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## Maternal Depression, Child Temperament, and Risk for Depression in Adolescence A Test of the Differential Susceptibility Hypothesis

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Honors Thesis

Karina Palermo

Department: Psychology

Advisor: Jackson Goodnight, Ph.D.

April 2019

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## A Test of the Differential Susceptibility Hypothesis

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### **Abstract**

This study examines the relationship between maternal depression and offspring risk for depression. A child's difficult temperament may be especially challenging for a depressed mother. The depression, in combination with child difficult temperament, may cause changes in parenting styles that put the child at a greater risk for depression. The purpose of this study is to examine whether links between maternal depression, maternal parenting, and offspring risk for depression in adolescence vary according to child difficult temperament. It is predicted that maternal depression will be more strongly predictive of parenting deficits for mothers of children with difficult temperament. Furthermore, consistent with the differential susceptibility hypothesis, it was predicted that children with difficult temperament will be more susceptible to the negative consequences of the parenting deficiencies associated with maternal depression, such that maternal depression would more strongly predict risk for depression in adolescence. This study will use previously collected longitudinal data from a nationally representative sample of mothers and their offspring. Results found support for a link between learning stimulation and risk for adolescence, and found evidence that deficiencies in learning stimulation helped explain the effect of maternal depression on adolescent offspring risk for depression.

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## **Introduction**

Research has indicated that negative childhood environments have magnified effects on children deemed vulnerable for genetic and temperamental reasons. However, the implications of these findings do not stop here. The differential susceptibility hypothesis states that vulnerable children are especially susceptible to their environments, both supportive and adverse (Belsky et al, 2007). Because maternal depression affects the mother-child relationship due to the mother's parenting styles, the child often becomes frustrated with inconsistencies in the relationship (Cummings & Davies, 1994). A child's temperament, or their disposition and reactivity, can affect a mother's depression. A child with a difficult or fussy temperament can potentially be more stressful to mothers resulting in more parenting problems.

Past research indicates that maternal depression is a risk factor for adverse psychological and behaviors outcomes in offspring during childhood and adolescence. Causes may include quality of early child care, biased reports, attachment styles, and parental self-efficacy (Jones & Prinz, 2005). Mothers experience maternal depression in many different ways. For example, some mothers may feel disconnected from their children. Parenting style can serve as a transmission mechanism for maternal and offspring depression. There are examples of this in postpartum depression. A mother may not seek out the typical expressions of mother-child bonding after child birth, such as touching, gazing, and smiling. The lack of this behavior, which promotes bonding, can result in a disconnect between mother and child, resulting in unhealthy attachment styles, and furthering depression in the mother (Nonnenmacher et al, 2016).

Another way maternal depression can affect the maternal relationship is an increased negative perception of the child's behavior. In a study conducted by Webster-Stratton and Hammond (1988), depressed mothers rated their children significantly more critically than their spouses. Moreover, Charrois found strong results that depressed mothers are more likely to over-report problems, and provide biased reports of child behavior. These negative observations in child behavior may contribute to the parent's concept of parental self-efficacy (PSE; Jones & Prinz, 2005). The findings of these researchers suggest that PSE impacts a child indirectly via changes in parenting practices. Evidence from this study showed links of changes in positive maternal interactive behavior, parental warmth, parental limit setting, and harsh discipline with child and adolescent behavior. Additionally, in observational studies, PSE was shown to be strongly associated with positive interactive behavior between the mothers and children due to the higher quality of communication and sensitivity available to the child. PSE is considered a possible indicator of child functioning and risk. Because PSE is a general self-reflection on parenting competency, depression can greatly influence a parent's thoughts on their PSE. Moreover, the researchers report that changes in parenting behavior and parenting patterns are influential factors when it comes to child disorders. Inconsistency in punishments can lead to aggressive behaviors and difficult temperaments in children (Jones & Prinz, 2005).

According to the differential susceptibility hypothesis, children of depressed mothers are more vulnerable to risk factors (Belsky et al, 2007). A child whose mother suffers from depression is genetically vulnerable to depression, and is exposed to an environment where depression is in effect at a young age. This provides the

environmental and genetic risk factors needed for the child to be deemed vulnerable. Charrois et al (2017) concluded that children in households with maternal depression benefit from access to quality child care due to their vulnerability. She found that children in a household with no maternal depression benefitted little from high quality child care, while children whose mothers were depressed benefited significantly from high quality health care. However, low socioeconomic status increases a mother's likelihood for depression, decreasing the chances that she will be able to afford quality child care. There is also evidence that children in low socioeconomic group are more likely to develop behavioral problems (Lahey et al, 2008).

Children with depressed mothers are at more vulnerable to their surroundings than peers in families without maternal depression. Because of this, children with depressed mothers are at greater risk for behavioral problems (Cummings & Davis, 1994). Cummings and Davis reported that even in the neonatal period of development, children of depressed parents are more likely to have difficult temperaments, as defined by high levels of negative emotion and irritability. These difficult temperament traits can contribute to parenting difficulties, which in turn may result in a greater risk for child depression (Webster-Stratton & Hammond, 1988).

Cummings and Davies (1994) report that parental depression has a significant association with insecure parent-child attachment styles. This finding implies that, in some cases, maternal depression interferes with the mother-child relationship. He also reports that the severity of depression increases the likelihood of unhealthy parent-child relationships. This disruption can interfere with the child's behavioral and emotional development, and therefore may lead to depression.

Exposure to the mother's depressive behavior is thought to make the child more sensitive to their environment. Children exposed to risk environments when young are shown to be more susceptible to risk factors in adolescence (Belsky et al, 2007). Moreover, the mother is more susceptible to negative life factors in her depressive state. Difficult child temperament has a greater impact on a depressed mother than on a mother with typical affect. The depression influences the perception of the child's behavior, magnifying the troubles in her and her child's life (Webster-Stratton & Hammond, 1987)

The mother-child relationship is influential for child outcomes. At the same time, child temperament can serve as a large influence when it comes to maternal depression. Riley (2008) reports a consistent and strong relationship between maternal depression and poor child outcomes. In fact, the exposure of maternal depression at an early age puts a child at risk for developing depression in adolescence. Cummings notes that a mother's varying reactions to a child's undesirable behavior can cause stress in the child, as well as produce the feeling that they have no control in their lives (Cummings & Davies, 1994). Riley also reports that a child may find frustration and confusion due to the inconsistency in their mother's actions. This frustration may lead to difficult temperament. For example, the researcher reports that when maternal depression is in place, a family's normal level of warmth and cohesion are at risk. Cummings reports that this warmth may be reduced by the depressed parent's irritability and fatigue (13). These constant changes leave the child at risk for depression and for conduct problems (Cummings & Davies, 1994)

Gelfand and Teiti (1990) explain that maternal depression is highly correlated with child dysfunction. The researchers do not deny the potential influence of the passing on of genes from mother to child, but the author does emphasize the importance of a

mother "acting depressed" on the child's mental health. The inconsistent punishments, withdrawn affect, and lack of warmth a child can experience due to maternal depression takes the greatest effect on the child, putting them at risk for difficult temperament and depression.

### **The Proposed Study**

A mother's depression is more greatly affected when raising a child with a difficult temperament. As the child's temperament creates a greater emotional strain on the mother, her parenting style change, resulting in a greater likelihood of child depression. The present study will examine links between maternal depression, maternal parenting, and child depression. Furthermore, it will test whether links between these variables are stronger for children with difficult temperament as compared to those without a difficult temperament. The following hypotheses will be tests: (1) Maternal depression will be associated with lower levels of positive parenting (i.e., responsiveness and cognitive stimulation), higher levels of harsh parenting, and higher levels of offspring depression in adolescence; (2) lower levels of positive parenting and higher levels of harsh parenting will be associated with higher levels of offspring depression in adolescence; (3) associations between maternal depression and parenting will be stronger for children with difficult temperament relative to children with easy temperament, and (4) the association between parenting and risk for depression will be stronger for children with difficult temperament relative to children with easy temperament.

### **Methods**

#### *Participants*

The National Longitudinal Survey of Youth (NLSY79) is a nationally representative sample of 6,111 Americans. The participants were born between 1957 and 1964 with ages ranging from 14 to 22. These participants were assessed annually from 1979 until 1994, and biennially thereafter. The offspring sample of these participants began participating in 1986, with data collection ongoing. The combined mother-child data set provides longitudinal and comprehensive information about developmental influences in children and mothers, such as cognitive, social, and emotional factors.

### *Measures*

**Child Temperament.** Difficult child temperament is defined as fussiness for the purpose of this study. Temperament scores were reported when children were between 1 and 23 months of age. The mothers rated their children's behavior regarding 17 temperament items each ranked by a five-point scale. Items ranked included temperament items such as fussiness and activity level.

**Parenting.** Parenting was assessed between child ages 3-5 and child ages 6-9 using the HOME-SF. This questionnaire is composed of 8 ratings of the mother's parenting, and the home environment recorded by an interviewer following an assessment, and 10 maternally reported items on her parenting and home environment. Maternal responsiveness (e.g., mother spoke to child, mother hugged child, mother answered child's questions) learning stimulation (e.g., how often the mother reads to their child, is the child taken on outings), and harsh parenting (physical restriction and instances of spanking in the past week). The same were created for ages 6-9, and with the exception that harsh parenting was replaced with a measure of spanking only. These

measures have shown adequate levels of reliability and validity in a previous analysis of the NLSY (Lahey et al., 2008).

**Depression.** Depression in adolescence was measured using the shortened CES-D in children averaged from 14 years of age to 17 years of age, and maternal depression was measured in 1992 using the CES-D. The CES-D is a 20-item scale in which participants rate how often in the past week they experienced symptoms of depression. For example, one statement, “I talked less than usual,” can be rated being felt from less than one day, to most or all of the time. The shorter version of the CES-D, the Boston Form, includes ten items that are all taken from the full-length version of the questionnaire.

## Results

### *Preliminary Analyses*

Means and standard deviations were calculated for the family (i.e., sibling) averages of the following variables: Maternal Depression, Adolescent Depression, Fussiness, Learning Stimulation (3-5 and 6-9), Harsh Parenting (3-5), Spanking (6-9) and Responsiveness (3-5 and 6-9). The results are presented in Table 1. Correlations were also calculated between the continuous variables. These are reported in Table 2. Significant correlations were found among most of the variables.

Table 1

### *Descriptive Statistics*

Measure	Mean	Standard Deviation	Range
Adolescent Depression	4.15	3.16	0.00-19.00
Maternal Depression	9.78	8.53	0.00-46.00
Fussiness	-.074	0.87	-1.59-4.41

Responsiveness (3-5)	0.24	0.73	-3.00-0.70
Learning Stimulation (3-5)	0.27	0.82	-2.57-1.04
Harsh Parenting (3-5)	0.39	0.99	-0.85-2.49
Responsiveness (6-9)	0.85	0.19	0.00-1.00
Leaning Stimulation (6-9)	0.62	0.27	0.00-1.00
Spanking (6-9)	0.34	0.68	0.00-6.00

Table 2

*Correlations of the Continuous Variables*

Measure	1	2	3	4	5	6	7	8
1. Responsiveness (6-9)								
2. Learning Stimulation (6-9)	.12**	-						
3. Spanking (6-9)	.10**	.24**	-					
4. Harsh Parenting (3-5)	.02	.03	.26**	-				
5. Learning Stimulation (3-5)	.13**	.50**	.25**	.75**	-			
6. Responsiveness (3-5)	.15**	.13**	.16**	.00	.16**	-		
7. Adolescent Depression	.02	.06*	.03	.07*	.06*	.01	-	
8. Fussiness	.03	.13**	.14**	.13**	.14**	.10**	.01	-
9. Maternal Depression	.08**	.19**	.11**	.05	.25**	.12**	.05	.19**

Note: \*\*  $p < .01$ ; \*  $p < .05$

*Primary Analyses*

**Associations between maternal depression and parenting.** Six tests were conducted regarding the associations between maternal depression and parenting variables. The first analysis considered harsh parenting from ages 3-5 as a mediator of the association between maternal depression and adolescent depression. Maternal depression ( $b = .0036$ ,  $p = .280$ ) was not significantly associated with harsh parenting, but fussiness ( $b = .1078$ ,  $p < .001$ ) was. In contrast, both maternal depression ( $b = .0141$ ,  $p = .227$ ) and

fussiness ( $b = -1194$ ,  $p = .274$ ) were not associated with adolescent depression, but harsh parenting ( $b = -.2455$ ,  $p = .017$ ) was. The indirect effect from maternal depression to adolescent depression via harsh parenting was not significant ( $b = .001$ , 95% CI [.0036, -.0003]).

The second analysis considered maternal responsiveness from ages 3-5 as a mediator of the associations between maternal depression and adolescent depression. Maternal depression ( $b = -.0111$ ,  $p < .001$ ) was significantly associated with responsiveness, but fussiness ( $b = -.0395$ ,  $p = .325$ ) was not. Moreover, maternal depression ( $b = .0205$ ,  $p = .094$ ), fussiness ( $b = .0060$ ,  $p = .959$ ), and responsiveness ( $b = .1151$ ,  $p = .417$ ) were not associated with adolescent depression. The indirect effect from maternal depression to adolescent depression via responsiveness (3-5) was not significant ( $b = -.0015$ , 95% CI [.0014, -.0050]).

The third analysis considered learning stimulation from ages 3-5 as a mediator of the associations between maternal depression and adolescent depression. Maternal depression ( $b = -.0202$ ,  $p < .001$ ) was significantly associated with learning stimulation, but fussiness ( $b = -.0375$ ,  $p = .409$ ) was not. Maternal depression ( $b = .0140$ ,  $p = .243$ ), fussiness ( $b = -.1828$ ,  $p = .101$ ) and learning stimulation ( $b = -.1783$ ,  $p = .115$ ) were not associated with adolescent depression. The indirect effect from maternal depression to adolescent depression via learning stimulation (3-5) was not significant ( $b = .0037$ , 95% CI [.0086, -.0007]).

The fourth analysis considered spanking from ages 6-9 as a mediator of the associations between maternal depression and adolescent depression. Both maternal depression ( $b = .0126$ ,  $p < .0001$ ) and fussiness ( $b = .1029$ ,  $p = .005$ ) were significantly

associated with spanking. Maternal depression ( $b = .0198$ ,  $p = .069$ ), fussiness ( $b = -.2479$ ,  $p = .032$ ) and spanking ( $b = .0550$ ,  $p = .680$ ) were not associated with adolescent depression. The indirect effect of spanking was not significant ( $b = .0006$ , 95% CI [.0040, -.0027])

The fifth analysis considered maternal responsiveness from ages 6-9 as a mediator of the associations between maternal depression and adolescent depression. Maternal depression ( $b = -.0021$ ,  $p < .001$ ) was significantly associated with responsiveness, while fussiness ( $b = -.0107$ ,  $p = .223$ ) was not. Maternal depression ( $b = .0215$ ,  $p = .046$ ) was associated with adolescent depression, but fussiness ( $b = -.1912$ ,  $p = .696$ ) and responsiveness ( $b = -.2447$ ,  $p = .629$ ) were not. The indirect effect of responsiveness (6-9) was not significant ( $b = .0005$  95% CI [.0030, -.0014]).

The next analysis considered learning stimulation from ages 6-9 as a mediator of the associations between maternal depression and adolescent depression. Maternal depression ( $b = -.0046$ ,  $p < .001$ ) was significantly associated with learning stimulation, but fussiness ( $b = -.0159$ ,  $p = .209$ ) was not. Maternal depression ( $b = .0187$ ,  $p = .084$ ) was not associated with adolescent depression, but both fussiness ( $b = -.4635$ ,  $p = .044$ ) and learning stimulation 6-9 ( $b = -.7128$ ,  $p = .040$ ) were. The indirect effect of learning stimulation (6-9) was significant ( $b = .0034$ , 95% CI [.0073, ..0002]). However, across all analyses, tests of difficult temperament as a moderator of links of maternal depression with parenting and adolescent depression were nonsignificant.

## **Discussion**

The purpose of the study was to examine the relationships between maternal depression, parenting style, child temperament, and risk for depression in adolescence. The present study tested associations between depression in mother and adolescent offspring, parenting, and child temperament. Several significant associations were found. Higher levels of learning stimulation in ages 6-9 were associated with a lower levels of adolescent depression. In addition, mothers with greater levels of depression had children with more difficult temperaments and were more likely to engage in negative parenting behaviors. Temperament did not show a consistent association with adolescent depression. These findings suggest that enhancing learning stimulating behaviors among depressed mothers may have the potential to reduce the intergenerational transmission of depression.

Compared to previous literature, findings were consistent in regards to depression affecting a mother's parenting. In general, the study found that maternal depression was associated with an increase in negative parenting behaviors. Moreover, the mother-child relationship was found to be a predictor for depression in adolescence when studying the degree to which a mother engages in learning stimulation behaviors with her child between ages 6-9. In addition, a child's fussy temperament was associated with an increase in negative parenting behaviors, which was also consistent with previous literature.

The strengths of the study include a large sample size, longitudinal data collection, and a nationally representative sample of mothers. The present study had

several limitations. First, the study did not account for biological factors as predictors for depression. A child whose mother suffers from depression is genetically vulnerable to depression (Belsky et al, 2007). Without the genetic factors taken into account, a significant gap in the study exists. The study is correlational, and maternal depression and child temperament were both reported on by the mothers. Moreover, data collection for the NLSY began in 1979. Since then, attitudes on physical discipline for children has changed. The reported results for parenting variables Harsh Parenting (3-5) and Spanking (6-9) would most likely differ significantly from 1979 to 2019. Additionally, the fathers were not included in the data collection. A father's presence or absence would have a large effect on the child and their upbringing. Even if the mother suffered from severe depression, a non-depressed father's presence could greatly benefit the child, and lower their risk for depression.

The implications of the findings are that if a mother is experiencing depression, a helpful area of focus may be learning stimulation behaviors. Especially when the child is between the ages of 6-9, engaging in behaviors such as reading together, or helping the child with homework may be a worthwhile use of energy and resources for the depressed mother, in order to help limit her child's risk for depression later on. Moreover, because maternal depression was associated with negative parenting behaviors, resources for handling depression while parenting may be beneficial to mothers if made readily available.

In the future, this study could serve as a baseline for studying why children of the same household react differently to the same parenting styles. In this case, the children would have been exposed to similar parenting from birth, and one may develop

depression while the other(s) do not. Exploring situations like these may help us understand how biological differences can influence individual cases of depression. A similar study could be used to study depression in cases of identical twins. In these situations, the children would have identical DNA as well as similar parenting. If cases of only one twin developing depression were found, additional causes of depression would need to be explored.

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