Household, Family, and Child Risk Factors After an Investigation for Suspected Child Maltreatment

A Missed Opportunity for Prevention

Kristine A. Campbell, MD, MSc; Lawrence J. Cook, PhD; Bonnie J. LaFleur, PhD; Heather T. Keenan, MDCM, PhD

Objective: To determine whether a Child Protection Services investigation for suspected child maltreatment is associated with subsequent improvements in household, caregiver, and child risk factors.

Design: Retrospective cohort study.

Setting: The Longitudinal Studies of Child Abuse and Neglect, a multicenter cohort study of the antecedents and consequences of child maltreatment.

Participants: A total of 595 children with the same maternal caregiver responding to Longitudinal Studies of Child Abuse and Neglect surveys at ages 4 and 8 years.

Main Exposure: Investigation for suspected child maltreatment between ages 4 and 8 years.

Main Outcome Measures: Adjusted differences in 7 modifiable risk factors (social support, family functioning, poverty, maternal education, maternal depressive symptoms, anxious or depressive child behaviors, and aggressive or destructive child behaviors) at age 8 years.

Results: Of 595 subjects, 164 (27.6%) experienced an investigation for suspected child maltreatment between ages 4 and 8 years. At age 8 years, investigated subjects were not perceptibly different from noninvestigated subjects in social support, family functioning, poverty, maternal education, or child behavior problems after adjusting for baseline risk factors. Mothers of investigated subjects did have more depressive symptoms than mothers of noninvestigated peers at the child’s age of 8 years. Substantiation of child maltreatment by Child Protective Services did not alter these findings.

Conclusions: Our finding that an investigation for suspected child maltreatment is not associated with relative improvements in common, modifiable risk factors suggests that we may be missing an opportunity for secondary prevention of maltreatment and maltreatment consequences.


In 2007, Child Protective Services (CPS) in the United States investigated 3.2 million children for suspected child maltreatment.1 A CPS investigation, regardless of outcome, signals a household at risk. In the years following CPS investigation, households are at increased risk for family violence and parental dysfunction, for child medical and behavioral problems, and for future incidents of maltreatment when compared with households not investigated by CPS.2-8 A CPS investigation grants unique access into high-risk households to provide services that may reduce repeat maltreatment and improve outcomes.9,10

It is not clear that we are taking advantage of this opportunity to help families. Just 38% of children investigated for maltreatment receive any postinvestigative services.1 While 42% of children have identifiable behavioral problems at the time of CPS investigation, only 28% of children receive mental health services during the 12 months following CPS investigation.11 Among caregivers reporting intimate partner violence at the time of CPS investigation, 40% report continued intimate partner violence 18 months later.12 In the years following a CPS investigation, 22% to 62% of children will be referred back for new concerns of maltreatment.13-19

Prior research has identified barriers to prevention efforts at the time of CPS investigation. The adversarial process of case investigation and case determination may
be one barrier. Constrained by system requirements, CPS caseworkers may focus on evidence collection and placement decisions rather than identification of and referral for household, caregiver, and child risk factors related to long-term outcomes.10,22 Caregivers upset by this investigative process may be reluctant to accept supportive resources offered by CPS caseworkers.21 Poor interdisciplinary communication during and after CPS investigation presents a second barrier. Involvement of CPS with a family is often brief in comparison with the involvement of primary care physicians and other mandated reporters. Despite this, physicians receive little, if any, follow-up information after an investigation, leaving them unaware of physical and behavioral problems identified during an investigation.22 A critical third barrier is our limited understanding of the effectiveness of interventions after child maltreatment. Traditional CPS interventions such as family preservation and family support services after investigation are not associated with reductions in repeat maltreatment or foster care placement.20,23,24 Researchers have described success with targeted interventions such as parent training programs after physical abuse, cognitive behavioral therapy after sexual abuse, and therapeutic peer interaction after neglect.25-30 While such results are promising, these practices have yet to be implemented and evaluated on a wider basis.

Many studies have examined repeat maltreatment and child outcomes based on risk factors measured at the time of CPS investigation.13,16,17,19,31,32 To our knowledge, however, there is no research describing change in risk factors after CPS investigation. We undertook this study to understand whether a CPS investigation for physical abuse, sexual abuse, or neglect is associated with changes in household, caregiver, and child risk factors for repeat maltreatment and poor child outcomes. Under ideal conditions, a CPS investigation would be associated with subsequent improvements in household, caregiver, and child risk factors when compared with changes observed in noninvestigated households. Alternately, a CPS investigation might be disruptive to a household and be associated with worsening in risk factors compared with noninvestigated households. Finally, a CPS investigation may be entirely independent of subsequent changes in risk factors. Based on previously identified barriers to providing effective interventions following a CPS investigation, we hypothesized that changes in household, family, and child risk factors would be independent of CPS investigation.

Table 1. Sample Characteristics From the LONGSCAN

<table>
<thead>
<tr>
<th>LONGSCAN Site</th>
<th>LONGSCAN Sample at Age 4 y, No. (%)</th>
<th>Sampling Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>237 (19.0)</td>
<td>Children identified as at high risk for maltreatment attending inner-city medical clinics, with and without CPS report for suspected maltreatment.</td>
</tr>
<tr>
<td>Midwest</td>
<td>222 (17.8)</td>
<td>Children reported to CPS for suspected maltreatment as infants, and neighborhood control subjects.</td>
</tr>
<tr>
<td>Northwest</td>
<td>250 (20.0)</td>
<td>Children reported to CPS for suspected maltreatment between ages 1 and 4 y classified as at moderate risk by CPS caseworker.</td>
</tr>
<tr>
<td>South</td>
<td>221 (17.7)</td>
<td>Children identified as at high risk for maltreatment at birth, with and without CPS report for suspected maltreatment.</td>
</tr>
<tr>
<td>Southwest</td>
<td>319 (25.5)</td>
<td>Children placed in foster care in the first 18 mo of life.</td>
</tr>
</tbody>
</table>

Abbreviations: CPS, Child Protective Services; LONGSCAN, Longitudinal Studies of Child Abuse and Neglect.

METHODS

DATA SOURCE

This cohort study relies on data from the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN).33 LONGSCAN is a consortium of 5 geographically distinct research sites that use common study procedures to examine the antecedents and consequences of child abuse among high-risk children. Between July 1991 and March 2000, LONGSCAN investigators conducted interviews with 1249 subjects at age 4 years. Depending on the study site, these subjects included children in foster care, children reported for maltreatment, children at risk for maltreatment, and nonmaltreated control subjects (Table 1).34 These subjects were followed up prospectively with face-to-face primary caregiver interviews every 2 to 4 years until age 18 years. The current study relies on interview data at ages 4 and 8 years from the combined LONGSCAN sample.

PERMISSIONS

The LONGSCAN data were made available to us by the National Data Archive on Child Abuse and Neglect, Cornell University, Ithaca, New York, and are used with Archive permission. The University of Utah Institutional Review Board granted institutional review board exemption for analysis of deidentified LONGSCAN data.

PARTICIPANTS

The study cohort was drawn from 712 LONGSCAN subjects with the same maternal caregiver responding to the interviews at the child’s ages of 4 and 8 years. We excluded subjects with different responding caregivers at each interview to improve consistency between interviews and to better identify changes experienced by caregivers and children after CPS investigation. Only subjects with complete data were included in the analyses.

EXPOSURE

The exposure of interest was a CPS investigation occurring between the LONGSCAN interviews at ages 4 and 8 years. Our investigated group included subjects with at least 1 CPS investigation for suspected child physical abuse, sexual abuse, or neglect between the interviews at ages 4 and 8 years. Our comparison group included subjects without a CPS investigation during the same period. Data describing the outcome of CPS investigation (substantiated or unsubstantiated) and time since last CPS investigation were retained for secondary analyses. Specific data on postinvestigation services, including foster placement, are incomplete within the LONGSCAN data set.

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depressive behaviors and aggressive or destructive behaviors).16,37-50

tion level and depressive symptoms), and child risk (anxious or
functioning, and poverty level), caregiver risk (maternal educa-
cluded child sex, child race (white vs other), maternal age, ma-
(modifiable risk factors) of interest. Baseline characteristics in-
with both our exposure (CPS investigation) and outcomes
able risks associated with outcomes after child maltreatment avail-
within the LONGSCAN data set (Table 2).33,36 These modi-
fiable risks included household risk (social support, family
functioning, and poverty level), caregiver risk (maternal educa-
tion level and depressive symptoms), and child risk (anxious or
destructive behaviors and aggressive or destructive behaviors).33,36-38
LONGSCAN relied on different measures for 3 risk factors (so-
cial support, family functioning, and maternal depression) be-
tween the interviews at ages 4 and 8 years. Although the results
of these different instruments cannot be directly compared, risk
factor outcomes at the interview at age 8 years can be adjusted
for baseline risk measured at the interview at age 4 years.

Table 2. Measures of Modifiable Household, Caregiver, and Child Risks

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Description</th>
<th>Age, y</th>
<th>Measure</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td>Quantity and quality of relationships providing support to a household</td>
<td>4</td>
<td>Duke-UNC Functional Social Support Questionnaire</td>
<td>10-50&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Family functioning</td>
<td>8</td>
<td>Social Provisions Scale</td>
<td>24-96&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Poverty</td>
<td>4, 8</td>
<td>Family APGAR and relationships and cohesion</td>
<td>5-23&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Self-report Family Inventory</td>
<td></td>
</tr>
<tr>
<td>Caregiver</td>
<td>Education</td>
<td>4, 8</td>
<td>Years of school completed provided by maternal caregiver</td>
<td>No. of years&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
<td>4</td>
<td>Center for Epidemiologic Studies Depression Scale</td>
<td>0-60&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>Brief Symptom Inventory depression subscale</td>
<td>0-100&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Child Internalizing behaviors</td>
<td>4, 8</td>
<td>Child Behavior Checklist internalizing subscale</td>
<td>0-100&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Child Behavior Checklist externalizing subscale</td>
<td>0-100&lt;sup&gt;h&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Abbreviations: APGAR, adaptability, partnership, growth, affection, and resolve; UNCG, University of North Carolina.
<sup>a</sup>Please refer to the Longitudinal Studies of Child Abuse and Neglect measures manuals (http://www.iprc.unc.edu/longscan/pages/measures/index.htm) for individual instrument properties.
<sup>b</sup>Increasing score indicates decreasing risk.
<sup>c</sup>Scores less than 9 reflect family dysfunction.
<sup>d</sup>Increasing score indicates increasing risk.
<sup>e</sup>Scores higher than 15 reflect high depressive symptoms.
<sup>f</sup>Age- and sex-normalized T scores higher than 63 define positive screening results.
<sup>g</sup>Age- and sex-normalized T scores of 67 to 70 define borderline problem behaviors and of higher than 70 define clinical problem behaviors.

OUTCOME

The outcome of interest was the adjusted difference between modifiable risk factors measured by the interview at age 8 years in the investigated group compared with the noninvestigated group.

COVARIATES

Modifiable Household, Caregiver, and Child Risk Factors

Based on a review of the literature, we identified a set of modifi-
able risks associated with outcomes after child maltreatment avail-
able within the LONGSCAN data set (Table 2).33,36 These modi-
fiable risks included household risk (social support, family
functioning, and poverty level), caregiver risk (maternal educa-
tion level and depressive symptoms), and child risk (anxious or
destructive behaviors and aggressive or destructive behaviors).33,36-38
LONGSCAN relied on different measures for 3 risk factors (so-
cial support, family functioning, and maternal depression) be-
tween the interviews at ages 4 and 8 years. Although the results
of these different instruments cannot be directly compared, risk
factor outcomes at the interview at age 8 years can be adjusted
for baseline risk measured at the interview at age 4 years. The on-
line LONGSCAN measures manuals provide a complete descrip-
tion of the study instruments (http://www.iprc.unc.edu/longscan/
pages/measures/index.htm).

Baseline Household, Caregiver, and Child Characteristics

In addition to modifiable risk factors measured at age 4 years
(baseline risk factors), we identified a set of nonmodifiable char-
acteristics (baseline characteristics) that might be associated with
both our exposure (CPS investigation) and outcomes (modifiable risk factors) of interest. Baseline characteristics in-
cluded child sex, child race (white vs other), maternal age, ma-
ternal relationship (biological vs adoptive mother), number of

STATISTICAL ANALYSIS

We first conducted a sensitivity analysis to examine the po-
tential bias of nonrandom missing data in the LONGSCAN da-
tabase. We compared characteristics of eligible subjects with
complete data with those without complete data on LONGSCAN
site, CPS investigation, and risk factors at age 8 years.

We then examined the univariate associations between base-
line risk factors and characteristics and (1) CPS investigation be-
tween the interviews at ages 4 and 8 years and (2) modifiable risk
factors measured at the interview at age 8 years. We retained base-
line risk factors and characteristics that predicted either CPS in-
vestigation or risk factors at age 8 years as covariates for all mul-
tivariable models (P < .05). We developed a logistic model to
examine how well these baseline risk factors and characteristics
distinguished between investigated and noninvestigated house-
holds by measuring the area under the receiver operating curve.

We next developed a series of linear mixed-effects models
to describe the adjusted differences in each risk factor at age 8
years based on exposure to CPS investigation between ages 4 and
8 years. We selected a linear mixed-model approach to ac-
commodate possible correlation of observations induced by clus-
tering by study site in the LONGSCAN data set. Linear mixed-
effects models are specified with a random effects component
describing the data clusters and a fixed effects component ad-
justing for the remaining covariates.51 We chose an exchange-
able correlation structure for the random components.

We created a separate multivariable model for each modifiable
risk outcome at age 8 years. For each model, a covariate for CPS
investigation between ages 4 and 8 years was specified in the fixed
effects component. In addition, the fixed effects component included
all baseline modifiable risks and characteristics retained from uni-
variate comparisons. The LONGSCAN site was entered as a ran-
don effects intercept for each model. The result of interest for each
model was the β coefficient for the CPS covariate, reflecting the

Children in the household at the interview at age 4 years, and
history of CPS investigation prior to age 4 years.


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of change in risk factors among investigated subjects. At the interview at age 4 years, there were significant unadjusted differences in baseline modifiable risks and characteristics between investigated and comparison subjects (Table 3). Households of investigated subjects had lower family function and more poverty than households of non-investigated subjects. Maternal caregivers of investigated subjects were older, had less education, and had more depressive symptoms than caregivers of comparison subjects. Investigated subjects were more likely to be white and to have had previous CPS investigation. Investigated subjects had more aggressive or destructive behaviors at age 4 years than comparison subjects. Child sex and household size were not associated with CPS investigation. Differences in LONGSCAN site were noted, with significantly higher proportions of investigated subjects at the northwest and southwest sites compared with the east, midwest, and south sites.

### Covariates Associated With Household, Caregiver, and Child Risk Factors at Age 8 Years

Univariate analysis demonstrated significant associations between all modifiable risk factors at baseline and age 8 years. Child sex was the only baseline characteristic not associated with at least 1 modifiable risk factor at age 8 years.

### Final Covariate Selection for Multivariable Analysis

Covariates selected for subsequent linear mixed-effects models included baseline characteristics (CPS investigation prior to age 4 years, white or other child race, biological or adoptive maternal relationship, maternal age, and number of children in the household) and baseline risk factors (household social support, poverty level, and family functioning; maternal education level and depressive symptoms; and child anxious or depressive behaviors and aggressive or destructive behaviors). In a logistic regression model that included a categorical LONGSCAN site variable, these co-

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**Table 3. Baseline Characteristics and Risk Factors at Age 4 Years**

<table>
<thead>
<tr>
<th>Characteristics and Risks</th>
<th>Investigated (n=164)</th>
<th>Not Investigated (n=431)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline characteristics, static</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child sex, No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>77 (46.9)</td>
<td>227 (52.7)</td>
</tr>
<tr>
<td>Male</td>
<td>87 (53.1)</td>
<td>204 (47.3)</td>
</tr>
<tr>
<td>Child race, No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>52 (31.7)</td>
<td>100 (23.2)</td>
</tr>
<tr>
<td>Other</td>
<td>112 (68.3)</td>
<td>331 (76.8)</td>
</tr>
<tr>
<td>Maternal relationship, No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological mother</td>
<td>156 (95.1)</td>
<td>397 (92.1)</td>
</tr>
<tr>
<td>Adoptive mother</td>
<td>8 (4.9)</td>
<td>34 (7.9)</td>
</tr>
<tr>
<td>No. of prior CPS investigations, No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥1</td>
<td>134 (81.7)</td>
<td>149 (34.6)</td>
</tr>
<tr>
<td>0</td>
<td>30 (18.3)</td>
<td>282 (65.4)</td>
</tr>
<tr>
<td>LONGSCAN site, No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>15 (9.1)</td>
<td>127 (29.5)</td>
</tr>
<tr>
<td>Midwest</td>
<td>20 (12.2)</td>
<td>125 (29.0)</td>
</tr>
<tr>
<td>Northwest</td>
<td>59 (36.0)</td>
<td>51 (11.8)</td>
</tr>
<tr>
<td>South</td>
<td>21 (12.8)</td>
<td>86 (20.0)</td>
</tr>
<tr>
<td>Southwest</td>
<td>49 (29.9)</td>
<td>42 (9.7)</td>
</tr>
<tr>
<td>Maternal age, mean (SD), y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.4 (6.6)</td>
<td>25.1 (6.9)</td>
<td></td>
</tr>
<tr>
<td>Children in household, mean (SD), No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0 (1.6)</td>
<td>2.9 (1.7)</td>
<td></td>
</tr>
<tr>
<td>Baseline risk factors, modifiable Score, mean (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household social support</td>
<td>37.6 (9.1)</td>
<td>39.0 (8.4)</td>
</tr>
<tr>
<td>Household family functioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.0 (2.6)</td>
<td>12.5 (2.6)</td>
<td></td>
</tr>
<tr>
<td>Household poverty</td>
<td>93.1 (58.0)</td>
<td>106.3 (77.3)</td>
</tr>
<tr>
<td>Maternal education</td>
<td>11.4 (1.8)</td>
<td>11.8 (1.9)</td>
</tr>
<tr>
<td>Maternal depressive symptom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.4 (10.7)</td>
<td>12.9 (10.6)</td>
<td></td>
</tr>
<tr>
<td>Child anxious or depressive behaviors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49.2 (10.2)</td>
<td>48.8 (8.6)</td>
<td></td>
</tr>
<tr>
<td>Child aggressive or destructive behaviors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56.5 (10.7)</td>
<td>54.5 (10.3)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: CPS, Child Protective Services; LONGSCAN, Longitudinal Studies of Child Abuse and Neglect. 

*P < .05

Increasing score indicates decreasing risk. 

Increasing score indicates increasing risk.

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**RESULTS**

### STUDY COHORT

Seven hundred twelve LONGSCAN subjects with the same maternal caregiver responding to the interviews at the child’s ages of 4 and 8 years were eligible for the current study. From this group, we identified a study cohort of 595 subjects (83.6%) with complete data. Eligible subjects with missing data did not differ from the study cohort based on LONGSCAN site, CPS investigations, child sex or race, maternal age or relationship, number of children in the household, social support, family functioning, maternal depression, or child behaviors. Subjects with missing data had lower maternal education at age 4 years compared with study subjects (11.2 vs 11.7 years, respectively; *P = .04*). This difference was less pronounced at age 8 years (11.6 vs 11.9 years, respectively; *P = .06*).

Of 595 study subjects, 164 (27.6%) had a CPS investigation between the interviews at ages 4 and 8 years. Investigated subjects experienced an average of 2.2 CPS investigations (median, 2 investigations; range, 1-9 investigations) during this time. The CPS investigation occurred a mean (SD) of 18.7 (13.3) months prior to the interview at age 8 years. The CPS investigations resulted in at least 1 substantiated finding of child maltreatment between the interviews at ages 4 and 8 years in 74 investigated subjects (45.1%).

### Covariates Associated With CPS Investigation Between Ages 4 and 8 Years

We conducted 2 secondary analyses. We compared subjects with a substantiated finding of child maltreatment with noninvestigated subjects to describe how substantiation of child maltreatment was associated with risk factor outcomes. We also examined the relationship between time since CPS investigation and risk factor outcomes to better understand the trajectory of change in risk factors among investigated subjects.
varieties provided good prediction of CPS investigation between ages 4 and 8 years (area under the receiver operating curve = 0.83). This assured us that we were adjusting for important baseline differences between our investigated and comparison subjects.

### HOUSEHOLD, CAREGIVER, AND CHILD RISK AT AGE 8 YEARS

In univariate analysis, a CPS investigation between ages 4 and 8 years was associated with higher levels of poverty, maternal depressive symptoms, and child behavior problems at the interview at age 8 years (Table 4). In fully adjusted linear mixed-effects models, a CPS investigation predicted higher maternal depressive symptoms at the child’s age of 8 years (2.5 points higher; \( P = .006 \)). A CPS investigation was associated with higher levels of risk in all remaining risk factors; however, these differences were not statistically significant (Table 5).

We conducted 2 subanalyses to better understand these results. We first compared subjects with a substantiated CPS investigation with those with no CPS investigation, excluding subjects with only unsubstantiated CPS investigation. As in our primary analysis, a substantiated CPS investigation predicted increased maternal depressive symptoms at the child’s age of 8 years (3.2 points higher; \( P = .008 \)). A substantiated CPS investigation was associated with nonsignificant increases in all other risk levels compared with no investigation (Table 5). We then examined only investigated households, adding a covariate for time since CPS investigation. Months since the last CPS contact was associated with increasing scores on the internalizing behaviors subscale of the Child Behavior Checklist (increase of 0.1 point per month since investigation; \( P = .07 \)). Similar trends in worsening aggressive or destructive behaviors (increase of 0.1 point per month; \( P = .09 \)) and family dysfunction (increase of 0.03 point per month; \( P = .07 \)) were not statistically significant.

## COMMENT

In our cohort of 595 households at high risk for child maltreatment, a CPS investigation for suspicion of maltreatment represented a legally mandated opportunity to identify needs and provide resources that might improve long-term outcomes for 164 households. Despite this, we identified no significant difference in social support, family function, poverty, maternal education, and child behavior problems associated with CPS investigation. Maternal depressive symptoms were worse in households with a CPS investigation compared with those without an investigation. These results did not change if an investigation resulted in a substantiated finding of child maltreatment, although these households were the most likely to have received postinvestigative services.

We considered 2 possible interpretations of these findings. One interpretation is that CPS investigation occurs during periods of worsening household, caregiver, and child risk and that CPS investigation results in a recovery to expected levels of risk. If this were the case, we would expect households with recent CPS investigation to have

### Table 4. Unadjusted Modifiable Risk Factors at LONGSCAN Interview at Age 8 Years

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>CPS Investigation Between Ages 4 and 8 y (n=164)</th>
<th>No CPS Investigation Between Ages 4 and 8 y (n=431)</th>
<th>Score, Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social supporta</td>
<td>77.7 (10.5)</td>
<td>78.0 (10.2)</td>
<td></td>
</tr>
<tr>
<td>Family functioningb</td>
<td>10.2 (2.9)</td>
<td>9.7 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Povertyc</td>
<td>83.2 (57.5)</td>
<td>99.3 (77.9)</td>
<td></td>
</tr>
<tr>
<td>Caregiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal educationa</td>
<td>11.8 (1.9)</td>
<td>12.0 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Maternal depressive symptomsb,c</td>
<td>52.7 (10.2)</td>
<td>49.3 (8.9)</td>
<td></td>
</tr>
<tr>
<td>Child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious or depressive behaviorsb,c</td>
<td>53.2 (10.9)</td>
<td>50.9 (10.0)</td>
<td></td>
</tr>
<tr>
<td>Aggressive or destructive behaviorsb,c</td>
<td>56.4 (11.3)</td>
<td>53.0 (11.1)</td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:** CPS, Child Protective Services; LONGSCAN, Longitudinal Studies of Child Abuse and Neglect.  
\( a \) Increasing score indicates decreasing risk.  
\( b \) Increasing score indicates increasing risk.  
\( c \) Negative difference indicates increased risk.  
\( d \) Positive difference indicates increased risk.

### Table 5. Adjusted Differences in Modifiable Household, Caregiver, and Child Risk Factors at Age 8 Years in LONGSCAN Subjects With and Without a Child Protective Services Investigation Between Ages 4 and 8 Years

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Any CPS Investigation vs No CPS Investigation</th>
<th>Substantiated CPS Investigation vs No CPS Investigation</th>
<th>Adjusted Difference in Risk, Score Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social supportc</td>
<td>-1.6 (-3.3 to 0.3)</td>
<td>-1.5 (-3.9 to 0.8)</td>
<td></td>
</tr>
<tr>
<td>Family functioningd</td>
<td>0.1 (-0.4 to 0.7)</td>
<td>0.5 (-0.2 to 1.1)</td>
<td></td>
</tr>
<tr>
<td>Povertyd</td>
<td>-1.6 (-6.6 to 3.4)</td>
<td>-1.8 (-8.6 to 4.9)</td>
<td></td>
</tr>
<tr>
<td>Caregiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal educationd</td>
<td>-0.1 (-0.3 to 0.2)</td>
<td>-0.2 (-0.4 to 0.1)</td>
<td></td>
</tr>
<tr>
<td>Maternal depressive symptomsd</td>
<td>2.5 (0.8 to 4.2)d</td>
<td>3.2 (1.1 to 5.4)d</td>
<td></td>
</tr>
<tr>
<td>Child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious or depressive behaviorsd</td>
<td>0.8 (-1.0 to 2.7)</td>
<td>0.5 (-1.9 to 2.8)</td>
<td></td>
</tr>
<tr>
<td>Aggressive or destructive behaviorsd</td>
<td>0.3 (-1.5 to 2.1)</td>
<td>0.1 (-2.2 to 2.4)</td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:** CI, confidence interval; CPS, Child Protective Services; LONGSCAN, Longitudinal Studies of Child Abuse and Neglect.  
\( a \) All comparisons are adjusted for prior CPS investigation, number of children in the household, social support, family functioning, and poverty level; maternal age, relationship, education, and depressive symptoms; and child internalizing and externalizing behavior problems at age 4 years. All models include a random intercept to adjust for LONGSCAN site effects.  
\( b \) No CPS investigation (n=431), any CPS investigation (n=164), and substantiated CPS investigation (n=74) indicate investigations between ages 4 and 8 years.  
\( c \) Negative difference indicates increased risk.  
\( d \) Positive difference indicates increased risk.  
\( e \) \( P < .05 \).
greater risk than households with more distant investigation, where passage of time might allow investigated households to reach a level of risk comparable to that of noninvestigated households. Our analysis failed to identify this association. The only significant time association identified was an increase in child behavior problems with passage of time since investigation.

The second interpretation is that a CPS investigation is not associated with the subsequent household, caregiver, and child risk factors examined. This interpretation is most consistent with our findings. The lack of change in household characteristics known to be associated with repeat abuse suggests that CPS intervention represents a missed opportunity to improve outcomes for children at high risk for future maltreatment, medical problems, and behavioral problems.

These findings are not surprising. Many risk factors examined in this study, such as poverty and social support, are not the focus for interventions offered as a result of CPS investigation. When postinvestigation services are offered, they commonly target risk factors associated with more immediate threats to safety such as substance abuse or domestic violence. Unfortunately, it is not clear that these interventions successfully reduce risk for future violence or abuse.

Changing long-term outcomes for families and children may require a shift in our attention to the broader household, caregiver, and child risk factors identified in the course of CPS involvement in the home. Improvements in financial resources and social support have been associated with successful primary prevention of abuse. Improvements in family function and child behaviors through parent–child interaction therapy have been shown to reduce repeat physical abuse. Higher levels of social support are associated with improved child well-being after abuse. Trauma-focused cognitive behavioral therapy is associated with better outcomes after sexual abuse. Future research should focus on identifying effective interventions to improve long-term outcomes and supporting the social, medical, and community resources needed to deliver these services.

Our findings must be interpreted in the context of the limitations of our study. As a secondary analysis of an existing database, our analysis was limited by the variables available in the LONGSCAN data set.

Potentially important modifiable risk factors were not included in the analysis owing to limitations in the LONGSCAN data set. Intimate partner violence was not examined because of the lack of a validated measure at the interview at age 4 years. Substance abuse was not considered because of the lack of a validated measure at the interview at age 8 years. Using multivariable analysis, we attempted to account for many baseline differences between households with and without a CPS investigation. The lack of reliable measures for substance abuse and intimate partner violence, however, limits our ability to understand the influences of these risk factors within households. We could not directly examine the chronology of changes in risk within these households or assess the causal relationship between the risk factors studied and a CPS investigation. We attempted to compensate for this by examining effects on outcomes by time from CPS referral. We cannot assess the role of specific postinvestigative services in altering household, caregiver, and child risk factors as not all LONGSCAN sites systematically collected this information. While we recognize that better understanding of the effectiveness of specific services is important, this study was intended to examine the effectiveness of the child protection system in using the opportunity provided by a CPS investigation. We recognize that LONGSCAN data, now more than a decade old, may not reflect current practices in support offered to families after an investigation for suspected child maltreatment. Finally, we recognize that it is difficult to interpret small differences in measures of risk identified in our study. It is likely that a 2- or 3-point difference in many measures might not reflect meaningful differences for these households. The absence of even minimal differences in risk measures between investigated and noninvestigated subjects, however, relaxes the need to identify clinically important differences for our conclusions.

This cohort study provides an important perspective on the association between a CPS investigation for suspected child maltreatment and subsequent household, caregiver, and child risk. Our finding that CPS investigation is not associated with improvements in common, modifiable risk factors suggests that we may be missing an opportunity for secondary prevention.

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Correspondence: Kristine A. Campbell, MD, MSc, Department of Pediatrics, University of Utah, 295 Chipeta Way, PO Box 581289, Salt Lake City, UT 84158 (kristine.campbell@hsc.utah.edu).

Online-Only Material: This article is featured in the Archives Journal Club. Go to http://www.archpediatrics.com to download teaching PowerPoint slides.

Author Contributions: Dr Campbell had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Campbell and LaFleur. Acquisition of data: Campbell. Analysis and interpretation of data: Campbell, Cook, LaFleur, and Keenan. Drafting of the manuscript: Campbell. Critical revision of the manuscript for important intellectual content: Campbell, Cook, LaFleur, and Keenan. Statistical analysis: Campbell, Cook, and LaFleur. Obtained funding: Campbell and Keenan. Study supervision: Keenan.

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REFERENCES


