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## Research article

## An examination of child protective service involvement among children born to mothers in foster care

Andrea Lane Eastman<sup>a,\*</sup>, Emily Putnam-Hornstein<sup>a,b</sup><sup>a</sup> Children's Data Network, School of Social Work, School of Social Work, University of Southern California, United States<sup>b</sup> California Child Welfare Indicators Project, School of Social Welfare, University of California, Berkeley, United States

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## ABSTRACT

**Objective:** This study identified children born to mothers in foster care and documented Child Protective Service (CPS) involvement among children.

**Methods:** Probabilistically linked birth and CPS records from California (2009–2012) were used to identify all mothers in foster care on or after conception. Children were followed prospectively using linked records to identify CPS involvement occurring during the first three years of life. Differences between reported and unreported children were examined using  $\chi^2$  tests. The Latent Class Analysis (LCA) identified classes of children born to mothers in care who were at increased risk of CPS involvement. Model fit was assessed using the Bayesian Information Criterion, entropy, and likelihood ratio tests. For each of the classes, the relationship to the distal outcome (i.e., a maltreatment report by age three), was examined.

**Results:** Findings indicate that 53% of children born to mothers in care were reported. The proportion of children reported to CPS for maltreatment declined over time, from 63% of children born to mothers in foster care in 2009, to 46% in 2012. The LCA documented three distinct classes of mother-child dyads with varying risk of report. More than one third of children in Class 1 and nearly 70% of children in Class 3 were reported.

**Conclusions:** This study was the first to develop multi-dimensional class profiles of two-generation CPS involvement among mother-child dyads. This study documents that mothers' experiences in care and mental health conditions vary widely, underscoring the importance of providing services that fit the needs of dyads.

## 1. Introduction

The rate of teen births has dropped over the past quarter century and stands at a historic low (Hamilton & Mathews, 2016), yet a disproportionate number of youth in foster care still become parents during their teen years. Using a national sample, Shpiegel, Cascardi, and Dineen, (2016) found that among females emancipating from foster care, one in five had given birth by age 19. A study of California birth rates found that among females in foster care at age 17, 19.0% had given birth at least once before age 19 and 35.2% had given birth before age 21 (Putnam-Hornstein, Hammond, Eastman, McCroskey, & Webster, 2016). As a result, many youths in foster care are transitioning from adolescence into adulthood when they are also becoming parents and ageing out of care (Schelbe & Geiger, 2016). Early parenthood places stress on both the mother (Beers & Hollo, 2009; Boden, Fergusson, & Horwood, 2008) and child (Jutte et al., 2010; Pogarsky, Thornberry, & Lizotte, 2006). Importantly, early motherhood is also associated with an

\* Corresponding author at: University of Southern California, 1150 South Olive Street, Suite 1400, Los Angeles, CA 90015, United States.  
E-mail address: [andrea.eastman@usc.edu](mailto:andrea.eastman@usc.edu) (A.L. Eastman).

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increased risk of next generation child abuse maltreatment and child protection involvement (Dixon, Hamilton-Giachritsis, & Browne, 2005; Noll, Putnam, Trickett, & Barnes, 2009).

The stress of early parenthood is compounded by the difficulties youth in care face. Youth in foster care have a higher risk internalizing and externalizing behaviors (Coleman-Cowger, Green, & Clark, 2011; Oswald, Heil, & Goldbeck, 2009) and mental health diagnoses (Pullmann et al., 2018; Taussig, Culhane, Garrido, & Raviv, 2010) in comparison to peers. Older youth in foster care are at risk of “ageing-out”, a term used when youth exit because they reach the legal age limit for placement. Youth are at risk of ageing out at a time when a sizeable proportion may become parents. This population faces economic hardship, housing instability, employment difficulties, low educational attainment, and increased risk for drug or alcohol issues (Courtney et al., 2007). Historically, the age limit had been the legal age of majority, but many states have been increasing opportunities for youth to remain in care as non-minor dependents, through age 21. In 2011, California was among the first states to extend foster care services through age 21 (A.B. 212, Ch. 459, 2011). In 2012, 67.2% of youth in care at age 17 were still in care at age 19 in California (Eastman, Putnam-Hornstein, Magruder, Mitchell, & Courtney, 2016). Analyses on mothers in care and their children are timely given these policy changes (Finigan-Carr et al., 2014).

Despite the difficulties parents in care face, the number of births to youths in care was not documented by states prior to 2016 (S. 794, Ch. 425, 2015; P.L. 113–183, 2014) and little is known about child’ outcomes (Lieberman, Bryant, & Boyce, 2015; Shpiegel & Cascardi, 2015). Only recently have prospective, population level analyses examined the link between an adolescent mother’s history of maltreatment and a child’s risk (Dworsky, 2015; Dworsky & DeCoursey, 2009; Putnam-Hornstein, Cederbaum, King, Eastman, & Trickett, 2015; Wall-Wieler, Brownell, Singal, Nickel, & Roos, 2018). Dworsky (2015) found that among those who gave birth in Illinois while in care, 39% of children were investigated, 17% were substantiated, and 11% were placed in out of home care by age five. Wall-Wieler et al. (2018) examined adolescent mothers in Manitoba County, Canada, and found that mothers who were in care when they gave birth were more than seven times as likely to have their child placed in out-of-home care before age two than mothers who were not in care. These findings highlight the importance of improving knowledge related to child protection involvement among children born to parents in care.

The present investigation identifies subpopulations of mother-child dyads that may vary in their risk of a maltreatment report to Child Protective Services (CPS) during the first three years of life based on factors recorded at birth. In California, children born to mothers in care are not reported due to the mother’s placement in care and children are not placed in out-of-home care to allow for the mother and child to reside in the same placement. This study used Latent Class Analysis (LCA) to examine how risk factors cluster among mother-child dyads in care. LCA allows for a person-oriented, instead of variable-oriented, examination of a population (Bergman & Magnusson, 1997). Variable-oriented approaches examine how specific variables relate to outcomes, but do not capture the multidimensional nature of the youths’ functioning (Keller, Cusick, & Courtney, 2007). Person-oriented approaches address this weakness. LCA is based on the assumption that no one factor can be understood in isolation, and that factors should be considered in light of their relationships to one another (Courtney, Hook, & Lee, 2012).

Several studies have used LCAs to examine youths in foster care (Armour, Elklit, & Christoffersen, 2014; Courtney et al., 2012; Keller et al., 2007), specifically the needs of vulnerable subpopulations. Courtney et al. (2012) identified four classes of former foster youth based on indicators concerning the transition to adulthood. Almost a quarter of youth fell into a class termed “struggling parents.” Three-fourths were female, more than half were black, and nearly all had a child living with them. Although youth who fell in the “troubled and troubling” (i.e., largely institutionalized) class had the most deleterious outcomes, struggling parents had the next highest rates of adversities in education, employment, and social support compared to other classes. The results highlight that many former foster youths are parenting at young ages and that these young parents likely have a significant service needs.

### 1.1. The current study

Children born to mothers in foster care were identified using linked, administrative data. The proportion of CPS reports during the first three years of life was documented among children born between 2009 and 2012. This study followed children for the first three years of life due to the developmental importance of this period. A large portion of the brain’s architecture is shaped during the first three years of life, and early exposure to abuse or neglect has been shown to impact development long term (Center on the Developing Child at Harvard University, 2012; National Scientific Council on the Developing Child, 2007). Research has documented the heterogeneity among parents in care (Schelbe & Geiger, 2016). This investigation is the first to employ a cluster analysis to examine this population of mother-child dyads in foster care. The aim of identifying subgroups within this population is to develop targeted services and nuanced policies.

## 2. Methods

### 2.1. Data sources

Using probabilistically linked birth and CPS records from California, this study examined all pregnant and parenting mothers in care and the children’s CPS involvement. Birth records between 2009 and 2012 were used to identify all births to a mother who was under age 21. Birth records were then subset into two files for linkage to CPS records: one for the mothers and a second for the children. The first file linkage was used to identify all mothers who were in foster care on or after the estimated date of conception. The second file linkage was used to prospectively document the CPS involvement of children in the chosen birth cohorts. The two linkages were then integrated using the unique identifier assigned to each birth to create one dataset with mother and child variables.

In a later step to define the universe of mother-child dyads, the universe was restricted to the population of mothers for whom it was a first birth as captured on the birth record. In the case of multiple births, the first born child was chosen based on time of birth. Open sourced probabilistic linkage software was used to develop record pairs, which were then clerically reviewed based on the match probability score. Additional match quality checks were conducted by examining birth spacing and dates of CPS reports relative to children's documented date of birth. Additionally, 45 record pairs were randomly selected for case narrative review. These reviews were used to confirm: (1) that the mother was in foster care while pregnant or parenting; and (2) that the information concerning a child's involvement with CPS (as indicated through linked records) aligned with narrative fields. For all 45 reviewed records, the accuracy of the linkage was verified.

## 2.2. Variables

The distal outcome was defined as a report for alleged abuse or neglect during the first three years of life (yes, no). The proportion of children with CPS involvement was examined across birth cohorts and included CPS reports, substantiations, and removals. A CPS report is made when an individual contacts CPS because they are concerned the child is maltreated. If the hotline determines the report warrants concern, the report is investigated. If there is evidence that maltreatment occurred, the case is substantiated. If the case worker determines that the child's safety is at risk, the child may be removed from the home and placed in out-of-home care. The variables selected were associated with risk of the child's CPS involvement based on prior studies examining adolescent mothers both in (Dworsky, 2015) and out of foster care (Putnam-Hornstein et al., 2015).

Demographic characteristics considered for inclusion in the LCA were drawn from the birth record and include maternal race and ethnicity (white, black, Hispanic, other), maternal age at the time of birth (minor, non-minor), and the presence or absence of paternity on the birth record (established, missing). Black race and Hispanic ethnicity have been associated with early childbirth among youth in care (Shpiegel & Cascardi, 2015). Maternal age at birth was coded based on the age of majority because minors and non-minors are qualitatively different, both developmentally and legally. Paternity was included because paternity and marital status are established proxy protective against child welfare involvement (Parrish, Young, Perham-Hester, & Gessner, 2011; Putnam-Hornstein et al., 2015).

Maternal child welfare case characteristics considered in the LCA included a documented mental health condition (none, present), one or more indications a youth had runaway or absconded from placement (no, yes), time in care / placement stability (< = 1 year, > 1 year and 1–2 placements, > 1 year and 3+ placements), and sexual abuse allegation (no, yes). Mental health coding was based upon the federal definition of mental health disabilities for the Adoption and Foster Care Analysis and Reporting System (Federal Register, 2016). An indication of a runaway from placement was coded if the mother experienced a placement move due to running away from care. Time in care and placement stability, measured through separate fields in the data, were integrated into one variable due to a high correlation between time and care and the number of placement moves. Categories were determined through one-way analysis of variances (ANOVAs) to identify statistically significant differences among groups. Sexual abuse reflected if the mother had been reported for alleged sexual abuse prior to giving birth. Child welfare case records data were left censored to 1998 because it was the first year records were maintained in the Child Welfare Services/Case Management System (CWS/CMS). To maintain a consistent look-back window across birth cohorts given differences in maternal age, the analysis was restricted to maternal child welfare histories from age 9 forward.

## 2.3. Variable selection

Descriptive statistics were used to characterize mothers in care and define factors for inclusion in the LCA. Differences between reported and unreported children were examined using  $\chi^2$  tests. Race/ethnicity was run as a post-hoc analysis so that stratifications across classes could be examined. The LCA was used to identify subgroups of children born to mothers based on risk of CPS involvement. Given the assumption of local independence (Collins, Lanza, Greenberg, Feinberg, & Cleveland, 2010), variables that were highly related to one another were not included in the same model. Runaway history was associated with the number of placements because it could only be coded if the mother experienced at least one placement move, so it was excluded from the LCA. Sexual abuse was highly correlated with lack of established paternity and the mother's mental health history. The final LCA model included maternal age at birth, paternity, mental health condition, and time in care / placement stability.

## 2.4. LCA model fit

After variables were selected, multiple models with an increasing number of classes were examined to assess the quality of fit and interpretability. The principle of parsimony suggests that if everything else is equal, the simpler model (e.g., fewer classes) is preferred. The model of best fit was selected based on a number of measures of best model fit (Nylund, Asparouhov, & Muthén, 2007), including the Bayesian information criterion (BIC), entropy, parametric bootstrapped likelihood ratio test (BLRT), and Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR LRT). The BIC was used to assess relative model fit and find the balance between fit and parsimony in choosing the number of classes (Collins et al., 2010). The BIC measures how parsimonious the model is, with dropping BIC scores indicating improved model fit. Entropy ranges from zero to one. A score of one is optimal fit and indicates a good degree of separation between classes (Magidson & Vermunt, 2002). The BLRT and VLMR LRT help assess absolute model fit, with significant findings suggestive that more classes have improved the model in comparison to the model with fewer classes. The fit of a one-class model (assuming homogeneity) was examined and the number of latent classes was increased until there was no benefit to adding

**Table 1**  
Demographic characteristics of first offspring born to mothers between 2009 and 2012 who were pregnant or parenting while in foster care.

	All mother-child dyads (N = 2,094) col%	Offspring reported in the first 3 years of life		$\chi^2$  p-value
		(N = 1,102) n	52.6% row %	
<i>Maternal race/ethnicity</i>				
White	14.4	164	54.3	p = 0.109
Black	24.9	287	55.1	
Hispanic	51.7	543	50.1	
Other	9.0	108	57.5	
<i>Maternal age at birth</i>				
Minor	64.6	783	57.9	p < .001
Nonminor	35.4	319	43.1	
<i>Paternity</i>				
Established	58.8	615	49.9	p = .003
Missing	41.2	487	56.5	
<i>Mental health condition</i>				
None	66.0	694	50.2	p = .002
Present	34.0	408	57.3	
<i>Runaway history</i>				
None	49.3	485	47.0	p < .001
Present	50.7	617	58.1	
<i>Time in care/placement stability</i>				
< = 1 year	36.0	255	56.5	p < .001
> 1 year and 1-2 placements	36.7	262	51.5	
> 1 year and 3+ placements	27.3	585	51.6	
<i>Sexual abuse allegation</i>				
No	35.6	355	47.7	p < .001
Yes	64.4	747	55.4	

Note. The  $\chi^2$  was used to assess the pairwise differences between children who were reported and those who were not reported by covariates. The resulting p-values are reported.

more classes.

### 2.5. Distal outcome

After deciding on the number of latent classes using the methods described earlier, the relationship between the distal outcome, a child's report for maltreatment by age three, was examined as it related to the constellation of characteristics. In LCA, the distal outcome provides information about how the subgroup characteristics relate to the outcome (Lanza, Tan, & Bray, 2013). The auxiliary setting used was DCAT, which treats the distal outcome as a covariate and is the preferred method for examining distal variables that are categorical (Asparouhov & Muthén, 2014). Variables were coded using Stata-MP, version 14.0 (StataCorp, College Station, TX, USA) and analyses were conducted using Mplus version 7.3 (Muthén & Muthén, 1998-2012; Muthén & Muthén, 1998-2012).

## 3. Results

Between 2009 and 2012, there were 2094 pregnant or parenting mothers in foster care who gave birth for the first time. Births declined during this time period, from 543 in 2009 to 497 in 2012. As documented in Table 1, a majority of mothers were Hispanic and almost two-thirds were under age 18 at the time of birth. One in three mothers had been diagnosed with a mental health condition and fully half had run away from care. Nearly two-thirds of mothers had been in care for more than a year and more than a quarter had experienced three or more placements. About two-thirds of mothers had a history of one or more sexual abuse reports. All characteristics were significantly associated ( $p < .05$ ) with the risk a child was reported during the first three years of life, with the exception of race / ethnicity. Factors that were associated with a lower risk of two generation CPS involvement included being older at the time of birth, and having established paternity. Risk factors included a documented maternal mental illness and a history of running away. Mothers who recently entered care had the greatest proportion of children who were reported.

Between birth and age three, 52.6% of children were reported to CPS ( $n = 1,102$ ), almost all of whom were investigated (992 of 1,102). Over half of reported children experienced a first report within five months of birth. By age three, one quarter (25.8%) of children had been substantiated as victims of maltreatment, and one in five (18.8%) had been removed and placed in foster care. As shown in Fig. 1, next generation CPS involvement decreased over time. Specifically, 63.0% of children born in 2009 were reported by age three compared with only 45.5% of those born in 2012. Likewise, roughly 25% of the 2009 birth cohort was placed in out of

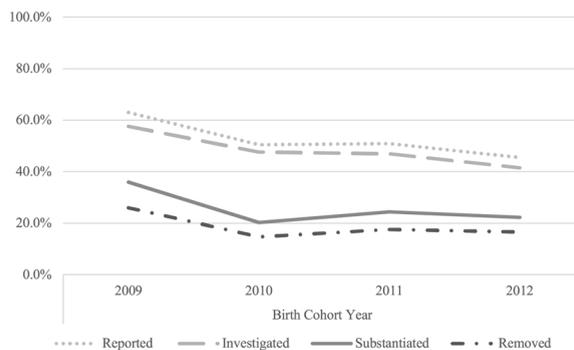


Fig. 1. Proportion of children with CPS involvement by age three.

home care versus only 16.5% of children born in 2012. A  $\chi^2$  test for trends showed the declines were statistically significant over time ( $p < .01$ ). Among reported children, 40% were first reported when the mother was in a foster care placement while 60% of children were reported after the mother had exited.

Analysis of the measures of model fit indicate that the three-class model was the best fitting solution compared to the 1-, 2-, 4- and 5-class solutions (see Table 2). The fit statistics support the 3-class model based on the lowest BIC score, high entropy, and significant likelihood ratio tests. As displayed in Table 3, class membership probabilities of this 3-class solution show that 30.1% of mother-child dyads fell into Class 1 ( $n = 631$ ), 46.6% in Class 2 ( $n = 976$ ), and 23.3% in Class 3 ( $n = 487$ ). Demographic and child welfare characteristics significantly differed across classes and were used to assign descriptive labels to each class to assist with interpretation. Class 1 was labeled “Non-minor mothers with stable placements.” None of the mothers were minors at the time of birth, the large majority had paternity established at birth, one third had a mental health condition, and nearly half had been in care for more than a year with fewer than three placements. Class 2 was the largest and labeled “Minor mothers with short placements.” Almost nine in ten mothers in this group were minor mothers at the time of birth. Less than half had paternity established and few had a mental health condition (13.2%). Nearly 40% had been in placement for less than a year. The highest risk group, Class 3, was termed “Mothers with unstable placements and mental health conditions.” More than three-fourths of mothers were minors and 58% did not have paternity established. Nearly all had mental health conditions. All of these mothers were in care for more than a year and 71% had experienced more than three placements. Post-hoc analyses documented notable differences across class probabilities by race/ethnicity, sexual abuse history, experiences running away from care, and mother’s placement at the child’s first report, as displayed in Table 3. Mothers who were Hispanic were concentrated in Class 2, which was also the class with the youngest mothers. Mothers who were white were fairly evenly distributed, but the highest proportion fell into class 3. Mothers who were black were concentrated in Class 3, the class with unstable placements and a higher risk of mental health conditions. A maternal sexual abuse allegation was the most common in Class 3. Likewise, Class 3 mothers had the highest proportion of runaway mothers and the risk increased across classes.

Using a second LCA, the distal outcome was incorporated and the association between class membership and risk of two-generation CPS involvement was assessed. Class 1 (Non-minor mothers with stable placements) had the lowest proportion of children reported to CPS by age three (36%). Meanwhile, in Classes 2 (Minor mothers with short placements) and 3 (Mothers with unstable placements and mental health conditions), more than half of children were reported by age three (55% and 68%, respectively). Analyses also show that relative differences in outcomes across were similar for substantiations and removals. In Class 1, 11.0% substantiated, and 5.8% were placed in out of home care. For Class 2, 29.6% substantiated, and 19.6% were placed in out of home care. In the highest risk group Class 3, 43.1% substantiated, and 35.1% were placed in out of home care. Class 3 dyads were the most likely to be reported while the mother was in care. Among those who were reported, in Class 1, 8.8% of mothers were in care when the child was first reported, 19.9% of those in Class 2, and 61.7% of those in Class 3.

#### 4. Discussion

This study was the first to develop multi-dimensional class profiles of two-generation CPS involvement among mother-child

Table 2  
Measures of model fit for latent class analysis.

Model	BIC	Entropy	BLRT	VLMR LRT
1 Class	12815.3	NA	NA	NA
2 Classes	11746.2	0.81	$p < .001$	$p < .001$
<b>3 Classes</b>	<b>11675.9</b>	<b>0.75</b>	<b><math>p &lt; .001</math></b>	<b><math>p &lt; .001</math></b>
4 Classes	11710.2	0.75	$p = .1132$	$p = .0839$
5 Classes	11754.0	0.69	$p = .999$	$p = .8095$

Note. These acronyms stand for the Bayesian Information Criterion (BIC) and Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR LRT).

**Table 3**  
Constellation of risk factors across classes.

3 Classes: Membership and Item Response Probabilities			
Class Name			
	<i>Class 1 (lowest risk): Nonminor mothers with stable placements</i>	<i>Class 2 (medium risk): Minor mothers with short placements</i>	<i>Class 3 (highest risk): Mothers with unstable placements and mental health conditions</i>
<b>Class Membership Probabilities</b>	631 (0.301)	976 (0.466)	487 (0.233)
<b>Distal Outcome</b>			
<i>CPS report</i>	0.36	0.55	0.68
<b>Item Response Probabilities</b>			
<i>Maternal age at birth (minor, nonminor)</i>			
Minor	0.00	0.88	0.78
<i>Paternity (established, missing)</i>			
Missing	0.19	0.45	0.58
<i>Mental health condition (none, present)</i>			
Present	0.34	0.13	0.98
<i>Time in care/placement stability</i>			
< = 1 year	0.00	0.38	0.00
> 1 year and 1-2 placements	0.48	0.33	0.29
> 1 year and 3+ placements	0.53	0.29	0.71
<b>Post-Hoc Analyses</b>			
<i>Maternal race/ethnicity</i>			
White	0.15	0.12	0.17
Black	0.19	0.17	0.31
Hispanic	0.57	0.65	0.40
Other	0.09	0.06	0.12
<i>Sexual abuse allegation (no, yes)</i>			
Yes	0.54	0.60	0.86
<i>Runaway history (none, present)</i>			
Present	0.43	0.30	0.82

Note. All probabilities may not sum to 1.00 due to rounding. The level of risk refers to the likelihood of a child CPS report. The class membership probabilities show the proportion of individuals falling into each class. The distal outcome was run in a second LCA and reflects the proportion of youth in the class who were reported in three years. Item response probabilities present the distribution of individuals within each covariate level in a given class.

dyads. This work is timely given the growing interest in research on national policies related to parents in care and children. Federal law allows states to extend foster care services to age 21, a time when many youths become pregnant (Putnam-Hornstein et al., 2016). This policy change has tremendous potential as parents and children may now receive additional supports through extended care. There is an opportunity to engage parents with supports and services during the early parenting period that may improve two-generation outcomes. This study highlighted four key findings that are relevant to policy, practice, and research.

First, there is an early and concentrated risk of CPS involvement among children born to mothers in foster care. The present investigation found 53% of children born to mothers in care were reported by age three, a proportion higher than the state's general population of three-year-old children (10%; Putnam-Hornstein, Mitchell, & Hammond, 2014). It is also higher than the proportion of children reported by age five (a bigger window) who were born to teen mothers (24%; Putnam-Hornstein et al., 2015), and teen mothers with a history of substantiated maltreatment (44%). The findings suggest children born to mothers in care are a uniquely vulnerable population.

Although California comparisons are possible, there are no national data on children born to parents in care and only one other state has examined two-generation CPS involvement. In Illinois, the proportion of two-generation CPS involvement among children born to parents in care was lower than what was observed among those in California even though children in Illinois were followed for a longer time horizon (through age five) (Dworsky, 2015). In Illinois, 39% were reported and investigated (compared with 49% in California). This finding may be due to the state differences including demographic characteristics (Dworsky's study included older mothers, fathers, and a large African American population), levels of surveillance, service delivery strategies, and policies. Also, Illinois has been aggressively pursuing policies and implementing programs targeting parents in care. Both studies highlight that a high proportion of children born to parents in care experience CPS involvement in early life and underscore the great opportunity to reduce CPS involvement among children.

Second, findings call attention to the heterogeneity of the population and the dissimilar service needs that exist for mothers and children. The LCA documented three distinct classes of mother-child dyads: (1) Non-minor mothers with stable placements, (2) Minor mothers with short placements, and (3) Mothers with unstable placements and mental health conditions. The results of the distal outcome, a child CPS report, illuminated the increasing risks. More than a third of children in Class 1 were reported and nearly 70% in Class 3 were reported. These findings indicate that the characteristics of classes are qualitatively distinct and signaled a need for a slate of services for pregnant and parenting youth in care. The mother's placement in care appeared to have a relationship with the

risk of report as the highest risk dyads in Class 3 were the most likely to be reported while the mother was in care. The heightened risks for children born to the youngest mothers stood out. The large majority of mothers in the two higher risk classes were minors and, in contrast, all mothers in Class 1 were non-minor dependents. Thirty-nine percent of all mothers were 16 years of age and younger at the time of birth. More than half of young mothers (ages 16 years and younger) were not in care at the time of birth, 12% were in kin placements, and 9% were in congregate care. Children born to young mothers in congregate care placements were at greatest risk for a CPS report. Two-thirds of children were reported whereas about half of children born to mothers in kin placements were reported. These findings underscore the importance of finding supportive placements for young mothers.

Mothers in Class 3 with unstable placement histories likely need significant supportive resources to address comorbid issues (i.e. mental health conditions and past sexual abuse trauma). A history of mental health conditions characterized nearly all mothers in Class 3, the subgroup at highest risk for a child's CPS report. Unstable placements could be the result of mental health conditions, or those conditions may emerge as a result of placement instability. Either way, there is a population of mothers with a history of multiple placements and mental health conditions, both of which are known at birth. The treatment and service interventions should reflect these identifiable needs and the LCA demonstrated the need to develop distinct services.

Third, not only are there differences in the characteristics of the mother-child dyads, but information collected in birth and child welfare records was related to child outcomes across all classes. The mother's history of running away from care was associated with an increased risk of a child's CPS report. Prior studies have identified a relationship between a runaway history and both early childbirth (Shpiegel & Cascardi, 2015) and two-generation maltreatment (Dworsky, 2015) among youth in care. Zhan et al. (2017) suggest running away may indicate mother's prosocial bonds; therefore, strengthening those may reduce the risk of a child CPS report. A stable placement history was an indication of better outcomes and aligns with research that suggests that youth who spend longer periods in care may accumulate benefits over time in comparison to youth with shorter stays (Font, Berger, Cancian, & Noyes, 2018). The current study also provides further evidence that a sexual abuse history is prevalent among mothers in care; specifically, 68% had a past allegation of sexual abuse. Prior literature has shown that sexual abuse is associated with adolescent pregnancy (Blinn-Pike, Berger, Dixon, Kuschel, & Kaplan, 2002; Noll & Shenk, 2013). As noted by Wilson et al. (2014), sexual activity is common and begins at very young ages among youth in care.

Fourth, although still high, the proportion of children who were reported to CPS for maltreatment has declined over time, from 63% in 2009 to 46% in 2012. Although a statistically significant trend, the period was relatively short and therefore conclusions drawn should be done so cautiously. There was also a decline in CPS reports among children born to mothers under age 21 in the same time span, although the drop was smaller. In 2009, 46% of children born to mother under age 21 were reported and in 2012, 41% of children were reported by age 3. While two-generation rates of CPS involvement decreased, the proportion of mothers remaining in care at older ages increased. In 2009, 22% of youth remained in care until age 19 and 2% until age 21. In 2012, 52% of youth remained in care through age 19 and 13% until age 21. That said, the decline in child CPS reports remained significant even after restricting the sample to minor mothers. Recent policies aimed at supporting parents in care may be related to the shrinking proportion of child reports over time in California. In 2005, California implemented SB 500, which places children with their parents whenever possible when the parents are in foster care or probation placements called "Whole Family Foster Homes" (WFFH). WFFH caregivers assist parents with providing a safe, permanent home for children and transitioning to independence. The funding for WFFHs was expanded in 2012 (A.B. 12, 2010).

## 5. Strengths and limitations

Pregnant and parenting youth in care and their children are challenging to study because of the nature of data collected by child welfare systems, the size of the population relative to overall foster care caseloads, and the loss to follow-up common in longitudinal studies of vulnerable populations. Structured fields of child welfare data focus on the primary client and information about pregnancy and births is more likely to be found in unstructured case notes. Even though birth rates are relatively high among adolescents in foster care, acquiring an adequately-sized sample to study the children is challenging because the absolute number of births is low relative to the overall caseload. Following these families overtime can be even more difficult as the parents tend to be transitory and wary of oversight (Schelbe & Geiger, 2016). The present study overcame these challenges by using large-scale, linked, state data sources and analyzing the most recent data for which three full years of follow-up were available. The size of the state's population allows for a deep dive into subgroup dynamics. The prospective design minimizes bias to which retrospective designs are susceptible. However, findings will need to be understood in the context of several limitations.

Although vital records are the official source of all birth information and CPS records are the official source of information on maltreated children, administrative data are subject to human data-entry errors that may compromise probabilistic match rates and subsequent analyses. To address this limitation, estimates were developed that incorporate different assumptions regarding missing data and out-of-state attrition. For example, the robustness of the model was tested first using the full population, then after excluding foreign-born mothers, and again after excluding any mothers who were not born in California. Results were consistent across all populations. Data used were limited to fields available in birth and CPS records, even though information from other data sources (e.g., mental health records, medical records, education) may also be relevant to the questions examined. Relatedly, LCAs are sensitive to the variables used in the analysis. When variables were modified (e.g. including sexual abuse instead of mental health diagnosis) the model profiles of the subgroups remained the same, which provides further evidence of the robustness of model.

The generalizability of findings is unknown given that these data are limited to California; however, this study can serve as an exemplar of how data sources can be linked to study this issue. Children born to mothers in foster care will undoubtedly be subject to greater surveillance than children born to mothers who are not in foster care. Although this bias cannot be controlled, differences in

two-generation outcomes among children reported while the mother lived in foster care were examined, potentially highlighting factors associated with increased oversight. The current study includes paternity as a covariate but focused primarily on mothers. This decision was made because paternity is more difficult to determine using birth records given the high proportion of children with missing paternity at birth. Future research should examine fathers in care as paternity emerged as a strong protective factor.

While state policies improve outcomes for children born to mothers in foster care given that CPS involvement is decreasing over time, the present study was unable to determine how many families were benefitting from the programs. WFFHs may provide support for mothers, but the number of homes statewide is unknown. More than a third of the mothers in the present investigation lived in Los Angeles County at the time of removal ( $N = 760$  over 4 years), yet as of 2017 no more than 25 WFFH exist in the county (Los Angeles County Department of Children and Family Services, personal communication, November 6, 2017). Further, neither the state nor county collect data on youth served by WFFH, making it difficult to assess the effectiveness of programs.

Among all 17-year-old youth in care in California 67% remained in care through age 19 in 2012 (Eastman et al., 2016), a higher rate than what was observed among mothers in care. Courtney et al. (2012) hypothesized that remaining in care as a non-minor dependent may be more difficult for foster youth mothers because they may be unable to fulfil the educational and employment requirements due to childcare responsibilities. Future research should examine reasons why mothers do not remain in care as non-minor dependents because the findings of the current investigation suggest that mothers and children may benefit from ongoing services and supports.

## 6. Conclusions

Pregnant and parenting youth in foster care have increasingly come to the attention of service providers, researchers, and policymakers. The current study highlights the need to develop programs that fit the needs of mothers in care, assess the effectiveness of these programs, and replicate policies that are improving outcomes for mothers and children. The present study focuses on outcomes after a birth and demonstrates the need to develop a range of programs that fit the needs of parents, given that the mothers' experiences in care and mental health needs vary widely.

Specifically, the data highlighted a number of risk factors available in the mother's CPS and the child's birth records that are known at the time of the child's birth. These findings suggest interventions can be developed to address these needs to better support mother-child dyads. Young mothers, mothers in congregate care placements, mothers with a history of running away from care, mothers with unstable placement histories and mental health conditions were more likely to have a child reported to CPS in the first three years of life. Mothers giving birth in their early to mid-teens may benefit from stable placements with adults who can aid their parenting efforts, until they are developmentally able to parent independently. A history of a mental health condition can signal the need for additional psychological services to better prevent two-generation CPS involvement. Because a sexual abuse history is common among young women who give birth while in care, caseworkers, caregivers, and medical professionals may need additional training to address the reproductive and health needs of this population. Importantly, medical professionals should provide information about the forms of birth control best suited to this population given high rates of placement instability.

Additionally, the population-level data show the risk of two-generation CPS involvement has decreased over time, suggesting that policies that have increased permanency for older youth, extended services to non-minor dependents, and expanded WFFHs may yield two-generation benefits. However, the concentrated risk of child CPS involvement suggests that more work needs to be done to address needs. The Fostering Connections to Success Act, key legislation for transition-age youth in care, makes no mention of pregnant or parenting youth, which is problematic given the rates of early pregnancy among transition-age youth. States should ensure that the eligibility for the extension of foster care allows new mothers to participate and that resources are available. Identifying ways to support mothers' needs may improve two-generation outcomes for mother-child dyads.

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