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## Adverse Childhood Experiences, Coping Resources, and Mental Health Problems among Court-Involved Youth

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### Abstract

**Background:** Mental health problems are gaining attention among court-involved youth with emphasis on the role of childhood adversity, but assessment lags.

**Objective:** The present study uses a commonly delivered assessment tool to examine mental health problems (current mental health problem, mental health interfered with probation goals, and suicide ideation) as a function of an expanded set of adverse childhood experiences (ACEs; childhood maltreatment, family dysfunction, and social disadvantage). Adaptive coping resources—impulse control, aspirations, and social support—were tested as both direct contributors and moderators of the influence of ACEs on mental health.

**Methods:** Using a diverse sample of youth on probation (N=5,378), this study utilized logistic regression models to test contributions of the three domains of childhood adversity—childhood maltreatment, family dysfunction, and social disadvantage. These models also examined the moderating roles of coping resources.

**Results:** Childhood maltreatment emerged as the strongest contributor to mental health problems, with significant moderation from social support. Youth aspirations were inversely related to mental health problems and moderated the relation with ACEs and mental health problems that interfered with probation.

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Compliance with Ethical Standards:

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The local Institutional Review Board approved all procedures. The first author takes responsibility for the data integrity and analysis procedures.

The authors of this study have no conflicts of interest to report.

**Conclusion:** Assessment and mitigation of the detrimental effects of childhood maltreatment are important considerations in the intervention programs that target mental health outcomes of court-involved youth. Intervention programs to prevent recidivism and improve mental health should improve impulse control and aspirations.

### Keywords

Juvenile justice; assessment; mental health; adverse childhood experiences; coping resources

Youth involved with the juvenile justice system suffer higher rates of mental illness than their counterparts in the general population (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). Moreover, mental illness is one of the most reliable predictors of recidivism among delinquent youth (Barrett, Katsiyannis, Zhang, & Zhang, 2014). Many jurisdictions in the United States are increasing their focus on improving the mental well-being of these minors, resulting in some improvement of mental health assessments (Shufelt & Coccozza, 2006). Routine use of such assessment tools holds promise for providing timely, practical guidance for these institutions toward mitigating the risk that mental illness carries for problematic outcomes. Elucidating risk and protective factors surrounding mental illness could improve the ability of communities and local governments to allocate resources more appropriately and effectively to help affected individuals and their families, as well as to prevent delinquency and recidivism.

A growing literature argues that a contributing factor for high rates of mental illness among court-involved youth is elevated exposures to childhood adversities, such as family dysfunction and child maltreatment (Baglivio et al., 2014; Dierkhising et al., 2013). This youth-focused work builds on two decades of research investigating adverse childhood experiences (ACEs) and associated sequelae, which demonstrates that increased exposure to ACEs is tied to higher rates of mental and behavioral disorders among adults (Downey, Gudmunson, Pang, & Lee, 2017; Felitti et al., 1998; Schilling, Aseltine, & Gore, 2007). Unsurprisingly, youth involved in the juvenile justice system are much more likely to have been exposed to one or more ACEs than the general population (Baglivio et al., 2014).

However, few studies have examined the mental health consequences of ACEs for delinquent youth and fewer still have explored the role of protective factors in this framework and population (Craig, Baglivio, Wolff, Piquero, & Epps, 2017; Perez, Jennings, Piquero, & Baglivio, 2016). Emphasis instead has been placed on the roles of ACEs in contributing to delinquent behavior (Baglivio & Epps, 2015; Fox, Perez, Cass, Baglivio, & Epps, 2015). For example, Barrett and colleagues (2014) found that more extensive childhood maltreatment and prior diagnosis of mental health disorder are each related to higher rates of delinquency, but they did not test direct pathways between social factors and mental health. The relative lack of research on ACEs and mental health alongside the limited availability of mental health resources in juvenile court systems has left the relations among adverse life experiences, mental health, and delinquent behavior relatively underspecified (Desai et al., 2006). Despite this, the ability to address these questions has improved. Recent examinations have extended the ACE framework to include other forms of adversity germane to youth health and development, such as poverty (Logan-Greene, Kim, & Nurius,

2016; Sacks, 2014) and out-of-home placements (Cronholm et al., 2015; Rebbe, Nurius, Ahrens, & Courtney, 2017), which better capture the breadth of adversity frequently experienced by court-involved youth.

There is a growing consensus among practitioners and researchers that issues of mental health should be better monitored and addressed by court systems in order to help ameliorate the effects of mental illness with concurrent involvement in juvenile justice (Shufelt & Coccozza, 2006; Underwood & Washington, 2016). However, because of the lack of research on the issue, there is relatively little clinical guidance for how court personnel can identify and best treat youth with mental health needs, especially when those needs may be related to burdens of trauma and adversity (Desai et al., 2006).

The present study aims to address this gap by testing how three domains of childhood adversity - childhood maltreatment, family dysfunction, and social disadvantage - contribute to risk of mental health problems among court-involved youth. Furthermore, our analysis assesses the role of coping resources and demographic factors (e.g. race, income, access to health insurance) in maintaining and constraining the ACE-mental health association. Although bivariate associations between ACEs and mental health have been examined in juvenile court populations, multivariate associations linking ACEs, mental health, coping resources, and demographics have remained relatively unexamined. Lastly, the few studies of ACEs in juvenile justice populations have clustered primarily within Cook County, Illinois and Florida (Baglivio & Epps, 2015; Teplin et al., 2002). Our present population extends geographic representation to the Western United States, offering further insights into how associations between early life adversity and mental health and behavior are maintained and differ across regions in the US.

## ACEs and Developmental Cascades

ACEs catalyze a diverse range of sequelae through effects on both biological and psychosocial development with demonstrated associations to eroded psychological health throughout the lifespan (Chapman et al., 2004; Nurius, Green, Logan-Greene, & Borja, 2015; Taylor, Way, & Seeman, 2011). Exposure to childhood maltreatment often results in long-term changes in stress responses that include abnormal hormone regulation, hyper-reactivity, hyper-arousal, and limited impulse control (Danese & McEwen, 2012). These effects predispose individuals to social, emotional, and cognitive impairment and the adoption of risky behaviors that can cause further issues beginning in childhood that may last throughout their lifetimes (Duke, Pettingell, McMorris, & Borowsky, 2010; Fang & Corso, 2007; Purewal et al., 2016; Sprague, Verona, Kalkhoff, & Kilmer, 2011). ACEs are associated with increased risk for psychiatric disorders throughout life, including depression, anxiety, attention-deficit disorder, and posttraumatic stress disorder (Arnou, 2004; McLaughlin et al., 2012), in addition to increased risk for delinquent behavior (Barrett et al., 2014).

These effects on mental health do not occur in a vacuum. Work on developmental cascades demonstrates that difficulties in one domain or system of development often result in effects spreading across and accumulating in other facets of an individual's development because of

the many complex interactions between domains (Masten & Cicchetti, 2010). For example, depressive affect early in life can prevent an individual from succeeding in different developmental tasks, such as adaptive socialization with peers, thus limiting their ability to recover from developmental insults (Masten & Cicchetti, 2010). As stressor exposures accumulate, neurobiological response systems become overwhelmed, disrupting development of self-regulatory processes (e.g., attention control, inhibitory control, planning) that help children cope with external demands (Evans & Kim, 2013). Compromised parenting capacity can further compound these deficits and represent an important intervention target (Lengua et al., 2014). An individual with developmental difficulties, such as a lack of positive social supports, self-regulation deficits related to impulse control and future-oriented planning, and mental health difficulties, is further marginalized by delinquency with limited opportunities for interrupting the challenges in their developmental trajectories. This hypothesis is demonstrated in work focusing specifically on court-involved youth (Underwood & Washington, 2016).

## **Mental Health and Developmental Cascades in Court-Involved Youth**

Mental health is particularly salient for individuals involved in the judicial system not only because they suffer a disturbingly high prevalence of mental health problems (Abram et al., 2008; Fazel, Doll, & Långström, 2008; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002), but also because the resulting developmental cascades often lead them to experience a worsening cycle of negative outcomes. The danger of these trajectories is readily apparent from studies comparing delinquent youth with and without mental illness. Those diagnosed with mental health disorders are more prone to recidivism (Barrett et al., 2014), and they are more likely to be victims of violent death - over 4 times as likely for males and 8 times for females (Teplin, McClelland, Abram, & Mileusnic, 2005). The combination of experience in the legal system and living with poor mental health likely leads them to suffer more negative outcomes than individuals with poor mental health alone. Their risk of suicide and substance dependence in adolescence, for example, is significantly greater than their peers without histories of criminal justice experience (Abram et al., 2008; Kinner et al., 2014). The elevated risk underscores the serious need to address these youth therapeutically, not just punitively, during the involvement with the courts

There has been some work investigating ACEs and juvenile justice populations, especially with regards to ACEs and mental health in juvenile justice populations (Baglivio & Epps, 2015). However, elucidating how coping resources and demographic characteristics moderate associations between ACEs and mental health may provide insight into treating these youth and preventing or mitigating damaging developmental cascades. The importance of coping resources alongside risk factors has been laid out previously in criminological frameworks. At least one primary theory positions them as potentially impactful targets for intervention with wide-ranging and long-lasting effects on preventing further delinquency.

## **Protective Factors and General Strain Theory**

General Strain Theory (GST) is a useful lens through which to link childhood adversity, coping resources, mental health problems, and delinquency. It is a criminological framework

that explains how delinquency results from the accumulation of strain on individuals (Agnew, 2001). This strain develops from the pressure of negative affective states stemming from life stressors. Typically, the sources of strain are considered to be 1) the failure to achieve positive goals; 2) the removal of positively valued stimuli; and 3) the presentation of negative stimuli (Agnew, 2001). Once this strain surpasses a threshold, individuals may become prone to reactive and maladaptive responding, including delinquency, both as a general state and as specific act, as a result of their strain. For example, if an individual blames someone for his or her inability to gain a positively valued stimuli, directing aggression towards that person may be seen as a way to rectify the inequity. Or, if individuals feel unable to achieve their goals, they may resort to drugs or other maladaptive coping to change their affective states, relieving their stress through reduced investment in these goals or calming of their biological states.

Empirical tests have demonstrated the general validity of these hypotheses in that elevated strain in the context of limited agency is associated with increased delinquency and, alternatively, improved coping resources reduce the likelihood an individual engages in delinquency. For example, perceived experience of repeated injustices (which convey social strain) has been positively associated with delinquency among middle and high school students (Rebellion, Manasse, Van Gundy, & Cohn, 2012). Conversely, higher levels of social support from an individual's neighborhood weaken the association between victimization and substance use in adolescents (Fagan, Wright, & Pinchevsky, 2013). Further studies have demonstrated that regulatory capacities mediate these linkages. Hollist, Hughes, and Schaible (2009), for example, tested GST and found that negative emotions partially accounted for the relation between adolescent maltreatment and delinquency.

Because not everyone who is exposed to these pressures commits delinquent acts, there is a need to consider individuals' constraints and resources buffering them from, or catalyzing them towards, delinquency. These come in the form of coping resources, such as social skills and supports, and self-regulatory abilities, such as impulse control. In addition, the experience of early adversity affects an individual's psychosocial and neurobiological development in ways that often decrease their coping capacities and aspirations for the future (Danese & McEwen, 2012; Lengua et al., 2013). For example, increased exposure to institutional care (e.g., foster care) early in life has been tied to decreased impulse control in children (Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012). An individual with decreased impulse control is less likely to have the skills to adaptively resolve conflicts with authority figures, and within the framework of GST, this would increase the likelihood that this individual commits delinquent acts.

By incorporating coping resources, such as aspiration and impulse control, alongside demographic factors typically considered protective, such as income levels, our analyses apply GST to further the understanding of mental health ecologies in court-involved youth - moving beyond a basic descriptive analysis of this relation.

## The Present Study

The present study integrates the ACEs framework with GST to advance our understanding of how three domains of early adversity (maltreatment, family dysfunction, social disadvantage) are related to mental health problems among court-involved youth, and how coping resources may affect these pathways. Our focus on court-involved youth with demographic characteristics that differ importantly from other populations represented in the literature extends the regional scope and generalizability of this body of literature. We hypothesize that increased exposure to childhood adversities will be associated with increased mental health problems and that coping resources will attenuate this association. Specifically, we predict that poorer coping resources will serve to compound the effects of early adversity; those with higher adversity and poor coping resources will be at greatest risk of mental health problems.

## Methods

### Data

These data come from the Washington State Juvenile Court Assessment (WSJCA) provided by a juvenile court in a diverse jurisdiction containing both urban and rural areas in Washington (Barnoski, 2004b). In 1997, the Washington State Legislature enacted the Community Juvenile Accountability Act (CJAA) to encourage the use of research-based programs aimed at reducing crime and recidivism rates among adolescents. As part of the Act's requirements, the Washington Association of Juvenile Court Administrators and the Washington State Institute for Public Policy (WSIPP) collaborated to develop a 132-item assessment tool, which was implemented statewide in 1999. The Washington State Institute for Public Policy has examined the measures in this assessment tool and found them to be valid and empirically sound (Barnoski, 2004a). The rater training has been an implementation priority, especially across gender and race/ethnicity groups (Baglivio & Jackowski, 2013; Barnoski, 2004a). The assessment includes measures of dynamic and static risk and protective factors spanning multiple domains of youths' psychosocial context (Barnoski, 2004b). Only the courts and similar state personnel can grant access to this dataset. An Institutional Review Board approved all study procedures.

### Sample

The youth included in this dataset (N=5,378) were identified by the court as moderate to high risk youth (Barnoski, 2004a) who had a minimum of three months community probation between 2003–2013. Youth with sex offenses were excluded. For those who appeared in the dataset multiple times due to recidivism, only the first assessment was used. A majority of the participants were male (76.4%) with an average age of 15.5 years ( $SD = 1.46$ ). Racial composition was as follows: 59.8% Caucasian, 25.8% African-American, 6.1% Latinos (assessment did not differentiate between race and ethnicity), 3.2% Native Americans, 3.1% Asian Americans, 1.6% Hawaiians, and 0.4% mixed or other race.

## Measures

The delivery of the WSCJA is completed by court personnel (usually probation officers, termed Juvenile Probation Counselors in Washington State) who have received in-depth training. They are instructed to answer each question after interviewing the youth and their family, and after consulting extant records (e.g., school collaterals, child welfare databases) as appropriate.

**Adverse Childhood Experiences (ACEs).**—We created three ACEs scales to assess separate domains of adversity hypothesized to have differential, individual impacts on mental health: childhood maltreatment, family dysfunction, and social disadvantage. These scales are designed to distinguish between adversities that carry clear threat of harm (maltreatment) with those that more reflect dimensions of deprivation (family dysfunction reflecting variables that are likely to compromise healthy and sufficient parenting; social disadvantage reflecting poverty) (McLaughlin, 2016). All items included in these indexes were either dichotomous in their original form or collapsed for use in this analysis where noted (see [blinded for review] for more information). Total scores represent sums of ‘yes’ (0 = “No,” 1 = ‘Yes’) responses across identified items.

Prior ACE work has addressed questions of dimensionality within assessed exposures with mixed results (Ramiro, Madrid, & Brown, 2010; Scott, Burke, Weems, Hellman, & Carrión, 2013). It is well accepted that having one ACE exposure increases the likelihood that an individual will experience other ACEs, but the particular linkages between different types of exposures have varied across populations. Because childhood adversities tend to co-occur and to be cumulative in nature relative to health impacts, increasing emphasis has been placed on use of cumulative assessments (Arata, Langhinrichsen-Rohling, Bowers, & O’Brien, 2007; Dube et al., 2003; Edwards, Holden, Felitti, & Anda, 2003; Evans, Li, & Whipple, 2013). A single exposure is less likely to influence developmental outcomes, because a multiplicity of stressful experiences are more likely to overwhelm the body’s stress response systems and capacity to cope (Evans, 2003; Flouri, 2008). Focus on individual adversities is useful when contrasts in specific items undergird the premises of the research question. However, this approach risks missing the range of exposures, and could increase error by interpreting single item effects to be equivalent to a larger, more inclusive domain of adversity. Therefore, we included three ACE scales to distinguish separate domains of adversity that, based on the literature, may have differential impacts on mental health.

*Childhood Maltreatment* ( $M = 1.18$ ,  $SD = 0.97$ ) included four different types of maltreatment reported by youth (range=0–4). The WSJCA differentiates between physical and sexual abuse events within and outside the family, which were collapsed into one item each for the present analysis. Neglect was assessed with a single item. Dichotomized family violence/emotional abuse was based on having experienced any exposure to family violence, verbal abuse, or very heated arguments.

*Family Dysfunction* ( $M = 1.34$ ,  $SD = 1.24$ ) was measured as the sum of six dichotomized items of parental experiences of alcohol abuse, drug abuse, mental health problems, physical

health problems, family member imprisonment (any of father, mother, or sibling), and any out-of-home placements (range=0–6).

*Social Disadvantage* ( $M = 0.99$ ,  $SD = 0.94$ ) was assessed as a total across 4 dichotomized items: having low family income (either a family income of less than \$15,000 or below the poverty line based on family size), lack of health insurance, history of parental employment problems, and homelessness (range=0–4).

**Coping Resources.**—Indicators of coping resources included impulse control, aspirations, and social support. *Impulse control* was measured using the mean of six items that pertain to the youth's ability to monitor triggers, avoid impulsive responses, and aggression ( $\alpha = 0.79$ ,  $M = 0.00$ ,  $SD = 0.70$ ). Because this scale included items with differing number of anchors (e.g., some questions had three possible answers, others had four), we created z-scores for each item before creating the mean scale. This minimized the effects the different formats had on total scale values, and yielded a scale with a mean near zero. *Aspirations* was assessed as the mean of three items (also transformed to z-scores) pertaining to belief in future success, optimism, and goal setting ( $\alpha = 0.68$ ,  $M = 0.00$ ,  $SD = 0.78$ ). *Social support* is an inverse sum of two items measuring past and current lack of any close friends ( $r = 0.67$ ,  $p < .001$ ,  $M = 1.86$ ,  $SD = 0.47$ ); higher scores indicate consistently having close friends.

**Mental health problems** were assessed in three dichotomous forms: whether the youth had any current diagnosed mental health problems, had reported suicidal thoughts, and whether mental health problems interfered with court personnel's work with the youth during probation. These three variables capture complementary dimensions of mental health and allow us to assess stability of predictor effects across them. Table 1 provides descriptive statistics for these three indicators.

### Analytic Approach

We first assessed the prevalence of adversities within this sample by examining the frequencies of exposure to childhood maltreatment, family dysfunction, and social disadvantage. Next, we examined the bivariate relations among study variables using correlations. Logistic regression models tested the cumulative impact of adversities and coping resources on mental health indicators, accounting for demographic factors. Finally, we employed interaction terms to examine the moderating capacity of each coping resource on the relations between ACEs and mental health problems. For the multivariate analyses, we used dummy variables to compare minority youth (Black, Latino, and Other), using Caucasian youth as the reference group, in part because they comprise the largest portion of the sample, but also to be in line with research that highlights the needs of minorities within the justice system. We also examined the significance of the smaller racial groups (Hawaiian, Native American, and Asian), and observed no significant effects. We did not include those groups independently due to small cell size problems with the dependent variables.



## Results

### Prevalence of Study Variables

Results reveal that a large proportion of the youth in this sample had experienced some form of childhood maltreatment (see Table 1). Almost 75% experienced at least one type, and 10% had experienced at least three types of maltreatment. Experiences of family dysfunction showed similar patterns, where 70% of the sample reported at least one type, and 17.5% reported at least three types of family dysfunction. Most of the sample experienced some form of social disadvantage, with 64.1% reporting at least one type of economic disadvantage, and 8.4% reporting three or more.

The prevalence of indicators of mental health problems were also relatively high. Over a quarter (26.5%) of the sample carried some sort of mental health diagnosis. 6.8% of the sample were deemed to have a mental health problem that interfered with probation work. Finally, 6.3% reported current suicide ideation.

### Bivariate Relations

The majority of relations among study variables were significant and in the expected direction (see Table 2), with effects ranging from small (e.g., social support with family dysfunction and social disadvantage) to large (e.g., aspirations and impulse control). Although social disadvantage was significantly associated with other adversity domains and all of the coping variables in the expected direction, it was inversely related to mental health problems, contrary to our expectations. All coping factors were significantly related to all adversities and mental health indicators. No associations were sufficiently strong to indicate multicollinearity.

### Logistic Regressions

We next conducted logistic regression models (see Table 3) that predicted each of the three mental health problems as a function of demographics, ACEs, and coping resources. For all three models, minority groups were less likely to report a mental health problem compared to Caucasian youth. Being younger was linked to mental health diagnosis, whereas females were more likely to report suicide ideation, net of other factors. Childhood maltreatment was a robust predictor for each mental health indicator, whereas social disadvantage was significant in the opposite direction; family dysfunction did not achieve significance. All three of the coping variables were significant and robust contributors, controlling for other factors.

To test whether coping resources moderated the relations between childhood adversities and mental health problems, we created multiplicative interaction terms. In Table 4, the results of nine regression models are presented that test each coping factor's moderating capacities for each of the three ACE scales. In the first seven lines of the table, the moderating effects of impulse control on the three ACE scales are presented for each of the three dependent variables. The main effects of ACEs and impulse control are relatively unchanged across each of these models. Table 4 also shows the analogous sets of interaction tests for aspirations and social support, respectively. Aspirations significantly moderated the relations

between family dysfunction and social disadvantage with having a mental health problem that interferes with probation work. Social support significantly moderated the relation between childhood maltreatment and suicide ideation, showing a pattern of worsening mental health problems relative to their peers with high aspirations.

These four significant interactions were probed using the Johnson-Neyman method (Hayes, 2013; Hayes & Matthes, 2009) and the PROCESS macro for SPSS (Hayes, n.d.) to determine the ranges of significant moderation effects. The first of the interactions, childhood victimization X impulse control predicting having a mental health problem, was not significant when probed. The second, family dysfunction X aspirations predicting mental health problems that interfered with probation, showed significant moderation when aspirations was  $< 0.85$  and  $> 0.09$ . The third interaction, social disadvantage X aspirations predicting mental health problems that interfered with probation, was significant when aspirations was  $> -0.09$ . The fourth interaction, childhood victimization X social support predicting suicide ideation, was significant when social support was  $> -1.16$ . Figures 1–3 present graphs of these results for easier interpretation (Dawson, n.d.). In Figure 1, it is clear that having low aspirations in the presence of high family dysfunction significantly elevates the risk of having a mental health problem that interferes with probation. Figure 2 shows that low aspirations plus low social disadvantage has the same effect. Finally, Figure 3 reveals that low social support and high child victimization makes suicide ideation more likely.

## Discussion

This study is among the first to provide a detailed assessment of three domains of adverse childhood experiences among court-involved youth and their contributions to mental health. It is distinctive in testing the cumulative and unique contributions of these adversity forms, as well as by linking ACEs to coping resources as direct and moderating protective resources. Findings bolster the importance of assessing potentially ameliorative coping resources that could serve as targets for preventive and resilience-fostering interventions. This research fills an important gap in the literature on links between mental health and childhood adversity, which often rely on either “typical” population-based samples or very high risk samples, such as incarcerated, hospitalized, or group residential youth. As probation is often a first contact point for delinquent youth, it presents an opportunity for secondary prevention across a range of systems to address mental health needs to foster rehabilitation and reduce recidivism (Kim, Losen, & Hewitt, 2010).

### Adverse Experiences among Court-Involved Youth

As expected, these court-involved youth demonstrated substantial burdens of childhood adversity. Only 25.1% of the sample reported no form of childhood maltreatment; almost 10% had experienced 3 or different types of maltreatment by the time of assessment. This is much higher than the rates found in the original ACEs study, in which they estimated that 48.0% of the general population reported no childhood exposures to any ACE items (Felitti et al., 1998). A recent study using a sample of low-income pediatric patients showed that only 32.8% had experienced no ACEs of any kind (Burke, Hellman, Scott, Weems, & Carrion, 2011); examining all ACE items included here showed that only 6.7% had

experienced no exposures, underscoring the heavy burden of adversity carried by court-involved youth. The results of the current study strengthen the epidemiologic case that court-involved youth who enter the system are more likely to have experienced adverse childhood experiences compared to their uninvolved counterparts (Baglivio et al., 2014; Dierkhising et al., 2013).

Family dysfunction was also high, as hypothesized. Only 29.6% had none of the assessed experiences, and 37.9% had two or more. We assessed a wider scope of possible adverse experiences than is typically included in the ACE assessment, including the addition of physical health problems, which may confer unique difficulties to a youth population by stress associated with a hospitalized parent or poverty from a parent who is unable to work (Choi, 2011). Consistent with some pediatric adversities screening (Purewal et al., 2016), we included out-of-home placements. These experiences are of particular concern to practitioners in juvenile justice because of their negative effect on youths' behaviors and mental health (Jonson-Reid & Barth, 2000), and may serve as avenues through which youth get funneled into the juvenile justice system. Overall, these high levels of family dysfunction demonstrate that the majority of youth in our sample struggled with a disrupted and stressful home life.

It is also clear that this sample struggled with economic deprivation, with 64% endorsing one or more indicators, which provides important contextual information toward capturing chronic poverty related adversities cumulative with maltreatment and family dysfunction. Social disadvantage is not only germane to engaging in delinquency; it is an important stressor with impacts on biopsychosocial development (McBride Murry, Berkel, Gaylord-Harden, Copeland-Linder, & Nation, 2011). Economic deprivation is associated with food insecurity and the neglect of other important aspects of children's care. This can lead to both physical maldevelopment - compounded by a lack of access to medical care and nutritional and residential security - and deficits in social skills and emotional health (Jarjoura, Triplett, & Brinker, 2002). The high burden of poverty faced by youth in this sample demonstrates not only disproportionate adversity, but also home life that lacked the capacity to meet youths' basic needs. Although not commonly assessed, other research has expanded the understanding of ACEs to include poverty and other forms of strain more likely to be encountered in court-involved youth (Purewal et al., 2016; Wade, Shea, Rubin, & Wood, 2014), and found that family poverty can be one of the most stressful experiences based on youth report.

### **ACEs and Mental Health Problems**

Childhood maltreatment and family dysfunction showed positive relations with the three mental health problem indicators, as expected. The strength of the association between childhood maltreatment on mental health indicators aligns with a longitudinal relationship between ACEs and depressive symptoms in a previous study of the general US population (Schilling et al, 2007). Further, the increase in odds of having a mental health problem with each increase in childhood maltreatment is similar to what a recent study found with a general population of adults in Iowa (Downey, Gudmunson, Pang, & Lee, 2017). However, social disadvantage had an inverse relation with both mental health problems and suicidality.

This unexpected finding may be in part a function of the way mental health is commonly assessed in juvenile court setting. In this assessment, probation officers talk with youth and their families about any mental health diagnoses that the youth have formally received, including whether youth have received mental health treatment. However, this assumes that all youth have equitable access to assessment and treatment, which is a fundamentally flawed assumption. Socially disadvantaged youth are less likely to receive mental health assessments, particularly minority youth or those without health insurance (Kataoka, Zhang, & Wells, 2002). This finding does not, in our view, indicate that youth from impoverished backgrounds are less likely to have mental health problems, but rather that those problems are less likely to be identified or impact dimensions other than what is assessed here. Unfortunately, available data makes confirmation difficult, as this tool does not directly assess clinical symptomology of psychopathology. However, the significant findings with respect to coping resources (discussed in more detail below) provide tentative support for underreporting of diagnoses, rather than a lack of impairment.

The full models demonstrated support for the importance of multi-form adversity in explaining mental health problems. Although few of the demographic factors demonstrated significance, two merit noting. First, females were more likely, net of other factors, to report suicide ideation. This is congruent with findings that girls in the juvenile justice system are more likely to demonstrate mental health problems compared to boys (Cauffman, Lexcen, Goldweber, Shulman, & Grisso, 2007; Teplin et al., 2002), and more likely to report suicide ideation (Abram et al., 2008). Additionally, racial minority groups in each model were significantly less likely than Caucasian youth to report assessed mental health problems, net of other factors. This initially surprising factor may also be explained by the underutilization of mental health services by minorities (Garland et al., 2005), which is often attributable to stigma, income, or other barriers to access. This finding bolsters previous research suggesting that low minority access of mental health services is a serious public health concern.

The pattern of ACE scales effects were relatively consistent across the three outcomes, with childhood maltreatment making a strong independent contribution. Although this may suggest that childhood maltreatment has a stronger net contribution to explaining mental health outcomes (Schilling et al., 2007), other ACEs carry detrimental effects. Importantly, these experiences rarely happen in isolation and carry a cumulative level of impact (Baglivio & Epps, 2015). Thus, examining youth's experiences broadly provides insight into multiple pathways through which different forms of adversity carry effect. Childhood maltreatment has been found particularly detrimental to mental health, and may reflect environments in which youth are exposed to other forms of adversity not assessed here, such as community violence (Finkelhor, Ormrod, & Turner, 2007).

### **ACEs and Coping Resources**

Childhood adversity is theorized to impact physical and mental health via biological stress pathways and neurological dysregulation that are strongly related to socioeconomics (Turner, Thomas, & Brown, 2016). An important corollary to this is that the mechanisms may be interrupted by protective capacities to reduce stress and improve emotional

regulation. The three coping resources examined in this study - impulse control, aspirations, and social support - all demonstrated significant bivariate associations with all three ACE scales in the direction and relative size seen in previous studies (Lovallo et al., 2013; Mc Elroy & Hevey, 2014). The results are consistent with prior findings that impairment resulting from maltreatment and related toxic stressors can be ameliorated by malleable factors such as impulse control and fostering aspirational traits such as goal setting skills, optimism, and self-efficacy beliefs.

Poor impulse control has long been viewed as a likely contributor to delinquent behaviors (Hirschfield, Maschi, White, Traub, & Loeber, 2006), and recent research linking adversity with impairment of neurological mechanisms of self-regulation provides insight into the mechanism of action. Briefly, chronic or severe adversity in childhood can disrupt the neural systems in charge of stress responses, impairing an individual's ability to cope with social interactions and potential threats, predisposing them to behave aggressively (Shonkoff et al., 2012), which aligns with GST theorizing. Although the one significant interaction was not evident after probing, impulse control had strong independent effects in all models. Congruent with this, recent research supports interventions that target self-control as a method to reduce delinquency (Piquero, Jennings, Farrington, Diamond, & Gonzalez, 2016).

In our study, youth aspirations made significant independent contributions to all three mental health indicators, and moderated the relations between family dysfunction and social disadvantage when mental health interfered with probation work. Lowered aspirations may have direct, immediate impacts to both delinquency and mental health difficulties. First, lower aspirations lead individuals to have shorter time horizons in decision-making and display greater temporal discounting (Joshi & Fast, 2013). That is, they discount delays in reward much more steeply than those with high aspirations - they are less willing (and perhaps able) to wait for the same reward. This impacts long-term decisions such as financial planning and health-promoting behaviors, but also leads to greater risk-taking and attraction to promise of immediate gains. Mental health is then impacted through the behavioral cascade resulting from these changes - poor physical health impacts mood, anxiety, and executive control (particularly through changes in neurogenesis and other mechanisms) - and lowered aspirations often lead to depressive affect and mood disorders (Gallagher & Lopez, 2009) and undermine resilience to trauma (Tedeschi & Calhoun, 2004).

Our results at least partially support this. Figure 2 displays our finding that lowered aspirations impact mental health indicators more strongly in youth with high family dysfunction. As family dysfunction increases, increased aspects of our aspirations measure (i.e. belief in future success, optimism, and goal setting) may motivate youth to interact more constructively with probation officers. However, lowered aspirations appear to impact mental health indicators more strongly in youth with low social disadvantage (Figures 1 & 2). Individuals with lower aspirations are more likely to have higher social disadvantage our sample (Table 2), so individuals who are both low in social disadvantage and low in aspirations may differ more strongly from most of the same-age peers with whom they interact. This may increase distress experienced from lowered aspirations. Previous research has pointed to the importance of local inequalities in determining mental health (e.g. Riva, Bambra, Curtis, & Gauvin, 2011), and perhaps our measure of aspirations is acting similarly.

Further, the individual parts of our aspirations measure (i.e. belief in future success, optimism, and goal setting) may manifest in ways that factor strongly in a mental health diagnosis. In this way, differences in access to mental health professionals would be reflected more strongly in individuals with low aspirations as opposed to high aspirations. Unfortunately, we do not have the data to parse through these explanations, but, taken together, these results highlight the protective aspects of higher aspirations among these youth.

Social support is widely viewed as one of the more consistent buffers of adversity across a variety of outcomes, including both delinquency and mental health problems (Chu, Saucier, & Hafner, 2010; Hill, Kaplan, French, & Johnson, 2010; Wang & Eccles, 2012). Our study found that social support was significantly associated with ACEs and mental health problems at both the bi- and multivariate levels. The relationship between mental health problem indicators and social support is similar to the range of effect sizes reported by Chu and colleagues (2010). It was a significant moderator of the relation between childhood maltreatment and suicide ideation. Social support is complicated with delinquent youth wherein antisocial peer support may lead to recidivism (Martinez & Abrams, 2013). However, prosocial support by peers and adults is an important target for reducing youth distress and improving regulatory capacity. Indeed, accumulating research suggests that adolescents' support is crucial to reduce delinquency and improve functioning following adverse experiences (Kort-Butler, 2010).

### Limitations

A primary limitation of this study involves measurement constraints. The indicators of mental health problems, for example, do not include directly assessed symptomology. However, the indicators used do tap important clinical parameters, including receiving a mental health diagnosis, suicidality, and challenges to working relationships with court personnel. Even with these limitations these findings are coherent, consistent with prior research, and suggest the value of using system data, routinely collected at baseline, to guide early prevention-oriented services. This aligns with calls for fuller use of administrative data toward providing "practical strategies" to address youth maltreatment and related problems, and for developing theory (Putnam-Hornstein, Needell, & Rhodes, 2013). Our findings also argue the value of strengthening assessment of mental health, such as symptomology, which may be particularly helpful for youth with diminished access to clinical assessments and treatment. Although system data often lack a theorized base or the benefit of multi-item scaling, our findings encourage use of assessment tools applied in many juvenile justice jurisdictions that assess ACEs as a beginning point in linking early adversity with youth mental health and protective resources that might be strengthened to support resilience.

An additional limitation is the nature of the sample. These youth are from a western US district, which raises questions as to representativeness of other areas of the country. However, this district is diverse in respect to both race/ethnicity and socioeconomic characteristics. For example, 60% of juveniles are labeled Caucasian and 25.8% African-American, which places the district between the extremes found between states like Maine and Mississippi with about 90% Caucasian and 45% African-American, respectively

(Sickmund & Puzzanchera, 2014). The county includes a mid-size metropolitan city, Native American reservations, and some fairly rural conditions. Thus, the sample is better reflective of the diversity found in the United States than many other single jurisdiction samples might be.

Finally, as this is a cross-sectional sample, we do not have longitudinal data to verify temporal relations among variables nor the ability to verify some aspects of reported ACEs. Studies have shown, however, that recall is excellent for youth reporting childhood maltreatment and adversity, and that self-report is consistent with substantiated system records in analyses (Smith & Thornberry, 1995). Additionally, some of the adversities assessed for childhood are likely to be ongoing. Although the measurement may limit the certainty of prevalence and causal relations, findings to date suggest that linear relations tend to be robust to these limitations (Baglivio, Wolff, Piquero, & Epps, 2015; Hardt, Vellaisamy, & Schoon, 2010; Yancura & Aldwin, 2009). As a final note, it is important to acknowledge that our sample size is large, meaning that small effect sizes may emerge as significant. For this reason, we have provided detailed information from our results (i.e., unstandardized and standardized betas in addition to odds ratios), so that the reader can accurately assess the clinical importance of each finding.

## Conclusions and Implications

This study adds to a growing body of literature demonstrating both significant mental health challenges and burdens of childhood adversity among juvenile justice-involved youth. A significant implication of the present research, however, is that commonly used assessment tools may miss mental health problems among economically disadvantaged youth by asking specifically about mental health diagnoses rather than symptoms. To better identify these youth, a clinical tool that identifies symptomology should be added to initial assessment. The Massachusetts Youth Screening Instrument (MAYSI-2) is a particularly well-suited tool because of the inclusion of questions concerning traumatic experiences. This initial processing has been identified as a critical opportunity for assessment for these vulnerable youth (Skowrya & Coccozza, 2007).

Despite these circumstances, delinquent youth with psychopathology are typically under-treated, due largely to the lack of resources and limited understanding of which environmental factors increase their risk for developing mental health difficulties (Kinner et al., 2014). Expanding our understanding of these risk factors in juvenile offenders will improve allocation of mental health resources, prevention-based mental health care strategies for social workers and communities, and general insight into why individuals become involved in delinquent behavior. Furthermore, self-regulatory mental health precursors, such as poor impulse management, play key roles in shaping system-involved youths' stress response profiles, including behaviors that require effortful control. Understanding the associations between these symptoms and developmental environments can potentially elucidate pathways between early adversity and delinquency and the negative developmental cascades caused by their co-occurrence.

Once identified, court-involved youth need services that can address mental health issues that stem from childhood adversity. At present, research suggests that these needs are not well met, perhaps especially among youth on probation (Shufelt & Coccozza, 2006). Fortunately, evidence based programs do exist. However, their implementation requires that governmental resources be invested in programming. Although some states have taken steps to meet these needs, others still lag (Skowrya & Coccozza, 2007). As research accumulates that demonstrates the high burden of adversities among court- involved youth, the resulting mental health problems they face, and potential targets for intervention such as impulse control and a positive outlook, more programming will be put in place to improve outcomes.

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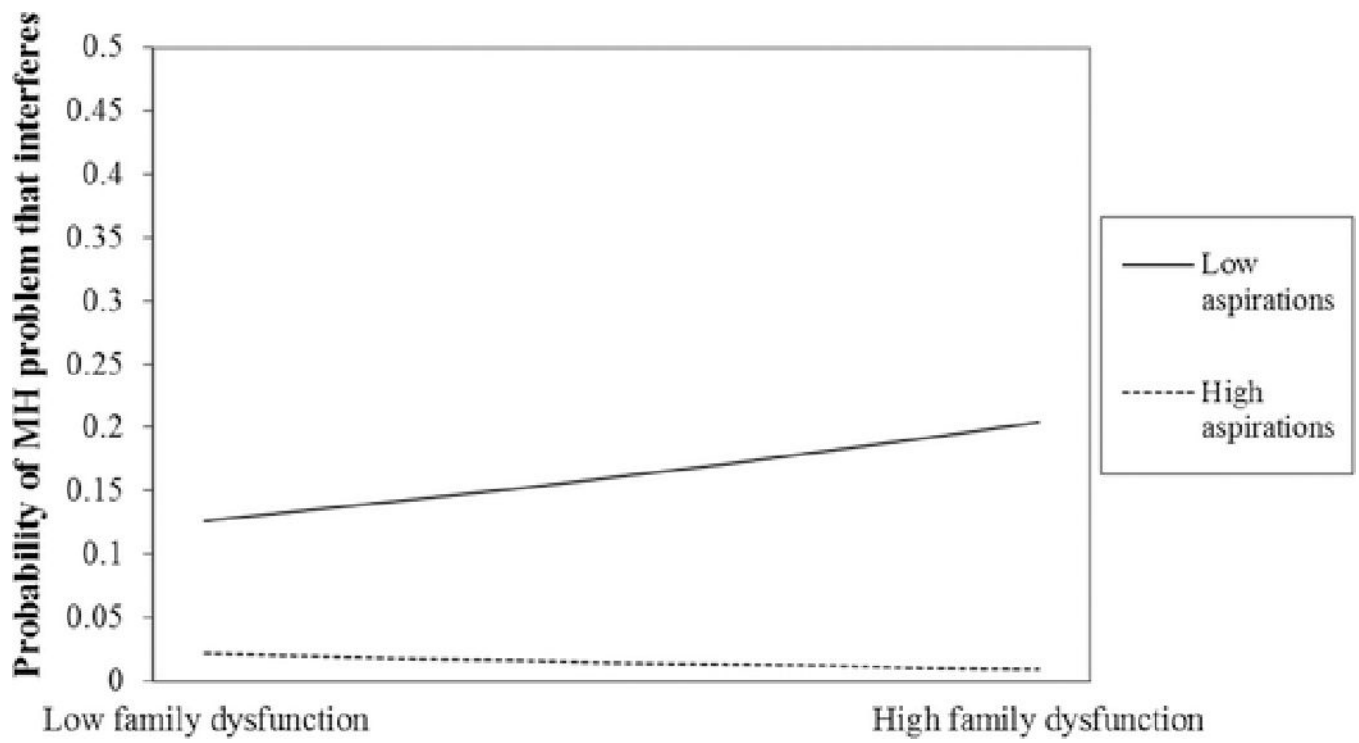
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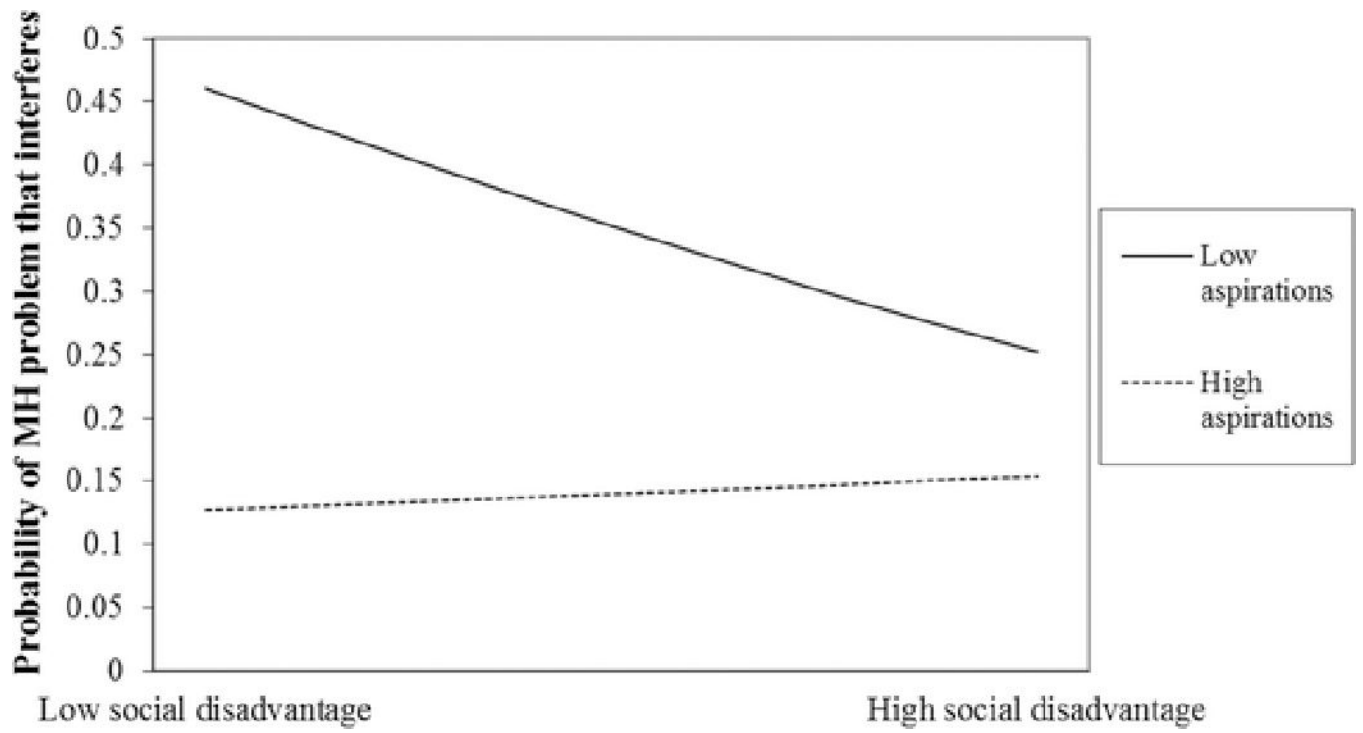
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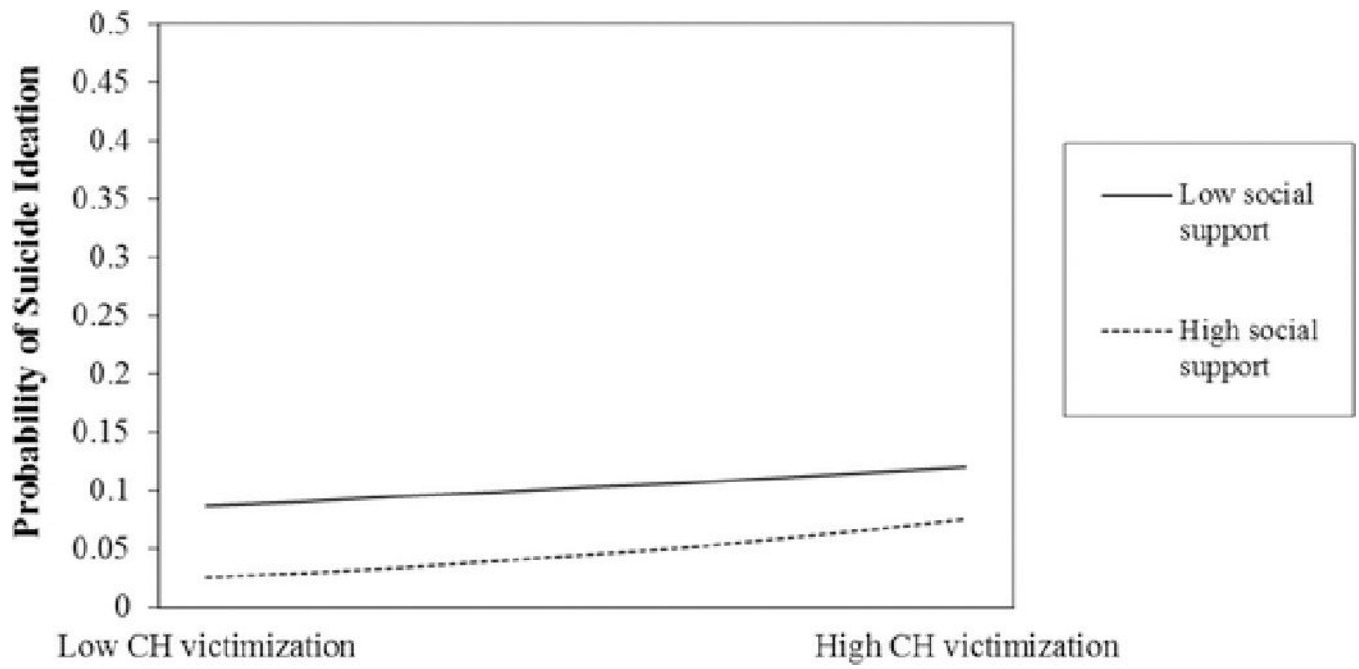
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**Figure 1.** Plot of interaction between family dysfunction and aspirations, predicting having a mental health problem that interferes with probation.



**Figure 2.** Plot of interaction between social disadvantage and aspirations, predicting having a mental health problem that interferes with probation.



**Figure 3.** Plot of interaction between childhood victimization and social support, predicting having suicide ideation.

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**Table 1**

Count of exposures for Adverse Childhood Experiences - frequency (percentage)

	Number of Exposures			
	0	1	2	3
Maltreatment	1351 (25.1%)	2356 (43.8%)	1124 (20.9%)	547 (10.2%)
Family dysfunction	1592 (29.6%)	1749 (32.5%)	1098 (20.4%)	939 (17.5%)
Social disadvantage	1933 (35.9%)	2002 (37.2%)	989 (18.4%)	454 (8.4%)

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Table 2

Correlations between ACE scales and coping factors

	1	2	3	4	5	6	7	8
1. Mental health problem								
2. MH problem interferes	0.450***							
3. Suicide ideation	0.433***	0.256***						
4. Maltreatment	0.256***	0.178***	0.151***					
5. Family dysfunction	0.087***	0.062***	0.034***	0.336***				
6. Social disadvantage	-0.049***	-0.007***	-0.031*	0.157***	0.373***			
7. Impulse control	-0.174***	-0.164***	-0.097*	-0.226***	-0.132***	-0.169***		
8. Aspirations	-0.159***	-0.193***	-0.209***	-0.209***	-0.128***	-0.161***	0.504***	
9. Social support	-0.205***	-0.225***	-0.078***	-0.138***	-0.079***	-0.035*	0.089***	0.126***

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$ .

**Table 3**  
 Regressions (ORs) using ACEs and coping factors to explain mental health outcomes

	Mental Health Problem			Mental Health Problem Interferes with Probation			Suicide Ideation		
	B (SE)	B	OR (sig)	B (SE)	B	OR (sig)	B (SE)	B	OR (sig)
Age	-0.049 (0.024)	-0.092	0.952 <sup>*</sup>	0.005 (0.042)	-0.015	1.005	0.027 (0.043)	0.022	1.027
Gender	-0.080 (0.083)	-0.031	0.924	0.195 (0.149)	0.041	1.099	-0.381 (0.135)	-0.160	0.683 <sup>**</sup>
Black	-0.889 (0.089)	-0.381	0.411 <sup>***</sup>	-0.886 (0.173)	-0.383	0.412 <sup>***</sup>	-0.893 (0.173)	-0.386	0.409 <sup>***</sup>
Latino	-0.66 (0.235)	0.112	0.407 <sup>***</sup>	-0.072 (0.486)	0.019	0.358 <sup>***</sup>	-0.093 (0.504)	0.024	1.10
Other race	-1.365 (0.169)	-0.481	0.255 <sup>***</sup>	-1.198 (0.324)	-0.389	0.333 <sup>***</sup>	-1.225 (0.332)	-0.433	0.294 <sup>***</sup>
Maltreatment	0.477 (0.040)	0.481	1.612 <sup>***</sup>	0.463 (0.065)	0.467	1.589 <sup>***</sup>	0.449 (0.064)	0.451	1.567 <sup>***</sup>
Social disadvantage	-0.285 (0.042)	-0.264	0.752 <sup>***</sup>	-0.295 (0.074)	-0.278	0.745 <sup>***</sup>	-0.289 (0.075)	-0.271	0.749 <sup>***</sup>
Family dysfunction	0.040 (0.031)	0.049	1.041	0.017 (0.054)	0.021	1.017	-0.037 (0.055)	-0.046	0.964
Impulse control	-0.451 (0.062)	-0.200	0.637 <sup>***</sup>	-0.678 (0.120)	-0.357	0.507 <sup>***</sup>	-0.398 (0.112)	-0.175	0.672 <sup>***</sup>
Aspirations	-0.160 (0.051)	-0.175	0.852 <sup>**</sup>	-0.561 (0.086)	-0.478	0.571 <sup>***</sup>	-0.365 (0.086)	-0.325	0.694 <sup>***</sup>
Social support	-0.610 (0.069)	-0.286	0.544 <sup>***</sup>	-0.778 (0.074)	-0.369	0.459 <sup>***</sup>	-0.234 (0.101)	-0.113	0.791 <sup>*</sup>
Classification		75.9%			93.6%			93.8%	
Nagelkerke R <sup>2</sup>		0.208			0.220			0.124	

<sup>a</sup>Female = 1, Male = 2. Racial referent group = Caucasian.

\* *p* .05,

\*\* *p* .01,

\*\*\* *p* .001.

**Table 4**  
Regression-Based Tests of Moderation: Coping Factors with ACEs on Mental Health

	Mental Health				Mental Health				Suicide	
	Problem				Interferes with Probation				Ideation	
	B (SE)	B	OR (sig)	B (SE)	B	OR (sig)	B (SE)	B	OR (sig)	
<b>Impulse Control:</b>										
Impulse control main effects	0.532 (0.040)	-0.421	0.548***	-1.077 (0.174)	-0.755	0.341***	-0.620 (0.155)	-0.434	0.538***	
Maltreatment	0.143 (0.054)	0.517	1.702***	0.582 (0.070)	0.566	1.790***	0.476 (0.066)	0.463	1.609***	
Impulse control * Maltreatment	0.143 (0.054)	0.142	1.153**	0.122 (0.098)	0.121	1.129	-0.030 (0.091)	-0.303	0.971	
Family Dysfunction	0.039 (0.032)	0.048	1.039	0.005 (0.063)	0.007	1.005	-0.015 (0.058)	-0.018	0.985	
Impulse control * Dysfunction	-0.036 (0.048)	-0.43	0.965	-0.066 (0.094)	-0.080	0.936	0.083 (0.088)	0.100	1.087	
Social Disadvantage	-0.290 (0.044)	-0.273	0.748***	-0.275 (0.089)	-0.259	0.760**	-0.284 (0.083)	-0.268	0.753***	
Impulse control * Disadvantage	-0.101 (0.065)	-0.091	0.904	-0.059 (0.130)	-0.053	0.943	-0.075 (0.377)	-0.068	0.928	
<b>Aspirations:</b>										
Aspirations main effects	-0.388 (0.084)	-0.303	0.678***	-0.812 (0.149)	-0.634	0.444***	-0.627 (0.146)	-0.490	0.534***	
Maltreatment	0.534 (0.039)	0.519	1.706***	0.591 (0.071)	0.575	1.806***	0.512 (0.066)	0.498	1.669***	
Aspirations * Maltreatment	0.042 (0.046)	0.054	1.043	0.076 (0.074)	0.096	1.079	0.086 (0.073)	0.109	1.090	
Family Dysfunction	0.038 (0.031)	0.047	1.039	-0.110 (0.065)	-0.135	0.896	-0.029 (0.059)	-0.036	0.971	
Aspirations * Dysfunction	-0.036 (0.038)	-0.054	0.964	-0.260 (0.065)	-0.385	0.771***	0.023 (0.065)	0.034	1.023	
Social Disadvantage	-0.258 (0.042)	-0.243	0.773***	-0.130 (0.083)	-0.123	0.878	-0.300 (0.083)	-0.283	0.741***	
Aspirations * Disadvantage	0.021 (0.051)	0.023	1.021	0.276 (0.091)	0.304	1.318**	-0.072 (0.090)	-0.079	0.931	
<b>Social Support:</b>										
Social support main effects	-0.742 (0.132)	-0.349	0.476***	-1.119 (0.161)	-0.526	0.327***	-0.680 (0.195)	-0.320	0.506***	
Maltreatment	0.600 (0.135)	0.584	1.823***	0.440 (0.137)	0.428	1.553***	0.182 (0.173)	0.176	1.199	
Social support * Maltreatment	-0.033 (0.072)	-0.062	0.968	0.075 (0.078)	0.142	1.078	0.198 (0.094)	0.375	1.220*	
Family Dysfunction	-0.078 (0.117)	-0.097	0.925	-0.173 (0.129)	-0.214	0.841	-0.118 (0.169)	-0.146	0.889	
Social support * Dysfunction	-0.301 (0.151)	0.155	1.066	0.115 (0.072)	0.278	1.122	0.043 (0.090)	0.105	1.044	
Social Disadvantage	-0.301 (0.151)	-0.283	0.740*	-0.088 (0.164)	-0.083	0.916	-0.111 (0.217)	-0.105	0.895	

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Impulse Control:	Mental Health Problem			Mental Health Interferes with Probation			Suicide Ideation		
	B (SE)	B	OR (sig)	B (SE)	B	OR (sig)	B (SE)	B	OR (sig)
Social support* Disadvantage	0.037 (0.080)	0.069	1.038	-0.066 (0.094)	-0.122	0.936	-0.066 (0.321)	-0.123	0.936

Note: Regressions control for all demographics.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$