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Unintentional child injury in child welfare placements

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ABSTRACT

Background: Child welfare professionals are charged with protecting children from non-accidental caregiving behaviors resulting in intentional injuries as well as environmental risks and parenting behaviors resulting in unintentional injuries. Yet little is known about unintentional injury prevalence and risk factors by child welfare placement type.

Objective: To examine factors related to unintentional child injury requiring medical attention, including child welfare placement type, child behavioral problems, caregiver characteristics, and neighborhood factors.

Methods: Data from the second and third wave of the 2010 National Survey of Child and Adolescent Well-Being (NSCAW II) were used. Stable child welfare placements between waves 2 and 3 included investigated biological, reunified, adopted, licensed and unlicensed kin, and nonkin foster homes. Logistic regression analysis modeled injury as a function of placement type while controlling for other covariates. Interaction effects between placement and child behavioral scores were also modeled.

Results: Children with more behavioral problems were at greater odds of an injury (OR = 1.05, $p < .01$) compared to children with fewer behavioral problems. However, interaction models showed that children with more behavioral problems were at decreased odds of injury if living with unlicensed kin (OR = .91, $p < .05$), licensed kin (OR = .92, $p < .001$), or foster care (OR = .92, $p < .001$) compared to biological homes.

Conclusion: The absence of a behavioral problem was associated with higher risk of injury for children placed in foster care. More research is needed to better understand injury type, prevalence and specific risk factors.

1. Unintentional injury in child welfare placements

Protecting children from harm stemming from abuse and neglect is the central vocation of Child Protective Services (CPS) and the child welfare system (CWS). In practice, CPS and CWS generally are not only concerned with intentionally harmful caregiving behaviors, but also environmental risks that could increase the likelihood of childhood injuries (Pecora, Chahine, & Graham, 2013). A quick look at any of the multiple endangerment or risk assessment forms used by various state CPS investigators will reveal an extensive section on hazardous living conditions that increase a child's risk of injury from fires, falls, and unintentional poisonings. While unintentional injury efforts have been integrated as part CPS practice and CWS response, child abuse and neglect scholars have predominantly considered preventing *intentional* forms of parental abuse or neglect as the principle outcome of interest when studying safety. A few exceptions have been studies that examined emergency department visits of either older youth in foster care placements (Jee, Antonucci, Aida, Szilagyi, & Szilagyi, 2005; Rubin, Alessandrini, Feudtner, Localio, & Hadley, 2004; Thackeray,

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Leonhart, Yackey, Cooper, & Kelleher, 2016) or children who remain with biological parents following an investigation (Schneiderman, Leslie, Hurlburt, Zhang, & Horwitz, 2012). There has been little effort to expand the study of child safety to unintentional forms of harm and compare injury risks across the continuum of child welfare placements. We know little about the correlation between prevalence and risk of unintentional injury of children in CWS.

1.1. Background

Injuries are the leading cause of morbidity and mortality for children. Costs of unintentional injury are high. Treatment or death from injuries in 0–19 year olds in 2012 resulted in an estimated \$92 billion in medical and work loss costs and an additional \$502 billion in quality of life losses (Spicer, Lawrence, & Miller, 2016). Nonfatal injuries account for 83% of these costs. Different demographic characteristics of family, parent, and child are associated with increased risk for childhood unintentional injury. Low educational attainment, female-headed households, and Non-Hispanic White parents report fewer instances of childhood injuries than other households or parents. Further, the greater number of children in the household and parental work fatigue have been reported as barriers to proper supervision of children to prevent injury (Ablewhite et al., 2015). For children, male gender and older age are associated with higher injury risks (Borse et al., 2008).

Psychological factors of the child are also important correlates. Externalizing behavioral problems, such as conduct disorders, inability to control impulsivity, and antisocial behavior have been linked to increase the risk of injury in children (Brehaut, Miller, Raina, & McGrail, 2003; Garzon, Huang, & Todd, 2008; Zhang et al., 2016). Internalizing behaviors, including anxiousness and depression, have also been linked to increased injury risk (Lee, Harrington, Chang, & Connors, 2007; Rowe, Maughan, & Goodman, 2004; Zhang et al., 2016). Different types of behavior may increase the chance of injury via different pathways. For instance, externalizing behaviors may make children take more risks. On the other hand, internalizing behaviors may make it hard for a child to hold attention on a certain task, making accidents like falls more likely to occur. Additionally, children with behavioral problems are also more likely to experience intentional injuries stemming from child abuse and neglect (Helton & Cross, 2011), whether in the general population (Sullivan & Knutson, 2000) or in various child welfare placements (Drake, Jonson-Reid, & Sapokaite, 2006; White, Hindley, & Jones, 2015).

There are several reasons to suspect that unintentional injury risk may vary by child welfare placement. First, abuse and neglect rates vary by placement (Font, 2015; Helton, Boutwell, & DiBernardo, 2017). A recent study (Helton & Gochez-Kerr, 2017) found that older youth who remained with a biological parent or who were reunified with a biological parent after a stay in foster care were the most likely of all placement arrangements to report being physically assaulted within the home. Kinship foster parents are also more likely to engage in more punitive styles of parenting, such as spanking, compared to non-kinship foster parents (Dolan, Casanueva, Smith, & Bradley, 2009). This difference in parenting styles may be correlated to increase injury risk as parents who engage in more punitive parenting styles are more likely to exhibit a lack of monitoring behaviors that put children at risk for injury (Jaques, Weaver, Weaver, & Willoughby, 2018).

Second, neighborhood safety varies by placement. Kinship homes are more likely to be in disadvantaged neighborhoods than traditional foster parents (Barth et al., 2008), and neighborhoods with higher levels of socioeconomic risk are associated with high average rates of unintentional child injuries (Veras et al., 2018). Further, unsupervised children living in unsafe neighborhoods are at a higher risk of injury (McClure, Kegler, Davey, & Clay, 2015). Finally, placements vary in terms of administrative management, as informal kinship arrangements, adoptive placements, biological homes following reunification or closed following an investigation are not subject to the same bureaucratic oversight as licensed foster or licensed kinship care. Although licensing standards vary by state, almost all have three main components: parent training, background checks, and some form of a safety and capacity assessment of the family home (Beltran & Epstein, 2012). Children living in homes with licensed parents are generally safer from abuse and neglect than children living in homes with unlicensed parents (Font, 2015; Nieto, Fuller, & Testa, 2009). It is our hypothesis that these homes, which require safety assessments, will have lower rates of unintentional injuries as well.

Utilizing data from a nationally representative sample of families in the CWS, this study examines factors related to unintentional child injury requiring medical attention, including placement type, child attributes, caregiver characteristics, and neighborhood characteristics. In particular, we examine the extent to which child behaviors interact with placement type to increase risk of child injury. First, we hypothesize that due in part to different caregiver risk factors, as well as bureaucratic oversight and regulations stipulating that the home receive an initial and ongoing safety and endangerment assessment, adoptive, licensed kinship, and traditional foster care homes would be safer from unintentional injury than biological and unlicensed homes. Second, we hypothesize that children without behavioral problems will have lowest reports of unintentional injury. Finally, because the caregivers in licensed homes may have had training to address a variety of child behavioral challenges that may pose a risk to child injury, we hypothesize that children with behavioral problems in these placements will have lower rates of injury than those with behavioral problems in unlicensed and biological homes.

2. Methods

The second cohort of the National Survey of Child and Adolescent Well-Being (NSCAW II) included cases that were sampled from CPS investigations closed between February 2008 and April 2009 in the United States ($n = 5873$). NSCAW II used a two-stage stratified sample design (children within primary sampling units, mostly counties, within 30 different states), with the final sample representative of the national population of children being investigated for abuse and neglect (Dowd et al., 2011). Assessments of child well-being, investigative case characteristics, and family demographics were collected through face-to-face interviews with

current caregivers, children, and caseworker in three data collection waves: 4 months, 18 months, and 36 months after the close of an investigation. The analytic sample for this study included children ages 3 through 17 years of age at the 36 month interview, which was conducted between 2011 and 2012. The thirty-six month follow-up interview was selected to allow youth sufficient time to be reunified or adopted if they had been previously placed in foster care.

Data used for this analysis were restricted in important ways. First, the analysis used data that were collected at the 36 month interview, with the exception of child behavioral problems. Child behavior measured at the 18 month interview was used for analysis to address the temporal relationship between behavioral problems and outcomes of interest. Further, the sample was restricted to caregivers of children under 18 years of age as our measures of injury and child behavior were only asked of caregivers of children in this age range. Because of this, youth who were 15 years of age and older at baseline sampling were dropped from the sample. Secondly, because injury events were assessed within the year prior to the 36 month interview, we only included cases where the caregiver had custody of the child for at least 12 months prior in order to compare injury experiences for children being cared by different caregiver types ($n = 2863$). Response rates were 83% for caregiver interview and 94% for caseworker interview.

2.1. Measures

2.1.1. Injury

Caregivers were asked, in the previous year, if the child under their care experienced any accident, injury, or poisoning that required a visit to a doctor or nurse. “Yes” responses were coded as 1, and “no” responses were coded as 0. Although the type, severity, and location of the injury were reported by caregivers, these descriptive measures were not used for this study due to missing values.

2.1.2. Placement

Placement was taken from the 36 month caseworker interview, and included a variety of households: living in-home with a biological parent after a maltreatment investigation, reunified with a biological parent after time in foster care, adoptive parent, unlicensed kinship parent, licensed kinship home, or traditional foster parent. Placements were further categorized by the authors based on license status, with licensed kin, traditional foster, and adoptive placements coded as 1, and bio parent placements and unlicensed kinship placements coded as 0.

2.1.3. Child behavioral problems

Child behavioral problems were measured at the 18 month interview by the caregiver reported Child Behavior Checklist (CBCL), a widely used measure of social competence and behavioral problems standardized by age and gender (Achenbach & Rescorla, 2001). The CBCL measures domains of both internalizing problems, including withdrawn episodes, somatic complaints, and anxiety/depression, and externalizing behaviors, including attention problems and aggressive behaviors. The total score ranged from 0 to 100, has a population mean of 50 and a standard deviation of 10, with higher scores indicating more severe behavioral problems.

2.1.4. Child demographics

A child’s age (continuous in years), race/ethnicity, and sex were assessed by structured interview with current caregiver.

2.1.5. Caregiver characteristics

Caregivers age, current work status, educational attainment, and marital status were also controlled for in this study. Age was measured continuously. For work status, caregivers reporting working full time or at least 35 h a week were coded as 1 by the authors, all others reporting unemployment, part-time work, or not working due to illness, disability, home responsibilities, or school were coded as 0. For educational attainment, caregivers reporting less than high school, General Education Degree (GED), or a high school diploma were categorized by the authors as high school or less; those reporting some college, associate’s degree, bachelor’s degree, or more were categorized as more than high school. Caregivers reporting being married were coded as 1, with all other coded as 0.

2.1.6. Number of children in household

Caregivers reported how many children were currently living in the household. This measure was treated as a continuous variable.

2.1.7. Family poverty

Poverty was measured by calculating the family’s income-to-needs ratio, which was estimated by dividing family income by its corresponding poverty threshold in 2009. The poverty threshold varies by family size and is based on the money necessary for the minimally accepted amounts of food. Caregivers reported both family income and household size. This measure was divided into three categories by the authors: at or below the poverty line, between 101% of the poverty line and 200%, and above 200% of the poverty line.

2.1.8. Neighborhood

Caregivers were asked a series of questions about their neighborhood environment from the abridge Community Environment Scale (Furstenburg, 1990). Two questions were used in this study: “compared to other neighborhoods, rate the safety of your current

neighborhood”, and “how big of a problem is unsupervised children in your neighborhood”? Caregiver responses of “not as safe as most neighborhoods” were coded as 1 and responses of as safe or safer were coded as 0. Likewise, responses of unsupervised teens being a big problem in the neighborhood were coded as 1, and responses of not a problem at all or a little bit of a problem were coded as 0.

2.2. Analytic approach

All analyses were performed using STATA Statistical Software Release 13 (Stata, 2013). Due to NSCAW’s complex sampling design, specific STATA survey commands were applied to obtain unbiased estimates of population parameters (NSCAW Research Group, 2002). Percentages for demographic variables were weighted for sample probabilities. Differences between placement type or licensing status and reported injury were examined using the Pearson χ^2 test. Logistic regression analysis modeled injury as a function of placement type while controlling for other influential characteristics of the child, caregiver, and neighborhood characteristics. Independent variables were entered into the model sequentially, with placement type entered first and then control variables entered next. Interaction effects between placement and child behavioral scores were entered as a final logistic regression model. This study was reviewed and approved by the University Institutional Review Board.

3. Results

Seven percent of caregivers reported their child was injured in the last year (Table 1). A majority of children (89%) were living with a biological parent either in-home (85%) or reunified (2%), 9% were living with a kinship provider (7% informal kin and 2% licensed), 3% were with adoptive parents, and 1% with foster parents. The mean age was 9 years, 40% of children were White Non-Hispanic, 31% were Hispanic, and 23% were Black Non-Hispanic. Gender was evenly distributed and mean behavioral scores of the sample (51.9) were close to the population mean (50). Average caregiver age was 36 and the racial distribution was similar to the children’s distribution. About a third (34%) were working fulltime and about a third (35%) were married. The average number of children in the household was 3, and almost half of households were at or below the federal poverty line (46%). About one-in-ten neighborhoods were rated by caregivers as unsafe, and a little less than a third (31%) were rated as having a somewhat or big problem with unsupervised children.

Related to our first hypothesis that adoptive, licensed kinship, and traditional foster care homes would be safer from unintentional injury than biological and unlicensed homes, Fig. 1 shows the bivariate cross tabulation of injury by placement with licensed homes shaded lighter than biological and unlicensed homes. A 2×2 cross tabulation showed that a smaller percentage of caregivers reported a child injury in licensed placements (adoptive, licensed kin, and traditional foster care) compared to unlicensed or biological homes, 2.7% vs. 7.8%, $\chi^2(1, n = 2863) = 6.73, p < .01$. There were no significant differences between the six placement types and injury.

Table 2 presents the results of a logistic regression predicting an injury by placement, injury by placement controlling for child and caregiver characteristics, and finally an interaction model. Shown in the unadjusted column, compared to biological homes, adoptive placements (OR = .37, $p < .01$) and foster care placements (OR = .21, $p < .01$) were at decreased odds of reporting a child injury in the previous year. Once all covariates were accounted for, there was no relationship between placement and injury risk. In relation to our second hypothesis, children with more behavioral problems were at greater odds of an injury (OR = 1.05, $p < .01$) compared to children with fewer behavioral problems. African-American caregivers were at decreased odds (OR = .31, $p < .05$) of reporting a child injury compared to White Non-Hispanic caregivers. Finally, caregivers reporting living in unsafe neighborhoods were at decreased odds (OR = .14, $p < .01$) of child injury compared to caregivers living in safer neighborhoods.

To test the moderating effect of child behavioral problems on the relationship between placement and injury risk, which was related to our third hypothesis, interaction terms between behavioral scores and placement type were entered into the logistic regression model with all covariates (see both the *Interaction* column in Table 2 and Fig. 2; reunification and adoptive homes were left out of the figure for readability). Children with greater behavioral problems living in biological homes were at increased odds of injury compared to other children. The opposite result was found for children living in unlicensed kin (OR = .91, $p < .05$), licensed kin (OR = .92, $p < .001$), or foster care (OR = .92, $p < .001$) placements. Children in these homes with greater behavioral problems were at decreased odds for injury compared to other children. Behavioral scores did not moderate the relationship between injury and reunified or adoptive placements.

Three sensitivity tests were conducted but not reported in the tables. For the first two, separate models were conducted with internalizing and externalizing in place of total behavioral scores. In the separate models, the effect size of each was in the same direction as the reported total measure, but neither were significant at the .05 level (internalizing $p = .10$ and externalizing $p = .08$). The total measure of behavior of the CBCL includes additional items not taken into account by the two measures of externalizing or internalizing behaviors. It may be that these additional items provide enough statistical power to make the total score a significant correlation with injury. A third sensitivity test was conducted where injury at 18 month interview was added as a covariate in the model predicting injury at 36 month interview. The addition of this variable did not change the size, direction, or significance level of any other independent variable.

4. Discussion

Our study began with the hypothesis that unintentional injury rates would vary by child welfare placement much like intentional

Table 1
Sample characteristics (N = 2863).

		N	%	SE
Injured				
	Yes	182	7	0.95
	No	2681	93	0.95
Child characteristics				
	Age (mean)	9		14.43
	Race			
	Black/Non-Hispanic	832	23	3.25
	White/Non-Hispanic	960	40	4.22
	Hispanic	871	31	3.99
	Other	193	7	12.1
	Sex			
	Female	1350	48	1.9
	Male	1514	52	1.9
	Behavioral problems (m)	51.9		44.06
Placement				
	In-home	1746	85	1.29
	Reunified	242	2	0.43
	Unlicensed kin	199	7	1.08
	Licensed kin	132	2	0.39
	Foster care	85	1	0.16
	Adopted	446	3	0.42
Caregiver characteristics				
	Age (m)	36		34.76
	Race			
	Black/Non-Hispanic	806	22	3.24
	White/Non-Hispanic	1273	49	4.45
	Hispanic	708	26	3.73
	Other	77	3	0.85
	Education			
	Less than high school	1207	44	2.02
	High school equivalent	1010	34	2.06
	Some college	641	22	2.02
	Work status			
	Full-time	864	34	2.07
	Other	1997	66	2.07
	Marital status			
	Married	961	35	1.99
	Not married	1900	65	1.99
	# children in household (m)	3		6.96
	% poverty line			
	< 100%	1347	46	2.13
	> = 100%	1390	53	2.13
Neighborhood				
Safety				
	Safer or as safe as others	2598	91	1.57
	Less safe	259	9	1.57
Unsupervised children in neighborhood				
	Not a problem	1932	69	1.63
	Somewhat or big problem	917	31	1.63

injuries stemming from abuse and neglect. Using a nationally representative sample of CWS placements, we found that examining this issue was more nuanced than simply assessing placement type. Bivariate analysis showed that injury rates were significantly lower for adoptive and licensed kinship homes, but that this relationship disappeared once other covariates were entered into the model. African-American caregivers were at decreased odds of reporting their child was injured compared to Non-Hispanic White caregivers; this relationship is similar to studies of families in the general population (Veras et al., 2018). Neighborhood safety was an important correlate of injury, but the direction of the relationship was opposite of previous research (McClure et al., 2015). Since the etiology of many of these injuries may be play related, we might hypothesize that parents would not permit children to play outside as often in unsafe neighborhoods, thereby reducing their exposure to injury risk. Although, this hypothesis would not hold for household injuries and accidents.

Child behavior problems, in the overall model, were associated with increased rates of unintentional injury. This is similar to findings from the general population of non-maltreated children (Lee et al., 2007; Rowe et al., 2004; Ruiz-Goikoetxea et al., 2018). However, this overall relationship between behavior and injury may be driven by children in biological homes investigated for maltreatment, as our final model showed differing child behavioral scores in various foster care placement had an opposite effect on injury risk. For children living with biological parents, an increase in frequency and severity of problematic behaviors resulted in increased injury risk. These children may be taking more risks, unable to follow directions from parents around safety, or are less

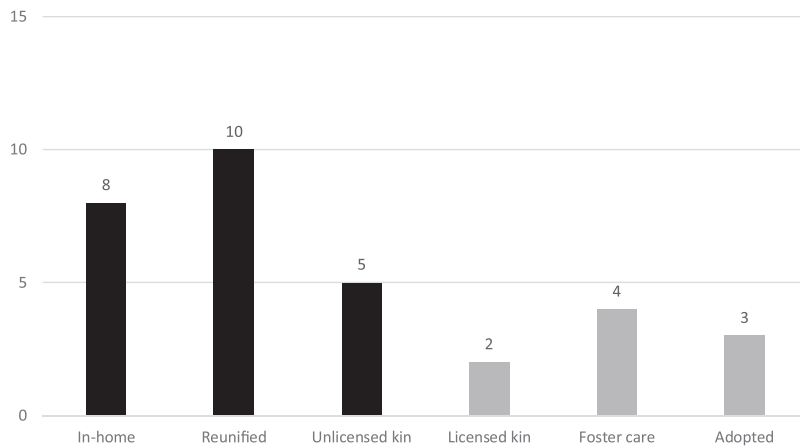


Fig. 1. Percent of children injured in the previous year by placement type.

Table 2

Logistic regression modeling any injury in the previous year by child, caregiver, and neighborhood characteristics.

	Unadjusted		Child characteristics		All covariates		Interaction	
	O.R.	SE	O.R.	SE	O.R.	SE	O.R.	SE
Placement								
In-home								
Reunified	.93	0.89	.82	0.49	.78	0.48	.79	0.47
Unlicensed kin	.76	0.62	.83	0.45	1.66	1.04	1.57	1.01
Licensed kin	.23	0.06	.19*	0.16	.56	0.49	.40	0.44
Foster care	.21**	0.01	.14**	0.09	.33	0.23	.27	0.19
Adopted	.37**	0.14	.31**	0.01	.48	0.26	.40	0.25
Child characteristics								
Age			.99	0.05	1.04	0.06	1.04	0.06
Race								
Black/Non-Hispanic			.68	0.26	1.62	0.72	1.48	0.68
White/Non-Hispanic								
Hispanic			.45**	0.11	.46	0.22	.52	0.23
Other			1.65	1.02	2.28	1.19	1.99	0.99
Female			1.25	0.35	1.39	0.43	1.37	0.43
Behavioral problems			1.06**	0.01	1.05**	0.01	1.05**	0.01
Caregiver characteristics								
Age					.95	0.02	.96	0.02
Race								
Black/Non-Hispanic					.28**	0.13	.31*	0.14
White/Non-Hispanic								
Hispanic					1.00	0.56	.96	0.52
Other					.24	0.24	.29	0.29
Education								
Less than high school								
High school					1.78	0.63	1.61	0.55
Some college					1.12	0.46	1.12	0.45
Full-time					.85	0.27	.84	0.25
Married					1.03	0.33	1.04	0.33
# children in household					.99	0.13	1.00	0.13
< 100% poverty line					1.19	0.46	1.18	0.45
Neighborhood								
Unsafe							.09**	0.06
Unsupervised children							1.85	0.58
Interactions								
Placement x behavior								
Reunified							1.03	0.04
Unlicensed kin							.91**	0.05
Licensed kin							.92*	0.02
Foster care							.91*	0.02
Adopted							.94	0.04

** p < .01.

* p < .05.

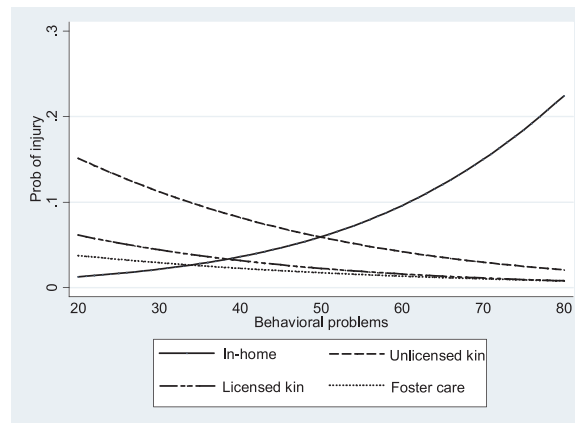


Fig. 2. Conditional effect plot predicting injury by child behavioral score and placement type.

likely to perceive the consequences of their actions. It could also be that increased feelings of depression or anxiety is making it difficult for these children to concentrate on a particular task, which then results in injury. These behavioral risks are compounded by the vulnerabilities of biological parents involved with the CWS, including mental health, domestic violence, and lower socio-economic status (Marcenko, Hook, Romich, & Lee, 2012; Ogbonnaya & Kohl, 2018), which may diminish a parent's ability to monitor. For those children living with kin or traditional foster parents, regardless of licensing status, decreased behavioral problems were associated with increased injury risk. This may show that foster caregivers are more casual with monitoring a child that does not present behavioral problems under their care. It may also imply that foster parents are perhaps better at identifying children with behavioral problems that need additional attention or direction in high risk situations than biological parents.

The lowest rates of injury in licensed placements may suggest that there is a benefit for foster parent training or that requirements about the safety of the homes where children are placed are effective in reducing injury risk. On the other hand, there appears to be a need for the CWS and CPS to make available injury prevention training and education to investigated and reunified biological homes. Because children with more disruptive behavioral problems may be less receptive to training, Rowe et al. (2004) suggest targeting parents and reducing the presence of hazards in the home environment. Others in the public health field (Schnitzer, Dowd, Kruse, & Morrongiello, 2015) suggest that supervision and parent-child conversations are key to reducing injury risk. When children are young (< 2 years), parents often rely on direct visual supervision of their children, which has been shown to decrease odds of injury. Interviews with caregivers of children who were taken to the ER reported children who were proximally beyond reach of their caregiver were more likely to be injured. In other words, children with lower supervision scores had the greatest odds of injury. Parent-child conversations for older children have been shown to help instill safety values in children. These conversations can be either proactive (before the child engages in an unsafe activity) or reactive (after the child has engaged in an unsafe activity). In the case of retroactive conversations, parents have frequently reported discussing alternative strategies for the future, and discuss why an activity was dangerous (O'Neal, Plumert, & Peterson, 2016). Finally, injury prevention programs can be modified and delivered as part of home visitation programs (Nicks et al., 2016). These types of programs can help parents develop realistic expectations for their children's behavior based on development and age through improving home safety practices or changing child behavior (Kendrick, Barlow, Hampshire, Stewart-Brown, & Polnay, 2008).

The study findings must be viewed within the context of several limitations. Due to missing values, we were unable to examine the type of injury sustained by the child or where the injury occurred. This type of information is vital to prevention efforts, as different injuries occurring within the home, in the neighborhoods, or at school would mandate different training around parental monitoring strategies. In a study of adolescent foster children in either residential placement or family foster home, Thackeray et al. (2016) found that children in family foster homes were more likely to report injuries sustained during recreation where adolescents in group homes reported injuries sustained in fights and self-inflicted injuries. However, family foster homes were not differentiated in the study by biological relatedness. Thus it is still unknown if children in kin placements are more likely to sustain falls in the immediate neighborhood where kids in foster care are more likely to experience injuries at school. Future research is also needed to better understand differences in injury type by child welfare placement. These may include either minor injuries, such as broken bones from falls, scrapes, and cuts, but could also include serious injuries such as burns, poisonings, motor vehicle crashes, animal bites, electrical shock, suffocation, and drownings. Understanding the safe keeping and storage of household chemicals and medications and the differences in practices in child welfare placements is also needed.

One of the key strengths of our study was temporal order and reliable measures of caregiver and household contexts where injury would have taken place. We were able to measure injury a few years after a child first entered foster care and had adequate time to achieve reunification or permanency. Because of this, we were able to survey a wider array of placement types. Although this truncated our sample, by only examining families who have had custody of their children for at least a year, we could ensure the injury occurred within the current placement. This is a more reliable measure of injury report compared to retrospective measurements that may confuse unintentional injury with other injuries stemming from abuse and neglect in the past. However, we did not measure rates of injury for children who moved between placements. It is reasonable to suspect that their rates of unintentional

injury may be as high or even higher than children who had stable home environments.

5. Conclusion

In the end, the most consistent and robust measure associated with unintentional injury was child behavioral problems, but only within investigated or reunified biological homes. Within foster homes, be it kin or nonkin, the absence of child behavioral problems placed a child at a higher risk of unintentional injury. This has implications for child injury prevention programs in that different strategies around monitoring and managing behavioral problems are different depending on placement type. For biological families at risk for child abuse and neglect, what is needed is better understanding of the interaction of environment and behavioral antecedents of unintentional child injury. On the other hand, foster and kin parents may need more traditional injury prevention programming to target children without problematic internal or externalizing behavioral problems.

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Declaration of Competing Interest

The authors have no conflicts of interest to disclose.

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