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An Honors-In-Discipline Thesis

by

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According to the Centers for Disease Control and Prevention (CDC; 2019), one in seven children have experienced abuse and/or neglect within the past year. Adverse childhood experiences such as these have been consistently identified and examined across a range of empirical studies. These include findings from the Adverse Childhood Experiences (ACE) survey. Initially evaluated within Kaiser Health Plan members, the ACE questionnaire was used to examine the relationship between childhood experiences that occurred before the age of eighteen and later physical health outcomes in adulthood. The resulting questionnaire consisted of ten items across three categories, including indicators of abuse, neglect, and household dysfunction. A dose-response relationship between cumulative ACEs and adult outcomes was identified; as the number of ACEs increased, the likelihood of experiencing poor health also increased (Felitti et al., 1998). This led to further investigation of the impact of these experiences on other outcomes in adulthood (Felitti et al., 1998) and a recognition that ACEs not only affect adults physically, but mentally and emotionally as well.

Since its initial use, the ACE survey has been used to associate ACEs with mental and behavioral health problems in adulthood (Anda, Felitti, & Brown, 2010; Felitti et al., 1998). As is true with regard to physical health outcomes, as the occurrence of ACEs increases, the likelihood of experiencing a range of other negative outcomes also increases. This includes substance abuse, risky sexual behaviors, suicidality, depression, emotional dysregulation, and diagnosis of trauma-related disorders (Espleta et al., 2018; Lew & Xian, 2019; Ramakrishnan et al. 2019; Van Niel et al., 2014).

ACEs and associated negative outcomes are often interrelated. For example, those with one ACE were two to eighteen times more likely to experience another ACE than individuals with no ACEs (Dong et al., 2003). Ultimately, the number of ACEs positively correlates with the number of negative outcomes that an individual may experience (Font & Maguire-Jack, 2016; Mandelli, Petrelli, & Serretti, 2015; Putnam, Harris, Putnam, 2013). Differential rates of ACEs have also been researched within gender and racial and ethnic groups. In the original ACE study, African-Americans (20%) and Latinos (19%) were more likely to experience three or four ACEs than were Caucasians (13%); however, recent research has found that African-Americans are often more likely to experience higher rates of ACEs than Caucasians and Latinos (Felitti et al., 1998; Maguire-Jack et al., 2020). Though African-Americans are more likely to experience ACEs at higher rates, research has shown that certain ACEs, including physical and familial sexual abuse, are often reported more by Caucasians (Schilling, Aseltine, & Gore, 2007). These unreported ACEs have been attributed to the fact that African-Americans are more likely to experience social and structural factors (i.e. poverty, discrimination, and substandard pay) that may deter them from reporting ACEs and are also hesitant to disclose personal familial issues, both of which may result in a misdiagnosis of related problems (Davis & Winkleby, 1993). ACEs have also been examined with regard to sex differences as well. Among participants from the original ACE study sample, females reportedly experienced more ACEs than males (Felitti et al., 1998; Petruccelli, Davis, & Berman, 2019). ACE outcomes differences between males and females, however, have demonstrated inconsistent results. Males were found to engage in more alcohol abusive related behaviors, experience emotions related to delinquency and crime and be more likely to engage in delinquent behaviors than females in relation to their ACEs (Broidy & Agnew, 1997; Loudermilk et al., 2018; Maas, Herrenkohl & Sousa, 2008). On the other hand,

females have been found to experience more mental health disorders, engage in more internalizing responses, and be more likely to engage in substance abuse behaviors than males when ACEs are present (Craig et al., 2019; Broidy & Agnew, 1997).

More recently, the exploration of ACEs and their lasting effects have been narrowed to considerations within specific populations. Some groups represent differential accumulated risk, with ACEs that are more prevalent and a more intensified dose-response relationship between ACEs and important outcomes. One such population evidencing increased risk are those who are involved in the justice system. Adults who have experienced ACEs are more likely to engage in criminal behavior, and thus, more likely to become involved with the legal system (Courtney & Maschi, 2013). Adults who have engaged in the illegal use of drugs and alcohol, violent crimes, and sexual offending exhibit significantly higher ACE scores than non-offending adults in the general population (Harlow, 1999; Levenson, Willis, & Prescott, 2014).

Comparison studies of justice-involved youth and the Kaiser Health plan members from the original study indicate that justice-involved youth are 13 times less likely to have zero ACES, and four times more likely to have ACE scores of four or higher (Baglivio et al., 2014). More specifically, youth who have experienced child abuse and/or witnessed domestic violence are more likely to demonstrate increased likelihood of externalizing and internalizing behavior problems in adolescence (Moylan et al., 2010). Externalizing behaviors, particularly aggression, has been seldom researched with regard to onset and number of ACEs. In a sample of adult inpatients residing in secure forensic psychiatric care, with each additional ACE reported, likelihood of a history of any juvenile aggression increased by 44.2%, and a history of juvenile aggression prior to the age of 12 increased by 45.4% (Stinson, Quinn, & Levenson, 2016). ACEs have also been linked to earlier onset of arrest and chronic offending. In an examination of

justice-involved youth in Florida, higher numbers of ACEs were associated with an earlier age at first arrest and an increased likelihood that this arrest would occur from childhood through late adolescence (Baglivio et. al, 2015).

We additionally know that higher rates of ACEs are associated with specific types of criminal outcomes as well, including the likelihood of becoming a serious, violent, and/or chronic (SVC) offender. For example, in a sample comparing SVC offenders who have aged out of the juvenile system and one-and-done (O&D) offenders, SVC offenders had twice the number of ACEs than O&D offenders. Furthermore, with each ACE experienced, the risk of becoming a SVC offender increased by 35%, with physical abuse and having an incarcerated household member being the two most prevalent predictors (Fox et al., 2015). Similarly, in a sample of young adults with an official record of juvenile criminal offenses, having an incarcerated household member strongly predicted an official record of juvenile delinquency and continued criminal engagement in adulthood (Basto-Pereira et al., 2016). Similarly, higher numbers of ACES are associated with chronic offending through adulthood (Baglivio et al., 2015).

As the link between ACEs and juvenile criminal offending becomes clear, there is a need to investigate the relationship between ACEs, youth offending, and various forms of out-of-home placement. Out-of-home placement refers to any alternative environment that in which an individual youth is placed as a result of the need for formal removal from their home of origin. These placements may include a range of environments, such as foster care, juvenile detention center, residential treatment facility, other family members' homes, psychiatric hospitals, group homes, and the like. Youth may be placed outside of the familial home for numerous reasons; however, these placements are intended as interventions in response to adverse or harmful experiences within their home of origin and would ideally create a stable developmental

environment (e.g., Hall, Stinson, & Moser, 2017, Degue & Widom, 2009). Extant literature suggests mixed findings with regard to out-of-home placements and positive outcomes in children and youth.

Children placed in out-of-home placements evidence significantly more historical ACEs than children who remain in their homes. In a study evaluating findings from the National Survey of Children's Health, researchers found that children in nonparental care were 30 times more likely to have experienced four or more ACEs than children raised in a two-biological-parent home. It was reported that more than half of children in foster care had experienced caregiver violence or caregiver incarceration, and almost two-thirds had lived with someone who had a drug or alcohol problem (Bramlett & Radel, 2014). Not only do these children experience an increased rate of ACEs, but an increased likelihood of adult criminality (Loeber & Farrington, 2011), delinquency (Garrido, Weiler & Taussig, 2017) placement instability (Zima et al., 2000, Landsveerk et al., 1996), and longer stays within out-of-home care (Connel et al., 2006). Such findings suggest that ACEs not only have a cumulative effect but also that at-risk youth are experiencing ACEs and associated negative outcomes at significantly higher rates.

There is also evidence that the timing and age at which youth are placed in out-of-home care can impact later outcomes as well. For example, in one study evaluating child welfare via Medicaid records in Illinois, children who were placed in a residential care facility as their first placement were almost three times more likely to experience three or more placements than children placed in other settings for their first placement (Park & Ryan, 2008). Increased risk of placement instability is also known to be associated with youth of older ages (James, 2004). The presence of older youth in out-of-home care is associated with entry into residential care (James et. al., 2006, Potter & Burns, 2005) and the increased usage of mental health services (Leslie et.

al., 2000). Furthermore, youth who are placed in their first placement after seven years of age are to seven times more likely to be arrested as an adult, ten times more likely to be arrested as a juvenile, and five times more likely to have a violent arrest than is true of children who were placed before the age of one. This suggests that perhaps children with fewer placements, early intervention in the home, and environmental stability may exhibit decreased involvement with out-of-home care and/or the justice system in later life (Widom, 1991; Reid & Barth, 2003; McMahon & Claywarner, 2002). These findings suggest a continuing impact of timing and persistence of an out-of-home placement on later outcomes, which are likely interrelated with early experiences of ACEs and evidence of emerging behavioral problems.

The purpose of the current study is to evaluate the relationship between both ACEs and evidence of aggression or behavioral problems and the onset and persistence of out-of-home placements. The following hypotheses guide the current research:

1. Youth with higher ACE scores and earlier onset of individual ACEs will exhibit earlier and longer placement in out-of-home care.
2. Onset and seriousness of aggression and behavioral problems, including problematic sexual behavior, will result in earlier and longer placement in residential-based out-of-home placements and incarceration, as compared to youth in family-based placements.
3. Different forms of individual ACEs and youths' behavioral problems will differentially impact onset, type, and length of out-of-home placements.

Methods

Participants. The sample ($N = 295$) consisted of 290 males and 5 females. The mean age was 14.8 years at time of first admission ($SD = 1.56$; range: 10-17 years). The sample was

minimally diverse with regard to ethnicity: 83.1% Caucasian, 9.5% African American, 0.7% Hispanic, 4.4% mixed race, and 2.4% unspecified. The majority of participants were referred by the state's Division of Children's Services (68%), while others were referred by court representatives (20%), parents/guardians (3%), mental health providers (4%), insurance representatives (0.7%), or others (0.3%). These referrals were often used as an alternative to formal legal sanctioning (i.e., court diversion). Prior to admission, the majority of participants were residing in either a family member's home (40.3%), residential care (78.3%) and/or foster care (48.4%), though others came from group homes (37.3%), inpatient care (36.9%), and/or a friend's home (4.4%). The majority had only one admission to the current facility (89.5%), while approximately 10% had two or more admissions.

Procedures. Archival records were collected from a nonprofit inpatient treatment facility for adolescents who have engaged in sexually abusive behaviors. Youth who are admitted into the facility must complete a structured program prior to discharge. Available records primarily consisted of admission and discharge summaries, school records, legal documents, criminal records, and psychological testing results. The primary investigator obtained IRB access to protected yet deidentified data, which were coded by trained graduate and undergraduate research assistants. Predictor variables of interest include those related to ACEs, indicators of whether or not specific events or behaviors resulted in an episode of out-of-home placement, and ages of onset of aggressive, illegal, and suicidal behaviors. Outcome variables of interest include age at first episode of varying types of out-of-home placements, as well as aggregated duration of time spent in those types of out-of-home placements. Variables and how they are coded for the purposes of analysis are presented below in Table 1.

Table 1. Variable descriptions and coding procedures.

Independent variables	
Variable name	**Variable coding**
Total ACE score	Summary of yes/no occurrences of ten specific ACEs; final variable will range from 0-10.
Physical abuse before age of 18	Yes = 1, No = 0
Age at first occurrence of physical abuse	Age in years
Intrafamilial sexual abuse before age of 18	Yes = 1, No = 0
Age at first occurrence of intrafamilial sexual abuse	Age in years
Neglect before age of 18	Yes = 1, No = 0
Age at first occurrence of neglect	Age in years
Domestic violence within the home before age of 18	Yes = 1, No = 0
Age at first occurrence of exposure to domestic violence within the home	Age in years
Exposure to parental substance abuse before age of 18	Suspected = 2, Yes = 1, No = 0
Age at first exposure to parental substance abuse	Age in years
Out-of-home placement resulting from participant's own behavioral problems	Yes = 1, No = 0
Out-of-home placement resulting from participant's own problematic sexual behaviors	Yes = 1, No = 0
Out-of-home placement resulting from parental abuse and/or neglect	Yes = 1, No = 0
Out-of-home placement resulting from parental incarceration	Yes = 1, No = 0
Participant's age at first aggression	Age in years
Participant's age at first arrest	Age in years
Participant's age at first nonsexual violent arrest	Age in years
Participant's age at first sexual arrest	Age in years
Participant's age at first suicide attempt	Age in years
Dependent variables	
Variable name	**Variable coding**
Participant's age at first out-of-home placement	Age in years
Participant's age at first placement in a family home (e.g., home of aunt, grandparents)	Age in years

Participant's age at first placement in a friend's home	Age in years
Participant's age at first placement in foster care	Age in years
Participant's age at first placement in a group home	Age in years
Participant's age at first placement in residential care	Age in years
Participant's age at first placement in inpatient psychiatric care	Age in years
Participant's age at first incarceration	Age in years
Total length of time in out-of-home placements (pre-admission)	Length in years
Total length of time in placement in a family home (e.g., home of aunt, grandparents)	Length in years
Total length of time in placement in a friend's home	Length in years
Total length of time in placement in foster care	Length in years
Total length of time in placement in a group home	Length in years
Total length of time in placement in residential care (pre-admission)	Length in years
Total length of time in placement in inpatient psychiatric care	Length in years
Total length of time incarcerated	Length in years

Analytic Plan. Due to small numbers of individuals with available data in some categories of outcome variables, outcomes were collapsed into three major groups: 1) family-based placements (to include placements in the home of other family members, friends, and foster care), 2) residential-based placements (to include placements in group homes, residential care, and inpatient psychiatric facilities), and 3) incarceration. Ages at first placement and length of time in these placements were calculated and used for the purposes of the analyses. Please refer to Table 2 for descriptive reports of predictor and outcome variables.

Table 2. Descriptive data for independent and dependent variables, $N = 295$.

Independent Variables

Variable	*n* (%)	Mean	*SD*	Range
Total ACE score		4.99	2.700	0-10
Physical abuse before age of 18	150 (50.8)			
Age at first occurrence of physical abuse		3.61	4.003	0-16
Intrafamilial sexual abuse before age of 18	123 (41.7)			
Age at first occurrence of intrafamilial sexual abuse		5.14	3.283	0-14
Neglect before age of 18	132 (44.7)			
Age at first occurrence of neglect		2.67	4.145	0-15
Domestic violence within the home before age of 18	122 (41.4)			
Age at first occurrence of exposure to domestic violence within the home		2.51	3.966	0-16
Exposure to parental substance abuse before age of 18	190 (64.4)			
Age at first exposure to parental substance abuse		0.84	2.499	0-16
Out-of-home placement resulting from participant's own behavioral problems	116 (39.3)			
Out-of-home placement resulting from participant's own problematic sexual behaviors	195 (66.1)			
Out-of-home placement resulting from parental abuse and/or neglect	108 (36.6)			
Out-of-home placement resulting from parental incarceration	21 (7.1)			
Participant's age at first aggression		9.13	3.763	2-17
Participant's age at first arrest		13.29	1.906	7-17
Participant's age at first nonsexual violent arrest		13.23	1.888	8-17
Participant's age at first sexual arrest		13.93	1.609	8-17
Participant's age at first suicide attempt		13.11	2.455	6-17

Dependent Variables

Variable	Mean	*SD*	Range
Age at 1st family-based placement	8.67	5.377	0-18
Total length of family-based placements, in months	2.51	4.042	0-18
Age at 1st residential-based placement	12.83	2.884	1-17
Total length of residential-based placements	1.55	1.500	0-17
Age at 1st incarceration	14.24	1.419	11-18
Total length of incarceration	0.149	0.2708	0-2

Correlational analyses using the Pearson's *r* statistic were performed to determine significant associations between predictor variables and each of the outcome variables (see Table 3 within Results section, below). Predictors significantly correlated with a given outcome were

retained and used in multiple linear regression analysis (backward). All descriptive, correlational, and regression analyses were performed using SPSS version 26.

Results

Data describing occurrences of ACEs were available for all 295 youth within the sample. Their mean ACE score was 4.99 (*SD* = 2.700, range 0-10), with only 4.4% reporting no experiences of ACEs, and 67.4% reporting a history of four or more ACEs. As is evident from Table 2 above, many within the sample experienced their first ACE prior to the age of five. On average, these youth experienced early onset of neglect (*M* = 2.67, *SD* = 4.145, range 0-15) and domestic violence (*M* = 2.51, *SD* = 3.966, range 0-16) within their homes, occurring prior to the age of three. It was also notable that many participants in this sample were exposed to parental substance abuse before the age of one (*M* = 0.84, *SD* = 2.499, range 0-16). Findings regarding ages at which the youths' own behavioral problems emerged suggested that their onset of aggression occurred around the age of nine (*M* = 9.13, *SD* = 3.763, range 2-17). Consequently, their age at first arrest patterns and age at first suicide attempt appeared to occur later in childhood at around the age of thirteen.

On average, participants had resided in a mean of approximately five out-of-home placements (*M* = 5.07, *SD* = 5.867, range 0-64) prior to their admission to the current residential treatment facility. With regard to the outcome variables describing initiation and length of placement, results suggest that these youth were placed in family-based placements at younger ages and for longer periods of time. Many of the participants were later moved to residential-based placements by the age of twelve, with a mean stay of 1.5 years. Youth who were incarcerated were older at the time of their incarceration and remained in juvenile detention for less than a year, on average.

Below, please find the correlational data used to determine which predictors significantly correlated with outcomes of interest. Higher ACE scores were associated with younger first placement ages and longer stays in both family-based and residential-based placements. More specifically, the presence of physical abuse within the home was associated with a younger age at first family-based placement and longer stays in family-based and residential-based placements. Experience of neglect within the home was linked to both younger ages at first family-based and residential-based placements, as well as longer stays within both types of placements. Exposure to parental substance abuse was associated with longer stays in family-based placements, younger ages at first residential-based placement and interestingly, longer lengths of incarceration. There were also significant relationships between out-of-home-placements and the participants' behavior. Out-of-home placements resulting from the participant's own behavioral problems were associated with longer stays in family-based and residential-based placed placements, as well as younger ages at first residential-based placements. Out-of-home placements resulting from the participant's own problematic sexual behaviors were associated with longer stays in residential-based placements and incarceration. Surprisingly, older age at first suicide attempt was associated with older age at first incarceration. Lastly, it appeared that out-of-home placements resulting from the parents' behavior (i.e., incarceration and abuse/neglect) were associated with both younger ages and longer stays in family-based placement. Significant relationships, bolded within the table, yielded predictor variables for subsequent linear regression analyses.

Table 3. Pearson's *r* correlations between predictors and outcomes.

Predictors,	Age at 1st family-	Total length of family-	Age at 1st residential-	Total length of residential-	Age at 1st incarceration	Total length of incarceration

	based placement	based placements	based placement	based placements		
Total ACE score	**-.180***	**.324*****	**-.257*****	**.381*****	.041	.092
Physical abuse before age of 18	-.111	**.238*****	**-.130***	**.343*****	-.020	.084
Age at first occurrence of physical abuse	.226	**-.237***	.137	-.114	-.141	.033
Intrafamilial sexual abuse before age of 18	-.037	.036	**-.135***	**.163***	.009	.013
Age at first occurrence of intrafamilial sexual abuse	**.263****	-.114	.012	-.177	.118	.041
Neglect before age of 18	**-.216****	**.347*****	**-.175****	**.267*****	-.062	-.022
Age at first occurrence of neglect	.175	-.192	.088	-.046	.152	.036
Domestic violence within the home before age of 18	-.016	.089	-.160	**.213****	-.099	**.156***
Age at first occurrence of exposure to domestic violence within the home	.144	.034	.214	-.023	-.058	.017
Exposure to parental substance abuse before age of 18	-.120	**.207****	**-.213****	.125	.094	**.133***
Age at first exposure to parental substance abuse	.099	-.123	.010	-.067	-.008	.119
Out-of-home placement resulting from participant's own behavioral problems	-.075	**.194****	**-.213****	**.431*****	.076	.088
Out-of-home placement resulting from participant's own problematic sexual behaviors	-.083	.119	.027	**.213****	-.106	**.214*****
Out-of-home placement resulting from parental abuse and/or neglect	**-.283*****	**.445*****	-.111	**.291*****	.046	-.033
Out-of-home placement resulting from parental incarceration	**-.160***	**.191****	-.115	.006	.003	-.001
Participant's age at first aggression	.009	-.109	**.352*****	**-.266****	-.026	.115
Participant's age at first arrest	**.184***	-.012	.119	-.103	**.590*****	.034
Participant's age at first nonsexual violent arrest	.270	-.270	**.292***	.049	**.492***	-.171
Participant's age at first sexual arrest	.107	-.002	.103	-.008	**.770*****	.079
Participant's age at first suicide attempt	.117	-.030	**.392****	-.121	**.535***	-.084

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Multiple linear regression models examining the relationships between predictor variables and outcome variables related to onset, length, and type of out-of-home placements yielded varying, yet interesting, results. The first regression model examined the impact of proposed predictors on age at first placement in an out-of-home, but family-based (i.e., other family member's home, friend's home, or foster home) placement. A significant model emerged after four iterations ($F = 4.622$, $p = 0.007$, adjusted $R^2 = 0.188$). Predictors of age at first family-based placement included the age at which intrafamilial abuse began, the presence of parent abuse/neglect in the home, and the age at first arrest. Regression results for this and subsequent models are reported below in Table 4. The second model evaluated relationships between ACEs and participants' behavior on cumulative length of time spent in family-based out-of-home placements. A significant model emerged after seven iterations ($F = 7.374$, $p = 0.001$, adjusted $R^2 = 0.137$). Predictors of increased time in family-based placements included earlier age at which physical abuse began and having at least one placement due to parental abuse or neglect (see Table 4).

Regression analyses examining onset and length of residential-based out-of-home placements similarly produced significant models. The third model evaluated the impact of the proposed predictors on the age at first residential-based placement (i.e., group home, residential care, and inpatient psychiatric care). A significant model emerged after six iterations ($F = 22.007$, $p < 0.001$, adjusted $R^2 = 0.890$). Significant predictors of age at first residential-based placement included total ACE score, the presence of intrafamilial sexual abuse, placement outside of the home due to the patient's own behavioral problems, age at first aggressive behavior, and age at first suicide attempt (see Table 4). The fourth model assessed the relationship between ACEs and the participants' behavior on the overall length of time spent in

residential-based placements. A significant model emerged after six iterations ($F = 13.804$, $p < 0.001$, adjusted $R^2 = 0.286$). Predictors of increased time in residential-based placements included the presence of physical abuse within the home, placement outside of the home due to the patient's own behavioral problems, placement outside of the home due to the patient's inappropriate sexual behaviors, and age at first aggressive behavior (see Table 4).

Analyses of predictors for onset and length of youth incarceration were significant, though with fewer significant predictive variables. The fifth model examined the impact of the proposed predictors on the age at first incarceration. A significant model emerged after three iterations ($F = 6.690$, $p = 0.020$, adjusted $R^2 = 0.532$). Significant predictors of age at first incarceration included age at first sexual offense arrest and age at first suicide attempt (see Table 4). The sixth model assessed the correlation between ACEs and the participants' behavior on the collective length of time spent incarcerated. A significant model emerged after two iterations ($F = 8.743$, $p < 0.001$, adjusted $R^2 = 0.058$). Significant predictors of increased incarceration time included the presence of domestic/intimate partner violence within the home and placement outside of the home due to the patient's inappropriate sexual behaviors (see Table 4).

Table 4. Regression analyses describing the influence of ACEs and youths' behavioral problems on out-of-home placements.

	B	**SE (B)**	***β***	***t***	***p***
Age at first family-based out-of-home placement					
Constant	-4.280	5.740		-.746	0.460
Age intrafamilial sexual abuse began	0.343	0.196	0.244	1.754	0.086
Placement due to parent abuse or neglect	-2.756	1.424	-0.261	-1.935	0.059

Age at first arrest	0.952	0.384	0.345	2.480	0.017
Length of total family-based out-of-home placements					
Constant	2.241	0.890		2.517	0.014
Age physical abuse began	-0.192	0.115	-0.173	-1.667	0.100
Placement due to parent abuse or neglect	3.263	0.964	0.352	3.385	0.001
Age at first residential-based out-of-home placement					
Constant	1.417	1.529		0.927	0.381
Total ACE score	0.585	0.181	0.422	3.228	0.012
Occurrence of intrafamilial sexual abuse	1.957	0.458	0.419	4.271	0.003
Placement due to participant's behavioral problems	-4.885	1.137	-0.544	-4.297	0.003
Age at first aggressive behavior	0.586	0.085	0.921	6.901	0.000
Age at first suicide attempt	0.392	0.087	0.431	4.484	0.002
Length of total residential-based out-of-home placements					
Constant	1.157	0.428		2.700	0.008
Occurrence of physical abuse	1.007	0.249	0.312	4.052	0.000
Placement due to participant's behavioral problems	0.913	0.256	0.284	3.566	0.001
Placement due to inappropriate sexual behaviors	0.558	0.295	0.150	1.887	0.061
Age at first aggressive behavior	-0.071	0.035	-0.163	-2.023	0.045
Age at first incarceration					
Constant	1.261	3.793		0.332	0.748
Age at first sex offense arrest	0.634	0.234	0.588	2.713	0.027
Age at first suicide attempt	0.312	0.118	0.570	2.631	0.030
Length of total episodes of incarceration					
Constant	0.037	0.033		1.141	0.255
History of domestic violence / IPV in home	0.078	0.034	0.139	2.257	0.025

Placement due to inappropriate sexual behaviors	0.122	0.037	0.205	3.332	0.001

Discussion

Consistent with previous research, over half of the youth in this sample had four or more ACEs (Baglivio et al., 2014). On average, before the age of three, these youth experienced neglect, domestic violence, and parental substance abuse. The youths' own behavioral problems appeared to emerge at later ages, with onset of aggression occurring at approximately age nine, and early arrests and suicide attempts occurring at around 13 years of age. These findings were consistent with prior empirical research using populations at greater risk of ACEs and aggression and suicidality (e.g., Stinson, Quinn, & Levenson, 2016; Baglivio et. al, 2015). Further, participants were placed in an average of five out-of-home placements prior to their stay for residential treatment of sexual behavior problems, which underscores the severity of their placement instability. In subsequent analyses, it was determined that different ACEs and behavioral issues impact out-of-home placements in varied ways.

Regarding patterns in out-of-home placements, findings were consistent with my hypotheses. Correlational analyses and regression models both demonstrated that the youth in this sample who experienced a higher number and more severe forms of ACEs were placed in family-based placements earlier and for longer periods, which was consistent with previous research (Bramlett & Radel, 2014). This may suggest that perhaps child protective agencies are more likely to intervene earlier when the severity of the ACEs is more noticeable and prevalent. There may also be multiple attempts to try to keep youth within home- or family-based placements prior to other forms of intervention (e.g., residential care). However, it may be that once the youth's own behaviors become more problematic, residential and other non-family-based forms of placement may occur.

With regard to residential-based placements and incarceration, a different pattern emerged. Consistent with my hypotheses, the combination of ACEs and the youth's own behavior influenced age and length of placement in residential-based placements and juvenile detention. Here, a combination of suicidal, illegal, aggressive, and sexual behavior problems were more indicative of residential-based placements and incarceration. These findings suggest that perhaps more extreme behaviors led to residential placements at younger ages and for longer amounts of time. Data suggest that these youth were placed in family-based placements initially, following experiences of childhood maltreatment, but the severity of their developing behavioral problems led to eventual residential care. It is also possible that their own problematic behaviors within the home of origin emerged before intervention for their ACEs and prompted immediate residential-based placement. Similarly, correlational analyses and regression models both showed that the youths' problematic sexual behaviors led to both younger ages and longer stays in correctional settings or juvenile detention. Again, those behaviors viewed as more serious and problematic (e.g., sexual offenses) prompted a more serious system response. These conclusions are consistent with previous findings from the literature regarding ACEs and subsequent behavioral problems (Garrido, Weiler & Taussig, 2017; McMahon & Claywarner, 2002; Degue & Widom, 2009).

Overall, findings portray a need for access to intervention and prevention programs. As previously mentioned, the majority of these youth experienced a significant number of ACEs prior to the age of three. Early prevention programs that provide treatment for families in distress could provide the parents the tools that they need to cope with the problems they are facing, like poverty or intergenerational histories of substance abuse and familial violence. Such programs could include parenting training, substance abuse programs, and mental health resources for both

parents and their children. Further, many of these youth experienced intimate partner violence and/or sexual abuse within their home of origin. Providing healthy sexuality education for children who experience early adversity within the home may aid them in learning appropriate relationship boundaries and healthy sexuality expression.

Results further indicate that these youth may need more intensive treatment and reintegration programming, as they have exhibited aggressive and sexual behavior problems at a rather younger age and consequently have spent the majority of their development within residential-based placements and juvenile detention facilities; thus, they may require additional efforts toward community reintegration. Finally, these youth need interventions to address multiple and complex behavioral concerns, rather than focusing on one primary presenting problem. As noted previously, the youth in this sample were drawn from a residential treatment facility for those who had engaged in a range of sexually abusive behaviors. For this reason, their treatment is heavily focused on those behaviors. However, from these data it is evident that these youth have other behavioral issues, including aggression, suicidality, and psychopathology. Having a treatment plan that addresses these problems with evidence-based practices simultaneously would be beneficial.

There were a number of limitations to the current research. First, data were derived from archival records. For this reason, there were records with missing and/or vague information. Information that lacked specificity was conservatively coded to reduce the likelihood that the results would be biased or inaccurate. And while data were obtained from multiple sources, there is also the possibility that self-reported data were not exactly representative of the youth's experiences within the home. Second, this facility was for youth who have engaged in sexually abusive behavior, and the sample consisted of primarily males. Consequently, these findings may

not generalize to females or those without a history of sexually abusive behavior. Lastly, the ten items from the ACE survey were used to evaluate their early negative experiences within the home. As was noted in the descriptive data, the majority of these youth have experienced four or more ACEs, and of such severity that it necessitated removal from the home. Thus, the ACE survey methodology may not accurately assess the impact of ACEs in a sample with such a high degree of risk and severity.

Future research should use data that are complete and obtained in a uniform manner. This will ensure that the results are consistent with the youth's experiences and provide a practical view of their needs. Researchers should also compare the findings from the current study to similar groups to establish reliability of findings. Further, comparing these findings to those in youth who have had out-of-home placements but who have not engaged in sexually abusive behaviors could determine if similar patterns emerge. Future research would also benefit from using a sample that is more inclusive and that accounts for other variables like gender and race. It would be interesting to examine patterns as a function of different demographic variables. Lastly, researchers should consider additional details related to experiences of ACEs. This could include variables such as who abused them within the home, the duration of abusive incidents, and how long their parent(s) were incarcerated. This would allow researchers to gain a more nuanced understanding of the impact of ACEs.

In all, the current study sought to evaluate the temporal relationship between ACEs, behavioral issues, and the onset of out-of-home placements. First, findings from this unique sample supported the hypothesis that higher ACE scores and earlier onset of certain ACEs were associated earlier and longer stays in out-of-home placements. Second, aggression and problematic sexual behavior were both associated with residential-based placements and

incarceration more so that was seen for family-based placements. Third, the results suggested that certain ACEs and the youth's own behavioral problems had differential effects on the onset, type, and length of out-of-home placements. These findings exhibited a clear need for early prevention programs, healthy sexuality education, and more holistic forms of intervention. Overall, these findings contribute to a better understanding of youth who have engaged in sexually abusive behaviors and the different predictors that may forecast the onset and type of out-of-home placements they experience.

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