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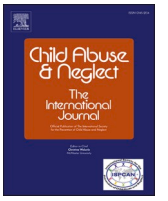

Homelessness and child protection involvement: Temporal links and risks to student attendance and school mobility☆

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ABSTRACT

Background: The experience of homelessness and child protection involvement pose risks to children's school success. Elucidating processes by which these interrelated systems affect child well-being is important for guiding policy and practice.
Objective: This study examines the temporal relation between emergency shelter or transitional housing use and child protection involvement among school-aged children. We evaluated effects of both risk indicators on school attendance and school mobility.
Participant and setting: Using integrated administrative data, we identified 3278 children (ages 4 to 15) whose families used emergency or transitional housing in Hennepin and Ramsey County of Minnesota during the 2014 and 2015 academic years. A propensity-score-matched comparison group of 2613 children who did not use emergency or transitional housing.
Method: Through a series of logistic regressions and generalized estimating equations, we tested the temporal associations of emergency/transitional housing and child protection involvement as well as how both experiences affected school attendance and mobility.
Results: Experiences of emergency or transitional housing often proceeded or occurred concurrently with child protection involvement and increased the likelihood of child protection services. Emergency or transitional housing and child protection involvement posed risks for lower school attendance and greater school mobility.
Conclusions: A multisystem approach to assist families across social services may be important for stabilizing children's housing and bolstering their success at school. A two-generation approach focused on residential and school stability and enhancing family resources could boost adaptive success of family members across contexts.

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1. Introduction

Data from the National Center for Homeless Education (2020) reported that public schools identified 1.5 million children experiencing homelessness in the 2017–2018 school year. This was an 11 % increase from the previous year and the highest number ever recorded nationally. Homelessness can be defined as an individual lacking fixed, regular, and adequate night time residence. Homelessness among school aged children is a well-established risk factors for school difficulties including low achievement, chronic school absence, higher rates of discipline, and lower rates of high school completion (Manfra, 2019; Masten et al., 2015; Miller, 2011). A national study of 10,362 US school-aged children in the United States found that children who moved three or more times were 1.6 times more likely to be in the top tenth percentile of scores on behavioral problems, compared to peers that never moved (Simpson & Fowler, 1994).

The experience of homelessness among school aged children is a serious concern in the state of Minnesota. According to the Federal Reserve Bank of Minneapolis, Minnesota ranks as one of the worst states in the nation for academic achievement gaps across race, income, and housing status (Grunewald & Nath, 2019). The Minnesota Department of Education reported 8079 students experiencing homelessness during a point in time count on October 1, 2018. They were disproportionately students of color, and often had difficulties with school engagement and achievement. These students missed four-times as many days of school, were 9.5 times more likely to be chronically absent, were 40 % less likely to be proficient in math, and 37 % less likely to be proficient in reading (Minnesota Department of Education, 2019). Students experiencing homelessness in Minneapolis, Minnesota have also been found to have lower levels of academic achievement and slower growth in academic skills over time (Cutuli et al., 2013). Another evaluation using state wide administrative data in Minnesota has also found associations between student homelessness with decreased attendance rates, and an increased likelihood of emotional behavioral problems among school aged children (Larson & Meehan, 2011).

Developmental research and theory suggest that risk factors often pile up, with one risk or adversity leading to others in a cascading sequence of experiences that are harmful to an individual's wellbeing (Boyce et al., 2021; Masten & Cicchetti, 2016). Experiences of homelessness have been related to an increased likelihood of child protection (CP) involvement, and vice-versa (Culhane et al., 2003; Foust et al., 2020; Rodriguez & Shinn, 2016). In a 2013 to 2016 study of families experiencing homelessness in Los Angeles County, 63.4 % of parents had been referred to child protective services since 1998. At the time of their most recent homeless episode, 23.2 % of parents were CPS involved (Foust et al., 2020). According to the Administration for Children, Youth, and Families (2016), approximately 10 % of children in the United States entering foster care in 2015 were removed at least in part due to inadequate housing. Further, an evaluation of children staying specifically in an emergency shelters found that 20 % of child protection referrals occurred before shelter entry, 40 % during a shelter stay, and 40 % after shelter exit (Cowal et al., 2002). This suggests that shelter stays often occur during or directly before involvement with child protection.

Direct intervention work indicates that providing families with permanent housing subsidies reduces their number of days in shelter and their likelihood of CP involvement (Shinn et al., 2017). Other intervention studies suggest that providing families with housing-related services reduces repeated maltreatment and facilitates family reunification – even when housing was not the reason for child protection involvement (Dworsky, 2014). Further, the Keeping Families Together intervention improved family's CP outcomes upon supportive housing placement. This included 61.1 % of CP cases being closed, a significant decrease in the number of days children were placed out of home (680 days before to 124 day after supportive housing placement), and lower rates of repeated maltreatment (Swann-Jackson et al., 2010).

There are many potential reasons for the association between the experience of homelessness and CP involvement. Some families are referred due to concerns of neglect that are actually the consequences of poverty. Although many states include a poverty exemption in their definitions of neglect, the circumstances under which homelessness should be attributed to neglect versus poverty are not well defined (Cohen-Schlanger et al., 1995; Dale, 2014; Eamon & Kopels, 2004; Shdaimah, 2009). Beyond concerns of neglect, families using housing services may be more likely to be involved with child protection due to the "fishbowl effect" where they are under a higher degree of scrutiny for their parenting behaviors. Parenting behaviors that would usually go unobserved are then reported to CP services (Cowal et al., 2002; Park et al., 2004). Although some of these referrals may be warranted, it could also create a culture of suspicion and stigma. These concerns could increase a family's reluctance to use the shelter system and subsequently result in families choosing housing in more dangerous and lower-resourced settings.

Further, there are cyclical interactions among poverty, child protection involvement, and housing. Many low-income families receive cash assistance that is tied to the custody of their children. If families become involved with CP services and children are placed in out of home care, families lose that cash assistance. Often parents are using those funds for housing costs and without this support, they can lose their housing. Once they do not have stable housing, CP is reluctant to reunify parents with their children until they find stable housing.

In other cases, homelessness plays an indirect role. The stress associated with homelessness may exacerbate punitive parenting practices, leading to physical abuse or compromising the parent's ability to meet their child's needs (Cowal et al., 2002; Park et al., 2004; Tracy and Stoecker, 1993). This includes the worsening parent mental health concerns, which are also common among families involved with CP (De Bellis et al., 2001; Marsh et al., 2006). However, many states – including Minnesota – have a CP services department that operates with dual "tracks." After a case is accepted, social workers determine whether that family needs additional supportive services, or if an investigation into the allegations of maltreatment are warranted. Families placed on the investigation track will then have a determination if maltreatment was present. Some studies have found a relationship between CP involvement and experiencing homelessness, but no increased rates of association for being placed on an investigation track or having a child maltreatment confirmed (Rodriguez & Shinn, 2016). This suggests that the latter hypothesis of why these two services are associated with each other may be less prevalent.

This paper aims to further evaluate the interrelations of a subsect of homelessness – specifically children residing in emergency or transitional (E/T) housing – and various levels of child protective service involvement, with the goal of advancing knowledge about the reasons for increased cross system engagement for these families. If families experiencing homelessness do not have an increased rate of maltreatment determinations but are more likely to be involved in the child protections system compared to peers not using E/T housing, this would suggest that there is some form of systematic bias in the system that inaccurately increases the referral rates for families experiencing homelessness.

It is concerning when children are experiencing multiple adverse events because each experience may individually pose a risk to developmental adaptation. Much like the direct relationship of homelessness to child educational challenges, CP involvement has also been related to maladjustment at school. In studies of children from Minnesota, children who experienced maltreatment were more likely to have lower math and reading achievement as well as decreased attendance rates (Kiesel et al., 2016; Piescher et al., 2014; Renner et al., 2018). Data from Michigan also has found that children who have been investigated for maltreatment had poorer math and reading scores in the 3rd grade (Jacob & Ryan, 2018).

Furthermore, experiencing more than one adversity may create a compounded risk for child adjustment. Research and theory on cumulative risk suggest that each additional risk factor a child experiences is related to worse child outcomes, including decreased school engagement (Crouch et al., 2019). Of children that have specifically experienced both homelessness and CP, many report school adjustment difficulties (Bender et al., 2015; Semanchin Jones et al., 2018). Supporting these conclusions, another study also found that multisystem involvement increases the likelihood of school dropout among children in grades 7 through 9 (Garcia et al., 2018). However, despite knowing that children who experience homelessness and thus use E/T housing and CP have many of the same school-based adaptation challenges, very little work to our knowledge has looked at the joint impact and implications for school aged children's involvement across systems.

Further, although involvement in services like E/T housing or CP reflects high exposure to adversity, this situation also represents an opportunity for intervention services. We sought to identify ways to mitigate the probability of children's school adjustment problems by evaluating how children's involvement with child protection and E/T housing services were related, both in time and their effects. By pinpointing how these experiences were temporally related, we aimed to inform targeted strategies for intervention. If providers can identify when families encounter social workers, it may be possible to mitigate the consequences of child adversity exposure more effectively and bolster the probability of positive child adaptation. This knowledge could guide the development of policies that mitigate multiple experiences of risk while simultaneous reducing the financial load on service use from multisystem involved families.

1.1. The current study

(1) Our first aim was to test whether school-aged children who use emergency/transitional (E/T) housing are more likely to be involved with the CP systems compared to children who did not use E/T housing but were demographically similar. Given previous literature that has found associations between CP involvement and E/T housing (Culhane et al., 2003; Foust et al., 2020; Rodriguez & Shinn, 2016), we hypothesized that there would be a general positive relationship between the two experiences, holding other key demographic variables constant. (2) Our second aim was to evaluate whether CP involvement and E/T housing use are related to lower child school attendance and higher school mobility. Aligned previous findings finding unique association between each risk and school adjustment (Kiesel et al., 2016; Manfra, 2019; Masten et al., 2015; Miller, 2011; Piescher et al., 2014; Renner et al., 2018), we hypothesized that children who experience both of these services would have lower school attendance and higher school mobility than if they only experienced one of these risks,. (3) Our third aim was exploratory. We sought to identify if CP involvement occurred most often concurrently with or after E/T housing (Cowal et al., 2002). We also evaluated if CP investigation track placement more likely and confirmed instances of maltreatment would be less likely among families who used E/T housing compared to children who had not (Rodriguez & Shinn, 2016).

2. Methods

Data for this study were made available through the Minnesota Linking Information for Kids (Minn-LInK). The current study compiled its data from Minnesota statewide administrative data across multiple agencies including the Minnesota Automated Reporting Student System (MARSS), Social Service Information System (SSIS), and the Homeless Management Information System (HMIS). All data sources were linked together through MARSS records, and all children had to have a MARSS identifier to be included in the administrative data build. MARSS records include all children who attended a publicly funded school in Minnesota. Students attending private schools and those being home schooled were not included. Names and birthdates for children from the MARSS system were used to link children's data to other systems using the Link Plus (Registry Plus, 2010). Matches that had below a 10 % probability of being correct based on name and birthdate were dropped. Following the automatic probabilistic matching, first name, middle initial, surname, and birth date were hand matched by hand at Minn-LInK to assure the largest number of true matches. All identifiers were then removed from data files. This study was approved by the BLINDED and by collaborating state departments (i.e., data owners).

To meet inclusion criteria for the current study, children had to attend a school in the Minneapolis or St. Paul, Minnesota metropolitan area during the 2013–2014 or 2014–2015 school year. These years were selected to parallel when a population of families with school aged children took part in a pilot study that provided them with housing subsidies in order to reduce their risk for homelessness. We hoped to gather a population level understanding in the same “historical time” of how homelessness, child

protection, and child achievement were related.

All children had to be at least four years old at the start of the study and under eighteen years old by the end of the study period (i.e., school aged with the possibility of being in all administrative data sets). Children were coded as experiencing homelessness if they stayed in E/T housing between August 1, 2013 and July 31, 2015 (in alignment with the school calendar). Emergency shelters are any facility that families can stay in after experiencing a crisis. These facilities provide short-term stabilization and support services, until families can find appropriate accommodations. Transitional housing has a similar goal of providing a temporary residence. Families stay in these accommodations for six to twenty-four months on average, and there are support services to improve employability and help individuals gain permanent housing as quickly as possible. Data tracked by HMIS are data from the homeless response system that is largely funded by a variety of local, state, or federal services. These data meet the US department for Housing and Urban Development definition of literal homelessness by living in a publicly or privately operated shelter designated to provide temporary living arrangement (US Department of Housing and Urban Development, 2012). These data do contain missing information from privately funded shelters that did not wish to share their data with HMIS as well as domestic violence shelters. Based on reports of total available beds in the area compared to total beds reported to HMIS in the years 2013, 2014, and 2015, we were able to estimate that 75 % of emergency shelter beds for families with children were reported to HMIS, and 83.6 % of transitional housing beds for families with children were report to HMIS.

Ultimately, we identified 3278 children in the study time frame who were included in all subsequent analyses. We then completed a propensity score match to select a comparison group that adequately accounted for potentially confounding variables that may be related to CP involvement, attendance, and school mobility. We used a nearest neighbor approach with replacement to get a 1 to 1 match of all children who experienced E/T housing. Children were matched on age, sex, race, eligibility to received special education services, free and reduced lunch status, the homeless and highly mobile indicator in education data, CP involvement before the study time frame, and E/T housing use before the start date of the study time frame. Children in the match group also had to attend the same school during the same school year as participants in the E/T housing group. Thus, we were able to adjust for any unobserved confounding associations explained by selection into a specific school. For children who experienced E/T housing, school data were from the first school year in which they experienced homelessness.

The match was successful and there were no large standardized mean differences (e.g., SMD > 0.1) between the E/T and non-E/T groups except for children's experience of E/T housing before the study's start (Table 1). Children with current E/T status had a statistically greater likelihood of experiencing E/T before the study start and thus this unequal variation was controlled for in all subsequent analyses. Notably, this effect size was weak, ($d = 0.23$), indicating minimal imbalance. The school flag for homeless and highly mobile students was also significantly higher (based on *t*-test metrics; Table 1), but did not meet our criteria for inclusion as a control variable based on low SMD. This effect was also small ($d = 0.16$). We performed sensitivity analyses where we controlled for school identification of homeless and highly mobile, and saw no substantive differences in outcome and thus was not included in the final analyses. This process resulted in 2615 children in the matched comparison group.

Children in the final total sample were 49 % male (dummy coded as one) and 9.6-years old on average at the start of the study. Children of color were disproportionally represented in the current study sample. Although this is typical of urban students experiencing homelessness, it is markedly different from the general population in the Minneapolis-St. Paul metro area. For example, Black children represent 12 % of Twin Cities children in the general population, but 73.3 % of the current sample. Similarly, Indigenous children represent 3 % of general population, but 7 % of the study population. Additionally, we see higher rates of special education eligibility, free and reduced lunch status, E/T housing before the start of the study, and CP involvement before the start of the study compared to the general population (Table 1). The disproportional rates of risk factors among children from historically marginalized

Table 1
Children's demographic characteristics and propensity score match results.

	Emergency or transitional housing		Matched comparison group		Eligible comparison population				
	% (M)	n (SD)	% (M)	n (SD)	% (M)	N (SD)	SMD	*t*-Test	Cohen-d
Age	(9.54)	(3.57)	(9.58)	(3.63)	(9.45)	(3.66)	0.01	0.72	0.01
Male	49 %	1616	50 %	1306	51 %	363,990	0.01	0.07	0.02
Indigenous	8 %	247	6 %	157	3 %	18,615	0.08	–	–
Asian	1 %	44	2 %	52	7 %	52,261			
Hispanic	7 %	240	7 %	183	9 %	62,183			
Black	73 %	2401	76 %	1987	12 %	86,286			
White	11 %	348	9 %	236	69 %	493,063			
Special education status	26 %	851	26 %	679	15 %	105,936	0.01	0.18	0.00
Free/reduced lunch	90 %	2937	90 %	2361	7 %	226,787	0.04	–	0.01
HHM[a]	73 %	2390	65 %	1709	2 %	11,478	0.03	6.21 ***	0.16
CW[b] Involvement before AY14[c]	38 %	1249	39 %	1019	9 %	64,080	0.02	1.56	0.04
E/T[d] housing before AY14	18 %	598	14 %	365	0.2 %	1550	0.12	8.84***	0.23
Total	56 %	3278	44 %	2615		712,363			

[a] Homeless and highly mobile flag from education data.
[b] Child protection.
[c] Academic Year 2014.
[d] Emergency or transitional.

minority groups is the result of generations of systemic oppression and discrimination (Edwards, 2021; Evangelist & Shaefer, 2020; Shinn & Khadduri, 2020).

2.1. Variables

2.1.1. Education data

All participant demographic variables (e.g., sex, race, age, grade, school) were ascertained through MARSS. We also gathered information about children's special education eligibility status (coded one if eligible), free and reduced lunch status (coded one if reduced lunch, dummy code two if free lunch), school homeless and highly mobile indicator (coded one), school mobility, and attendance rate. *School mobility* was calculated by evaluating the number of school enrollment moves to any school within Minnesota over the school year. Given the low number of instances of moving schools more than once in a school year, we created a dummy variable of zero for not moved and one for moved. *Attendance* was calculated by dividing the number of days enrolled by the number of days attended.

Given that we were looking at data across two school years, education data was used from the first year that students experienced E/T housing in the study time frame. As a part of the match process, comparison students had to be in the same school during the same school year as when student's first used E/T housing. We also chose to include the school homeless and highly mobile indicators in our matching procedure because it overlaps with the HMIS definition but extends it to include children who are doubled-up, living in motels/hotels (McKinney-Vento Act (42 US Code §§11431-11435), n.d.). Including this variable in the match allowed us to specifically evaluate the experience E/T housing compared to high residential mobility in general.

2.1.2. Emergency or transitional housing

Indicators of child E/T housing came from HMIS. These indicators do not capture families who are doubled up with friends/family nor those living in places not meant for habitation (e.g., cars, parks, etc.). Families engaging with E/T housing often have limited resources elsewhere and may be experiencing a higher amount of risk and mobility than families experiencing other forms of homelessness. Further, engagement in these systems allows for more contact and support with local government systems that can provide or augment services.

Most children who used E/T housing only had one unique event of homelessness (i.e., a single instance) in the study time frame (n = 2243; 68 %). However, a number of children used these services two (n = 649; 20 %), three (n = 205; 6 %) and four (n = 112; 3 %) times in the two-year study time frame. To address aim three, E/T housing entry and exit dates were used to create a long data file, where children received a one if they were using E/T housing in any given month. We then created a series of lagged variables to denote if children had experienced E/T housing in the month following or after any given month.

The vast majority of children using E/T housing were also documented as homeless and highly mobile (HHM) by their schools (n = 2389; 73 %), but 889 (27 %) children who used E/T housing were not marked as HHM. Of children in the comparison group who did not use E/T housing, 1709 (65 %) children were identified as HHM in school data during the same year they experienced E/T housing. Schools use a broader definition of homelessness that includes all individuals who lack fixed, regular, and adequate night time residence. This definition includes doubled-up status. All students included in this study are experiencing a high amount of housing instability, and risk, but only those in the E/T housing group used E/T housing services, to our knowledge. All subsequent analyses are a fairly strict assessment of the specific role of E/T housing on CP involvement controlling for other forms/experiences of homelessness.

2.1.3. Child protection involvement

Indicators of CP involvement stem from SSIS data. All cases represent ‘accepted cases’, which means a report was made and a case was opened. This does not indicate whether families were on the family assessment or investigation track nor does it indicate if maltreatment was determined or not. Cases accepted in the CP system but placed on the family assessment track are getting assessed for additional service needs. Cases on the investigation track are tasked with determining if children are experiencing abuse or not.

Most children were involved with CP once during the study time frame (n = 960), with 254 kids experiencing it twice, and 92 kids experiencing it three or more times. The vast majority of CP cases were placed on the family services track (n = 1160; 66 %) which means that families staying in shelters most often required access to additional resources to support their family and parenting. Of those investigated (n = 592; 33 %), 356 (6 % of the entire sample) were determined to include instances of maltreatment. We also included a variable of CP involvement prior to the start date of the study in the propensity score match. Finally, to address aim three, a long data file was created where children received a one in any month in which a new CP case was opened.

2.1.4. Analytic plan

A series of logistic regression models were fitted using the base stats package in R version 3.6.1 (R Core Team, 2020) to address the first and second aims of the study because key dependent variables were binary. CP involvement for aim one was coded as a binary (not involved or involved), school attendance was bounded from 0 to 1, and school mobility also was coded as binary (did not move schools or moved schools). All regression models were weighted to account for the use of a nearest neighbor matching method with replacement. All logistic regression coefficients were transformed to odds-ratios, by taking the exponent of the coefficient. A Robust Sandwich Estimator was used to address the rare instance when siblings were included in the sample, or there were multiple treatment children in one school. HMIS involvement before the start of the study was controlled for across all analyses.

To test the interaction effect between CP involvement and E/T housing using on school outcomes, we created a variable that

indicated different risk experiences of the children. The coding had four levels, where children could experience neither risk, just CP involvement, just E/T housing use, or both risks in the study time period. We initially evaluated the effects of risk, on school attendance and mobility, with neither experience serving as the reference group. We then adjusted the reference group in order to make all relevant comparisons across coded groups.

To address aim three (i.e., the relationship between service timing), we used both children who used E/T housing, as well as a matched comparison group of kids who did not use those services. We controlled for E/T housing status prior to the study start. Further, in order to account for cumulative instances of E/T housing use, we also controlled for cumulative number of unique instances of E/T housing use. We employed a generalized estimating equation (GEE) to address aim three. This method is ideal for modeling longitudinal data that is binary and non-normally distributed. It is a semiparametric method, which imposes some structure on the data (e.g. linearity), but does not specify a distribution. Given that we had no hypotheses about the correlation structure of the data for the generalized estimating equation (GEE) models, we fit a series of baseline models (i.e., time, concurrent CP and E/T housing involvement, E/T total tally, and E/T before study start). We then evaluated model fit using QICC and determined that an exchangeable correlation structure worked best for our analyses.

To run these models, we created a long dataset of children E/T and CP service use. Children received a 1 code if they experienced a service in a given month and 0 if they did not. We then created a series of variables for E/T housing experience that were lagged forward after exiting E/T housing and backwards before entering E/T housing by 1-month increments. We fit a series of GEE models testing the effect of E/T involvement one month prior to CP involvement, concurrent with CP involvement, and CP involvement one month after E/T housing exit. All GEE models were conducted in SPSS, and had CP as the dependent variable and E/T housing use as the independent variable. When testing multiple time lags, we controlled for all nested lags in the same direction. After we determined the number of lags in each direction that were significant and improved model fit, we combined all parameters for a final GEE model (Table 2).

3. Results

3.1. CP involvement and E/T housing

Based on descriptive analyses, approximately 26 % (n = 860) of children who stayed in E/T housing also experienced CP involvement during the two-year time period, compared to 17 % (n = 446) of children in the comparison group. A chi^2 test suggested a significant difference between groups ($\chi^2 = 70.43$, $p < .001$). Using logistic regression, we found that children who experienced E/T housing at any point in the study time frame were 1.58 times more likely than the comparison group to experience CP, on average ($OR = 1.58$, 95 % CI [1.39, 1.79], $z = 6.16$, $p < .001$).

3.2. School mobility and attendance

Both CP involvement and E/T housing showed unique relations with lower school attendance. Children who experienced both E/T housing and/or CP attended school less often compared to peers that had neither of those experiences in the same school year (Fig. 1). Children who experienced only E/T housing attended 3 % fewer days of school on average, compared to children with no experiences of E/T housing or CP ($B = -0.23$, 95 % CI [-0.31, -0.15], $z = -5.19$, $p < .001$). Children who were involved with CP but did not use E/T housing attended 5 % fewer days of school on average ($B = -0.37$, 95 % CI [-0.51, -0.23], $z = -5.19$, $p < .001$) compared to those with neither experience. Attendance rates for experiencing only one of the risks (e.g., either E/T housing or CP involvement), was not significantly different from the attendance rate for children who experienced the other risk (with E/T Housing only as reference group; $B = 0.13$, 95 % CI [-0.01, 0.27], $z = -1.88$, $p = .06$).

Children who experienced both CP and used E/T housing attended 6 % fewer days on average ($B = -0.41$, 95 % CI [-0.51, -0.31], $z = -7.91$, $p < .001$) compared to those with neither experience. Experiencing both risks had significantly lower attendance rates compared to only experiencing E/T housing (E/T housing and CP as reference group; $B = 0.17$, 95 % CI [0.07, 0.27], $z = 3.78$, $p < .001$), but it was not significantly different from only experiencing CP (E/T housing and CP as reference group; $B = -0.04$, 95 % CI

Table 2
GEE of E/T housing on CP involvement.

	B (SE)	CI	Wald	*p*-Value	OR	OR CI
Intercept	4.76 (0.07)	4.90 to 4.63	5105.46	<.001	0.01	0.007–0.01
Time	0.02 (0.004)	0.01–0.02	11.75	.001	1.02	1.01–1.02
E/T housing Concurrent	0.83 (0.10)	0.63–1.03	63.02	<.001	2.29	1.87–2.81
E/T housing 1 month prior	0.34 (0.12)	0.59 - -0.10	7.78	.005	0.71	0.56–0.90
E/T housing Exit lag 1 month	0.49 (0.11)	0.27–0.711	19.11	<.001	1.63	1.31–2.04
E/T total tally	0.12 (0.02)	0.08–0.16	32.30	<.001	1.12	1.08–1.17
E/T before 2013	0.32 (0.08)	0.17–0.48	17.03	<.001	1.38	1.19–1.61

Note: QIC = 18,507.32; QICC = 18,502.20.

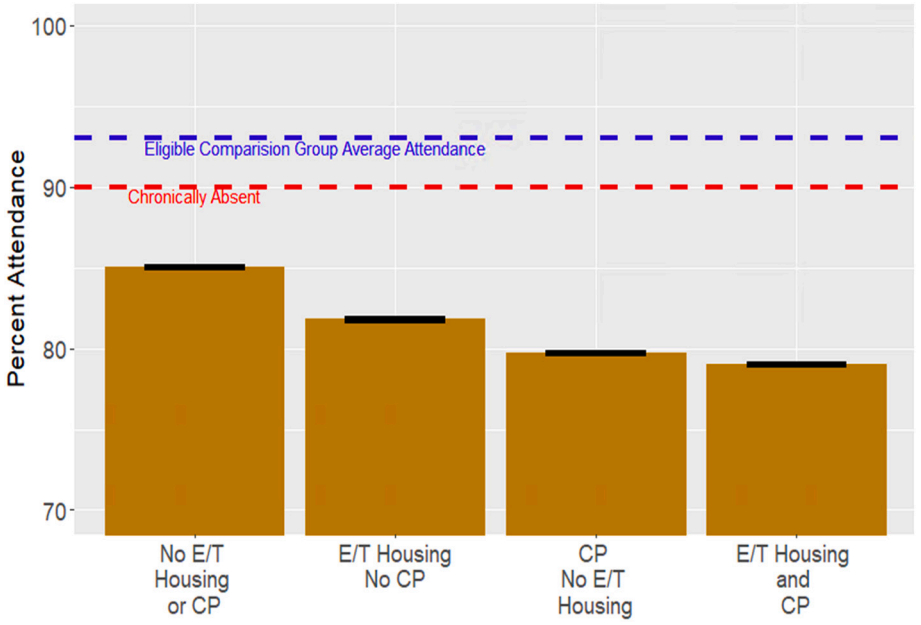

Fig. 1. Percent attendance based on experiences of emergency/transitional (E/T) housing and child protections (CP). The red dotted line notes the 90 % attendance line. The blue dotted line denotes the average attendance for the eligible comparison group. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

[0.19, 0.11], $z = 0.55$, $p = .58$).

The overall attendance rates of the children in this study were quite low compared to national and state averages. The national average is 95 % days attended (U.S. Department of Education, 2013). Based on our administrative data, Minnesota students in the 2014 and 2015 school year had an average attendance of 92 % and students in our eligible comparisons group had an average attendance of 93 % compared to our final dataset's average attendance rate of 84 %. Students with attendance rates below 90 % are often considered "chronically absent" and by this criterion the average attendance of the sample was in this range.

Results also support the hypothesis that experiences of E/T housing and CP are risk factors for greater school mobility, controlling for E/T housing use before the start of the study. Children who experience only E/T housing ($OR = 1.3$, 95 % CI [1.15, 1.45], $z = 3.93$, $p < .001$) or only CP ($OR = 1.3$, 95 % CI [1.10, 1.63], $z = 2.36$, $p < .05$) were 1.3 times more likely to move schools compared to experiencing neither of these risk factors. Children who experience both E/T housing and CP were 1.5 times more likely to move schools ($OR = 1.5$, 95 % CI [1.25, 1.71], $z = 4.44$, $p < .001$) compared to experiencing neither of these risks. Experiencing both risks did not pose a significant difference in the odds of experiencing school mobility from experiencing either just E/T housing ($OR = 0.88$, 95 % CI [0.76, 1.04], $z = 1.55$, $p = .12$) or just CP ($OR = 0.91$, 95 % CI [0.74, 1.13], $z =$ 0.68, $p = .50$). Further, experiencing one of these risk factors, such as E/T housing, did not significantly affect the odds of experiencing school mobility, compared to experiencing the other risk factor (i.e., CP; $OR = 1.03$, CI [0.75, 1.25], $z = 1.55$, $p = .12$).

3.3. Timing effect of E/T housing on CP involvement

To evaluate the temporal effects and ordering of services, we examined the date of all E/T housing involvement subtracted from the date of all CP involvement. The average distance from entering E/T housing to the opening of a CP case was 10.86 days with a mode of 1 day. This means that children often entered E/T housing before CP involvement because the number of days was in the positive direction. We then descriptively evaluated the distance from children's *first* experience of E/T housing in the study time frame to all CP events. The direction of the effect became more pronounced with the mean number of days from the first experience of E/T housing to CP involvement being 46.15 days and the mode being 0 days. This means that of the children involved in both systems, when they entered E/T housing for the first time a CP case was then opened on the same day.

The final GEE model (Table 2) indicated that E/T housing use was related to a within-person increased likelihood that a CP case would be opened within the same month. Further, 1 month after exiting E/T housing, there was also an increased with-in person likelihood that a CP case would be opened. Holding the experience of pre-study E/T housing use, total E/T housing use, the experience of use of E/T housing use one month prior, as well as E/T housing use one month after constant, the odds of CP involvement were twice as great in a month in which families were in E/T housing compared to months in which they were not in E/T housing. In the month after exiting E/T housing, families had a 1.63 greater odds of CP involvement. Children were also approximately 0.29 times less likely to experience CP if they experienced ET in the month following CP involvement. The effect size of the contemporaneous effect was functionally identical when estimated on its own, suggesting that there is no explained carryover effect when accounting for lagged

relationships. A two- and three-month delay between services were evaluated but results were not significant.

Between-person positive relations were also evident – albeit, weaker. On average the odds of CP involvement were 1.12 times higher for each additional month of E/T housing use across the study time span. Further, E/T housing use prior to the start of the study was associated with a 1.41 greater odds of CP involvement during our study span (Table 2).

Finally, we evaluated the relation between E/T housing on being placed on the CP investigation track. Results suggested no relationship between concurrent E/T housing experiences and an increased chance of being placed on an investigation track. Further, we evaluated the relationship between E/T housing on having a determination of maltreatment. There was also no significant relationship. This result suggests that there is no difference in odds of investigation or maltreatment determinations if children experiencing E/T housing. However, there are increased of involvement in CP in general.

4. Discussion

The purpose of this study was to understand how experiences of E/T housing are related to CP involvement. Further, we aimed to evaluate how experiences with both systems may confer risk for school mobility and attendance. Children who experienced both E/T housing and CP had lower school attendance compared to children just experiencing E/T housing. However, it was not significantly different than experiencing only CP involvement. Contrary to cumulative risk theories, experiencing both risks was also not significantly different than experiencing just one of the risk factors on school mobility. However, all combinations of risk were related to decreased school attendance and increased school mobility compared to children who had neither experience. These findings align with previous research in Minnesota (Kiesel et al., 2016; Piescher et al., 2014; Renner et al., 2018) and studies in other populations that suggest both these experiences of adversity have been related to lower school engagement and performance (Eckenrode et al., 1995; Manfra, 2019; Perlman & Fantuzzo, 2010). This study is the only study to our knowledge that directly evaluated the cumulative effects of E/T housing and CP involvement among school aged children. Children's involvement in either of these systems likely captures the same variability in risk to school attendance and mobility. Evidence that both E/T housing and CP involvement are markers for student outcome suggests that more service targeted toward these populations could be important.

We also found that there was an increased risk for experiencing CP during the two-year study time period if someone also used E/T housing. This is in line with theory suggesting that the experience of one adversity (e.g., homelessness) increases the likelihood of experiencing other adversities (e.g., child maltreatment, McEwen & McEwen, 2017). In other words, risk predicts risk, and adverse experiences can accumulate in the lives of children (Evans et al., 2013; Masten & Sesma, 1999). In combination, aim one and aim two findings may reflect an unfolding period of family stress and instability. This supports the need for a multisystem approach to assist families across multiple social services and educational services. There is some research support that programs such as Keeping Families Together (Swann-Jackson et al., 2010), and other housing interventions, including Homework Starts with Home (Menne & Urbanski, 2021), are poised to strengthen the coordination of care and support for multisystem involved families. Incorporating and providing services through school setting could strengthen those services, given the heightened access to children where services can be consolidated and easily delivered.

We also found that E/T housing often occurred concurrently with CP involvement or CP involvement occurred one-month after exiting E/T housing. Longer time lags from E/T housing to CP and after E/T exit were not significant. This may suggest that involvement with these systems were a part of the same crisis event for families. Providing a path to housing stabilization or preventing homelessness to begin with may be a key lever to encourage family adaptation. Currently there are efforts in Minneapolis and St. Paul, Minnesota to increase school engagement by providing housing vouchers to families with school aged children experiencing homelessness. Given the relation between E/T housing occurring before or concurrently to CP involvement at the population level, it is possible that interventions that prevent homelessness or that occur at the onset of entering E/T service, may also reduce or improve children's experiences with CP. Assisting families in finding stable housing may help stop a cycle of negative events by enhancing resources and ultimately family and children's adaptive success across contexts. This could result in less time in out of home placement, or even prevent involvement to begin with (e.g., Dworsky, 2014; Shinn et al., 2017; Swann-Jackson et al., 2010).

A two-generation approach for families who do use E/T housing could also boost the adaptive success of family members across contexts. It may be helpful to offer preventative services such as the Parent Support Outreach Program to reduce the number of CP referrals. The Parent Support Outreach Program provides early intervention services and community resources to help meet families short term needs. This includes help with basic needs, health, parenting, transportation, childcare, and budgeting (Parent Support Outreach Program, 2021).

Results also suggested that while there is a strong association between E/T housing service and CP referral, there was no relationship between E/T housing use with experiences of CP investigation nor maltreatment. This is consistent with a study evaluating the relationship between CP involvement and shelter use in San Francisco county. Investigators found no relationship between child shelter involvement with case investigation status nor with child removal (Rodriguez et al., 2020). It is also consistent with findings among school aged children in Alameda County, California, were investigators found a relationship with CP referral but not with investigation, allegation, or child removal (Rodriguez & Shinn, 2016).

This pattern of results could stem from a variety of reasons and warrants further evaluations in order to understand the why these systems are associated. The most optimistic is that the CP systems are doing an adequate job in identifying families in need of additional services, without engaging in punitive investigation practices. Additionally, this could be evidence of the “fishbowl effect” when families enter E/T shelter and are more likely to be flagged for the CP system for less serious offenses because of increased monitoring. This may then point to a need for E/T housing staff to be trained on what constitutes CP referrals. It may also suggest that families using E/T housing need additional services not typically available in E/T housing such as preventative interventions that aim

to decrease parental stress and increase positive parenting behaviors. Anecdotally, parent stress groups, mental health services, day care services, developmental education, and parenting education classes may all be helpful to integrate into wrap-around care for families experiencing homelessness.

A notable strength of this study is that the results represent a reasonably strict test of the relationship between E/T housing and CP involvement. The study sample is drawn from a Minnesota population-wide administrative data set and we utilized a propensity score matching method that afforded a stronger causal assessment of the unique and specific role of E/T housing on our outcomes of interest – holding constant a host of other demographic factors that could have otherwise explained the relationship. As a result, all students included in the current study are racially diverse and likely have a range of adverse experiences, including other forms of homelessness. The process also illuminated the structural and racial disparities that families in Minneapolis and St. Paul Minnesota face. Our comparison group still had substantially lower school attendance compared to the general population and would be considered chronically absent, on average. These system-wide issues, deeply rooted in historical and ongoing racism – need to be addressed via collaborations across community, government, and service sectors.

Further, this study illustrates the importance of cross-system collaborations and data integration in answering questions about systemic risk. Administrative data integration can highlight families involved with multiple systems, illuminating far-reaching effects of systemic racism, as well as identifying potential conditions, timing, or targets for change/intervention. Administrative date integration is growing across the United States (Kitzmiller & Burnett, 2015). Policy, funding, and training for local communities of care informed by integrated administrative data project could help identify what workers need know about other service systems in their area, and how often families are navigating across them. It is important to bolster the coordinated entry system and increase access to affordable housing. Some counties in Minnesota have created resources to assist with cross-sector collaborations, and it could be advantageous to think about how those collaborations are improving services to families.

The administrative data available to this study do not include all the potential risk factors relevant to children nor do they assess many of the key resources or protective factors associated with child positive adaptation in the face of homelessness. Data also likely underrepresent E/T housing use and do not capture all forms of family homelessness. This includes emergency shelter use not including data on domestic violence. Residing in domestic violence shelters is often associated with CP involvement due to concerns for a child's exposure to domestic violence and other forms of maltreatment. Nonetheless, a strength of this study is the likelihood that it did capture the general risk associated with housing crises that often leads to families use of E/T housing services. This risk seems to be above and beyond the risks associated with other indicators and definitions of homelessness, that were captured in this study by the broader school data HHM flag. Further, the use of integrated HMIS data allowed for us to track temporal patterns of homelessness across the year, while the HHM flag is a single indicator for the whole school year. This study also uniquely provides an evaluation of the impact of children's involvement with these services on children's school attendance and mobility.

Additional research is necessary to understand the mechanisms linking homelessness among children and CP involvement, especially in early childhood. Experiencing homelessness in the first five years of life increases the likelihood of attention problems, psychopathology, and cognitive difficulties through adulthood (Fowler et al., 2014; Fowler et al., 2015; Kovan et al., 2014; Ziol-Guest & McKenna, 2014). Future studies should also evaluate how systemic and cross system interventions can reduce risk for child maladjustment and better stabilize families.

Data availability

The authors do not have permission to share data.

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