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# Didn't we just see you? Time to recurrence among frequently encountered families in CPS

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ABSTRACT

In child protection services, multiple maltreatment recurrences, or chronic maltreatment, has been a concern drawing increased attention because of its persistent harm to the children and the need to consider more effective intervention strategies to meet its unique needs. Timing has been an important issue in understanding the pattern of chronic maltreatment. No existing research has examined the influence of the interval between previous maltreatment incidents on future recurrences. The current study uses state administrative data to conduct longitudinal analyses to examine how the interval between previous maltreatment incidents is associated with the likelihood of future maltreatment occurrence among children who encountered multiple maltreatment recurrences. The findings suggest that short intervals are associated with increased likelihood of encountering a future recurrence, while controlling various covariates. The findings suggest the possibility of including the interval between previous maltreatment incidents as an indicator for child maltreatment risk assessment, and the need for developing responsive intervention strategies to stop the trend of chronic maltreatment.



## 1. Introduction

As a critical indicator of child safety and a primary measure of the effect of child protection services, maltreatment recurrence has been a primary concern of both policymakers and researchers. Many studies have examined risk and protective factors associated with child maltreatment recurrence However, research regarding maltreatment recurrence has generally focused on observing two adjoined maltreatment incidents, without considering the status in which children experience three or more maltreatment incidents (or alternatively, one index maltreatment incident plus two or more recurring incidents), namely multiple recurrences or chronic maltreatment (Bae, Solomon & Gelles, 2009; Jonson-Reid, Emery, Drake & Stahlschmidt, 2010; Loman, 2006). What has been defined as multiple maltreatment recurrences or chronic maltreatment is not unusual. Researchers have analyzed different datasets and estimated that cases with two and more recurrences ranged from 11% to 42%, but there are substantial differences in terms of the follow-up time and analysis units (Fluke, Shusterman, Hollinshead & Yuan, 2005; Loman, 2006). Researchers and policymakers have shown increased concerns about multiple recurrences because such cases indicate a persistent harm to the children, the inadequacy of existing child welfare intervention strategies, and the demand of disproportional amounts of child welfare resources (Loman, 2006).

Timing is a critical issue in understanding child maltreatment recurrence and its consequences, as well as the development of effective intervention strategies (Manly, 2005). Timing concerning child maltreatment includes multiple dimensions such as age of maltreatment onset, frequency of maltreatment incidents, the duration of maltreatment, and the time elapsed between maltreatment incidents. The last one refers to the interval between maltreatment incidents, and is the focus of this study. Although the interval is an important dimension of the timing relevant to child maltreatment, no study to date has examined its effect on maltreatment recurrence. Responding to such a knowledge gap, this study specifically investigates the effect of the interval on child maltreatment recurrence using a sample of chronic maltreatment cases.

## 2. Literature review

### 2.1. The issue of maltreatment recurrence

Maltreatment recurrence indicates unresolved harm to the children and the need for further child welfare intervention, and thus merits special attention among maltreatment cases. Understanding the prevalence and pattern of recurrence has been a key concern in maltreatment recurrence research (DePanfilis & Zuravin, 1998; Lipien & Forthofer, 2004). Maltreatment recurrence is a prevalent phenomenon, although recurring rates vary substantially in different study populations. DePanfilis and Zuravin's review reported recurrence rates ranging from 1–2% for low risk cases to 50% for high risk cases across different studies. More recently, Lipien and Forthofer investigated a sample of maltreated children using state administrative data in Florida and found that 26% of the children encountered a

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recurrence in 2 years. Similarly, Fluke, Shusterman, Hollinshead, and Yuan (2008) study used case-level data from the National Child Abuse and Neglect Data System (NCANDS) and found that 22% of the cases encountered maltreatment recurrence in 2 years. Bae et al. (2009) study used administrative data in Florida to examine recurrence at the family level and found that 11% of the families who had a substantiated child maltreatment incident had a maltreatment re-report in 5.4 years.

Research has also focused on understanding recurrence patterns, primarily the trend of recurrence over time. The wide application of survival analysis techniques since the late 1990s has greatly advanced such an attempt (DePanfilis & Zuravin, 1998; Lipien & Forthofer, 2004). Researchers have found that a large proportion of maltreatment recurrence is concentrated within the first several months to 1 year following the index maltreatment incident (DePanfilis & Zuravin, 1998, 1999b; Fluke et al., 2005; Hélie & Bouchard, 2009; Lipien & Forthofer, 2004). For example, Lipien and Forthofer's study found that 27% of the recurrence occurred within the first 6 months following the index incident, and a total of 85% of the recurrence occurred within the first 12 months. Fluke et al.'s study found that 45% of the recurrence occurred within 5 months following the index incident, and a total of 73% of the recurrence occurred within 11 months. Worth noticing, Lipien and Forthofer used child as an analysis unit, but Fluke et al.'s study used child-report as an analysis unit, where a child may contribute to multiple observations for the analysis if the child encountered more than one recurrence.

Researchers have examined a broad range of factors associated with maltreatment recurrence, such as child race, gender, age, caregiver characteristics, initial maltreatment type, initial indication type, family economic status, family structure, region, and service provision (Drake, Jonson-Reid & Sapokaite, 2006; Fluke et al., 2008; Lipien & Forthofer, 2004). However, the effect of such factors on recurrence are often mixed across different studies, possibly due to the variance in the studied populations, analysis units, definition of maltreatment incidents, analytical techniques, and observational periods which can range from 1 month to 10 years in different studies (DePanfilis & Zuravin, 1998; Hélie & Bouchard, 2009). Despite the variation, most studies have shown that White children are more likely to encounter recurrence than other children (Lipien & Forthofer, 2004), and that in-home child welfare service provision may increase recurrence rates, likely due to the enhanced monitoring from the child protection system (Fluke et al., 2008).

Although studies have examined many influential factors on maltreatment recurrence, some factors have not received adequate attention or applied necessary specification. For example, previous studies examining the influence of household size on recurrence typically used the number of children or number of household members as an indicator, and many studies have shown that a large household size or large number of children in the household is associated with increased risk of child maltreatment (e.g., Drake et al., 2006). However, such a measure is not specific enough to examine the influence of the caregiver and it is not clear how the number of caregivers in the household is associated with maltreatment risk. The current study will assess the influence of the number of children and caregivers at home on recurrence.

### 2.2. Importance of focusing on multiple recurrences

Some children or families have two or more maltreatment recurrences following the initial or index maltreatment incident, defined as multiple recurrences or chronic recurrence (Bae et al., 2009; Fluke, Yuan & Edwards, 1999; Loman, 2006). Multiple recurrences are not unusual among children or families involved in child protection services. Fluke et al. (2005) study analyzed data from the National Child Abuse and Neglect Data System (NCANDS) and found that 11% of the cases experienced two or more recurrences in 3 years. Loman (2006) examined multiple recurrences in two states. The sample in Missouri consisted of 33,395 families who had an index maltreatment incident during 1997–1997, and 42% of the families had two or more recurrences during the 4-year follow-up period. The sample in Minnesota consisted of 797 families in a county with an index maltreatment incident in 2001–2002, and 19% of the studied families had two or more recurrences in the 27-month follow-up period.

Researchers have shown that increased numbers of maltreatment incidents are negatively associated with child physical and mental health outcomes (Jonson-Reid, Kohl & Drake, 2012). By examining child maltreatment across developmental stages including infancy, preschool, and early school years, researchers have also found that children who had been maltreated during multiple developmental stages displayed more behavior problems and lower cognitive capacity than children who had only been maltreated during one developmental stage (Jaffee & Maikovich-Fong, 2010).

Despite the advancement of child maltreatment recurrence research in past years, existing studies have provided very limited knowledge about multiple recurrences. Most recurrence studies have not distinguished between multiple recurrence cases and single recurrence cases (Drake et al., 2006; Fluke et al., 2008; Lipien & Forthofer, 2004). Among a few studies that attended to multiple recurrences, typically only descriptive findings from univariate or bivariate analyses were presented. For example, using a sample of 497 families who had an initial substantiated maltreatment incident in an urban child welfare system, DePanfilis and Zuravin's (1999a) descriptive analysis showed that families with only one recurrence had the longest mean time to recurrence, and it was progressively shorter for families with each additional recurrence. Using a sample of 120,000 referrals in a Northwest child welfare system, Marshall and English (1999) applied survival curves to depict the recurrence trends for cases with different numbers of recurrences. The findings suggest that among cases with one, two to four, and five or more previous maltreatment incidents, those with higher numbers of previous incidents were more likely to encounter a subsequent recurrence.

Recently, a few studies have investigated factors contributing to multiple recurrences and the trajectory of multiple recurrences. Bae et al. (2009) study analyzed administrative data from Florida and defined maltreatment incidents as substantiated cases at the family level. The study found that family structure and initial maltreatment types contributed to the odds of being in non-recurrence, one recurrence, and two and more recurrences groups. Jonson-Reid et al. (2010) combined several administrative datasets to examine the influence of various family social and economic factors on predicting 1–2, 2–3, 3–4, and 4 or more child maltreatment reports. The study found that some factors had different predictive capacity for initial reports and higher levels of reports. A few recent studies concerning multiple recurrences have attempted to classify maltreatment cases by presenting their maltreatment trajectories largely based on the patterns of recurring incidents or underlying maltreatment risks, and explored factors associated with such trajectories (Chaffin, Bard, Hecht & Silovsky, 2011; Proctor et al., 2012).

The revealed difference between cases with multiple recurrences and cases with only one recurrence may imply there are different mechanisms underlying these two types of recurrences (Bae et al., 2009; Chaffin et al., 2011; Jonson-Reid et al., 2010). However, with a few exceptions, existing studies have largely treated cases with multiple recurrences the same as cases with one single recurrence or no recurrence in various analyses (Jonson-Reid et al., 2010). Given the potentially unique nature of multiple recurrences and the lack of knowledge in this area, it is important to specifically focus on the multiple recurrences cases for policy and practice concerns.

### 2.3. A missing component in maltreatment timing research

Manly (2005) points out that the timing in child maltreatment is the most important factor contributing to the developmental trajectory of

maltreated children. Manly suggests that maltreatment related timing includes multiple aspects such as age of onset, frequency of episodes, duration of maltreatment, recurrence of maltreatment, and the time elapsed or interval between maltreatment episodes. For example, many studies have found that the number of previous maltreatment incidents, or more simply, the existence of previous maltreatment incidents, were positively associated with increased likelihood of recurrence (DePanfilis & Zuravin, 2002; English, Marshall, Brummel & Orme, 1999).

Some studies have explored the interval and maltreatment occurrence at the aggregate level. Existing research typically uses longitudinal analysis techniques such as Life Table or Survival Curve analysis to describe the patterns of maltreatment recurrence at the aggregate level of the studied samples. The patterns are typically presented using the hazard ratio of recurrence over time to show the proportion of cases encountering a recurring incident versus cases that do not (Casanueva, Martin & Runyan, 2009; DePanfilis & Zuravin, 1998; Fluke et al., 2008). Although such analyses provide valuable information to understand the recurrence over time, such analyses do not answer whether the individual level interval between previous maltreatment incidents is associated with future recurrence. Examining the influence of the interval on recurrence has useful policy and practice implications. Maltreatment history, such as the number of previous maltreatment incidents and types of previous maltreatment, are important factors that need to be considered when assessing child maltreatment recurrence risk. If the interval between preceding incidents is predictive of recurrence, it would be a useful indicator to strengthen and improve child maltreatment risk assessment for the arrangement of more responsive services.

Among studies examining maltreatment recurrence, most of them have not distinguished between cases with multiple recurrences and cases with only one or no recurrence, and usually are only concerned about one recurring incident following the index incident which does not take into account multiple recurrences. As a result, no study has measured the interval between preceding maltreatment incidents and estimated its impact on recurrence, although such a timing dimension has been viewed as important in child maltreatment research (Manly, 2005). This study measures the interval between two previous maltreatment incidents and estimates how such an interval may impact the likelihood of occurrence of the third maltreatment incident for a case.

## 3. Sample and methods

### 3.1. Sample

The study drew data from the Illinois Child Abuse and Neglect Tracing System (CANTS), the state administrative dataset that records all child maltreatment reports and subsequent investigation procedures and findings, and the Children and Youth Centered Information System (CYCIS), which records procedures related to in-home and out-of-home child welfare services. The CANTS contains information such as maltreatment incident report time; child and caregiver demographic characteristics including age, race, gender, and disability; household adults and children at the time of investigation; and child–caregiver relationship. The chronic nature of the database records all maltreatment incidents reported to the child protection services (CPS), which is suitable for longitudinal analysis. The CYCIS contains information about children's foster care experience(s) and in-home family services, which need to be taken into account because such services may substantially alter the trajectory of maltreatment recurrence.

The study used the pair of child-report as an analysis unit. That is, a child encountering multiple maltreatment reports would be counted as multiple observations for the analysis (Fluke et al., 1999, 2005; Fuller & Nieto, 2009). Several criteria were applied for sample selection according to the research purpose. First, the study selected all maltreatment reports during the 1 year period from July 1, 2005 to June 30, 2006, and followed them through June 30, 2010. To allow the cases to be eligible for follow-up during the following 5 years, only children who were 14 years old and younger at the beginning of the observation were included, so that they would not exceed 18 at the end of the observation period. Children who had foster care experience(s) during the observation period were excluded because foster care placement may substantially change the pattern of maltreatment re-report. The study sample is further limited to children with at least two maltreatment reports during the observation period, which is necessary to measure the interval between preceding incidents. After these sampling procedures, 18,584 cases were retained. The study also excluded 318 cases where the case's substantiation status had not been determined, so that the analysis can compare the difference between substantiated cases versus unsubstantiated cases. Finally, the study dropped 70 cases with missing values in the analyzed variables, resulting in a final sample of 18,196 cases.

### 3.2. Methods

The study first describes characteristics of the sample. Then Cox Regression was used to estimate the influence of the interval between previous maltreatment incidents on maltreatment recurrence while controlling for other covariates. SAS 9.2 was used for the data analyses. Robust Standard Error estimates based on the Sandwich Estimation were used in the Cox regression model to control for intercorrelations among multiple observations derived from the same children (Allison, 1995).

### 3.3. Measures

#### 3.3.1. Dependent variable

The time-to-recurrence, namely the recurrence incident that takes into account the timing from the index incident to the recurrence is the dependent variable for the multivariate analysis. A child maltreatment incident reported to CPS and recorded in the CANTS is treated as maltreatment occurrence, regardless of its substantiation status.

#### 3.3.2. Independent variable

The interval is a measure of the elapsed time between preceding maltreatment reports. For each case, three maltreatment reports in a row are considered for the analysis. The timing (report date) of the first two incidents are needed to construct the interval; the second incident is treated as an index incident when modeling the recurrence, and the third incident, which may or may not occur within the observational period, is the recurring incident to be modeled. Because the distribution of the intervals is skewed, they are categorized into four levels: 6 months or less; 7–12 months; 13–24 months; and 25 months or more, with the last group being used as a reference group.

#### 3.3.3. Control variables

We included a series of covariates to control for the confounding effects on the outcome variable. Allegation types of the preceding maltreatment report were categorized into 5 types: sexual abuse, physical abuse, supervision neglect, living need neglect, and other neglect (Fuller & Nieto, 2009), with the last group being used as a reference group. For children who had a report associated with more than one allegation on a specific date, we used a hierarchical order following the types listed above to prioritize the allegations so that the most serious maltreatment types would be selected for representation. For example, if a report included sexual abuse and other allegations on the same report date, sexual abuse would be used to represent the maltreatment type. Cases that were substantiated for maltreatment were coded as 1. Otherwise, they were coded as 0.

A series of child and caregiver's characteristics were controlled. Child age was categorized into 6 groups: 0 to 2 years; 3–5 years; 6–8 years; 9–11 years; 12–14 years, and 15–18 years, with the last group being used as the reference group. Child gender was coded as 1 for boys and 0 for girls. Child race/ethnicity was divided into the following groups: White, African American, and Other, with the last category being used as a reference group. Although Hispanic children are often singled out for analysis, they were included in the "Other" group because they represented less than 1% in the sample. Child disability status was assessed by caseworkers during the course of maltreatment investigation. Children being assessed as having a disability were coded as 1. Otherwise, they were coded as 0.

xCaregiver characteristics variables were nearly the same as that of children. If a family had more than one caregiver, only one caregiver was selected for the analysis, and the caregiver who was found to be involved in the maltreatment was prioritized in the selection. Caregiver's age was categorized into the following groups: 20 or younger; 21–30 years; 31–40 years; 41–50 years; and over 50 years old, with the last being used as a reference group. Caregiver race/ethnicity was categorized as White, African American, and Other, with the last category being used as a reference group. Caregiver disability status was also assessed by the caseworkers during the maltreatment investigation. Caregivers being assessed as having a disability were coded as 1. Otherwise, they were coded as 0. Gender was coded as 1 for male caregivers and 0 for female caregivers. Caregiver–child relationship was grouped into four categories: bio-parent, adopt/step parent, other relative, and non-relative, with the last group being used as a reference group. Several variables were constructed to reflect household structure based on the information available in the databases. Number of the children in the household was a continuous variable, and number of caregivers in a household was coded as 1, 2, 3, and 4 or more.

We also included several variables to reflect maltreatment history. Pre-abuse was a dichotomous variable, with 1 indicating a child having at least one maltreatment report in the year prior to the beginning of the observation (July 1, 2004–June 30, 2005). In addition, the number of previous maltreatment reports was a time-variant variable calculated by summing the number of maltreatment reports during the pre-observational period and during the observational period until the index incident. Family service was a dichotomous variable indicating whether a child's family ever received child welfare services during the observation period, with 1 indicating receiving services and 0 indicating no services.

Finally, geographical areas in the state were grouped into four regions: Central, Cook, North, and South, with South being used as a reference group.

## 4. Results

### 4.1. Sample characteristics

Sample characteristics are shown in Table 1. In terms of the dependent variable, among the cases with at least two reports, 60% of these cases encountered a subsequent maltreatment report during the observation period. For the independent variable, the interval between two preceding maltreatment reports, most of the intervals were within 6 months (64%). The proportions for the intervals of 7–12 months, 13–24 months, 25 months or more were 19%, 11%, 7%, respectively.

Among the control variables, cases in the categories of sexual abuse, physical abuse, supervision neglect, living neglect, and other neglect were 14%, 26%, 20%, 16%, and 24%, respectively. A little less than one quarter (24%) of the cases were substantiated.

In terms of child characteristics, the proportions of children at the age of 0–2, 3–5, 6–8, 9–11, 12–14, and 15 and above were 13%, 23%, 26%, 21%, 14%, and 2%, respectively. The number of boys' cases (53%) was a little more than that of girls. Children in most of the cases were White (68%), followed by African American (24%) and other races/ethnicities (7%). Children in less than one fifth (18%) of the cases had a disability.

In terms of caregivers' characteristics, the proportions at the age of 20 or younger, 21–30; 31–40, 41–50, and more than 50 were 7%, 38%, 35%, 14%, and 7%, respectively. The distribution of caregivers' race/ethnicity

**Table 1**
Sample characteristics.

| | N | Percent/mean | SE |
|---|---|---|---|
| *Dependent variable* | | | |
| Re-report | 10,863 | 59.7 | |
| *Independent variable* | | | |
| Interval | | | |
| ≤6 months | 11,620 | 63.9 | |
| 7–12 months | 3364 | 18.5 | |
| 13–24 months | 1995 | 11.0 | |
| ≥25 months | 1271 | 6.7 | |
| *Control variables — General* | | | |
| Allegation types | | | |
| Sexual abuse | 2626 | 14.4 | |
| Serious physical abuse | 4747 | 26.1 | |
| Supervision neglect | 3550 | 19.5 | |
| Living need neglect | 2875 | 15.8 | |
| Other neglect | 4398 | 24.2 | |
| Substantiated | 4434 | 24.4 | |
| *Control variables — Child characteristics* | | | |
| Child age | | | |
| 0–2 | 2318 | 12.7 | |
| 3–5 | 4266 | 23.4 | |
| 6–8 | 4730 | 26.0 | |
| 9–11 | 3830 | 21.1 | |
| 12–14 | 2615 | 14.4 | |
| 15–18 | 437 | 2.4 | |
| Boys | 9568 | 52.6 | |
| Race | | | |
| White | 12,452 | 68.4 | |
| African American | 4444 | 24.4 | |
| Other | 1300 | 7.1 | |
| Disability | 3425 | 18.8 | |
| *Control variables — Caregiver characteristics* | | | |
| Caregiver age | | | |
| ≤20 | 1234 | 6.8 | |
| 21–30 | 6872 | 37.8 | |
| 31–40 | 6279 | 34.5 | |
| 41–50 | 2534 | 13.9 | |
| >50 | 1277 | 7.0 | |
| Male | 7283 | 40.0 | |
| Race | | | |
| White | 12,475 | 68.6 | |
| African American | 4117 | 22.6 | |
| Other | 1604 | 8.8 | |
| Disability | 2416 | 13.3 | |
| Number of children at home | 18,196 | 3.0 | 1.6 |
| Number of caregiver at home | | | |
| 1 | 6746 | 37.1 | |
| 2 | 8628 | 47.4 | |
| 3 | 2084 | 11.5 | |
| 4+ | 738 | 4.1 | |
| Child–caregiver relation | | | |
| Bio-parent | 12,867 | 70.7 | |
| Adopt/step parent | 999 | 5.5 | |
| Other relative | 3079 | 16.9 | |
| Non-relative | 1251 | 6.9 | |
| *Control variables — Historical context* | | | |
| Pre-abuse | 6568 | 36.1 | |
| Ever received family service | 1223 | 6.7 | |
| Number of previous maltreat reports | | 3.3 | 1.5 |
| Region | | | |
| Central | 6817 | 37.5 | |
| Cook | 3608 | 19.8 | |
| North | 4186 | 23.0 | |
| South | 3585 | 19.7 | |

was similar to that of the children, and the proportions of White, African American, and other races ethnicities in the cases were 69%, 23%, and 9%, respectively. About 40% of the caregivers were male, and 13% of the caregivers were assessed as having a disability. Most of the caregivers (71%) were bio-parents of the child, 6% were adopt/step parents, 17% were other relatives, and 7% were non-relative people.

There was an average of 3 children in a household. The proportions of having 1, 2, 3, or 4 or more caregivers at home were 37%, 47%, 12%, and 4%, respectively.

Seven percent of the families ever received child protection services during the observation period. The average number of maltreatment reports preceding a subsequent report was 3.3. The proportions of cases in the Central, Cook, North, and South regions were 37%, 20%, 23%, and 20%, respectively.

### 4.2. Multivariate analysis

The results of the Cox regression analysis is shown in Table 2. The interval between two preceding reports was associated with the risk of having a subsequent re-report. The shorter the interval was, the higher the risk a child would experience a subsequent re-report. Compared with cases with an interval of over 2 years, cases with an interval of 6 month and less, 7–12 months, and 13–24 months were 2.3 to 1.68 times as likely to experience a subsequent maltreatment re-report ($p < .001$), which shows a negative linear relationship between the elapsed time between preceding maltreatment incidents and the likelihood of encountering a maltreatment re-report in the future.

Some other variables were associated with the risk of experiencing a subsequent re-report. When compared with the category of other neglect, physical abuse and supervision neglect were at higher risk of experiencing a subsequent re-report. Older children (vs. younger children), boys (vs. girls), and children of other races/ethnicities (vs. White) showed lower risk of encountering maltreatment re-report. Children with a disability were at substantially higher risk of experiencing a subsequent re-report than children without a disability.

Some caregiver characteristics were associated with the risk of a child encountering a subsequent maltreatment re-report. Caregivers who were aged at 41–45 were associated with a lower risk of child maltreatment re-report when compared with caregivers who were aged 50 and above; children with African American caregivers were less likely to encounter maltreatment re-report than children with White caregivers; children with caregivers who had a disability were at higher risk of encountering a subsequent child maltreatment re-report; children in large households, indicated by both the number of children and the number of caregivers at home, were at higher risk of a maltreatment re-report; and children who lived with their bio-parents were more likely to encounter a re-report when compared with children in other living arrangements.

Previous maltreatment report and family child welfare service experience were also associated with maltreatment re-report. Children with maltreatment reports in the year before the observation period were at a higher risk of having a re-report than those who did not; children whose families ever received child welfare services were more likely to encounter a re-report than those whose families did not. The number of previous maltreatment reports was also positively associated with a higher risk of maltreatment re-report. Finally, compared with children in the South, children in the Cook and North regions were at a lower risk of experiencing a subsequent maltreatment re-report.

**Table 2**
Cox regression models of re-reports.

| | Coeff. | | SE | Hazard ratio |
|---|---|---|---|---|
| *Independent variable* | | | | |
| Interval (25+ month) | | | | |
| ≤6 months | 0.84 | *** | 0.06 | 2.33 |
| 7–12 months | 0.75 | *** | 0.06 | 2.12 |
| 13–24 months | 0.52 | *** | 0.06 | 1.68 |
| *Control variables — General* | | | | |
| Allegation types (Other neglect) | | | | |
| Sexual abuse | −0.01 | | 0.03 | 0.99 |
| Physical abuse | 0.08 | ** | 0.03 | 1.09 |
| Supervision neglect | 0.07 | * | 0.03 | 1.07 |
| Living need neglect | 0.06 | | 0.03 | 1.06 |
| Substantiated | 0.01 | | 0.02 | 1.01 |
| *Control variables — Child characteristics* | | | | |
| Child age (15–18) | | | | |
| 0–2 | 0.36 | *** | 0.10 | 1.43 |
| 3–5 | 0.35 | *** | 0.09 | 1.42 |
| 6–8 | 0.34 | *** | 0.09 | 1.41 |
| 9–11 | 0.23 | * | 0.09 | 1.26 |
| 12–14 | 0.23 | * | 0.09 | 1.25 |
| Boys | −0.06 | ** | 0.02 | 0.95 |
| Race (White) | | | | |
| African American | −0.08 | | 0.04 | 0.92 |
| Other | −0.15 | ** | 0.05 | 0.86 |
| Disability | 0.38 | *** | 0.02 | 1.47 |
| *Control variables — Caregiver characteristics* | | | | |
| Caregiver age (>50) | | | | |
| ≤20 | 0.00 | | 0.05 | 1.00 |
| 21–30 | −0.02 | | 0.04 | 0.98 |
| 31–40 | −0.07 | | 0.04 | 0.93 |
| 41–50 | −0.09 | * | 0.05 | 0.91 |
| Male | 0.01 | | 0.02 | 1.01 |
| Race (White) | | | | |
| African American | −0.13 | ** | 0.05 | 0.88 |
| Other | −0.08 | | 0.04 | 0.93 |
| Disability | 0.16 | *** | 0.03 | 1.18 |
| Number of children at home | 0.04 | *** | 0.01 | 1.04 |
| Number of caregiver at home (4+) | | | | |
| 1 | −0.15 | ** | 0.05 | 0.86 |
| 2 | −0.15 | ** | 0.05 | 0.86 |
| 3 | −0.16 | ** | 0.05 | 0.85 |
| Child–caregiver relation (non-relative) | | | | |
| Bio-parent | 0.14 | ** | 0.04 | 1.15 |
| Adopt/step parent | 0.12 | | 0.06 | 1.12 |
| Other relative | 0.07 | | 0.04 | 1.08 |
| *Control variables — Historical context* | | | | |
| Pre-abuse | 0.27 | *** | 0.02 | 1.31 |
| Ever received family service | 0.24 | *** | 0.03 | 1.27 |
| Number of previous maltreat reports | 0.03 | *** | 0.01 | 1.03 |
| Region (South) | | | | |
| Central | −0.04 | | 0.03 | 0.96 |
| Cook | −0.14 | *** | 0.04 | 0.87 |
| North | −0.11 | *** | 0.03 | 0.90 |

Note: groups in parentheses are reference groups.
* $P < .05$.
** $p < .01$.
*** $p < .001$.

## 5. Discussion and implication

The area of multiple recurrences has received limited research attention, despite its importance to both child welfare policy and practice (Loman, 2006). This study specifically focuses on children with at least two previous maltreatment incidents, and estimates the influence of interval of previous maltreatment incidents on future maltreatment occurrence. The findings from the present study provide a counterpart to compare with those of previous studies that did not distinguish between cases with multiple recurrences and cases with one or no recurrence. Furthermore, the present study measures the interval between two previous maltreatment incidents and estimates its influence on future recurrence, which explores a rarely investigated dimension of timing in child maltreatment (Manly, 2005).

The study shows that among children with at least two previous maltreatment reports, 60% of them had a subsequent re-report (the

third report) during the 4 year observation period. The high rate partially is because the sampling criteria that all cases should have at least two maltreatment incidents to be included for the multiple recurrence study. In addition, although such a rate is high when compared with studies that do not distinguish between cases of multiple recurrence and cases of one or no recurrences (Fluke et al., 2005), it is comparable with some other studies which made such a distinction. For example, Loman (2006) reported a recurrence rate of 52% for families with two proceeding reports in Minnesota in the 27-month follow up. The high recurrence rate among children with two preceding incidents warrants the concern of chronic maltreatment for these cases: when consecutive maltreatment incidents were not effectively stopped, the children had a higher chance of incurring future maltreatment incidents (Bae et al., 2009). When analyzing the intervals between preceding incidents, the findings indicate that most of the intervals were within 6 months, which corroborates findings from previous studies that most recurrences occur during the first several months following a preceding incident (Fluke et al., 2008; Lipien & Forthofer, 2004).

The findings from multivariate analysis revealed that the elapsed time between two preceding reports plays an important role in predicting future maltreatment re-reports. Children with shorter maltreatment intervals are at much higher risk of encountering a subsequent re-report than children with longer maltreatment intervals. Such findings suggest increased risk of developing into chronic maltreatment for children who have shorter intervals than children who have longer intervals. The findings suggest that it is important to consider intervention strategies to prevent chronic maltreatment at early stages. Traditionally, child risk assessment instruments include the number of previous maltreatment incidents or more simply, whether there are previous maltreatment incidents, to weigh the risk of the home environment for the children with maltreatment reports. If two children both have encountered two maltreatment incidents previously but with largely different intervals, no difference would be reflected in such traditional assessment instruments (Shlonsky & Gambrill, 2005). By including and weighing the interval of previous maltreatment incidents in the assessment instruments, it may improve the precision of assessment that can lead to better intervention planning.

Among other factors that are associated with the maltreatment re-report, many of them such as the relationships regarding child age, race/ethnicity, previous maltreatment types, child and caregiver disability status, ever receiving child welfare services, and child–caregiver relationship are consistent with previous recurrence studies which did not distinguish between multiple recurrences cases and cases with one or no recurrence (Drake, Jonson-Reid, Way & Chung, 2003; Drake et al., 2006; Fluke et al., 2005, 2008; Fuller & Nieto, 2009; Lipien & Forthofer, 2004). As shown in this study, physical abuse and supervision neglect are more likely to have a re-report compared with other types of neglect; younger children are more likely to have a future maltreatment report than older children, but boys are less likely to encounter a future report than girls; other races are less likely to encounter a future report than Whites, and children with a disability are more likely to encounter a future maltreatment report; children in biological parents families are more likely to have a future report than children in non-relative families; children with a previous maltreatment report, in families receiving families services, and higher numbers of previous maltreatment reports are all associated with increased likelihood of encountering a future maltreatment report.

In particular, this study used both the number of caregivers and the number of children at home to examine the influence of household structure on maltreatment recurrence. Previous studies have generally found that the number of children is positively associated with increased risk of recurrence (Drake et al., 2006), but the influence of the number of caregivers has been rarely examined specifically. The findings indicate no substantial difference when the number of caregivers is in the range of 1 to 3 in terms of its influence on recurrence, but when the number of caregivers reaches 4 and above, there is comparatively higher risk of recurrence. This suggests that a large number of adults in a household may indicate resource inadequacy and other problems that contribute to child maltreatment rather than better childcare. Another feature of the present study is to categorize neglect into supervision neglect, living need neglect, and other neglect, rather than treat it as a whole as in many previous studies. The findings suggest that the recurrence rate of supervision neglect is higher than that of the other type of neglect.

The study has useful implications for CPS. A recent movement in CPS is to differentiate cases for effective intervention, as indicated in the latest demonstration programs of Differential Response in some states. The purpose of Differential Response is to separate less imminent and severe maltreatment reports from those of more serious ones and use an alternative non-investigatory path to handle these cases, with the expectation of promoting caregiver engagement, mitigating maltreatment risk by offering needed services, and reducing expenditures incurred from costly investigations (Loman, 2006). Currently, there are generally no specific procedures and intervention strategies to handle multiple recurrence cases, and these cases usually undergo repeated processes of case intake, investigation, disposition, and services. In addition to the disproportional child welfare resources consumed by these cases, the outcomes are not satisfactory (Bae et al., 2009; Loman, 2006). More importantly, recent research has suggested that children who encounter multiple maltreatment incidents are at an elevated risk of suffering physical, mental, behavioral, and cognitive harm (Jaffee & Maikovich-Fong, 2010; Jonson-Reid et al., 2012). The findings provide evidence to suggest the meaning of segmenting multiple recurrence cases especially those with short intervals (6 months or less) from others for the consideration of more effective intervention strategies, given their substantially higher risk of recurrence than that of other cases.

### 5.1. Limitations

Some limitations exist in the present study. First, because the administrative databases only record maltreatment report time, the study can only rely on report time rather than the actual maltreatment occurrence time to measure the length of elapsed time between maltreatment reports, while the actual time of maltreatment occurrence may be days or even months back to the report time (Lipien & Forthofer, 2004). This may bias the model estimation if the difference between the report time and the actual occurrence time is large and systematic. Second, the administrative databases do not contain information regarding caregiver social economic status, such as caregivers' marital status, education, income, social support, and whether they have emotional and behavior problems that may contribute to child maltreatment recurrence (Casanueva et al., 2009; Drake et al., 2006). Although it is a common shortcoming for recurrence studies using administrative data (Fluke et al., 2008; Fuller & Nieto, 2009; Lipien & Forthofer, 2004), the lack of such covariates in the model may leave confounding effects undetached from that of the independent variable and other factors and result in biased estimation. Third, like most other studies examining maltreatment recurrence, it is hard to consider various maltreatment definitions and different levels of analysis units in one study. This study uses child-report as an analysis unit and treats a report as a maltreatment incident regardless of its substantiation status (Kohl, Jonson-Reid & Drake, 2009). It would be informative for future studies to verify the association between the interval and recurrence by measuring actual time of recurrence, incorporating measures of family social economic status in the model, and applying alternative definitions and analysis units of maltreatment incidents.

Despite the limitations, this study has unique contributions to child maltreatment recurrence research. It specially focuses on children who

have experienced multiple maltreatment incidents, measures the interval between preceding maltreatment incidents, and assesses the effect of such an interval. Such research explores the effect of a rarely investigated dimension of child maltreatment related timing on recurrence (Manly, 2005). The finding regarding the relationship between the interval and the likelihood of recurrence advances the understanding of timing on child maltreatment recurrence, and provides useful implications for the improvement of child risk assessment instruments and relevant child welfare intervention strategies.

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