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Toward an Understanding of the Impact of Adverse Childhood Experiences on the Recidivism of Serious Juvenile Offenders

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Abstract
Research has indicated juvenile delinquents with more Adverse Childhood Experiences (ACEs) are more likely to be recidivate. However, much of this research has relied upon limited samples, such as those serving a community-based sentence. The current study examined the impact of exposure to ACEs on recidivism among a cohort of serious state incarcerated juvenile offenders. The result indicate ACEs failed to predict post-release recidivism, measured as either any rearrest or felony rearrest. Instead, measures indicative of juvenile justice history, such as prior adjudications, length of incarceration, and the rate of disciplinary misconduct while incarcerated were most relevant in an explanation of post-release recidivism. Implications for research and policy are discussed.

Keywords Delinquency · Violence · Recidivism · Child maltreatment · Incarcerated juvenile offenders

Introduction

In recent years there has been growing interest regarding the impact that Adverse Childhood Experiences (ACEs) have on certain life outcomes. Initial studies on the impact of ACEs originated in the public health arena and focused on the relationship

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between ACEs and later life outcomes such as heart disease and early death (Anda, Butchart, Felitti & Brown, 2010; Felitti et al., 1998). Since then, this research base has expanded to explore a number of other negative life events such as risky sexual behavior, self-harm, and school-related problems (Baglivio, Epps, Swartz, Huq, Sheer, & Hardt, 2014; Malvaso, Delfabbro, Day, & Nobes, 2018). More recently, this line of research has made inroads into criminal justice and criminology scholarship. Recent evidence has found that not only are individuals with a higher ACE score more likely to engage in antisocial behavior, but they are also more likely to be serious, violent, and chronic delinquent offenders (Fox, Perez, Cass, Baglivio, & Epps, 2015).

The ACE-crime literature certainly represents a burgeoning line of research as studies have utilized diverse samples including representative samples of youth and adults as well as cohorts of adjudicated delinquents (Baglivio et al., 2014; Craig, 2019; Vaughn, Salas-Wright, Huang, Qian, Terzis, & Helton, 2015; Wolff, Baglivio, & Piquero, 2017). However, most of the studies that relied upon samples of adjudicated delinquents have either included all adjudicated delinquents, regardless of if they were community- or residentially-placed, or focused on community-placed youth only. Only two studies to-date have examined the impact of ACEs on offending among incarcerated youth (Bonner et al. 2019; DeLisi et al., 2017). Further, the ACE-recidivism studies have also been limited by the length of follow-up and did not examine recidivism past the teenage years (Craig, Intravia, Wolff, & Baglivio, 2019; Craig, Zettler, Wolff, & Baglivio, 2019; Wolff et al., 2017). The current study seeks to address this gap by examining the impact of ACEs on two distinct measures of recidivism among a sample of serious and violent incarcerated juvenile offenders from the State of Texas.

Adverse Childhood Experiences

While scholars have studied the impact of child maltreatment and other early childhood risk factors on later offending (Widom, 1989), it has only been in the past few years that criminologists have started to study the cumulative impact of these types of experiences (Baglivio, 2018). ACEs were first identified by Felitti and his colleagues (Felitti et al., 1998) as a set of 7 early childhood events that were found to predict poor health outcomes. The concept of ACEs was later expanded to include 10 events, specifically emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, violent treatment toward mother, household substance abuse, household mental illness, parental separation/divorce, and having a household member with a history of incarceration (Anda et al., 2010). A large collection of literature from a variety of disciplines have found exposure to ACEs is correlated with a large number of other negative life outcomes, such as chronic diseases, risky sexual behavior, higher unemployment, early death, and offending (Bellis, Lowey, Leckenby, Hughes, & Harrison, 2013; Craig, Piquero, Farrington, & Ttofi, 2017; Hillis, Anda, Dube, Felitti, Marchbanks, & Marks, 2004).

While there are several potential strategies to operationalize exposure to child maltreatment and family dysfunction, the methodology routinely employed is that an individual's cumulative ACE score is calculated by counting exposure to a specific ACE one time. In other words, even if an individual was physically abused several times, they would only receive a "1" for that particular ACE. Then, the number of

different ACEs they were exposed to from birth through age 18 would be summed so the potential count of ACEs ranges from 0 to 10 where 0 indicates the individual experienced no ACEs while 10 indicates they experienced all ACEs at least one time in their childhood or adolescence. A clear limitation to this operationalization is it fails to account for the severity, frequency, duration or timing of each trauma exposure (for example, see Thornberry, Henry, Ireland, & Smith, 2010). However, this measurement strategy does allow study of the cumulative effects of exposure relative to multiple forms of trauma; this is particularly pertinent as ACEs have been found to be highly correlated (Dong et al., 2004).

Of particular importance to the current study, research findings previously alluded to have revealed that juveniles with more ACEs are more likely to be involved in the juvenile justice system (Baglivio et al., 2014). These types of youth are also more likely to be placed in residential placement (Zettler, Wolff, Baglivio, Craig, & Epps, 2018), and also more likely to be serious, violent, and chronic juvenile offenders than their delinquent counterparts with fewer ACEs (Fox et al., 2015; Perez, Jennings, & Baglivio, 2018). High-ACE delinquents are also less likely to have prosocial bonds (Craig, Baglivio, Wolff, Piquero, & Epps, 2017), are more likely to come from disadvantaged environments (Baglivio, Wolff, Epps, & Nelson, 2017), engage in suicidal behavior (Perez, Jennings, Piquero, & Baglivio, 2016) and have lower future orientations (Craig, 2019).

In sum, these findings suggest that those who have been exposed to more traumatic experiences are not only more likely to be involved in the juvenile justice system, but also to be more serious offenders than those with fewer such experiences. However, it is important to note that the majority of the ACE-crime studies have been conducted relying upon data from the Florida Department of Juvenile Justice (for exceptions, see Bonner et al. 2019; DeLisi et al., 2017; Craig, Piquero, et al., 2017; Fagan & Novak, 2018). Further, of the studies assessing the impact of ACEs among adjudicated delinquents, these studies have considered samples of community-placed juveniles only (Craig, Baglivio, et al., 2017; Craig, Intravia, et al., 2019; Craig, Zettler, et al., 2019; Wolff et al., 2017) or broader samples of juveniles placed in either the community or in a residential center (Baglivio et al., 2014; Baglivio, Wolff, Piquero, & Epps, 2015; Fox et al., 2015; Perez, Jennings, & Baglivio, 2018; Zettler et al., 2018). While several studies have indicated a higher ACE score increases the likelihood of recidivism, these analyses have also tended to focus on community-placed delinquents and only assessed recidivism within one year post-release (Craig, Baglivio, et al., 2017; Craig, Intravia, et al., 2019; Craig, Zettler, et al., 2019; Wolff et al., 2017). However, it is unknown how ACEs impact recidivism among state incarcerated juvenile offenders specifically, a group of strong policy relevance.

Current Aim

The current study seeks to address gaps in knowledge by first examining the prevalence of juveniles with ACEs among a group of serious juvenile offenders sentenced to a period of state incarceration. Next, the study will examine the impact of ACEs on two distinct measures of recidivism—any rearrest three years post-release and felony rearrest three years post-release.

The focus of the current research is important to help inform researchers, policymakers, and practitioners how to treat serious juvenile offenders. At the most basic level, if the presence of ACEs can serve to predict the recidivism outcomes of juveniles incarcerated and released from a state residential juvenile facility placement, these factors could then function as a sort of early warning system to identify children most at-risk of reoffending during later juvenile years and in the transition to early adulthood. Further, this knowledge could also help practitioners fashion both institutional and community-based interventions in an effort to re-direct the trajectories of such young offenders away from the path of persistence and toward a path of desistance.

Methods

Sample and Data

The sample for this research includes a group of 621 serious and violent delinquent offenders incarcerated in Texas state juvenile correctional facilities from 2005 to 2013. Because of the focus on recidivism, all of the offenders had been released from confinement at the time of data collection. All members of the sample were adjudicated in a juvenile court and sentenced to state juvenile incarceration under Texas' blended sentencing statute. This law provides juvenile courts an alternative to adult certification for certain serious and violent delinquents whereby the juveniles start their sentence in a state juvenile correctional facility but have the possibility of later being transferred to an adult facility.[1] For further details on this statute and process, see for example Mears (1998) and Trulson, Haerle, Caudill, and DeLisi (2016).

Measures

Recidivism Two outcomes of interest were utilized. The first focused on the presence of any rearrest following release from state incarceration while the second was operationalized as any felony rearrest following release from state incarceration. Because offenders had different follow-up times due to different release dates, recidivism was constrained to a standardized 3-year follow-up for all cohort members. Thus, those offenders who incurred a rearrest within a 3-year follow-up from their individual release date were considered recidivists. Among this sample, 58% of the youth were rearrested for any offense 3-years post-release while 35% of the youth were rearrested for a felony offense during this same follow-up period.

[1] During the time frame of this study, the following offenses were eligible under the blended sentencing statute: murder, attempted murder, capital murder, attempted capital murder, manslaughter, intoxication manslaughter, aggravated kidnapping, attempted aggravated kidnapping, aggravated sexual assault, sexual assault, attempted sexual assault, aggravated assault, aggravated robbery, attempted aggravated robbery, felony injury to a child, elderly, or disabled person, felony deadly conduct, aggravated or first-degree controlled substance felony, criminal solicitation of a capital or first-degree felony, second-degree felony indecency with a child, criminal solicitation of a minor, first degree felony arson, and habitual felony conduct (three consecutive felony adjudications). Among our sample, the modal offenses were aggravated robbery (45%), aggravated assault (18%), and aggravated sexual assault (17%).

Recidivism data were provided by the Texas Juvenile Justice Department (TJJD), and those data were originally obtained from the Texas Department of Public Safety (DPS). DPS collects arrest information in the State of Texas and those arrest records were then matched to the offenders of focus in this study. Arrest data tracked the behavior of the offenders into adulthood so there is no artificial right censoring of data at the juvenile to adult age-graded transition.

ACE Score In order to measure each youth's trauma exposure, several TJJD variables were utilized to capture their ACE score. These variables derived from risk assessments and other records from TJJD and other state agencies collected during a youth's state intake. For the measures specific to abuse and neglect, these data are garnered from official records of the Texas' child protective services agency. Thus, they are based on officially documented reports to child protective services (noting that these records may have been comprised and/or supplemented from self-report interviews which would have been conducted by professionally trained investigators and other child protection services workers). Dichotomous indicators of physical abuse, emotional abuse, and sexual abuse were included. Several variables related to neglect were included, specifically physical neglect, parental neglect, medical neglect, and neglectful supervision. Each of these four variables were dichotomized and if the individual had experienced at least one of these four forms of neglect, they received a "1" for any neglect.[2]

Next, three variables indicated if the youth had a drug- or alcohol-addicted family member, had a mentally-ill, depressed, or suicidal family member, and if at least one of their family members was incarcerated. An additional measure of childhood trauma included a variable indicating whether at least one of the youth's parents either had their rights revoked or had abandoned the child. The final measure represented if the youth had witnessed domestic violence. Each of these variables were coded dichotomously where the presence of the trauma was coded as "1" and the absence was coded as "0." To create the overall ACE score, each of the ACEs were summed to form an overall scale where "0" indicated the youth had not experienced any ACEs and "9" indicated the youth had experienced all ACEs at least once in their life. The mean ACE score in the current sample was 1.99 (SD = 1.92).

Controls Several other relevant variables were also included in the analyses to rule out potentially spurious effects of ACEs on recidivism. First, as research has found those with more prior convictions are more likely to recidivate, the total number of delinquent adjudications was included (Piquero, Farrington, & Blumstein, 2003). The mean number of prior adjudications was 2.18 (SD = 1.56). As the age-crime curve predicts a change in offending frequency based upon an offender's age, this is another important control variable when studying recidivism (Sweeten, Piquero, & Steinberg, 2013). As a result, the current study included the youth's age at intake to state juvenile incarceration. The average age

[2] While the ACE score paradigm typically separates emotional from physical neglect, the current data did not allow us to make this distinction. For instance, as parental neglect could be considered to be either physical or emotional in nature, the conservative approach was used and all potential neglect measures were combined to form an overall indicator of any form of neglect.

of incarceration in the current sample was 16.36 (SD = 1.02). As the sample included serious and violent offenders, specific variables representing some of these offenses were also controlled for. Two dichotomous variables were included, the first indicating if the youth was adjudicated for a sex-related offense (i.e. indecency with a child, sexual assault, aggravated sexual assault) while the second indicated if the youth was adjudicated for a non-sex-related aggravated offense (i.e. aggravated assault, aggravated kidnapping, and aggravated robbery). Almost 20% (19.8%) of the sample was adjudicated of a sex offense while 64% were adjudicated of an aggravated offense.

An additional demographic variable included was sex given the known gender differences in offending (Piquero et al., 2003). Males were coded as "1" and females were coded as "0." The large majority of the youth (97%) were male. Further, as studies have indicated significant differences in offending based upon race/ethnicity (Piquero & Brame, 2008), this was an additional control variable and included codes for Black, Hispanic, and White. Whites were treated as the reference group in the analyses. Of the sample, 37% of the youth were coded as Black, 45% Hispanic, and 18% White.

Three other offending-related measures were included due to their known association with offending. The work of Thornberry, Krohn, Lizotte, and Chard-Wierschem (1993) have demonstrated the positive correlation between gang membership and delinquency so a measure indicating whether the youth was believed to be affiliated with a gang at state-intake ("1" = gang affiliated) was included; 40% of the sample was indicated as being gang affiliated. Second, a measure was included that indicated if the youth had a history of school truancy ("1" = truant), an additional correlate of offending (Vaughn et al., 2013).[3] Seventy-three percent of the sample had a history of truancy. Third, as involvement in disciplinary misconduct during periods of incarceration can be considered a form of continuity of offending, it was included as a potential predictor of post-release recidivism (Trulson, DeLisi, & Marquart, 2011). For this measure, the number of misconduct incidents the youth committed during their entire period of incarceration was also included. As the youths varied in the amount of time they spent at a TJJD facility and were thus at-risk for misconduct, the rate of misconduct incidents per 100 days confined in a TJJD facility was used to standardize this measure among all offenders. Among the current sample, the mean rate of misconduct was 7.95 per 100 days (SD = 7.85). The final control variable included was a measure of the length of time the juvenile was incarcerated. This was included to account for potential institutionalization effects (Gainey, Payne, & O'Toole, 2000). The mean length of incarceration was 3.28 years (SD = 1.51).

Analytical Plan

After first assessing the bivariate correlations between the key variables, two logistic regressions were estimated. Logistic regression models were utilized given the binary

[3] Unfortunately the definition TJJD used when deciding if a particular juvenile has a history of truancy was not provided. While it is unfortunate these contextual details are missing, this is not unusual in the use of agency data.

nature of the outcome variable. The first model estimated the effects of the ACE score and control variables on any rearrests while the second model estimated the effects of the ACE score and control variables on felony rearrests.[4]

Results

Bivariate Correlations

First the bivariate correlations between the variables of interest were examined. As can be seen in Table 1, there were no significant correlations between being rearrested and ACE score nor being rearrested for a felony and ACE score.[5]

Prevalence of ACEs

We first assessed the prevalence of ACEs among the sample. The distribution of ACEs is presented in Fig. 1. Almost three-quarters (72.27%) of the sample had at least one ACE. Table 2 indicates the prevalence of each ACE among the sample of juvenile offenders.

Impact of ACE Score on Rearrests

In order to investigate the effect of ACEs on post-release arrests, two logistic regression models were estimated. The first model predicted the likelihood of being rearrested for any offense and can be seen in the first panel of Table 3. The offender's ACE score had no significant impact on their later likelihood of recidivism. However, those who were older at incarceration and convicted of a sex offense were significantly less likely to be rearrested (OR = .77, $p < .05$; OR = .43, $p < .01$, respectively). Additionally, those with history of truancy and those with a higher rate of misconduct were more likely to have been rearrested (OR = 1.64, $p < .05$; OR = 1.03, $p < .05$, respectively). Finally, incarceration length significantly decreased the odds of recidivism as well (OR = .74, $p < .001$).

The logistic regression results predicting felony rearrests can be seen in the second panel of Table 3. Similar to the prior model, ACEs had no statistically significant effect on felony re-arrest. However, those with more prior adjudications (OR = 1.20, $p < .01$)

[4] The data were assessed for univariate and multivariate outliers. The misconduct rate variable appeared to have one outlier so this case was dropped from the analyses. While dropping these cases did not substantively change the results, the fit statistics of the models were improved. There were no other univariate outliers. 60 multivariate outliers (7.45% of the sample) were identified as multivariate outliers using Mahalanobis Distance scores. Supplemental analyses were estimated with and without the outliers and as the results were not substantively different, they were retained. The data were also assessed for missing data. The truancy measure was missing more than 5% of cases; the remainder were not missing any data. However, the truancy variable (20% missing) was missing at random and median imputation was used for these missing cases. The analyses were estimated with and without these missing cases and the results were substantively similar. However, the fit statistics were improved in the model that excluded the missing cases, so the results presented here are based upon the original measure.

[5] An assessment of the correlations indicate multicollinearity did not appear to be an issue in the current analyses. Post-analyses estimates of the variance inflation factors (VIF) support this as all values were less than 2.0.

Table 1 Bivariate correlations between all variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Any Rearrests	1.00													
Felony Re-Arrests	.62*	1.00												
ACE Score	−.05	−.03	1.00											
Prior Adjudications	.09*	.15*	.08	1.00										
Age at Incarceration	−.02	−.04	−.05	.20*	1.00									
Sex Offense	−.22*	−.13*	.17*	−.01	.05	1.00								
Aggravated Offense	.14*	.07	−.23*	−.07	−.01	−.66*	1.00							
Male	.01	.10*	−.02	.06	−.05	.08*	−.04	1.00						
Black	.08	.03	−.05	−.02	−.03	−.17*	.19*	−.06	1.00					
Hispanic	.03	.03	−.12*	.02	.01	−.09*	.06	.02	−.70*	1.00				
Gang Affiliation	.08*	.08	.02	.12*	−.03	−.26*	.18*	.11*	−.07	.20*	1.00			
Truancy	.18*	.05	−.04	.11*	.11*	−.31*	.29*	−.10*	.06	.13*	.22*	1.00		
Misconduct Rate	.07	.08*	.05	.01	−.18*	.02	.00	.04	.14*	−.14*	.05	.12*	1.00	
Time Incarcerated	−.13*	−.08	.01	−.22*	−.50*	.04	.09*	.00	.12*	−.04	−.03	−.06	.29*	1.00

* $p < .05$

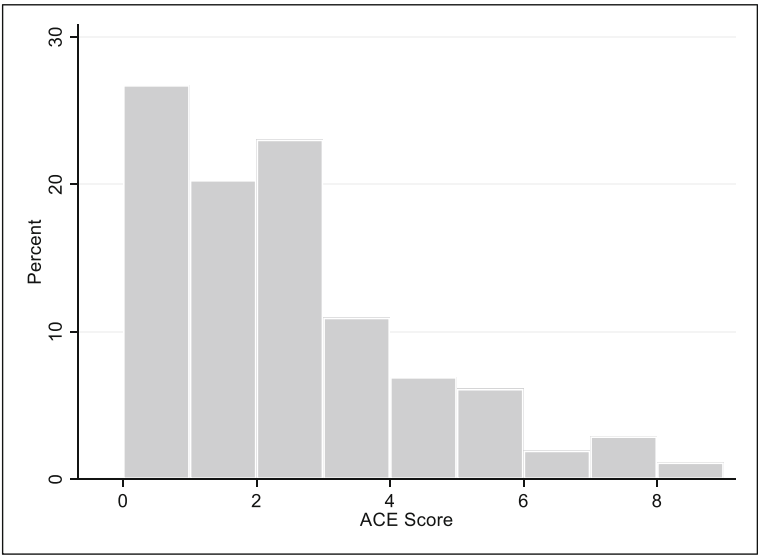

Fig. 1 Distribution of ACE Score

demonstrated a significantly higher likelihood of evincing a felony re-arrest than their counterparts. Age at incarceration and being convicted of a sex offense significantly decreased the odds of felony rearrest (OR = .81, $p < .05$; OR = .50, $p < .05$, respectively). Additionally, misconduct rate significantly increased the likelihood of felony rearrest (OR = 1.03, $p < .05$) while length of incarceration significantly decreased the likelihood of felony rearrest (OR = .83, $p < .05$).[6]

Discussion

Previous research has revealed that youth with greater exposure to ACEs are at a disadvantage across a number of life domains (Anda et al., 2010; Baglivio et al., 2014; Felitti et al., 1998). Youth with greater exposure to ACEs have also been found to be more likely to be involved in the juvenile justice system, and once in the system, tend to experience poorer outcomes than those without such exposure (Baglivio et al., 2015; Fox et al., 2015; Zettler et al., 2018). Further research has also found that those with a higher ACE score are also significantly more likely to recidivate following community-based placement (Craig, Intravia, et al., 2019; Craig, Zettler, et al., 2019; Wolff et al., 2017). However, the extent to which this applies to incarcerated juvenile delinquents is

[6] At the request of a reviewer, several supplemental analyses were estimated. The first relied upon a more stringent measure of ACE exposure by recoding the ACE score into the top quartile. This was coded where those with 3 or more ACEs (representing the top 27.76% of the distribution) were coded as 1 and those with 2 or fewer ACEs were coded as 0. However, the logistic regression results were substantively similar to those previously presented; ACE score had no significant effect on either measure of recidivism. Second, we conducted survival models to estimate the effects of ACEs and the control variables on the timing of recidivism (measured as both the number of days before the first re-arrest and number of days before the first felony re-arrest). ACEs did not have a significant effect on the timing to re-arrest for either operationalization. The results from these models are available upon request from the first author.

Table 2 Prevalence of ACEs

	Prevalence
ACE Score	1.99
Physical Abuse	.14
Neglect	.25
Emotional Abuse	.15
Sexual Abuse	.13
Substance Abusing Family Member	.39
Criminal Family Member	.53
Parental Loss/Abandonment	.14
Mentally Ill Family Member	.10
Witnessed Domestic Violence	.17

unknown as studies are yet to assess the ACE-recidivism relationship among a sample consisting solely of incarcerated delinquents.

The current study sought to fill this gap by first examining the prevalence of ACEs among this sample of deep-end juvenile delinquents and second, estimating the effects of ACEs on recidivism. The average ACE score in our sample was 1.99 which appeared to be slightly lower than that published in prior research. For instance, Baglivio and his colleagues (Baglivio et al., 2015) reported a mean ACE score of 3.61 among a sample of adjudicated youth who were referred to either a community- or

Table 3 Logistic regression models estimating effects of ACE Score on rearrests

	Any Rearrests		Felony Rearrests	
Variable	*OR*	*SE*	*OR*	*SE*
ACE Score	.98	.05	.99	.05
Prior Adjudications	1.10	.07	1.20**	.07
Age at Incarceration	.77*	.08	.81*	.08
Sex Offenses	.43**	.13	.50*	.16
Aggravated Offenses	.99	.25	1.04	.26
Male	1.33	.70	7.29	7.61
Black	1.60	.43	1.32	.38
Hispanic	1.37	.36	1.32	.37
Gang Affiliation	.97	.18	1.04	.20
Truancy	1.64*	.34	.95	.21
Misconduct Rate	1.03*	.01	1.03*	.01
Time Incarcerated	.74***	.05	.83*	.06
n	621		621	
McFadden R^2	.078		.057	

*** $p < .001$, ** $p < .01$, * $p < .05$ (two-tailed)

residential-based placement. Some of this discrepancy may be due to the current study's inability to measure all 10 ACEs; the original neglect measures utilized in the ACE score had to be consolidated so separate measures of emotional and physical neglect were unable to be used.

The second question driving the current study focused on the effect of ACEs on later recidivism. We also sought to further this line of inquiry by examining two different recidivism measures—any rearrest and felony rearrest. The evidence demonstrated that among this sample, ACEs failed to predict post-release recidivism, measured as either any rearrest or felony rearrest. This finding fails to support prior work that found ACEs increased recidivism (for recent examples, see Craig, Intravia, et al., 2019; Craig, Zettler, et al., 2019) and also fails to suggest that ACEs predict the continuation of a serious and chronic offending career. Such a finding brings up the question as to why ACEs have been found to be predictive of recidivism in several other studies but not for the offenders examined in the current study. Some explanation may be found in a comparison of the samples utilized in these studies, specifically the length of follow-up and the type of delinquent under consideration.

While Fox et al. (2015) and Perez et al. (2018) found that juvenile delinquents with more ACEs were more likely to be classified as a serious, violent, and chronic (SVC) delinquents, it is important to point out both studies defined an SVC offender as one who had 3 or more juvenile felony referrals where at least 1 was classified as a violent offense. Thus, while ACEs were predictive of serious and chronic *juvenile* offending, the extent to which this predicted further adult offending was not examined. To the best of our knowledge, only two studies have examined the effect of ACEs on recidivism into early adulthood. Craig and her colleagues (Craig, Intravia, et al., 2019; Craig, Zettler, et al., 2019) examined potential moderating effects in the relationship between ACEs and recidivism among a sample of Florida delinquents sentenced to a community-based placement. While the delinquents in the Florida sample were not as serious as the ones examined in the current study, the one-year follow-up did allow for the adult records of individuals who were released between ages 17–18 to be included. Both studies' results indicated that ACEs significantly increased the likelihood of recidivism within one year of completion of their community-based placement. This would suggest that ACEs predict continuing offending into early adulthood, at least among juveniles sentenced to a community-based placement.

Several important distinctions between the current study and the study by Craig and her colleagues (Craig, Intravia, et al., 2019; Craig, Zettler, et al., 2019) should be highlighted. First, the Craig et al. studies considered any new arrest post-release while the current study used both this broad definition of recidivism and a more policy-relevant definition focused specifically on felonies. Second, the current study utilized a longer follow-up of three years allowing for more juveniles to enter early adulthood than the one-year follow-up of the Craig et al. studies. Third, as mentioned, the current study focused on a more serious group of incarcerated delinquents.

Taken together, these factors indicate that ACEs may increase recidivism for some offenders, but not all. Specific to the findings of this study, the results indicate that ACEs become less central as an explanation of recidivism among serious juvenile offenders who have already entered early adulthood. Moffitt's (1993) arguments pertaining to the life-course-persistent offender could offer additional guidance. She posits that while early traumatic experiences may start an individual down a path of

childhood antisocial behavior, the cumulative consequences of this behavior contributes to its continuation over the life course and thus is more of a proximal cause of adult criminality. Thus, in the case of the current study's sample of serious, incarcerated delinquents, ACEs are not as relevant as other factors such as reduced education, limited employment opportunities, and lack of prosocial relationships.

While not much research has focused on offender differences in the ACE-recidivism relationship, the work of DeLisi and his colleagues (2017) suggests ACEs have differential effects based on the offense. The researchers analyzed a large sample of institutionalized male delinquents to assess how ACEs predicted specific commitment offenses. Of relevance to the current discussion, it was found that those with more ACEs were significantly less likely to commit homicide and serious property offenses but were significantly more likely to engage in sexual offending. While the DeLisi et al. analyses were focused on the offense type and the current study focused on the offender, these combined findings suggest that ACEs do not increase all types of offenses for all offenders. Future research should examine potential factors that may contextualize these differences. For instance, other risk factors found at the individual- or ecological-levels may be more important than trauma exposure among these serious offenders.

While ACEs were not related to recidivism among this sample of serious juvenile offenders, an alternative explanation may rest in the age-crime curve. It is important to note that these juvenile offenders tended to be older; the average age at incarceration was a little over 16 years of age. Further, their serious and violent offenses yielded them lengthy sentences of incarceration as they served on average 3.28 years. Since these offenders were older upon release it is possible that, based on the arguments of the age-crime curve, they may have started experiencing the predicted decrease in offending probability. Unfortunately, these factors along with others such as correctional facility characteristics, availability and quality of programs, post-release conditions, and trauma experienced during incarceration are unable to be specifically examined in the current study and are an important direction for future work.

There are other limitations to this study that should be considered to both help contextualize the findings and to inform and guide future research. A key limitation concerns the nature of the variables utilized to calculate the ACE score. While the variables that were used to develop the ACE score are consistent with prior operationalizations in the literature, more detailed ACEs measures were lacking. Specifically, all of the measures used to develop the ACE score were dichotomies, but access to more detailed information concerning relevant factors such as the timing, duration, frequency, and intensity of ACEs exposure would have improved the study's ability to provide more specificity with respect to the impact that ACEs have on recidivism. The dichotomous nature of ACEs operationalization, absent these contextual indicators, is a common limitation in the literature (Finkelhor, Shattuck, Turner, & Hamby, 2015; Hardt & Rutter, 2004), but one if remedied would have improved this study.

Related, we believe our study would have benefitted from more specific measures. For example, TJJD collects a tremendous amount of information from a variety of sources including diagnostic assessments, official records, staff observations, and other sources. Despite the amount of information collected, it would have been beneficial to have more detailed information on the measures utilized in this study to further situate

the findings. Although this is a typical consequence of utilizing agency collected data, more precise variable specifications beyond dichotomies or other information would have improved this study.

An additional limitation to consider is the restricted generalizability of the findings: the current sample is constrained to a group of serious juvenile offenders from one large southern state. Thus, the findings should be considered specific to the sample examined. The analyses also relied in part upon official records to measure sensitive topics such as childhood maltreatment which have been found to be biased as they tend to over-represent the more severe cases of child maltreatment or those from lower socioeconomic backgrounds (Widom & Shepard, 1996).

Despite these limitations, we are not aware of another study to-date that has examined the impact of ACEs on the post-release recidivism of state incarcerated delinquent offenders specifically. The results of this study bring up several important research implications. Future research would benefit by focusing on the impact ACEs may have in predicting recidivism or other relevant outcomes among different types of offending groups as the effects of ACEs do not appear to be equal across all juvenile delinquents. This implication is applicable across any number of group distinctions such as race/ethnicity, gender, and age. Distinctions between offenders with a community versus an institutional sentence is another area of relevance concerning the impact of ACEs and recidivism. Further precision into offender type differences would also be a noteworthy line of research. For example, instead of looking broadly at different types of offender groupings based on their sentence type, future research could extend the work of DeLisi and his colleagues (2017) and examine if ACE exposure relates to recidivism or other outcomes among more specific offender type groupings (e.g., homicide offenders versus sexual offenders).

Future research would benefit from more refined measures of ACEs that can account for the timing, frequency, duration, or intensity of these events. This focus would be especially useful using longitudinal datasets, in that such data would allow assessment of the impact of ACEs relative to a variety of time-based justice system related events (e.g., ACEs prior to first arrest, ACEs experienced between first arrest and potential incarceration). Such data would allow an examination of the impact of proximate versus distal ACEs effects on any number of outcomes. A related measurement research implication would be to examine if different levels of ACEs can serve as predictors of recidivism or other analogous justice-related outcomes. Most ACE measures are treated as dichotomies, but counting all frequencies per ACE, if available, would provide greater specificity as to what point do ACEs matter most and does the impact differ if ACEs are measured cumulatively or separately.

Conclusion

On a practical level, ACEs, if related to recidivism, could serve as a sort of early warning system for decision-makers relative to children at most risk of re-offending upon release from institutionalization. However, the current findings indicated ACEs were not a significant predictor of felony recidivism among this sample of serious, institutionalized delinquents. On a policy level, this finding underscores the importance of early intervention for juvenile offenders. This early intervention seems especially

important for offenders well before they reach the deepest ends of the juvenile justice system, and prior to the transition to early adulthood. While the current study does not dispute the prior studies that found a substantive connection between childhood trauma exposure and later recidivism, it does suggest these findings should be placed in context of the sample under study.

Compliance with Ethical Standards

Conflict of Interest Matt DeLisi receives consulting income and travel expenses in criminal and civil litigation relating to criminological and forensic assessment of criminal offenders, receives editorial remuneration from Elsevier, receives expert services income from the United States Department of Justice and the Administrative Office of the United States Courts, and receives royalty income from Cambridge University Press, John Wiley & Sons, Jones & Bartlett, Kendall/Hunt, McGraw-Hill, Palgrave Macmillan, Routledge, Sage, University of Texas Press, and Bridgepoint Education. No direct remuneration is associated with the current study.

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