each of the components. A composite score was created by standardizing each component and averaging the standardized scores.

  *Socioeconomic status (**SES**) was assessed using the Israeli Socio-Economic Index [12]. Higher scores indicate higher SES socioeconomic standing.

Results

Table 1

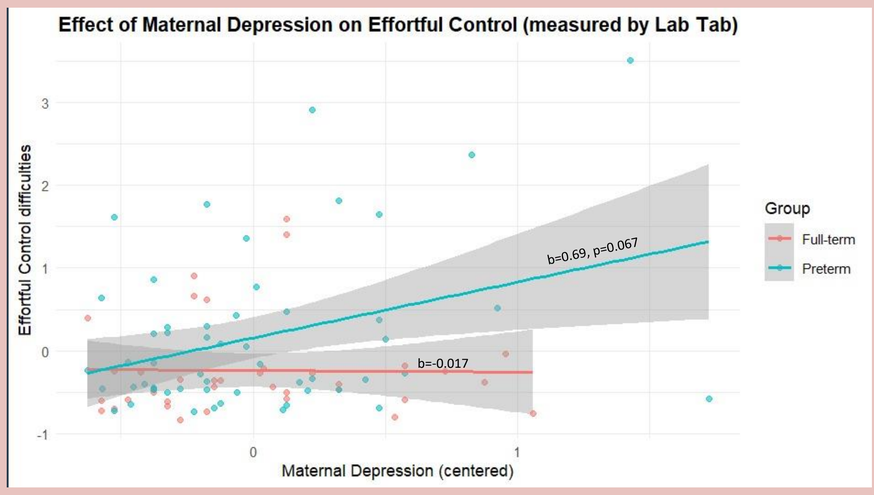
Hierarchical regression analyses predicting EC (CBQ and LAB-TAB) from maternal depression controlling for SES and prematurity and examining Prematurity as a moderator.

		Effortful control (DV)					
		Lab-TAB (Observation)			CBQ (Parent report)		
Predictors		b	R^2	*p*	*b*	R^2	*p*
Step 1			.1	.024		.01	.779
	SES	0.00		.795	-0.00		.300
Prematurity		0.41		.030	-0.04		.789
Maternal Depression		0.42		.028	-0.02		.902
Step 2			.14	.012		.01	.881
	SES	0.00		.674	-0.00		.292
	Prematurity	0.42		.025	-0.04		.784
Maternal Depression		-0.02		.955	0.04		.866
Maternal Depression x Prematurity		0.71		.067	.1		.755

Note. Higher scores on the Lab-Tab measurement indicate greater EC difficulties, whereas higher scores on the CBQ measurement indicate better EC abilities. Prematurity was coded as 0 = full-term, 1 = preterm.

Figure 1

Moderation Analysis of Prematurity on the Association Between Maternal Depression and EC Difficulties (LAB-TAB)



Discussion

- Our findings show that maternal depression was associated with lower EC. The association with maternal depression reached significance only when assessed with the Lab-Tab behavioral tasks, but not with the CBQ parent-report measure. This highlights the added value of objective measures in assessing temperament, as parent reports may not fully capture children's actual regulatory abilities.
- An additional finding in this study indicated that prematurity showed a trend-level moderation (p = .067) of the association between maternal depression and Lab-Tab-measured Effortful Control (EC), with a stronger negative association observed among preterm children. This finding can be explained by the diathesis-stress model, which posits that children with heightened susceptibility, such as preterm infants, are more strongly affected by negative environmental influences [8]. Therefore, it is plausible that in the current study, the preterm group was more affected by the negative effects of maternal depression on their EC, compared to the full-term group.
- Future research should include longitudinal studies to examine whether maternal depression has long-term effects on EC. It is also recommended to complement parent reports with objective measures, such as preschool observations and physiological indicators, to better understand self-regulation mechanisms. Clinically, it is crucial to provide tailored support for preterm children exposed to maternal depression through interventions in preschool and later in school.

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