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## **The Relationship Between Maternal Depression, In-Home Violence, And Use Of Physical Punishment: What Is The Role Of Child Behavior?**

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## ABSTRACT

**Context.** Maternal depression and in-home violence are independently associated with the use of physical punishment on children; however, the combined impact of these factors on the practice of physical punishment is unknown, as is the extent to which their relationship to physical punishment varies with child behavior.

**Objectives.** 1) Determine the combined impact of maternal depression and violence exposure on one physical punishment practice, smacking; 2) Explore the role of child behaviors in this relationship.

**Methods.** Multivariable regression analysis of a nationally representative sample of US kindergarten children. Maternal depressive symptoms, violence exposure, and use of smacking as a discipline technique were measured by parent interview. Child behaviors were reported by teachers.

**Results.** 12,764 mother-child dyads were included in the analysis. The adjusted odds ratio (aOR) for smacking among mothers with depressive symptoms was 1.59 (95% CI 1.40, 1.80); among mothers exposed to in-home violence, 1.48 (95% CI 1.18, 1.85); among dually exposed mothers, 2.51 (95% CI 1.87, 3.37). Adjusting these models for child self-control or externalizing behavior yielded no change in these associations, and no effect modification by child behavior was detected. Among mothers reporting to smack their children, depression was associated with an increased smacking frequency (aIRR 1.12; 95% CI 1.01, 1.24); however, this association was reduced to borderline significance when adjusting the models for child self-control or externalizing behavior (aIRRs 1.10; 95% CI 1.00, 1.21). Depressed mothers who were also exposed to violence demonstrated higher rates of smacking (aIRR 1.29; 95% CI 1.09, 1.53); this remained stable when adjusting for child behaviors.

**Conclusion.** Maternal depression and violence exposure are associated with smacking as a means of punishment. The magnitude of this association is increased when depression and violence occur together. When coexistent, they also appear associated with the frequency of smacking. Child self-control and externalizing behavior do not appear to impact substantially the association between maternal depressive symptoms, violence exposure, and smacking.

**Key words:** Maternal Depression, Violence, Corporal Punishment, Spanking, Smacking, Child Behavior.

## INTRODUCTION

Parental use of physical punishment – in particular, non-abusive smacking – has been a controversial topic among paediatricians for at least a decade. In the wake of a number of studies suggesting that physical punishment early in a child's life may be associated with subsequent maladaptive behaviors,<sup>1</sup> the Royal College of Paediatrics and Child Health in 1998 joined “Children are Unbeatable,” a coalition with a platform against all forms of physical punishment.<sup>3</sup> Disagreements on the issue, however, have been widespread, and debate continues.<sup>4 5</sup> Many argue that child healthcare providers, if they are to engage in effective discussions on discipline with parents, need to understand not only the relationship of parental characteristics and experiences to physical punishment, but also how certain child behaviors may impact these relationships.<sup>6</sup>

Previous studies have examined parent and child characteristics that are independently associated with smacking.<sup>7-10</sup> With respect to parents, maternal depression<sup>11 12</sup> and intimate partner violence – which themselves frequently co-exist<sup>13-18</sup> – are known to be associated with higher rates of physical punishment. With respect to children, externalizing behavior,<sup>19</sup> and the precise type of precipitating misbehavior (lying, stealing, being disrespectful<sup>9</sup>) are also known to be associated. Although most agree that family punishment practices are the result of a dynamic interplay between child and caregiver, we could find no reports that attempted to analyze parental factors associated with smacking, specifically in the context of varying child behaviors.

This study, therefore, has two principal aims. First, because the combined effects of maternal depression and violence exposure on the use of physical punishment remain unknown, we aim to study the association between maternal depressive symptoms, violence exposure, and smacking. Second, we aim to explore the impact of two child behaviors in these relationships: poor self-control and externalizing behavior, which have previously been associated with harsher punishment styles. We hypothesize that depressed mothers – particularly those exposed to violence – are more likely to practice physical punishment than non-depressed mothers; and that this effect will persist in the face of varying child behaviors.

## METHODS

**Data source and study sample.** We extracted data from the baseline kindergarten year of the Early Childhood Longitudinal Survey, Kindergarten Cohort (ECLS-K). The ECLS-K draws from a nationally representative sample of children in the United States who attended kindergarten in 1998-99, and employs face-to-face parent interviews, teacher surveys, and direct cognitive assessments.<sup>20</sup> Details of the ECLS sampling strategy, response rate, and overall design are available at <http://nces.ed.gov/ecls/kinderdataprocure.asp>. All variables included in this study were collected during the kindergarten year. Because of the many reasons that children cease to be cared for by their biological parents, we restricted our study to biological mother-child dyads for which the mother served as primary survey respondent.

**Maternal depression and violence exposure.** Respondent mothers answered a 12-item version of the Center for Epidemiologic Studies Depression Scale (CES-D), a valid and reliable measure of depressive symptoms.<sup>21</sup> Following convention, we combined responses to individual CES-D items to create a raw symptom score, and considered only those with a raw score >9 to have clinically significant depressive symptomatology. We chose this cut point because it corresponds with the most commonly used clinical cut point, indicative of depression (> 15), on the full CES-D.<sup>22</sup>

Exposure to in-home violence was defined using a single ECLS-K survey item. Respondents were asked, "When you have a serious disagreement with your partner, how often do you end up hitting or throwing things at each other?" We considered any response other than "never" to represent in-home violence.

Each mother-child dyad was assigned to 1 of 4 mutually exclusive exposure categories: neither maternal depressive symptoms nor violence, depressive symptoms only, violence only, both depressive symptoms and violence. Dyads for whom data on either depressive symptoms or violence were missing were excluded from the analysis.

**Child and Family Characteristics.** We extracted child's age and sex, mother's age, and number of other siblings in the home. In addition, household socioeconomic status was quantified by a continuous measure, which took into consideration parental education, household income, and social prestige of parental occupations – of last of which was computed to reflect the average of the 1989 US General Social Survey prestige score.<sup>23</sup>

We assessed child behavior through teachers' responses to the Social Rating Scale (SRS), an adaptation of the valid and reliable Social Skills Rating System,<sup>24</sup> which characterizes child behavior within a variety of thematic subscales. For this study, based on the advice of a panel of 3 developmental and behavioral paediatricians, we assessed one positive child behavior set, self-control; and one negative one, externalizing behavior. For each subscale, children were scored between 1 and 4, with higher numbers indicating a greater tendency to demonstrate the behavior. To make our results more clinically relevant and to follow the precedent of previous studies,<sup>25</sup> we dichotomized

responses at either the 5<sup>th</sup> percentile (self-control, as a positive behavior) or 95<sup>th</sup> percentile (externalizing behavior, as a negative behavior).

**Outcome Measures.** The frequency of smacking (commonly termed “spanking” in the US) was determined through the following question, “Sometimes kids mind pretty well and sometimes they don’t. About how many times, if any, have you spanked (Child) in the past week?” To make the most conservative estimate of smacking practices, mothers who reported no smacking in the previous week were considered not to smack their children.

**Data Analysis.** We used individual level weights from ECLS-K to yield valid national estimates. On weighted cross-sectional data, we used multivariable logistic regression to estimate odds ratios and negative binomial regression to estimate incident rate ratios. Negative binomial regression calculates rates when repeated events cluster within individuals (e.g. smacks per week), and data fail to fit the Poisson distribution.<sup>26</sup>

The logistic regression models were applied to the entire study population to distinguish between mothers who practiced smacking and mothers who did not. Because of the possibility that the use of smacking as a means of discipline is mediated by a distinct set of factors from how often a mother smacks her children, we restricted analyses of smacking frequency to mothers who reported any smacking at all. On this rationale, we applied negative binomial regression to the subpopulation of mothers reporting non-zero smacking frequency, as opposed to zero-inflated negative binomial regression to the entire population. We used the Taylor Series estimation to accommodate ECLS-K’s complex sampling design. Variables were selected for inclusion in the models because of their documented or theoretical relevance to the outcomes of interest. Our base multivariable models were adjusted for mother’s age, child’s age and sex, number of siblings in the home, and family SES.

We disaggregated maternal depressive symptoms and violence, deriving regression coefficients for depressive symptoms and violence independently, as well as together – a technique that yields identical regression coefficients to the use of an interaction term. To determine whether the potential effects of child behaviors could be misattributed to either maternal depression or violence exposure, we further adjusted these base regression models for the presence or absence of child self-control or externalizing behavior. Lastly, when sample size permitted, we stratified the study sample based on teacher reports of the child’s self-control and externalizing behavior, and examined the above associations within these strata. We formally assessed effect modification by child behavior (i.e. interaction between mother and child factors) by adding interaction terms (depression-by-violence-by-child behavior) to the models.

We performed all analyses using Stata 9.1 (College Station, Texas). The Boston University Medical Center institutional review board exempted this study from review.

## RESULTS

**Maternal depressive symptoms and violence exposure.** Among the 23,425 kindergarteners included in the ECLS-K cohort, 15,385 biological mother-child dyads were eligible for our study. The vast majority of the 8,040 ineligible dyads were ineligible because the mother did not serve as the primary survey respondent, therefore precluding an accurate assessment of depression symptomatology. Among the eligible dyads, 128 mothers (< 1%) had missing CES-D scores; data on in-home violence were missing in 2,610 (17%) of cases, but the vast majority of these (all but 1%) were due to non-applicability of the question (most commonly, the mother did not have a partner), as opposed to non-response.

A total of 12,764 dyads were assigned to 1 of 4 mutually exclusive exposure categories: 10,299 (81%), neither depressive symptoms nor violence; 1,742 (14%), depressive symptoms alone; 487 (4%), violence alone; and 236 (2%), both (Figure 1). All estimates were consistent with previously published data.<sup>27-29</sup> Depressive symptoms were over twice as common among mothers exposed to violence than among mothers not exposed (31% vs. 14%,  $p < 0.0001$ ). However, among mothers with depression scores over the clinical cutoff of 9, there was no clinically significant difference in raw CES-D score between those exposed and unexposed to violence (15.2 vs. 14.3), suggesting that violence exposure was not simply a marker for greater depression severity.

**Sample description by exposure group.** Overall, 51% of the cohort was male; the mean child age was 75 months (SD 4); mean maternal age was 33 years (SD 6); mean number of siblings in the home was 1.5 (SD 1). Across the depressive symptoms/violence groups, there were no significant differences in child age, maternal age, or ratio of girls to boys. However, SES tended to decrease among those affected by depressive symptoms and/or exposed to violence. Among mothers who reported neither depressive symptoms nor violence, 24% reported smacking; among mothers with depressive symptoms, 35% reported smacking; among mothers exposed to violence, 33% reported smacking; and among dually exposed mothers, 46% reported smacking. The mean number of weekly smacks among mothers reporting any smacks at all followed a similar pattern, ranging from 1.49 smacks per week in the neither-depression-nor-violence group to 1.92 in the dually exposed group (Table 1).

When dyads within each of the depressive symptoms/violence exposure groups were stratified according to child behaviors, negative child behaviors (as reported by the children's teachers) were generally associated with a greater likelihood of the mother to report smacking (Table 2). For example, among mothers with depressive symptoms, 33% of children with good self-control were disciplined through smacking, whereas 53% of children with poor self-control were disciplined through smacking ( $p < 0.05$ ). This trend did not persist with regard to the mean number of smacks per week among mothers reporting any smacking at all.



**Multivariable Analyses.** For the total study population, the adjusted odds ratio (aOR) for smacking among mothers with depressive symptoms was 1.59 (95% CI 1.40, 1.80); among mothers exposed to in-home violence, 1.48 (95% CI 1.18, 1.85); and among dually exposed mothers, 2.51 (95% CI 1.87, 3.37; Table 3). Further adjusting these models for child self-control or externalizing behavior yielded no clinically significant changes in the measured associations, and all associations remained statistically significant (Table 3). When the population was stratified by child behaviors, the magnitude of association of maternal depressive symptoms and violence exposure with smacking increased substantially among children with poor self-control: aOR 2.32 (95% CI 1.54, 3.52) for mothers with depressive symptoms, aOR 2.33 (95% CI 1.01, 5.37) for mothers exposed to violence, and aOR 5.22 (95% CI 1.62, 16.82) for dually exposed mothers (Table 3). Analysis of depression-by-violence-by-child behavior interaction terms, however, failed to demonstrate statistically significant effect modification by child behavior.

Among mothers reporting smacking, maternal depression was associated with a modestly increased frequency of smacking (aIRR 1.12; 95% CI 1.01, 1.24), but exposure to in-home violence was not (aIRR 1.13; 95% CI 0.92, 1.39). The association between maternal depression and frequency of smacking, however, was reduced to a borderline significant trend when further adjusting the models for either poor child self-control or externalizing behavior (aIRRs 1.10; 95% CI 1.00, 1.21). Depressed mothers who were also exposed to in-home violence demonstrated significantly higher rates of smacking (aIRR 1.29; 95% CI 1.09, 1.53), and this remained stable even when further adjusting the models for child behaviors (Table 4). Sample size limitations precluded either stratified analyses of adjusted incident rates of smacking by child behaviors, or an adequate assessment of effect modification.



## DISCUSSION

Among a nationally representative sample of kindergarten children and their mothers, we found that maternal depressive symptoms and violence between adult partners were both associated with an increased likelihood of smacking. Moreover, when co-existent, these two exposures were associated with an even greater likelihood of smacking. Among children with poor self-control, the magnitude of association of maternal depressive symptoms and violence with smacking appeared particularly high; however, there was no statistical evidence of effect modification. Among mothers reporting smacking, there was no statistically significant association between maternal depression or violence exposure alone with frequency of smacking, after controlling for child behaviors; however, when maternal depression and violence exposure were present together, mothers tended to report a higher frequency of smacking regardless of child behavior.

Our study is rooted in the known comorbidity of violence exposure and depression. While a significant minority of depressed women have been exposed to violence, the majority of women victimized by violence display clinically significant depressive symptomatology.<sup>17 30</sup> Furthermore, previous studies have documented correlates to the use of physical punishment.<sup>7 8 31 32</sup> Reporting maternal depression or violence as independent correlates, therefore, is not new. However, an increasing amount of data suggest that the impact of maternal depression – for both mother and child – can be exacerbated by a number of co-morbid factors, violence exposure chief among them.<sup>33</sup> Similarly, although existing data suggest that child behavior problems may develop as a result of physical punishment practices,<sup>2</sup> there is a paucity of data on how child behaviors impact the relationship between parent-level risk factors and the practice of physical punishment. Our results can be viewed as an initial inquiry into this potentially important dynamic.

A principal strength of this study is that child behaviors were reported by teachers, thereby preventing the potential bias of relying on parents to report both child behaviors and their own punishment practices. Our study, however, has a number of limitations. Since our study was cross-sectional, we cannot comment on causality; and as in any observational study, the potential for unmeasured confounding exists. Additionally, we were restricted to a single question to assess in-home violence – the psychometric properties of which are unknown. It is likely that the limited range of violent behaviors covered by this measure represents an underreporting bias, and limits the extent to which our results can be generalized to other types of violence. Furthermore, because the in-home violence measure specifically asked mothers about their relationship to their partner, our results can be generalized only to partnered mothers – who constitute 82% of the total representative ECLS dataset. It should be noted in this vein that multiple previous studies have demonstrated that maternal depression – our other principal exposure – is more common among single mothers;<sup>34</sup> and that it is possible that many such mothers are single due to previous domestic violence.

Similarly, although our question on smacking has been used in similar format in other studies,<sup>35</sup> it too represents a measure with unknown psychometric properties. That said, however, we know of no alternative question on smacking that has been proven valid or reliable, and our estimate of smacking frequency is consistent with at least one recent nationally representative US study on smacking,<sup>32</sup> suggesting our estimate is accurate. Lastly, our ability to demonstrate interactions between maternal depressive symptoms, violence, and childhood behaviors was also limited. Although our sample size was large, total sample size may not be the major driver of statistical power to detect interactions when a sample is parsed unevenly. Therefore, despite an initial large sample size, we actually faced small cell sizes when modeling interactions involving variables with uneven distributions – particularly the child behavior sets.

With these limitations in mind, we believe that our study offers further evidence for the combined adverse effects of maternal depression and violence exposure on the children of affected women. Our data suggest that these common – and potentially modifiable – risk factors are more apt to affect whether or not a mother uses smacking to discipline her children than it is to affect the frequency of smacking. Although the relationship between parent and child-level factors relative to punishment practices is complex, our data suggest that meaningful associations between maternal depression, violence exposure, and smacking persist in the face of varying child behaviors. While our findings are not necessarily generalizable to other parental risk factors or child behaviors, they do imply that subsequent research on maternal depression's impact on children should consider the potentially exacerbating effects of violence. They also suggest that subsequent research on physical punishment – and by association, efforts to find viable alternatives to it – should consider what both parent and child bring to the punishment interactions that occur between them.

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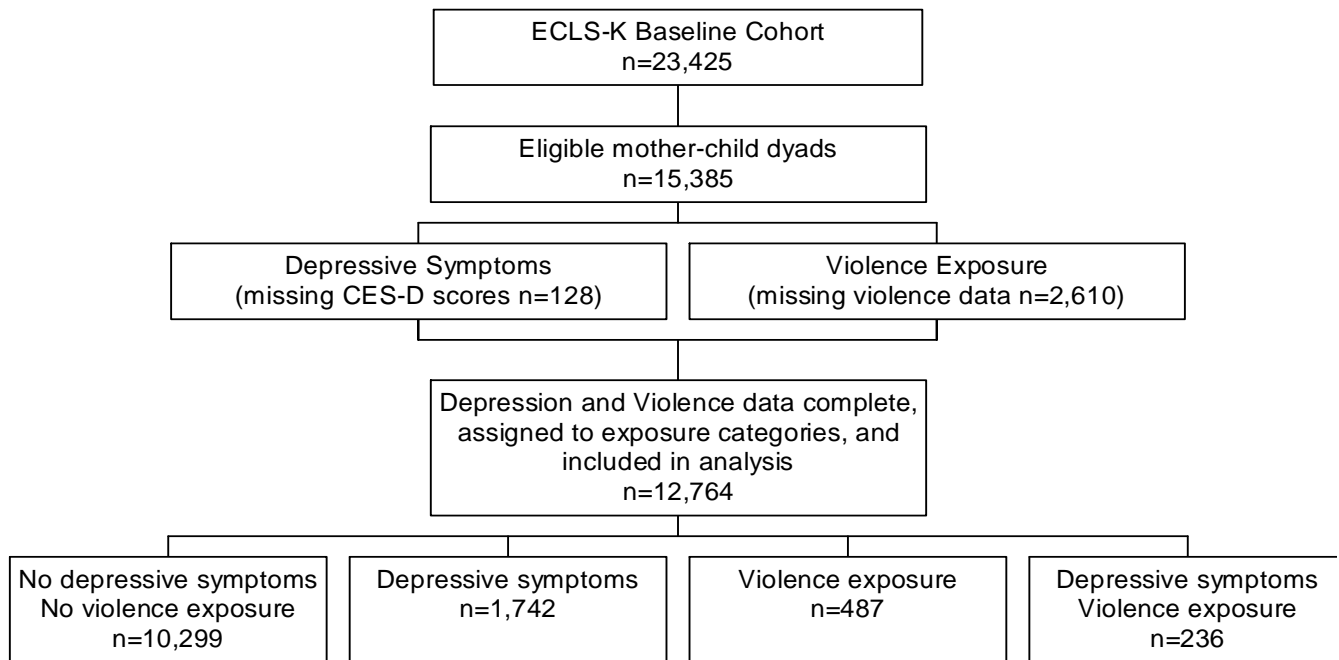
### **What is already known about this topic**

- Maternal depression and in-home violence are independently associated with the use of physical punishment on children.
- Negative child behaviors, considered independently from parent-level characteristics, are associated with the use of physical punishment on children as well.

### **What this study adds**

- When co-existent, maternal depression and in-home violence are associated with a greater likelihood to employ smacking as a means of discipline than when either factor is present alone.
- These associations do not appear to be modified substantially by child self-control or externalizing behaviors.

**Figure 1: ECLS-K mothers with depressive symptoms and violence exposure**



\*Data on in-home violence was missing in 2,610 (17%) cases. However, the majority of these (all but 1%) were due to non-applicability of the question (most commonly, the mother did not have a partner), as opposed to non-response.

**Table 1: Population characteristics and punishment practices according to maternal depressive symptoms and violence exposure (unweighted data)**

	<b>Total</b>	<b>No Depression or Domestic Violence</b>	<b>Depression</b>	<b>Domestic Violence</b>	<b>Depression and Domestic Violence</b>
<b>n</b>	12,764	10,299	1,742	487	236
<b>Approximate population estimate</b>	2,600,00	2,100,000	370,000	99,000	46,000
<b>Family characteristics</b>					
Child's age, months (SD)	75 (4)	75 (4)	75 (5)	75 (5)	74 (5)
Child is male, %	51	51	52	55	56
Mother's age, years (SD)	33 (6)	34 (6)	32 (6)	33 (6)	32 (6)
Family SES score (SD)	0.07 (0.8)	0.21 (0.8)	-0.09 (0.7)	0.03 (0.8)	-0.15 (0.7)
Siblings in home (SD)	1.5 (1)	1.5 (1)	1.6 (1)	1.6 (1)	1.5 (1)
<b>Child Behavior</b>					
Poor self-control	667 (6%)	508 (5%)	116 (7%)	32 (7%)	21 (10%)
Externalizing	362 (3%)	269 (3%)	61 (4%)	22 (5%)	10 (5%)
<b>Physical discipline</b>					
Mother has spanked child in the past week,	3,297 (26%)	2,425 (24%)	604 (35%)	160 (33%)	108 (46%)
Mean spankings per week among mothers who report any spanking at all (SD)	1.55 (1.4)	1.49 (1.5)	1.68 (1.3)	1.68 (1.5)	1.92 (1.5)

**Table 2: Punishment practices according to maternal depressive symptoms and violence exposure, stratified by child behaviors (unweighted data)**

	Total	No Depression or Domestic Violence	Depression	Domestic Violence	Depression and Domestic Violence
<b>Mother has spanked child in the past week (%)</b>					
Poor Self-Control	39*	33*	53*	50*	71*
Good Self-Control	27	23	33	31	43
Externalizing Behavior	38*	35*	51*	45	70
No Externalizing Behavior	27	23	34	32	45
<b>Mean spankings per week among mothers who report any spanking at all (SD)</b>					
Poor Self-Control	1.62 (1.20)	1.62(1.02)	2.10 (2.06) *	1.56 (0.81)	1.80 (0.94)
Good Self-Control	1.52 (1.36)	1.46 (1.39)	1.61 (1.14)	1.70 (1.61)	1.89 (1.40)
Externalizing Behavior	1.91 (1.71)	1.66 (1.39)	2.32 (1.13) *	1.60 (1.58)	2.43 (1.34)
No Externalizing Behavior	1.52 (1.33)	1.47 (0.87)	1.62 (2.70)	1.68 (0.97)	1.84 (1.13)

\*Indicates a significant difference at  $p \leq 0.05$  for within-column comparisons across behavior groups



**Table 3: Adjusted odds ratios (aORs) of having spanked the child in the past week, according to maternal depressive symptoms and violence exposure (weighted data)**

	Depressive Symptoms	Domestic Violence	Depressive Symptoms and Violence
	<b>aORs</b>		
Total population*	1.59 (1.40, 1.80)	1.48 (1.18, 1.85)	2.51 (1.87, 3.37)
Total study population (further adjusted for self-control)	1.58 (1.39, 1.79)	1.40 (1.12, 1.77)	2.43 (1.80, 3.27)
Total study population (further adjusted for externalizing behavior)	1.58 (1.39, 1.78)	1.40 (1.12, 1.76)	2.38 (1.76, 3.21)
<b>Stratified analyses by child behaviors</b>			
Poor Self-Control	2.32 (1.54, 3.52)	2.33 (1.01, 5.37)	5.22 (1.62, 16.82)
Good Self-Control	1.53 (1.34, 1.74)	1.35 (1.06, 1.73)	2.22 (1.61, 3.07)
Externalizing Behavior	1.93 (1.06, 3.51)	1.49 (0.49, 4.47)	2.14 (0.55, 8.29)
No Externalizing Behavior	1.57 (1.37, 1.80)	1.43 (1.11, 1.83)	2.45 (1.78, 3.37)

\* Adjusted for mother's age, child's age and sex, number of siblings in the home, and family SES. Not adjusted for child behaviors.

**Table 4: Adjusted incident rate ratios (aIRRs) of spanking frequency according to maternal depressive symptoms and violence exposure (weighted data)**

	<b>Depressive Symptoms</b>	<b>Domestic Violence</b>	<b>Depressive Symptoms and Violence</b>
	<b>aIRRs</b>		
Total population*	1.12 (1.01, 1.23)	1.13 (0.92, 1.39)	1.29 (1.09, 1.53)
Total study population (further adjusted for self-control)	1.10 (1.00, 1.21)	1.14 (0.92, 1.42)	1.30 (1.09, 1.54)
Total study population (further adjusted for externalizing behavior)	1.10 (1.00, 1.21)	1.13 (0.91, 1.41)	1.31 (1.10, 1.56)

\* Adjusted for mother's age, child's age and sex, number of siblings in the home, and family SES. Not adjusted for child behaviors.

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