

The interplay of maternal and paternal postpartum depressive symptoms with children's internalizing and externalizing symptoms from childhood to adolescence:

Does socioeconomic status matter? A longitudinal cohort study.

Myriam Clément^{1,2}, Marilyn N. Ahun³, Massimiliano Orri^{4,5}, Tina C. Montreuil⁶, Martin St-André⁷, Catherine M. Herba⁸, Gregory Moullec^{1,9}, Sylvana M. Côté¹



¹ Department of Social and Preventive Medicine, School of Public Health, Université de Montréal, Montréal, QC; ² Department of Nursing, Université du Québec en Outaouais, Saint-Jérôme, QC; ³ Department of Medicine, Faculty of Medicine and Health Sciences, McGill University, Montréal, QC; ⁴ Department of Psychiatry, McGill University, Montréal, QC; ⁵ Department of Epidemiology, Biostatistics, and Occupational Health, School of Population and Global Health, McGill University, Montréal, QC; ⁶ Department of Educational and Counselling Psychology, McGill University, Montréal; ⁷ Perinatal and Early Childhood Psychiatry Clinic, Sainte-Justine University Hospital Center, Montréal, QC; ⁸ Department of Psychology, Université du Québec à Montréal, Montréal, QC; ⁹ Public Health Research Center, Université de Montréal, Montréal, QC, Canada



Background

Child and adolescents' mental health problems



15 – 25 %

Parental postnatal depression



15 – 20 %

7 – 11 %

Risk of mental health problems in children exposed to postnatal maternal depression compared to unexposed children

Internalizing problems

Troubles émotionnels à 3.5 ans (n = 13 822 familles)

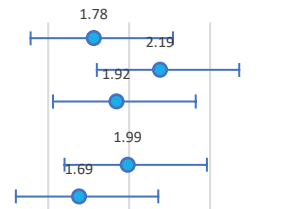
Anxiété entre 12 et 23 ans (n = 1189 familles)*

Dépression entre 12 et 23 ans (n = 1189 familles)*

Externalizing problems

Troubles de conduite à 3.5 ans (n = 13 822 familles)

TDAH de 1.5 à 18 ans (n = 32 584 familles)*



Risk of mental health problems in children exposed to postnatal paternal depression compared to unexposed children

Internalizing problems

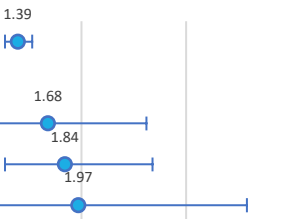
Troubles émoionnels à 4 - 5 ans (n = 2620 familles)

Externalizing problems

Hyperactivité à 3.5 ans (n = 10 024 familles)

Troubles de conduite à 3.5 ans (n = 10 024 familles)

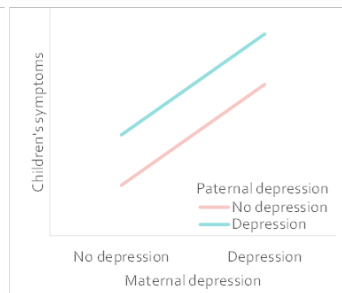
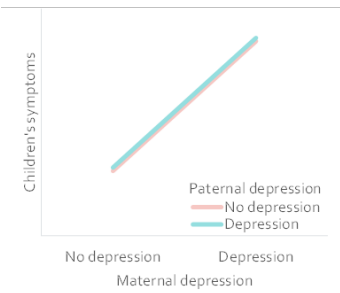
Troubles de conduite à 7 ans (n = 10 975 familles)



Competing Theoretical Models for the Interplay of Maternal and Paternal Depression on Children's Mental Health Symptoms

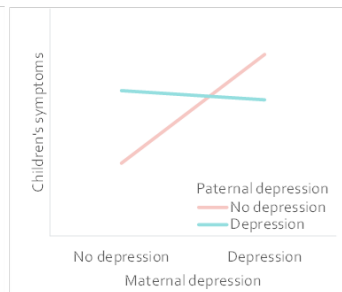
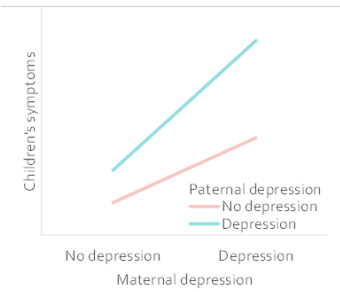
A. Unique maternal model

B. Independent additive model



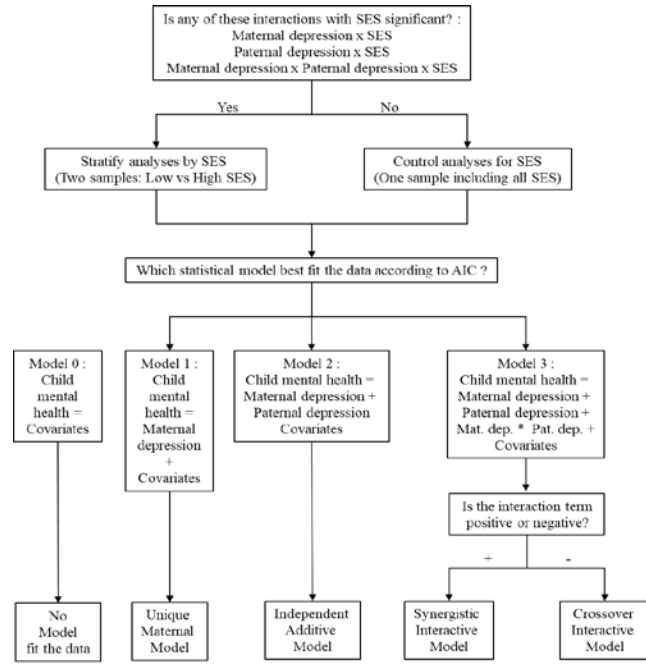
C. Synergistic interactive model

D. Crossover interactive model



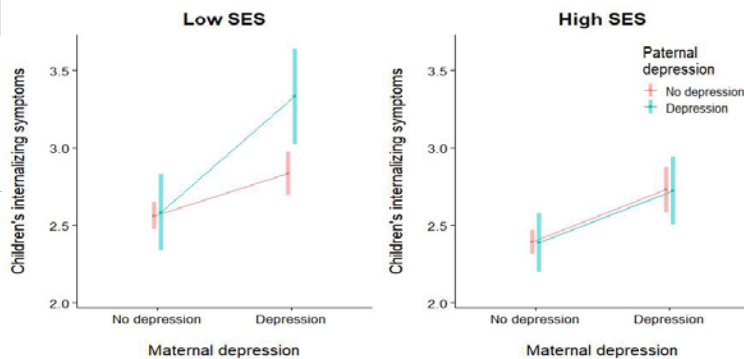
Methods

Model Selection Decision Tree

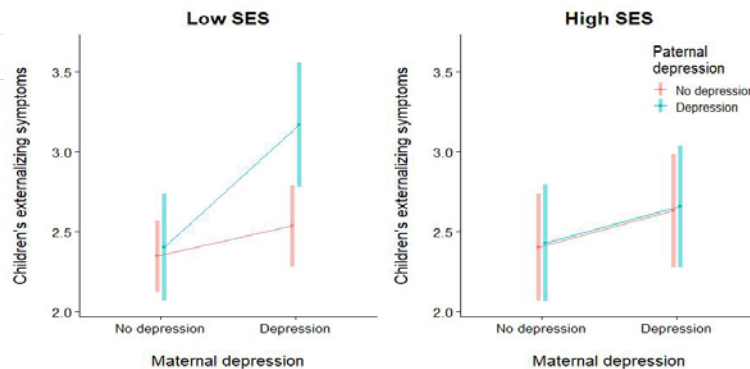


Results

Associations between Maternal Postpartum Depression and Children's Internalizing Symptoms at Ages 3.5-17 years, by Paternal Depression and Socioeconomic Status



Associations between Maternal Postpartum Depression and Children's Externalizing Symptoms at Ages 3.5-17 years, by Paternal Depression and Socioeconomic Status



Objective

Describe the interplay between maternal and paternal depression at 5 months postpartum and their associations with internalizing and externalizing symptoms in children and adolescents from ages 3.5 to 17 years, in families with low and high socioeconomic status

Conclusions

Screening and interventions promoting postpartum mental health should be offered universally to all mothers and prioritized for fathers living in families struggling with concurrent maternal depression and low socioeconomic circumstances.

The interplay of maternal and paternal postpartum depressive symptoms with children's internalizing and externalizing symptoms from childhood to adolescence:

Does socioeconomic status matter? A longitudinal cohort study.

Table 1. Participant Characteristics of the Study Participants in the QLSCD at Child's 5 Months, by Parental Depression.

	Parental Depression					P Value
	None (n = 1329)	Mother Only (n = 236)	Father Only (n = 96)	Both Parents (n = 39)	All (n = 1700)	
Child characteristics						
Male, No. (%)	664 (50.0)	124 (52.5)	41 (42.7)	24 (61.5)	853 (50.2)	0.19
Birth weight, g, mean (SD)	3410 (496)	3420 (487)	3410 (473)	3360 (464)	3410 (493)	0.69
Maternal characteristics						
Immigration status, No. (%)						
Born in Canada	1223 (92.0)	209 (88.6)	83 (86.5)	26 (66.7)	1541 (90.6)	< 0.001
European immigrant	37 (2.8)	5 (2.1)	3 (3.1)	2 (5.1)	47 (2.8)	
Non-European immigrant	69 (5.2)	22 (9.3)	10 (10.4)	11 (28.2)	112 (6.6)	
Age group, No. (%)						
< 25 years	232 (17.5)	67 (28.4)	20 (20.8)	9 (23.1)	328 (19.3)	0.01
25-39 years	1073 (80.7)	166 (70.3)	75 (78.1)	29 (74.4)	1343 (79.0)	
≥ 40 years	24 (1.8)	3 (1.3)	1 (1.0)	1 (2.6)	29 (1.7)	
Antisocial behaviour ^d , mean (SD)	0.952 (1.12)	1.26 (1.33)	1.15 (1.16)	1.36 (1.48)	1.01 (1.17)	0.001
Lifetime depression, No. (%)	181 (12.5)	76 (29.6)	17 (17.0)	15 (33.3)	289 (15.6)	< 0.001
University degree, No. (%)	449 (31.0)	43 (16.7)	36 (36.0)	7 (15.6)	535 (28.9)	< 0.001
Paternal characteristics						
Immigration status, No. (%)						
Born in Canada	1196 (90.0)	210 (89.0)	88 (91.7)	28 (71.8)	1522 (89.5)	< 0.001
European immigrant	40 (3.0)	5 (2.1)	0 (0)	0 (0)	45 (2.6)	
Non-European immigrant	93 (7.0)	21 (8.9)	8 (8.3)	11 (28.2)	133 (7.8)	
Age group, No. (%)						
< 25 years	94 (7.1)	25 (10.6)	6 (6.3)	7 (17.9)	132 (7.8)	0.005
25-39 years	1135 (85.4)	199 (84.3)	78 (81.3)	26 (66.7)	1438 (84.6)	
≥ 40 years	100 (7.5)	12 (5.1)	12 (12.5)	6 (15.4)	130 (7.6)	
Antisocial behaviour ^d , mean (SD)	1.37 (1.60)	1.44 (1.58)	1.58 (1.68)	1.83 (1.95)	1.40 (1.61)	0.20
Lifetime depression, No. (%)	127 (9.6)	42 (17.8)	30 (31.3)	17 (43.6)	216 (12.7)	< 0.001
University degree, No. (%)	369 (27.8)	39 (16.5)	26 (27.1)	6 (15.4)	440 (25.9)	0.001
Household characteristics, No. (%)						
Intact 2-parent family ^e	1178 (88.6)	206 (87.3)	78 (81.3)	35 (89.7)	1497 (88.1)	0.18
Siblings in family						
0	580 (43.6)	93 (39.4)	36 (37.5)	18 (46.2)	727 (42.8)	0.05
1-2	685 (51.5)	130 (55.1)	56 (58.3)	15 (38.5)	886 (52.1)	
3+	64 (4.8)	13 (5.5)	4 (4.2)	6 (15.4)	87 (5.1)	
Low socioeconomic status ^f	607 (45.7)	149 (63.1)	43 (44.8)	27 (69.2)	826 (48.6)	< 0.001

Model Selection for the Interplay of Maternal and Paternal Postpartum Depression on Children's Internalizing and Externalizing Symptoms at Ages 3.5 - 17 Years, in Families with Low Socioeconomic Status.

Internalizing symptoms						
	Model 1		Model 2		Model 3	
	β (95% CI)	P	β (95% CI)	P	β (95% CI)	P
Maternal depression	0.34 (0.2 to 0.47)	< 0.001	0.33 (0.19 to 0.47)	< 0.001	0.27 (0.12 to 0.42)	< 0.001
Paternal depression			0.19 (-0.01 to 0.39)	0.06	0.02 (-0.23 to 0.27)	0.85
Interaction						
Maternal x Paternal depression					0.48 (0.06 to 0.89)	0.02
Fit index						
AIC	42427,7		38560,7		38558,9	

Externalizing symptoms						
	Model 1		Model 2		Model 3	
	β (95% CI)	P	β (95% CI)	P	β (95% CI)	P
Maternal depression	0.26 (0.12 to 0.4)	< 0.001	0.25 (0.1 to 0.4)	0.001	0.18 (0.02 to 0.34)	0.03
Paternal depression			0.26 (0.04 to 0.47)	0.02	0.05 (-0.21 to 0.32)	0.69
Interaction						
Maternal x Paternal depression					0.59 (0.14 to 1.03)	0.01
Fit index						
AIC	36263.2		32829.3		32826.0	

Model Selection for the Interplay of Maternal and Paternal Postpartum Depression on Children's Internalizing and Externalizing Symptoms at Ages 3.5 - 17 Years, in Families with High Socioeconomic Status.

Internalizing symptoms						
	Model 1		Model 2		Model 3	
	β (95% CI)	P	β (95% CI)	P	β (95% CI)	P
Maternal depression	0.34 (0.19 to 0.48)	< 0.001	0.34 (0.19 to 0.49)	< 0.001	0.38 (0.23 to 0.54)	< 0.001
Paternal depression			-0.01 (-0.19 to 0.18)	0.95	0.06 (-0.14 to 0.27)	0.54
Interaction						
Maternal x Paternal depression					-0.39 (-0.88 to 0.1)	0.12
Fit index						
AIC	56348.6		53930.6		53930.9	

Externalizing symptoms						
	Model 1		Model 2		Model 3	
	β (95% CI)	P	β (95% CI)	P	β (95% CI)	P
Maternal depression	0.23 (0.09 to 0.36)	0.001	0.22 (0.08 to 0.36)	0.002	0.22 (0.08 to 0.37)	0.003
Paternal depression			0.03 (-0.14 to 0.2)	0.75	0.03 (-0.16 to 0.22)	0.76
Interaction						
Maternal x Paternal depression					-0.01 (-0.46 to 0.45)	0.98
Fit index						
AIC	47068.3		45059.7		45062.7	