

6-5-2018

The Potential Iatrogenic Effects of Formal vs. Informal Juvenile Justice System Processing: The Moderating Influence of Callous-Unemotional Traits

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THE POTENTIAL IATROGENIC EFFECTS OF FORMAL VS. INFORMAL JUVENILE
JUSTICE SYSTEM PROCESSING: THE MODERATING INFLUENCE OF CALLOUS-
UNEMOTIONAL TRAITS

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

in

The Department of Psychology

by

Emily Lynne Robertson
B.S., University of North Florida, 2014
August 2018

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List of Abbreviations

1. CU – Callous-Unemotional
2. SRO – Self-Report of Offending Scale
3. WASI- II – Wechsler Abbreviated Scale of Intelligence
4. PDS – Peer Delinquency Scale
5. PMI – Parental Monitoring Inventory
6. LGCM – Latent Growth Curve Model
7. FIMLE – Full Information Maximum Likelihood Estimation
8. MCAR – Missing Completely at Random
9. RMSEA – Root Mean Square Error of Approximation
10. TLI – Tucker-Lewis Index
11. CFI – Comparative Fit Index
12. BIC – Bayesian Information Criteria

Abstract

Previous research has indicated that adolescents who are formally processed by the juvenile justice system are at a higher risk of worse outcomes, most notably increased risk for subsequent offending and arrests. However, it is unclear whether this effect is due to the processing decision and subsequent involvement with the justice system or whether it is due to characteristics of the adolescents who are formally processed. Further, it is unclear whether formal processing increases the risk for future offending in *all* adolescents or whether its effects are more pronounced for certain adolescents. In the current study, we tested the predictions that formal processing upon first arrest would increase the risk for offending and rearrest and that this effect would remain even after accounting for key demographic and background variables. Further, we predicted that the adolescents' level of CU traits would moderate this effect such that formal processing would only increase the risk of offending and rearrest among adolescents who had low CU traits. First-time male juvenile offenders ($N = 1,216$; M age = 15.12, $SD = 1.29$) across three geographically distinct sites were assessed at 6-month intervals for 36 months after their initial arrest. Inclusion was based on the adolescent's offense characteristics, such that the offense resulted in significant discretion to either formally process the youth or divert the youth from the system. As predicted, formal processing increased risk of self-reported offending and official records of rearrests across the follow-up period. Importantly, this effect remained significant for rearrests, even after controlling for key demographic and background characteristics, such as the child's self-reported lifetime history of delinquency provided at the time of arrest, neighborhood disorder, intelligence, ethnicity, impulse control, peer delinquency, parental education, and parental monitoring. Further, self-reported CU traits assessed immediately following arrest moderated this effect, such that formal processing increased the

risk of offending, but only in adolescents low on CU traits. This latter finding has important policy implications in suggesting that the effects of formal processing may have been underestimated in past research for children lower on CU traits.

Introduction

How to most appropriately handle adolescents who have committed crimes has been the subject of considerable debate for over a century (Monahan, Steinberg, & Piquero, 2015). When a child or adolescent is arrested, a decision is made as to whether the case is processed formally through the juvenile (or adult) courts or alternatively, processed informally outside of the court (e.g., diverted). Across the United States, there is great variability in the ways these decisions are made (Feld, 1991; Feld, 1993; Ghezzi & Kimball, 1986; Krisberg, Litsky, & Schwartz, 1984; Snyder & Sickmund, 1999). In practice, this means that adolescents with a similar history of delinquent behavior who commit the same crime may be processed in vastly different ways in different jurisdictions, leading to a cascade of different life outcomes for these youths. Because of this, there is a growing interest in a more nuanced understanding of what types of processing decisions are most effective in rehabilitating delinquent adolescents upon their first arrest, most notably in reducing future offending and future contact with the system.

Juvenile Justice System

The juvenile justice system was created as a separate entity from the adult criminal justice system in the late 19th century because policy makers argued that children and adolescents are less culpable for their behavior and are more amenable to treatment. Thus, these reformers made the argument that children and adolescents should not be subjected to the punitive criminal justice system, and instead, subjected to individualized programs that rehabilitate the individual (see Monahan et al., 2015 for review). Specialized facilities were created for juveniles in New York City, NY and Chicago, IL as a way to seclude juveniles from incarcerated adults and provide rehabilitative treatments. By 1925, the majority of US states had set up juvenile court

systems, and these courts were based on the legal doctrine of *parens patriae*, meaning ‘parents of the country’. This doctrine deemed the state governments as the guardian of the youth entering the system, and as such the courts were tasked with acting in the child’s best interest rather than being tasked with administering retribution. As such, many of the same protections afforded to adult clients were not deemed necessary in the juvenile court system.

By the mid 20th century, several cases led to a series of consequential Supreme Court decisions including *In re Gault* (1967), which designated that adolescents, just as adults, have the right to due process (e.g., legal counsel, confront witnesses). Despite many agreeing these changes were necessary, the decisions led the juvenile justice system to adopt more formal procedures in their legal proceedings, becoming more similar to the adult system. By the 1980s, there was a growing fear of juvenile crime after a series of high-profile crimes (Scott & Grisso, 1997). The growing perception that juvenile crime was increasing in frequency and becoming more severe pressured legislators to ‘get tough’ on juvenile crime, leading to more punitive approaches to juvenile justice (Garland, 2001; Scott & Grisso, 1997). Thus, legislation was drafted to expand the options for incarcerating juveniles, including being transferred to adult court (Snyder & Sickmund, 2006).

Despite the oscillation between punitive vs. rehabilitative methods for handling juvenile offenders over the last century, support toward more evidence-based, rehabilitative processes still exist among the majority of the public (Moon, Sundt, Cullen, & Wright, 2000), legislators, and reformers (Monahan et al., 2015). This is evident by recent Supreme Court decisions including *Roper v. Simmons* (2005), which deemed the death penalty was an unconstitutional punishment for crimes committed by those under 17, as well as *Graham v. Florida* (2010) and *Miller v. Alabama* (2012) which together deemed life sentences without the possibility for parole

unconstitutional for juveniles. Further, a significant amount of attention has been directed toward understanding the effects of the punitive legislation drafted in the 1980s and 90s on adolescents' outcomes, such as recidivism. For example, it appears that waiving youths to adult court is more harmful than beneficial (Monahan et al., 2015). That is, youths transferred to adult court are more likely to reoffend than youths who remained in the juvenile justice system (Bishop & Frazier, 2000; Fagan & Zimring, 2000; Kupchik, 2007; Lanza-Kaduce, Lane, Bishop, & Frazier, 2005).

Potential Harmful Effects of Justice System Involvement

In addition to understanding the effects of transferring juveniles into the adult criminal system, it is equally important to understand how other processing decisions within the juvenile system impact those who enter it. Despite considerable reductions in the rate of juvenile arrests in the U.S. over the previous decade, approximately 922,000 adolescents were arrested in 2015 (OJJDP, 2017). To date, the majority of studies that have examined the effect of juvenile system involvement on subsequent adolescent offending, have found an iatrogenic influence of the system on future criminality (Cuellar, McReynolds, & Wasserman, 2006; Dishion, Poulin, & Burraston, 2001; Dishion, McCored, & Poulin, 1999; Gatti, Tremblay, & Vitaro, 2009; Loughran et al., 2009; Petitclerc, Gatti, Vitaro, Tremblay, 2013; Petrosino, Turpin-Petrosino, & Guckenburg, 2010). In what is perhaps one of the most well-known studies to investigate this topic, a large sample of over 1,000 low income Canadian boys were followed into adulthood. In this sample, juvenile justice intervention (i.e., intervention without supervision, with supervision, or with placement) between the ages of 12-17 increased the risk for adult offending by a factor of nearly 7, compared to boys who were not exposed to any intervention by the system, with the most intensive interventions (i.e., out of home placement) having the largest criminogenic effect

and the least restrictive interventions (i.e., no supervision) having the least criminogenic effect (Gatti et al., 2009). Further, these authors found that taking the adolescent out of the home and institutionalizing them, the most restrictive and intensive intervention assessed, increased the risk for adult offending by a factor of 37 when compared to those who were not institutionalized. In another study using the same sample, Peticlerc et al (2013) used a more sophisticated analysis (i.e., propensity score matching) to account for any differences between those who were formally processed by the court and those who were informally processed (e.g., impulsivity, previous offending) that may explain the results of Gatti et al. (2009). These authors found that the youths processed formally had three times the risk of being convicted of a criminal offense at age 25 and committed almost twice the number of violent and nonviolent crimes compared to matched youths who were arrested for the same crime but were processed informally. Stated simply, all of this work suggests the more intensive the juvenile system processing an adolescent receives, the more at risk they are for continued criminality as an adult.

These results are quite troubling given that the juvenile justice system, although established to treat and individually rehabilitate delinquent youths, has become increasingly punitive in recent decades. One theory to explain this iatrogenic effect of formal processing within the justice system posits that contact with the juvenile justice system increases contact with other delinquent youth who may encourage continued antisocial behavior, sometimes referred to as ‘delinquency training’ (Cairns & Cairns, 1994; Dishion et al., 2001; Dishion et al., 1999; Matsueda & Anderson, 1998; Shapiro, Smith, Malone, & Collaro, 2010). This theory suggests that criminogenic attitudes are shared among these youths and criminal skills are taught through modeling and reinforcement (Akers, 1985; Warr & Stafford, 1991). For example, entering the juvenile justice system increases the odds of joining a gang by a factor of over 5

(Bernburg, Kohn, & Rivera, 2006) and gang involvement is associated with increased criminality and reduced association with conventional institutions (Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003; Thornberry, Krohn, Lizotte, & Chard-Wierschem D, 1993). It has been estimated that deviancy training among peers accounts for approximately 35% of the variation in maladjustment (e.g., substance abuse, adult convictions, relational problems) among young adults (Patterson, Dishion, and Yoerger, 2000). As such, adolescent relationships formed around having a shared experience of criminality appear to have criminogenic effects on the adjustment of the adolescent, which subsequently increases their risk for future offending.

In addition to deviant friends increasing an adolescents' criminal behavior, involvement with the justice system can have a negative influence on recidivism by promoting the adoption of a delinquent identity (Jensen, 1972; Matsueda, 1992; Sampson & Laub, 1997). Known as labeling theory, this theory posits that society's acknowledgement and reaction to criminal behavior influences the identity development of an adolescent such that once society labels the individual as a criminal, they begin to take on that persona and behave in ways a criminal would. Although there are several mechanisms through which labeling may have a negative influence on adolescents, one mechanism suggests that the stigma associated with being labeled a deviant may cause the adolescent to withdraw from their normal peer groups and seek relationships with other similarly labeled youths (Goffman, 1963). In fact, labeled adolescents feel more comfortable interacting with other labeled peers because it reduces embarrassment, requires less impression management, and they experience reduced judgement from their newly formed friends' parents (Bernburg & Krohn, 2003). Importantly, several studies have found that this change from traditional to more deviant peer groups is the mediating mechanism through which labeling

increases subsequent antisocial behavior (Adams, 1996; Becker, 1963; Bernburg et al., 2006; Heimer & Matsueda, 1994; Matsueda, 1992).

It is also possible that involvement with the justice system can have negative effects on adolescents' outcomes by a change in how societal institutions (i.e., police, schools) treat the youths. That is, once a youth is labeled a delinquent, he or she may experience external pressures that increase criminality. For example, once a juvenile is known to be under the juvenile system supervision, police officers who may have ignored less severe law violations (e.g., loitering), may apply more scrutiny and rearrest an adolescent for an offense that other non-labeled youths would not be arrested (Schur, 1973). Additionally, the delinquent label alters the adolescent's relationship with his or her school (De Li, 1999; Hirschfield, 2004; Kirk & Sampson, 2013). For example, adolescents with a record are often forced out of their traditional middle and high schools and placed in alternative schools with other delinquent youths (Kirk and Sampson, 2013). Further, youths who are arrested and formally processed (i.e., court appearance) are more likely to drop out of school than those who are not required to appear in court (Sweeten, 2006). Finally, labeled adolescents also experience reduced employment opportunities, either directly as a consequence of being arrested, or indirectly as educational attainment is reduced, and thus opportunities for gainful employment are reduced (Bernburg & Krohn, 2003).

Lastly, involvement with the justice system can have negative influences on adolescents through an increase in trauma exposure while in the system. That is, adolescents confined within juvenile and criminal justice facilities are exposed to trauma either directly (i.e., target of victimization) or indirectly (i.e., witnessing victimization) (Beck, Harrison, & Guerino, 2010; Beck & Rantala, 2016; Fagen & Kupchik, 2011; Greve, 2001; Kiessl & Wurger, 2002; Tie & Waugh, 2001). For example, in a nationwide survey of adolescents confined in juvenile facilities

in the United States, approximately 12% reported at least one sexual victimization by staff or other youths within the last year, and approximately 4% of youths reported at least one assault with the use of force by staff. Although much of the research on trauma exposure within the juvenile and criminal justice system has focused on sexual victimization, other forms of trauma and victimization are also prevalent including physical assault (with or without a weapon), the threat of physical assault, theft, excessive restraint, and intimidation, among others (Forst, Fagen, & Vivona, 1989; Human Rights Watch Children Rights Project, 1995; Lanza-Kaduce, Frazier, Lane, & Bishop, 2002; Redding, 1999). Given that exposure to trauma has been consistently linked to increased risk for antisocial behavior (Dong et al., 2004; Dziuba-Leatherman & Finklehor, 1994; Finkelhor, 2008; Hussey Chang, & Kotch, 2006; Smith, Ireland & Thornberry, 2005; Vidal et al., 2017; Widom & Maxfield, 2001), it is plausible the trauma exposure adolescents experience as they move through the juvenile and criminal justice system contributes to the increased risk for recidivism.

Potential Beneficial Effects of Justice System Involvement

Despite the extensive literature on potential criminogenic influences of juvenile system processing, there are also potential benefits of processing adolescents through the system. First, system involvement can have positive effects on adolescents' outcomes by increasing the level of supervision by law enforcement, and thus limiting the adolescents' opportunity to reoffend. That is, when an adolescent is arrested and detained in a facility (i.e., incapacitated), they are unable to reoffend within the community. Alternatively, increased community supervision through a parole or probation officer may also limit the adolescents' ability or willingness to reoffend, through a lack of opportunity or a fear of being caught. Channeling adolescent offenders through the juvenile justice system may also reduce their risk for future offending by

providing the adolescent with needed interventions, particularly mental health or substance use services. A substantial body of work suggests a link between substance use and offending in adolescents suggesting that treatment for substance use may reduce recidivism (Sullivan, Veysey, Hamilton, & Grillo, 2007). Lastly, it is possible that system contact may improve educational attainment in youths by requiring class attendance while incarcerated. Since earning a high school diploma is a protective factor for future offending, it is reasonable to theorize that ensuring the adolescent is exposed to the academic material to earn a high school diploma, may increase the likelihood of graduating which in turn may reduce future offending.

Limitations of Previous Work

In summary, it is clear that advancing knowledge on the effects of the juvenile justice system on an adolescent's development can have important implications for the adolescent and for public policy. Importantly, there are two critical limitations in the existing research on this topic. First, it is unclear whether the previously reported deleterious effects of the juvenile justice system are due to the type and degree of system contact or whether they are better explained by preexisting individual differences among adolescents (e.g., self-reported offending, impulsivity, parental supervision). That is, adolescents who are arrested for more serious crimes and who have longer histories of more severe antisocial behavior may be more likely to have more extensive criminal histories as an adult, regardless of the type of system processing. Further, youth who are arrested have higher rates of impulsivity and score lower on measures of intelligence, and they also come from more disadvantaged neighborhoods and families (Farrington, 2004; Farrington, Loeber, & Ttofi, 2012). As a result, it is also not clear whether these preexisting vulnerabilities may, at least in part, explain the worst outcomes among adolescents in the juvenile justice system.

As noted above, one study reported controlling for these important preexisting vulnerabilities and still found that more involvement with the justice system predicted increased risk for adult offending (Petitclerc et al., 2013). However, it would be important to replicate this Canadian study in other jurisdictions. Another study, the Pathways to Desistance Study, is a longitudinal study that began in 2000 and followed a sample of 1,354 ethnically-diverse adolescents (age range = 14-17) in Philadelphia, PA and Phoenix, AZ who had been found guilty of a serious crime against another person (e.g., armed robbery). This study reported no differences in the rate of self-report of offending or rearrest among the participants who were placed in institutions compared to those who were given probation or between those with longer and short stays in an institution (Loughran et al., 2009). However, participants in this study were arrested for serious offenses and may have had substantial contact with the justice system prior to this arrest. Thus, it would be important to follow adolescents after their first arrest, to eliminate any effects of previous justice involvement.

A second critical limitation in previous work is that it is not clear if any negative or positive effects of juvenile justice system involvement are the same for *all* adolescents. Despite consistent evidence supporting negative effects of formal processing on adolescent future offending, this does not mean that the system leads to worse outcomes in all adolescents. The generalizability of these findings is especially questionable given that research has conclusively shown that there is great heterogeneity among the adolescents that come into contact with the juvenile system in terms of causal factors leading to their antisocial behavior (Frick & Viding, 2009). That is, certain interpersonal characteristics of the youth may moderate the influence that justice system processing and subsequent experiences within the system have on later offending.

Moderating Role of Callous-Unemotional Traits

One such characteristic is the presence of elevated callous-unemotional (CU) traits. CU traits are a combination of traits that represent the affective component of psychopathy prior to adulthood, and include the lack of guilt, absence of or reduced empathic concern for others, lack of concern over performance in important activities, and reduced displays of emotion (Frick, Ray, Thornton, & Kahn, 2013). CU traits are found in approximately 25-30% of youths with severe conduct problems (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012). However, the presence of elevated CU traits appears to designate a clinically important subgroup of youths with conduct problems or adolescents with delinquent behavior. Specifically, adolescents with CU traits exhibit behavioral problem earlier than their peers without CU traits, and they show a particularly severe and chronic pattern of behavioral problems (Ray, Frick, Thornton, Steinberg, & Cauffman, 2016; McMahon, Witkiewitz, Kotler, & The Conduct Problems Prevention Research Group, 2010). Further, the presence of elevated CU traits increases the adolescents' risk for more premeditated and instrumental aggression, and this aggression tends to be more harmful to the victims (Frick, Cornell, et al., 2003; Kruh, Frick, & Clements, 2005; Lawing, Frick, & Cruise, 2010; Marsee & Frick, 2007).

Thus, the more severe and aggressive antisocial behavior of adolescents elevated on CU traits often bring them in contact with the juvenile justice system. Further, there are several reasons why the presence of CU traits may moderate the influence of system processing on future offending. First, adolescents with CU traits are less responsive to punishment as measured by a variety of experimental paradigms (Blair, Colledge, & Mitchell, 2001; Centifanti & Modecki, 2013; Fisher & Blair, 1998; Frick et al., 2003; Gluckman, Hawes, & Russell, 2016). In addition, youths with elevated CU traits also appear to underestimate the likelihood of

punishment for deviant behavior (Pardini, Lochman, & Frick, 2003). For example, 169 confined juveniles read a series of vignettes that either asked them to imagine using aggressive behavior to obtain a reward or in response to poor treatment by another person. They were then asked to rate the likelihood that various outcomes would occur (e.g., punishment, dominance). Compared to adolescents without elevated CU traits, detained adolescents with elevated CU traits were less likely to believe that they would be punished for aggressive behavior and endorsed caring less about being punished. Finally, adolescents with elevated CU traits are also less amenable to treatment compared to adolescents with conduct problems with normative levels of CU traits. A review of 20 studies that examined treatment outcomes among adolescents with conduct problems with or without elevated CU traits found that 90% of the studies reported youths with elevated CU traits showed worse treatment outcomes (Frick et al., 2013). For example, adolescents with elevated CU traits that were incarcerated in the juvenile justice system were less likely to participate in treatment, demonstrated lower quality of participation, and were more likely to reoffend after treatment than their peers with normative levels of CU traits (Falkenbach, Poythress, & Heide, 2003; Gretton, McBride, Hare, O'Shaughnessy, & Kumka, 2001; O'Neill, Lidz, & Heilbrun, 2003; Spain, Douglas, Poythress, & Epstein, 2004). For these reasons, it is quite possible that youths with elevated CU traits who enter the juvenile justice system will be less influenced by their experiences compared to other adolescents who come in contact with the juvenile justice system.

Second, research has demonstrated that adolescents with serious conduct problems with and without CU traits exhibit distinct temperaments which may impact how justice system processing influences adolescents entering the system. That is, those with serious conduct problems and elevated CU traits exhibit a pattern of blunted emotional affect, lower levels of

fear, and lower levels of anxiety. In contrast, adolescents with serious conduct problems with low or normative levels of CU traits actually show heightened levels of anxiety and emotional reactivity (Andershed, Gustafon, Kerr, & Stattin, 2002; Barker, Oliver, Viding, Salekin, & Maughan, 2011; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Pardini, 2006; Pardini, Lochman, & Powell, 2007; Roose, Bijttebier, Claes, & Lilienfeld, 2011; Sadeh, Verona, Javdani, & Olsen, 2009). For example, in a sample of 1,077 adolescents from the community (M age = 14.41), boys with elevated CU traits showed less anxiety than boys that had conduct problems but normative levels of CU traits (Andershed et al., 2000). This fearless temperament among those with conduct problems and elevated CU traits appears to be evident even in children as young as 2 years old. For example, in longitudinal study of 7,000 children, those with conduct problems and elevated CU traits at age 13 had showed higher rates of fearless temperament at age 2, compared to youths with conduct problems but normative levels of CU traits (Barker et al., 2011). As described above, research has demonstrated youths who move through the juvenile justice system are at risk of trauma exposure such as intimidation, physical violence, emotional abuse, sexual assault, among others (Bureau of Justice Statistics, 2010; Bureau of Justice Statistics, 2016; Fagen & Kupchik, 2011; Forst et al., 1989; Greve, 2001; Human Rights Watch Children Rights Project, 1995; Kiessl & Wurger, 2002; Lanza-Kaduce et al., 2002; Tie & Waugh, 2001). Given that youths with anxious temperaments may be more traumatized by adverse experiences (Ebner & Singewald, 2017; Franklin, Saab, & Mansuy, 2012; Weger & Sandi, 2018), it is possible that formal processing may be more harmful for adolescents with conduct problems and low CU traits (i.e., anxious temperament), while these experiences may be less impactful among adolescents with conduct problems and elevated CU traits (i.e., fearless temperament).

Lastly, adolescents with conduct problems and elevated CU traits may be less susceptible to peer influences compared to those with conduct problems but low or normative CU traits. Much research has demonstrated that youths with conduct problems and CU traits tend to associate with other deviant youths, are more likely to be members of a gang, and are more likely to commit their crimes in groups with other adolescents, when compared to adolescents with normative levels of CU traits (Goldweber, Dmitrieva, Cauffman, Piquero, & Steinberg, 2011; Kimonis, Frick, & Barry, 2004; Muñoz, Frick, Kimonis, & Aucoin, 2008; Pardini & Loeber, 2008; Thornton et al., 2015). However, those adolescents with elevated CU traits seem to be more likely to be the leader of the antisocial peer group and less likely to be influenced by their peers. For example, in a sample of over 1,200 first-time male adolescent offenders, boys with elevated CU traits were more likely to commit their crimes in groups, were more likely to report being the leader of these groups and were more likely to report that the crime committed was their idea (Thornton et al, 2015). Further, in a sample of 847 community adolescents, CU traits were associated with an adolescent having more influence on their peers' antisocial behavior, whereas adolescents high on CU traits were less influenced by their peers' antisocial behavior (Kerr, Van Zalk, & Stattin, 2012). As suggested above, theories to explain the deleterious effects of justice system processing on adolescent recidivism have often considered the exposure to and influence of other delinquent youths as an importance factor to explain these effects (Adams, 1996; Becker, 1963; Bernburg et al., 2006; Heimer & Matsueda, 1994; Matsueda, 1992). Given that adolescents with elevated CU traits appear to be less influenced by their deviant peers, it is possible that these youths will be less impacted by the justice system compared to their peers with low or normative levels of these traits.

Statement of the Problem

In summary, there has been substantial debate about the effects of juvenile justice involvement on adolescents' risk for problems in adjustment; most notably, their risk for later offending. On the one hand, it has been suggested that justice system involvement can have positive effects on adolescents' outcomes by a) increasing the level of supervision by law enforcement and thereby limiting their opportunity for future offending or b) providing adolescents with needed treatment of unmet mental health needs and thereby reducing risk for later offending. On the other hand, research has suggested that involvement with the juvenile justice system can have negative effects on adolescents' outcomes by a) exposing the youth to other delinquent adolescents who may encourage continued antisocial behavior, b) promoting the adoption of a delinquent identity, or c) increasing the risk of arrest due to increased supervision by law enforcement, which subsequently increases detection of antisocial behaviors.

Importantly, there are two critical limitations in this research. First, it is unclear whether the previously reported iatrogenic effects of the juvenile justice system are due to the type and degree of system contact or whether they are better explained by preexisting individual differences among adolescents. That is, adolescents with longer histories of more severe antisocial behavior may have a number of individual risk factors (e.g., lower intelligence; poor impulse control) and come from more disadvantaged backgrounds. They may also be more likely to be processed formally by the justice system. As a result, it is not clear if risk for later arrest is due to the severity of the adolescents' antisocial behavior, preexisting vulnerabilities, or the justice system involvement. Second, it is not clear if the effects of juvenile justice system involvement are the same for *all* adolescents. That is, certain interpersonal characteristics may moderate the influence that justice system processing and subsequent experiences within the

system have on later offending. One such characteristic is the presence of elevated callous-unemotional (CU) traits. Past research has suggested that justice-involved adolescents are more likely to be elevated on CU traits and these traits are associated with risk for later offending, especially violent offending. However, research has not explored whether CU traits moderates the influence of system involvement on recidivism. It is possible that due to their reduced responsiveness to intervention (e.g., punishment), lack of emotional reactivity, fearless temperament, and resistance to deviant peer influence, adolescents with elevated CU traits will be less influenced by the degree of contact with the juvenile system after first arrest. Put simply, these adolescents may engage in a high rate of crime regardless of how the system processes their case, while those with low CU traits may exhibit increased recidivism when processed formally compared to informally.

Thus, the current project will address these limitations by studying whether processing decision (the decision to either formally process or divert the youth after first arrest) in the juvenile justice system influences adolescents' antisocial behavior and arrests over a 3-year follow-up period. To overcome limitations in past work, the study will include only first-time offenders in order to control for previous system contact and include those arrested for offenses of moderate severity that had a high likelihood of both being either formally or informally processed. That is, offenses were chosen for inclusion in the present study if they were associated with between a 35% to 65% chance of being formally (vs. informally) processed over the 5 years prior to the study onset. This design controls for prior system contact (first time offender) and severity of offense (only moderate severity), while increasing the variability in decisions made on whether to formally or informally process the youth. Further, after testing whether processing decision is related to later offending, we will retest this association after

controlling for a host of characteristics of the adolescent (i.e., demographic variables, self-reported level of delinquency prior to their first arrest, impulse control, CU traits, peer delinquency, parental supervision and education) at the time of their arrest that could contribute to group differences in later arrests. Finally, we will test whether CU traits moderate the influence of processing decision on later offending.

To advance this area of research, several hypotheses were tested. First, it was hypothesized that adolescents formally processed by the juvenile justice system upon their first arrest would engage in more self-reported offending and would be arrested more frequently across the 36-month follow-up period compared to the adolescents who were informally processed. Second, these effects were hypothesized to remain even after controlling for baseline characteristics including race/ethnicity, age, IQ, self-reported lifetime offending prior to first arrest, impulse control, CU traits, neighborhood dysfunction, peer delinquency, and parental supervision and education. Finally, it was hypothesized that the influence of justice system processing on adolescent delinquency across the 36-month period would be moderated by the adolescents' level of CU traits such that those with elevated CU traits would not show an increase in offending when formally processed. In contrast, those with low or normative levels of CU traits were hypothesized to show much higher levels of later antisocial behavior and arrests over the 36-month follow-up period if they were formally processed.

Method

Participants

Participants were 1,216 male first-time juvenile offenders from the Crossroads Study, an ongoing longitudinal study of juvenile offenders in Orange County, CA ($N = 532$), Jefferson Parish, LA ($N = 151$), and Philadelphia, PA ($N = 533$) who were reassessed at 6 months, 12 months, 18 months, 24 months, 30 months, and 36 months following arrest. Participants were eligible for the Crossroads Study if they were English speakers, were arrested for an eligible offense of low to moderate severity and were between the ages of 13 and 17 at the time of their first arrest.

At the start of the study, the mean age of participants was 15.29 ($SD = 1.29$). The sample was primarily Hispanic (45.9%) and African American (36.9%) with a smaller proportion identifying as Caucasian (14.8%) and Other (2.5%). The highest level of education either parent obtained included less than high school (27.2%), GED or high school (34.1%), trade school or some college (20.4%), 4-year college degree (13.5%), and graduate level education (4.8%). Participants' intelligence was on average lower than that of the general population ($M = 88.50$, $SD = 11.87$), although not different from other juvenile justice samples in the United States (Brandt, Kennedy, Patrick, & Curtin, 1997; Hampton, Drabick, & Steinberg, 2014).

Procedures

The Institutional Review Board at all three institutions (i.e., University of California, Irvine, Temple University, and Louisiana State University) approved the study procedures. Parental informed consent and youth assent were obtained at each time point for all participants before interviews were conducted. After youth turned 18 years old, the parent or legal guardian were no longer asked to provide parental consent. Participants and their parents were informed

that participation was entirely voluntary, would not influence the youth's relationship with the juvenile justice system or court, and that they were able to withdraw from the study at any time without penalty. The youth and parents were informed that the research project had obtained a Privacy Certificate from the Department of Justice, which protected their data from being subpoenaed for use in legal proceedings. Interviewers were extensively trained regarding the study design, safety procedures, participant recruitment, tracking of participants, obtaining consent/assent, maintaining confidentiality, rapport building, and interview administration. Prior to being authorized to conduct interviews independently, interviewers were required to pass test on the received training, accompany and observe two interviews with the study coordinator, and finally successfully complete a check-out interview supervised by the study coordinator.

Youth completed the baseline assessment within six weeks of the disposition date for their initial arrest. They were then re-assessed every six months for 36 months (6 time points). Participants were able to select their preferred location to complete the interviews, often at the youth's home, a local restaurant, public library, at the respective research team's university, or in a secure facility if a participant was incarcerated at the time of a follow-up interview. Finally, if participants moved too far to conduct in person interviews, phone interviews were completed. Interviews lasted on average approximately 2-3 hours and were administered using a secure computer-based program on a laptop. To control for participants reading ability, interviewers read aloud all items. Participants were compensated \$50 for the baseline interview and the payment increased by \$15 for each subsequent interview (i.e., \$65 for the second interview, \$80 for the third interview). Retention rates ranged from 95.48% at the 6-month follow-up to 91.34% at the 36-month follow-up with an average retention rate of 93.38% across the 6 follow-up points.

Measures - Baseline Predictors

Juvenile justice system processing. Official court records were used to categorize the youth into two groups based on how they were processed by the justice system after their first arrest (i.e., baseline). Formally processed youth ($n = 473$; 38.9%) were youth whose cases were petitioned and went through the formal court system. Formally processed youth, received court-ordered probation or were adjudicated through the court for their initial arrest. In contrast, informally processed youth ($n = 743$; 61.1%) were diverted from court after their initial arrest and were handled only by a probation department or other designated agency (e.g., Families in Need of Supervision; mental health agency). Processing decision was dichotomously coded such that informal processing was coded as 0 and formal processing was coded as 1.

Measures - Outcome Variables

Self-report offending. Offending was measured at each follow-up point using the 24-item revised version of the Self-Report of Offending Scale (SRO) that assess drug and property offenses, as well as crimes against persons (SRO; Huizinga, Esbensen, & Weiher, 1991). The drug offense items included “driven while drunk or high”, “sold marijuana”, and “sold other drug”. The property offense items included “destroy property”, “set fire”, “broke in to steal something”, “shoplift”, “receive stolen property”, “use credit card illegally”, “stole car”, and “enter car to steal something”. The items describing crimes against persons included “killed someone”, “forced someone to have sex with you”, “shot someone (where the bullet hit the victim)”, “shot at someone (where you pulled the trigger)”, “taken something from another person by force, using a weapon”, “taken something from another person by force, without a weapon”, “beaten up or physically attacked someone so badly that they probably needed a doctor”, “beaten up, threatened, or physically attacked someone as part of a gang”, and “been in

a fight". Scores on this scale have been shown to correlate with aggression and official records of offending across diverse samples (Farrington, Loeber, Stouthamer-Loeber, van Kammen, & Schmidt, 1996; Piquero, Macintosh, & Hickman, 2002; Thornberry & Krohn, 2000).

Each item asked participants (yes or no) if, in the last 6 months, they engaged in each crime, and if yes, how many times. The SRO variety score was calculated to evaluate the number of different crimes (i.e., offense types) the individual endorsed over each assessment period. This method is often preferred over a frequency score because the variety score is less prone to recall errors, especially when the offense is frequently committed, such as selling drugs (Hindelang, Hirschi, & Weis, 1981; Thornberry & Krohn, 2000). Higher scores represent a greater variety of crimes committed and is correlated with measures of seriousness and frequency of antisocial behavior (Monahan & Piquero, 2009). The stability of the variety score from the first 6-month follow up ($M = 1.03$, $SD = 1.55$) to the 36-month follow-up ($M = .79$, $SD = 1.83$) was significant ($r = .33$; $p < .001$). The internal consistency for this scale from the 6-month through the 36-month follow up was acceptable and ranged from $\alpha = .81 - .83$.

Arrests. Data from participants' official records of both juvenile and adult arrests were obtained within the jurisdictions in which the participant was initially arrested during the follow up periods from 6 months to 36 months. Only new charges during the follow up periods were included (i.e., probation and technical violations were excluded). Over the 36-month follow-up period, 40.8% ($n = 496$) were rearrested for any offense, with 24.7% arrested for a violent crime. Among the entire sample, 19.4% ($n = 236$) of the sample were rearrested once, 10.7% ($n = 130$) were rearrested twice, 5.8% ($n = 70$) were rearrested three times, and 4.9% ($n = 60$) were rearrested four or more times across the 36-month follow up period. The most common offenses participants were rearrested for included drug related crimes (31.7%; e.g., possession, possession

with intent to distribute), theft (18.1%), and burglary (11.8%). The rearrest outcome variable included the total number of arrests for offenses across all assessment points ($M = .84$, $SD = 1.39$).

Measures - Moderating Variable

Callous-unemotional traits. CU traits were assessed at baseline using the self-report version of the Inventory of Callous-Unemotional traits (ICU; Kimonis et al., 2008), a 24-item instrument that utilizes a four-point Likert scale (i.e., 0 (*Not at all true*) to 3 (*Definitely true*) to indicate how accurate each statement describes them. The scale contains equal numbers of items worded in the callous (e.g., *I do not feel remorseful when I do something wrong*) and non-callous (e.g., *I am concerned about the feelings of others*) direction, and the non-callous items are recoded so that higher scores indicate higher levels of CU traits. The total ICU score has been consistently associated with antisocial behavior (Essau, Sasagawa, & Frick, 2006; Fanti, Frick, & Georgiou, 2009; Kahn, Byrd, & Pardini, 2013; Kimonis et al., 2008; Roose, Bijttebier, Decoene, Claes, & Frick, 2010) and negatively associated with prosocial behavior (Eremsoy, Karanci, & Berument, 2011) in adolescent samples. The internal consistency for baseline ICU was acceptable ($M = 26.28$, $SD = 8.08$; Cronbach's $\alpha = .68$).

Measures – Baseline Control Variables

Self-report offending. Self-reported offending prior to the first arrest was assessed at baseline using the Self-Report of Offending Scale (SRO). Details about this scale are described above. Each item asks participants (yes or no) if they had *ever* in their life engaged in each crime listed, and if yes, how many times. The variety score was used such that the number of different types of crimes reported prior to baseline was summed and used in the analyses ($M = 3.43$, $SD = 3.10$). The internal consistency was acceptable (Cronbach's $\alpha = .76$).

Demographics. The participants reported their age and race/ethnicity. Race/ethnicity as dichotomized such that endorsement of the race was coded as a 1 and no endorsement was coded as 0 (i.e., 1 – African American, 0 – Not African American; 1 – Hispanic, 0 – Not Hispanic). IQ ($M = 88.43$, $SD = 11.59$) was assessed at baseline using the matrix reasoning and vocabulary sub-tests of the Wechsler Abbreviated Scale of Intelligence (WASI- II; Wechsler, 1999).

Parental Education. The highest level of education either parent obtained was assessed at baseline and used as a proxy for socioeconomic status of the adolescent (Shulman & Cauffman, 2013; Cauffman et al., 2010). The majority of participants' parents' highest level of education was “GED or high school diploma” (34.1%), followed by “less than a high school diploma” (27.2%), “trade school or some college” (20.4%), “4-year college degree” (13.5%), and “graduate level education” (4.8%). Based on the distribution, the variable was coded such that “less than a high school diploma” was coded as a 1, “GED or high school diploma” was coded as a 2, and more than a high school diploma was coded as a 3.

Impulse control. Impulse control was assessed at baseline using the 8-item self-report Impulse Control subscale of the Weinberger Adjustment Inventory (Weinberger & Schwartz, 1990). Participants were instructed to respond using a 5-point Likert scale (1 = *False*, 2 = *Somewhat False*, 3 = *Not Sure*, 4 = *Somewhat True*, and 5 = *True*) to such items as, “I do things without giving them enough thought”. Higher scores on this subscale represent more impulse control. The WAI has been associated with behavioral problems, delinquency, and drug use in adolescents (Farrell & Danish, 1993; Farrell, Danish, & Howard, 1992; Farrell & Sullivan, 2000). The internal consistency for WAI at baseline was acceptable ($M = 3.25$, $SD = .86$; Cronbach's $\alpha = .73$).

Peer delinquency. Peer delinquency was assessed at baseline using the Peer Delinquency Scale (PDS), a 13-item self-report scale that asks the youth to state how many of their friends have engaged in certain types of delinquent acts, such as destroying property, carrying a gun, and getting into fights (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994). Participants were instructed to respond using a 5-point Likert scale (1 = *None of them*, 5 = *All of them*). Higher scores represent a higher number of friends who are perceived to engage in antisocial behavior. Scores on this scale have been shown to be positively related to self-reported offending in samples of adolescents (Ray et al., 2017; Chung & Steinberg, 2006). The internal consistency for PDS at baseline was excellent ($M = 1.75$, $SD = .67$; Cronbach's $\alpha = .93$).

Parental supervision. Parental supervision was measured at baseline using the Parental Monitoring Inventory (PMI; Steinberg, Lamborn, Dornbusch, & Darling, 1992). Five items assessed how much the caregiver *tried* to know about domains of the adolescents' life (e.g., who time was spent with, how free time was spent, how money was spent, where time was spent after school/work, where time was spent at night), using a 4-point Likert scale (1 = Doesn't try at all, 4 = Tries extremely hard). An additional five items assessed the degree to which the caregiver *actually knew* about those life domains, using a 4-point Likert scale (1 = Doesn't know at all, 4 = Knows everything). An additional four items assessed how often the caregiver required a set time to be "home on school or work nights" and on "home on weekend nights", as well as how often the caregiver knew "what time they would be home when they've gone out", and "if caregiver is not home, how often have you left a note, called, or communicated with the caregiver in some way about where you were going". Higher scores on this scale indicate more parental monitoring and have been negatively related with self-reported offending in adolescents

(Steinberg, Blatt-Eisengart, & Cauffman, 2006). The internal consistency for PMI at baseline was acceptable ($M = 3.16$, $SD = .68$; Cronbach's $\alpha = .78$).

Neighborhood conditions. The neighborhood conditions surrounding the adolescent's home at baseline was measured using 21-items to assess physical disorder (e.g., "cigarettes on the street or in the gutters", "graffiti or tags") and social disorder of the neighborhood (e.g., "adults fighting or arguing loudly", "people using needles or syringes to take drugs") (Elliott et al., 1996; Sampson & Raudenbush, 1999). Participants were instructed to respond using a 4-point Likert scale (1 = Never, 4 = Often) as to how frequent each item occurred within their neighborhood, with higher scores indicating a greater degree of neighborhood dysfunction. If a participant moved at any point during the 6 months prior to arrest, they were instructed to answer the questions about the neighborhood they lived in for the longest. Ratings on this scale has been found to be positively related to poverty and crime (Sampson & Raudenbush, 1990; Sampson, Raudenbush, & Earls, 1996). The internal consistency for the neighborhood conditions scale at baseline was excellent ($M = 2.07$, $SD = .68$; Cronbach's $\alpha = .94$).

Analytic Plan

First, zero-order correlations were conducted to test the association between demographic variables and the main study variables. Next, we estimated an unconditional growth model to evaluate the average pattern of change in self-report offending. We then ran a series of latent growth curves and negative binomial regressions to evaluate our three study hypotheses. The first hypothesis tested the prediction that adolescents who were formally processed upon first arrest would engage in more offending and would have a higher risk for an additional arrest across the 36-month period compared to those adolescents who were informally processed. To test this hypothesis, we used latent growth curve modeling to evaluate the influences of

processing decision immediately following arrest as a time-invariant effect on self-reported delinquency across time. We then conducted a negative binomial regression to assess how processing decision predicted the risk for future arrest across the 36-month period. The second hypothesis tested the prediction that these effects of formal processing would remain significant, even after controlling for baseline characteristics including age, race/ethnicity, IQ, self-reported lifetime offending prior to first arrest, CU traits, impulse control, peer delinquency, parental monitoring, parental education, and neighborhood dysfunction. To test this hypothesis, we reran both the latent growth curve model and the negative binomial regression, and in both models included baseline characteristics as covariates in the model. Third, it was hypothesized that the influence of justice system processing on adolescent delinquency across the 36-month period would be moderated by the adolescents' level of CU traits, such that adolescents with elevated CU traits would exhibit similar levels of offending regardless of processing decision, but that those with low CU traits would exhibit higher rates of offending when processed formally than when they were processed informally. To test this hypothesis, we reran the latent growth curve and the negative binomial regression analyses and included the interaction between CU traits and processing decision in the models, with the predictors mean centered using the sample mean.

All latent growth curve models (LGCM; Muthen & Muthen, 1998-2010) were conducted using the full information maximum likelihood estimation (FIMLE; Enders & Bandalos, 2001) to handle missing data. A chi-square test was used to determine if missing data fit the criteria for missing completely at random (MCAR) and this test was non-significant for all models, which suggests that the data fit were consistent with this assumption ($\chi^2 = 1,465.717 - 1,466.96$, $dfs = 61,875$, $ps = 1.00$; Little & Rubin, 2002). Due to the unconditional growth model not being able to impute data for participants who were missing all follow-up points, the unconditional

growth model removed 21 participants ($n = 1,195$). Model fit for latent growth curve models are typically assessed via root mean square error of approximation (RMSEA), Tucker-Lewis index (TLI), and comparative fit index (CFI) such that values lower than .08 suggest acceptable model fit (Hu & Bentler, 1999). However, latent growth curve models using count outcome variables cannot be evaluated using these absolute value model fit indices (Muthen & Muthen, 1998-2010).

Given the limited variability of the number of arrests across assessments, latent growth curve models were not appropriate to predict the risk of future arrest. Instead, negative binomial regressions were utilized to predict the total number of arrests across all follow up periods given that the total number of arrests across assessments exhibited a large number of “0” values, and followed a skewed, over dispersed distribution such that the variance of the dependent variable was greater than the mean. However, unlike with the latent growth curve models, there are not currently any methods for using multiple imputation for regressions with count outcome variables (Kleinke & Reinecke, 2013; Muthen & Muthen, 1998-2010). While ad hoc methods have been used by some researchers to handle missing count data in unique situations, including treating the count variable as continuous and then using multiple imputation, these solutions typically do not end up representing the data well (Kleinke & Reinecke, 2013; Yu, Burton, & Rivero-Arias, 2007). Thus, for most of the negative binomial regressions, all participants with missing data were removed from the model (i.e., list wise deletion) resulting in a sample size of 1,098.

Results

Preliminary Analyses

Zero-order correlations among demographic and main variables are reported in Table 1. First, age was positively correlated with self-reported offending at baseline. IQ was negatively correlated with total arrests across all follow-up points. Being of a minority race was differentially related to processing decision such that being African American was related to informal processing while being Hispanic was related to formal processing. Race was also differentially related to self-reported offending such that being African American was related to less self-reported offending before baseline and across the follow-up periods. In contrast, being Hispanic was unrelated to self-reported offending prior to baseline but related to increased self-reported offending at the majority of the follow up periods. Being of a minority race was unrelated to the total number of arrests across the 36-month period. Second, formal processing decision upon first arrest was positively correlated with CU traits at first contact with the system, self-reported offending across most follow-up points, and the number of total arrests. Third, CU traits at first contact with the system was also positively correlated with both self-report and official report of offending across all time points, peer delinquency, and negatively correlated with impulse control, parental monitoring, and neighborhood dysfunction. Lastly, participants arrested for a non-violent offense were more likely to be informally processed (63.7%) than formally processed (36.3%), $\chi^2 = 15.78, p < .001, \phi = .11$.

Table 1. Zero-Order Correlations among Demographic Variables and Main Study Variables.

	1	2	3	4	5	6	7	8	9	10	11
1. Age	-										
2. IQ	.06	-									
3. African American	-.09**	-.14**	-								
4. Hispanic	.03	-.07**	-.70**	-							
5. Peer Delinquency	.16**	-.01	-.08**	.03	-						
6. Impulse Control	-.01	.02	.10**	-.05	-.33**	-					
7. Parental Monitoring	-.12**	.03	.06	-.07	-.32**	.21**	-				
8. Parental Education	.08*	.21**	.14**	-.33	.03	-.05	.04	-			
9. Neighborhood Dys.	.01	-.11**	.18**	-.05	.39**	-.19**	-.09*	-.07	-		
10. Processing Decision	.02	-.13**	-.13**	.17**	.05	-.02	.03	-.07	-.03	-	
11. ICU	-.02	-.08*	-.08*	.11**	.35**	-.34**	-.24**	-.04	.17**	.06	-
12. Offending – Baseline	.20**	-.10**	-.10**	.05	.69**	-.33**	-.29**	.08*	.29**	.08*	.35**
13. Offending – 6 Months	.05	-.10*	-.10**	.08*	.47**	-.27**	-.20**	.03	.20**	.05	.34**
14. Offending – 12 Months	.01	-.09*	-.09*	.05	.39**	-.18**	-.13**	.01	.16**	.08*	.29**
15. Offending – 18 Months	-.04	.00	-.08	.08*	.27**	-.13**	-.13**	-.01	.10**	.06	.19**
16. Offending – 24 Months	-.02	.00	-.09*	.07	.28**	-.12**	-.10**	.02	.11**	.10*	.20**
17. Offending – 30 Months	-.01	.02	-.08*	.06	.25**	-.14**	-.13**	.02	.07	.08	.20**
18. Offending – 36 Months	-.01	.03	-.07	.04	.22**	-.08*	-.08**	.03	.07	.07	.15**
19. Total Arrests	-.02	-.12**	.02	.05	.15**	-.10**	-.14**	-.10**	.06	.12**	.17**
Mean	15.29	88.50	-	-	1.75	3.25	3.16	-	2.07	-	26.28
Standard Deviation	1.29	11.87	-	-	.67	.86	.68	-	.68	-	8.08
Percentage	-	-	36.9%	45.9%	-	-	-	-	-	39.9%	-

Note: Neighborhood Dys. = Neighborhood Dysfunction. ICU = Inventory of Callous-Unemotional Traits. African American and Hispanic are coded 1 for endorsing the race/ethnicity and 0 for all other individuals. Processing Decision coded 1 for formal processing and 0 for informal processing. ¹ Percentage of adolescents who had at least one rearrest during the 36-month assessment period.

Table 1 (con't). Zero-Order Correlations among Demographic Variables and Main Study Variables.

	12	13	14	15	16	17	18	19
1. Age								
2. IQ								
3. African American								
4. Hispanic								
5. Peer Delinquency								
6. Impulse Control								
7. Parental Monitoring								
8. Parental Education								
9. Neighborhood Dys.								
10. Processing Decision								
11. ICU								
12. Offending – Baseline	-							
13. Offending – 6 Months	.55**	-						
14. Offending – 12 Months	.47**	.59**	-					
15. Offending – 18 Months	.33**	.43**	.60**	-				
16. Offending – 24 Months	.34**	.42**	.53**	.62**	-			
17. Offending – 30 Months	.29**	.37**	.45**	.53**	.63**	-		
18. Offending – 36 Months	.27**	.33**	.39**	.43**	.52**	.61**	-	
19. Total Arrests	.15**	.20**	.20**	.24**	.23**	.17**	.17**	-
Mean	3.43	1.39	1.20	1.01	.91	.88	.79	.84
Standard Deviation	3.10	2.26	2.22	1.98	1.94	1.97	1.83	1.39
Percentage	-	-	-	-	-	-	-	¹ 40.8%

Note: Neighborhood Dys. = Neighborhood Dysfunction. ICU = Inventory of Callous-Unemotional Traits. African American and Hispanic are coded 1 for endorsing the race/ethnicity and 0 for all other individuals. Processing Decision coded 1 for formal processing and 0 for informal processing. ¹ Percentage of adolescents who had at least one rearrest during the 36-month assessment period.

Next, we estimated an unconditional growth model to evaluate the average pattern of change in self-report offending in the sample. Subjects with missing data for all 6 follow up periods were removed from the model ($n = 1,195$) given that the growth could not be estimated for these subjects. To assess the shape of the change in self-reported offending over time, we constrained the unconditional growth model as linear, cubic, and quadratic and compared the

Table 2. Unconditional Growth Model of the Latent Growth Curve Model Testing the Prediction of Self-Report Offending.

	Coefficient	S.E.	95% CI	<i>p value</i>	<i>n</i>
S WITH I					
Means					
Intercept	-0.021	.025	-0.069, .028	.401	1,195
Slope	1.081	.001	-		
	-.103	.001	-		
Variiances					
Intercept	1.692	.116	1.465, 1.919	.001	
Slope	.065	.009	.048, .082	.001	

Note: S WITH I = Correlation between the slope and intercept. S.E. = Standard Error. CI = Confidence Interval.

model fit using sample size corrected Bayesian Information Criteria (BIC). The linear model was the best fitting model as indicated by a lower sample size-adjusted BIC value (15,820.47) compared to both the cubic (adjusted BIC = 15,826.79) and quadratic (adjusted BIC = 15,826.81) unconditional models. Thus, the remaining conditional growth models were linearly constrained. Overall in the sample, the level of self-reported offending decreased over time (-.103). Also, the correlation between the slope and intercept was not significant, suggesting that change in self-report offending was not dependent on the starting level. Finally, the unconditional growth model demonstrated significant variability in the initial level (i.e., intercept) and change (i.e., slope) in offending over time, which suggested that proceeding to test conditional growth models was appropriate (Table 2).

Test of Main Study Hypotheses

Processing decision predicting offending. To test our first hypothesis, we conducted a conditional growth model to evaluate whether formal processing decision at baseline predicted increased offending across assessment periods (Table 3). As predicted, a main effect of baseline processing decision significantly predicted the level of offending at the 6-month assessment (i.e. intercept), such that formally processed adolescents reported significantly more offending at the 6-month assessment period than informally processed adolescents. However, processing decision did not predict change in offending after this point (i.e., slope), such that the rate of change was not different between the two groups.

We then used a negative binomial regression to evaluate whether baseline processing decision predicted the total number of arrests across the assessment periods. Similar to the results predicting self-reported offending, there was a significant main effect of processing decision in the prediction of the number of rearrests, such that formally processed adolescents were rearrested more frequently than informally processed adolescents (Table 3).

Table 3. Latent Growth Curve Model Testing the Prediction of Self-Report Offending and Negative Binomial Regression Testing the Prediction of Frequency of Arrests.

Latent Growth Curve Model	Coefficient	S.E.	95% CI	<i>p</i> value	<i>N</i>
Processing Decision					1,216
Intercept	.280	.098	.089, .471	.004	
Slope	.041	.027	-.012, .094	.132	
S WITH I Intercepts	-.021	.023	-.066, .024	.354	
Intercept	-.500	.070	-.637, -.363	.001	
Slope	-.234	.022	-.278, -.190	.001	
Residual Variances					
Intercept	1.665	.110	1.45, 1.88	.001	
Slope	.065	.008	.050, .0820	.001	

(Table cont'd)

Negative Binomial Reg.	Coefficient	S.E.	95% CI	<i>p</i> value	<i>N</i>
Intercept	-.340	.057	-.451, -.228	.001	1,216
Processing Decision	.385	.086	.217, .553	.001	

Note: S WITH I = Correlation between the slope and intercept. S.E. = Standard Error. CI = Confidence Interval. Reg. = Regression.

Processing decision predicting offending controlling for vulnerabilities at arrest. To test the second hypothesis, the latent growth curve model was rerun to assess whether the effects of processing decision on offending over time remained even after controlling for key characteristics of the adolescent, his family, and neighborhood at the time of arrest. Contrary to predictions, baseline processing decision was no longer associated with the level of self-reported offending at the 6-month assessment (i.e. $B = .147$; $SE = .079$; $p = .063$) or the rate of change in offending over time (i.e., $B = .049$; $SE = .027$; $p = .071$; Table 4), although both of these coefficients approached significance.

Next, we conducted a similar test using negative binomial regression to determine if the influence of processing decision on risk for future arrests remained significant after controlling for key baseline characteristics of the adolescent. In support of our hypotheses, baseline processing decision continued to positively predict the number of arrests across assessment periods, such that formally processed adolescents were arrested more frequently across the 36-months following their first arrest than informally processed adolescents, even after controlling for key baseline characteristics (Table 4).

Table 4. Latent Growth Curve Model Testing the Prediction of Self-Report Offending and Negative Binomial Regression Testing the Prediction of Frequency of Arrests While Controlling for Key Covariates.

Latent Growth Curve Model	Coefficient	S.E.	95% CI	<i>p</i> value	<i>N</i>
Intercept					1,216
Processing Decision	.147	.079	-.009, .303	.064	

(Table cont'd)

	Coefficient	S.E.	95% CI	<i>p</i> value	<i>n</i>
CU Traits	.034	.005	.024, .045	.001	
Baseline SR Offending	.138	.016	.106, .169	.001	
Age	-.116	.032	-.178, -.054	.001	
IQ	.000	.004	-.007, .007	.918	
(Table cont'd)					
African American	-.106	.120	-.341, .130	.379	
Hispanic	-.003	.116	-.230, .225	.982	
Impulse Control	-.036	.050	-.145, .053	.473	
Peer Delinquency	.382	.078	.227, .532	.001	
Parental Monitoring	-.062	.060	-.180, .056	.306	
Parental Education	.073	.054	-.032, .179	.173	
Neighborhood Disorder	.068	.063	-.056, .192	.281	
Slope					
Processing Decision	.049	.027	-.004, .102	.071	
CU Traits	-.003	.002	-.006, .001	.141	
Baseline SR Offending	-.002	.005	-.012, .009	.770	
Age	-.027	.011	-.049, -.006	.011	
IQ	.001	.001	-.002, .003	.438	
African American	-.056	.041	-.135, .024	.169	
Hispanic	-.033	.039	-.109, .043	.401	
Impulse Control	.010	.017	-.023, .044	.553	
Peer Delinquency	-.004	.027	-.057, .048	.866	
Parental Monitoring	.001	.021	-.039, .042	.960	
Parental Education	.015	.018	-.021, .051	.424	
Neighborhood Disorder	-.026	.022	-.068, .017	.237	
S WITH I	.019	.017	-.016, .053	.288	
Intercepts					
Intercept	-.639	.687	-1.96, .707	.352	
Slope	.197	.231	-.257, .650	.395	
Residual Variances					
Intercept	.823	.075	.675, .971	.001	
Slope	.062	.008	.047, .077	.001	
Negative Binomial Reg.					
Intercept	1.183	.849	-.481, 2.847	.163	1,098
Processing Decision	.355	.095	.169, .540	.001	
CU Traits	.022	.007	.010, .035	.001	
Baseline SR Offending	.025	.020	-.015, .065	.215	
Age	-.077	.037	-.149, -.005	.008	
IQ	-.008	.004	-.017, -.001	.053	
African American	.376	.151	.080, .672	.013	
Hispanic	.199	.149	-.093, .492	.182	
Impulse Control	.019	.062	-.103, .140	.769	
Peer Delinquency	.143	.096	-.046, .331	.138	
Parental Monitoring	-.178	.072	-.319, -.037	.013	
Parental Education	-.127	.064	-.252, -.002	.053	
Neighborhood Disorder	-.030	.078	-.183, .122	.698	

Note: S WITH I = Correlation between the slope and intercept. S.E. = Standard Error. CI = Confidence Interval. Reg. = Regression.

Testing CU traits as a moderator. To evaluate the third hypothesis of whether CU traits moderated the influence of processing decision on risk for later offending, the latent growth curve model controlling for baseline characteristics was rerun with the interaction between CU traits and processing decision (Table 5). In support of our hypotheses, significant main effects of CU traits and processing decision emerged in predicting the 6-month level of self-reported offending (i.e., intercept), such that both higher CU traits and formal processing were related to more self-report offending. Further, as predicted, these effects were modified by a significant interaction between CU traits and processing decision on the intercept. As with the previous models, neither main effects or the interaction predicted rate of change in offending over time (i.e., slope).

Table 5. Latent Growth Curve Model and Negative Binomial Regression Testing the Moderating Effect of Callous-Unemotional Traits

Latent Growth Curve Model	Coefficient	S.E.	95% CI	<i>p</i> value	<i>N</i>
Intercept					1,216
Processing Decision	.182	.081	.023, .340	.024	
CU Traits	.041	.006	.029, .052	.001	
Interaction	-.021	.010	-.040, -.001	.035	
Baseline SR Offending	.140	.016	.109, .171	.001	
Age	-.118	.031	-.180, -.056	.001	
IQ	.000	.004	-.007, .007	.928	
African American	-.094	.120	-.329, .141	.433	
Hispanic	.001	.115	-.225, .227	.994	
Impulse Control	-.035	.050	-.133, .062	.479	
Peer Delinquency	.370	.078	.218, .522	.000	
Parental Monitoring	-.060	.060	-.178, .057	.315	
Parental Education	.070	.054	-.035, .175	.189	
Neighborhood Disorder	.073	.063	-.051, .196	.249	
Slope					
Processing Decision	.041	.028	-.014, .095	.142	
CU Traits	-.004	.002	-.008, .001	.093	
Interaction	.003	.003	-.004, .009	.400	
Baseline SR Offending	-.002	.005	-.013, .009	.725	
Age	-.027	.011	-.049, -.006	.012	
IQ	.001	.001	-.001, .003	.455	
African American	-.057	.041	-.136, .023	.161	
Hispanic	-.032	.039	-.109, .044	.403	

(Table cont'd)

	Coefficient	S.E.	95% CI	<i>p</i> value	<i>N</i>
Impulse Control	.010	.017	-.024, .043	.561	
Peer Delinquency	-.003	.027	-.055, .050	.922	
Parental Monitoring	.001	.021	-.039, .042	.952	
Parental Education	.015	.018	-.021, .052	.406	
Neighborhood Disorder	-.026	.022	-.068, .016	.227	
S WITH I	.020	.017	-.014, .054	.254	
Intercepts					
Intercept	.261	.652	-1.017, 1.539	.689	
Slope	.121	.221	-.312, .554	.583	
Residual Variances					
Intercept	.812	.075	.666, .958	.001	
Slope	.062	.008	.047, .077	.001	
Negative Binomial Reg.					
Intercept	1.790	.806	.211, 3.370	.026	1,098
Processing Decision	.381	.096	.193, .569	.001	
CU Traits	.031	.008	.016, .047	.001	
Interaction	-.020	.012	-.043, .002	.079	
Baseline SR Offending	.028	.020	-.012, .068	.173	
Age	-.080	.037	-.152, -.007	.031	
IQ	-.008	.004	-.017, .000	.057	
African American	.381	.151	.085, .677	.012	
Hispanic	.204	.149	-.088, .497	.171	
Impulse Control	.017	.062	-.105, .138	.789	
Peer Delinquency	.135	.096	-.054, .324	.161	
Parental Monitoring	-.181	.072	-.332, -.040	.012	
Parental Education	-.128	.064	-.253, -.003	.044	
Neighborhood Disorder	-.024	.078	-.177, .129	.757	

Note (Table cont'd.): S WITH I = Correlation between the slope and intercept. S.E. = Standard Error. CI = Confidence Interval. Reg. Regression.

To explore this significant interaction between CU traits and formal processing in predicting the intercept, a negative binomial regression was conducted to predict offending at the 6-month assessment point. The continuous (CU traits) by categorical (processing decision) interaction was plotted using the full regression equation with the predicted values of the outcome (i.e., self-reported delinquency) plotted at low (lower quartile) and high (upper quartile) CU traits separately for the formal and informally processed adolescents (Bauer & Curran, 2005; Preacher, Curran, & Bauer, 2006). The result of this procedure is provided in Figure 1. In support of our hypotheses, formal processing increased risk for offending at the 6-month

assessment but only for those with low CU traits.

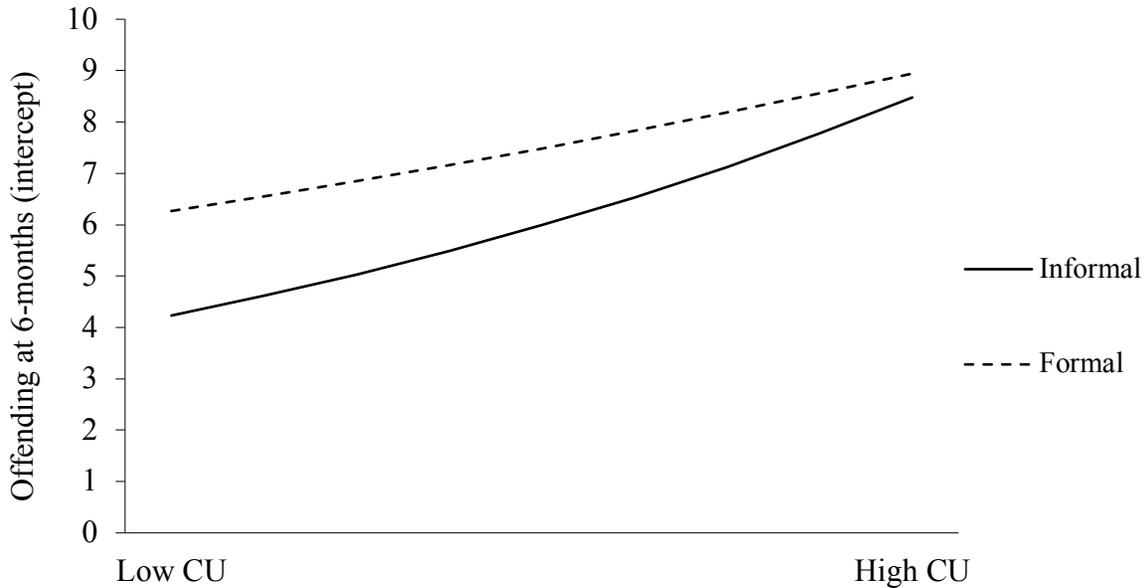


Figure 1. The interaction between processing decision and CU traits in the prediction of self-reported offending at the 6-month follow up (i.e., intercept).

Finally, to assess whether CU traits moderated the influence of processing decision on risk for rearrest, we reran the negative binomial regression that included the baseline characteristics but this time we included the interaction between CU traits and processing decision in the model. As with the latent growth curve model, significant main effects of CU traits and processing decision emerged. Contrary to our predictions, the interaction between CU traits and processing decision did not predict total arrests, although it approached significance (i.e., $B = -.02$; $SE = .012$; $p = .079$; Table 5). The form of this non-significant interaction is provided in Figure 2. Although non-significant, the form was in the hypothesized direction such that formal processing decision resulted in more arrests but only for those at low levels of CU

traits.

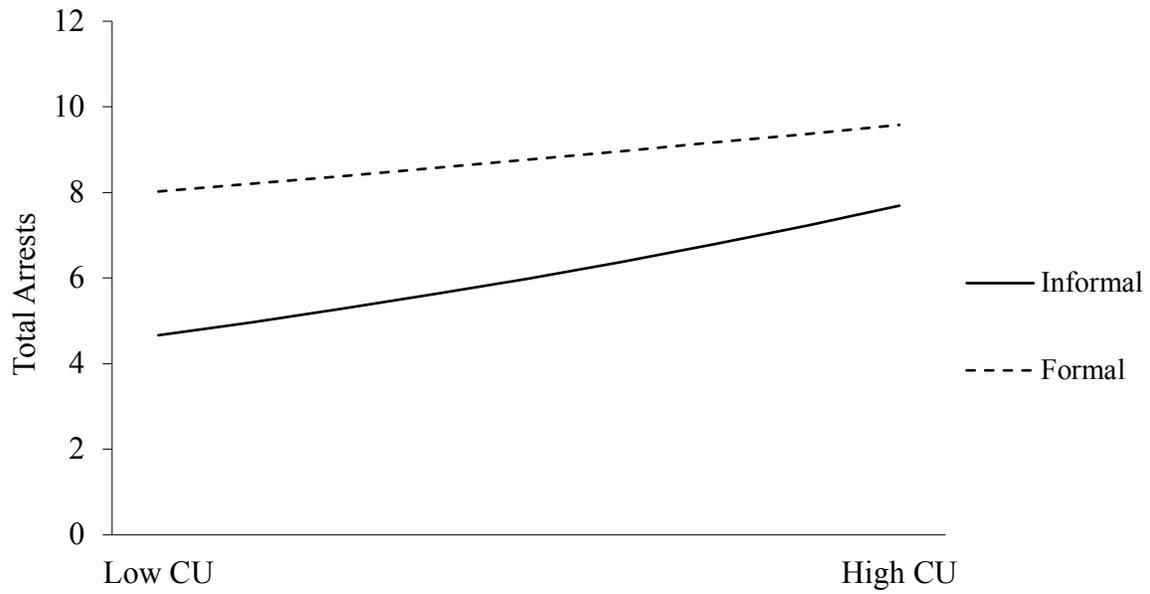


Figure 2. The interaction between processing decision and CU traits in the prediction of the total number of rearrests across the 36-months.

Discussion

Understanding the impacts of juvenile justice system processing decision (i.e., formal vs. informal) upon an adolescent's first arrest on the risk for future recidivism is of considerable importance, especially given the rate that adolescents are arrested in the United States (OJJDP, 2017). This is especially important, given the great variability among the ways in which these decisions are made in the juvenile justice system. Consistent with previous work, our results suggest that youths who are formally processed upon their first arrest are at a higher risk of future offending and rearrest compared to youths who are informally processed (Petitclerc et al., 2013).

However, our results advance this past work in several important ways. First, our results extend previous work by suggesting that the deleterious effect of formal processing on future offending can only partially be explained by vulnerabilities in the adolescent offenders who are processed formally. That is, even after controlling for a number of these characteristics at the time of arrest (e.g., age at first arrest, self-report of offending prior to first arrest, peer delinquency), the main effect of processing decision still predicted risk for later arrests. However, for the prediction of self-reported offending, both predicting the intercept (i.e., 6-month assessment) and slope was no longer significant. These results are similar to those reported by Petitclerc et al. (2013) in sample of 1,037 Canadian adolescent boys and who also used risk for rearrest from official records as their outcome variable. The fact that the effects of formal processing was largely retained when using official rearrests could support the possibility that formal processing increases the *detection* of crime by law enforcement (Schur, 1973) but may not lead to actual changes in criminal behavior.

Second, our results extend previous work by suggesting that the deleterious effects of processing decision are not consistent among all adolescents whom are arrested for the first time. In support of our predictions, we found a significant interaction between CU traits and formal processing when predicting self-reported offending. That is, adolescents who were formally processed were at a higher risk of self-reported offending, but only if they were low on CU traits. In other words, processing decision did not influence the rate of offending among those with elevated CU traits but had deleterious effects on those low on CU traits. While this interaction only reached significance when predicting self-reported offending, it approached significance (i.e., $B = -.02$; $SE = .012$; $p = .079$; Table 5) when using official arrests. Importantly, in both cases, the form of the interaction was very similar, in that the effects of formal processing were only evidence at low levels of CU traits.

While the current study is not able to test why adolescents at various levels of CU traits may be differentially influenced by formal processing, past research suggests a few possible reasons for this. Specifically, this finding aligns with previous work that suggests those with elevated CU traits are less responsive to punishment (Blair et al., 2001; Fisher & Blair, 1998; Gluckman et al., 2016) and less influenced by delinquent peers (Kerr et al., 2012). Thus, these youths may be less susceptible to experiences within the system. Also, those adolescents with low CU traits show heightened physiological arousal and anxiety (Frick et al., 1999; Pardini, 2006; Pardini et al., 2007; Roose et al., 2011; Sadeh, et al., 2009), which may make them more negatively impacted by trauma and other adverse events experienced in the juvenile justice system.

Thus, future work should explore how adolescents with CU traits respond differentially to their experiences in the juvenile justice system, and how these differences may depend on the

method of assessment. However, whatever the reason, this finding has important policy implications. Specifically, past research studying the effects of the juvenile justice system may have actually *underestimated* the potential iatrogenic influences due to not considering potential individual characteristics (i.e., CU traits) that may moderate these effects (Cuellar, McReynolds, & Wasserman, 2006; Dishion, Poulin, & Burraston, 2001; Dishion, McCored, & Poulin, 1999; Gatti, Tremblay, & Vitaro, 2009; Loughran et al., 2009; Petitclerc, Gatti, Vitaro, Tremblay, 2013; Petrosino, Turpin-Petrosino, & Guckenbug, 2010). For example, among serious juvenile offenders, after controlling for 66 covariates using propensity score matching procedures, no differences in arrest rate or self-reported offending was found between adolescents who were placed in an institution compared to those given probation (Loughran et al., 2009). Perhaps, controlling for key interpersonal and contextual variables, including psychopathic traits, without assessing the moderating influence of these traits, may have eliminated a potential effect of institutional placement on recidivism outcomes. In another example, Petrosino et al., (2010) conducted a meta-analysis of the studies that assess system processing on recidivism. While this meta-analysis found either null or negative influences of the system on recidivism across studies, the moderating variables assessed were methodological variables such as type of comparison group or history of prior offending but did not consider interpersonal characteristics of the study samples. Thus, future work in this area should consider the moderating influence of CU and other adolescent characteristics (e.g., anxiety, trauma exposure) that may determine their response to juvenile justice involvement.

An important methodological advance of the current study is the extended follow-up period with multiple assessment points. This methodology allowed us to study a fairly low base rate outcome: official arrests over the follow-up period. Thus, we were able to test our

hypotheses using two different methods (i.e., official arrests and self-reported offending), each with its own strengths and weaknesses. That is, official records can be limited because many crimes do not come to the attention of authorities (Skogan, 1997). Alternatively, these records can detect crimes that may not be reported by the adolescent. Our repeated assessments over an extended period also allowed use to test the effects of processing decision and its interaction with CU traits on the growth of self-reported delinquency over time. The results of the growth models consistently found a main effect of processing decision and the interaction with CU traits on the intercept of the growth curve for self-reported delinquency but not the slope. Thus, the effect of formal processing appears within the first six months after arrest (i.e., the first follow-up period), with no evidence for an effect on any change in rates of delinquency from this point. In other words, the iatrogenic influence of formal processing on self-reported delinquency seems to occur quickly. This finding is important because while previous research has reported increased recidivism for youths receiving more intense involvement in the juvenile justice system (Mulvey et al., 2010; Petitcherc et al., 2013), it has been unclear *when* the deleterious effects become apparent. Our results suggest that the decision to process a youth formally has fairly immediate consequences on future criminality.

These strengths of the study need to be weighed with some important limitations as well. The current study controlled for a number of key characteristics of the adolescent at the time of arrests. However, it did not consider fluctuations among these variables over time (i.e., time varying covariates) that may increase or decrease the risk for delinquency. For example, as discussed above, associating with delinquent peers mediates the relationship between labeling effects and future criminality (Adams, 1996; Becker, 1963; Bernburg et al., 2006; Goffman, 1963; Heimer & Matsueda, 1994; Matsueda, 1992). Thus, it is possible that as formally

processed adolescents dissociate with prosocial peers and increase contact with deviant peers, the rate of offending or rearrests could increase (i.e., change in slope). Similarly, changes in parental monitoring may influence later offending, given that increased monitoring is associated with less delinquency among adolescents (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Dishion, Capaldi, & Spracklen, 1995; Jacobson & Crockett, 2000; Li, Stanton, & Feigelman, 2000). It will be important for future research to assess how these key interpersonal and contextual characteristics may vary across time and how this might help to explain the deleterious effects of formal processing decision on future offending.

An additional limitation of the current study was that it was limited to boys and thus the generalizability of our findings to girls remains unclear. This is an especially notable limitation, given that girls in the justice system may be particularly vulnerable to experiencing traumatic events (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Wasserman, McReynolds, Ko, Katz, & Carpenter, 2005). Also, our study focused on a sample of juvenile offenders whose first arrest was for only low to moderately severe crimes. This was an important methodology because it restricted variability in previous system contact and severity of offense, and increased variability in how the system may respond to the same offense. Further, this sampling method also likely increased variability of both CU traits and the amount of recidivism within the sample relative to a more severe offending sample, which would have been more restricted at the lower levels of these variables. However, this methodology also means that it is not clear if the associations we found would replicate in other samples of adolescents who have committed more severe offenses leading to their first arrest and who would have more youth at higher levels of CU traits. In support of this possibility, among severe adolescent offenders the processing decision did not predict future criminality (Loughran et al., 2009).

Within the context of these limitations, our findings support the association between formal processing and increased risk of future criminality as reported in past samples (Gatti et al., 2009; Mulvey et al., 2010). However, our results suggest that formal processing decision has deleterious effects on adolescent recidivism, independent of vulnerabilities in the adolescent and his family, peer, and neighborhood context. Importantly, the effects of formal processing appear to occur quickly after arrest and is more severe for those offenders who are low on CU traits, at least in terms of self-reported offending. Thus, it will be important for future research to consider moderating effects of CU traits and other important interpersonal characteristics of adolescents, as well as multiple methods of assessing recidivism, as not considering either of these variables may underestimate the potential effects of formal processing decision on risk of future criminality. Lastly, district attorneys, judges, and policy makers may need to consider the characteristics of the adolescent when assessing how to process those that come into the juvenile justice system for the first time. Perhaps choosing to informally process first-time offenders, especially those low on CU traits, would assist in reducing recidivism.

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Appendix A
Self-Report of Offending (SRO)

In the past 12 months, have you....	If yes, how many times have you done this in the past twelve months?	Thinking about the last time you did this, was anyone with you at the time? (1) Yes (5) No
Purposely destroyed or damaged property that did not belong to you? (1) Yes (5) No		
Purposely set fire to a house, building, car, or vacant lot? (1) Yes (5) No		
Entered or broken into a building to steal something? (1) Yes (5) No		
Stolen something from a store (shoplifted)? (1) Yes (5) No		
Bought, received, or sold something that you knew was stolen? (1) Yes (5) No		
Used checks or credit cards illegally? (1) Yes (5) No		
Stolen a car or motorcycle to keep or sell? (1) Yes (5) No		
Sold marijuana? (SRORow8) (1) Yes (5) No		
Sold other illegal drugs (cocaine, crack, heroine)? (1) Yes (5) No		
Carjacked someone? (1) Yes (5) No		Did you have a gun the last time you did this? (1) Yes (5) No
Driven while you were drunk or high? (1) Yes (5) No		
Been paid by someone for having sexual relationship with them? (1) Yes (5) No		

Forced someone to have sex with you? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Killed someone? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Shot someone (where bullet hit the victim)? (1) Yes (5) No			
Shot AT someone (where you pulled the trigger)? (1) Yes (5) No			
Taken something from another person by force, using a weapon? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Taken something from another person by force, without a weapon? (1) Yes (5) No			
Beaten up or physically attacked someone so badly that they probably needed a doctor? (1) Yes (5) No			
Been in a fight? (1) Yes (5) No			
Beaten up, threatened, or physically attacked someone as part of a gang? (1) Yes (5) No			Did you have a gun the last time you did this? (1) Yes (5) No
Carried a gun? (1) Yes (5) No			
Broken into a car to steal from it? (1) Yes (5) No			
Gone joyriding? (1) Yes (5) No			

Appendix B
Inventory of Callous-Unemotional Traits

Please listen carefully to each statement and decide how well it describes you. Choose the appropriate answer for each statement.

	Not at all true	Somewhat true	Very true	Definitely true
I express my feelings openly.	(0)	(1)	(2)	(3)
What I think is “right” and “wrong” is different from what other people think.	(0)	(1)	(2)	(3)
I care about how well I do at school or work.	(0)	(1)	(2)	(3)
I do not care who I hurt to get what I want.	(0)	(1)	(2)	(3)
I feel bad or guilty when I do something wrong.	(0)	(1)	(2)	(3)
I do not show my emotions to others.	(0)	(1)	(2)	(3)
I do not care about being on time.	(0)	(1)	(2)	(3)
I am concerned about the feelings of others.	(0)	(1)	(2)	(3)
I do not care if I get into trouble.	(0)	(1)	(2)	(3)
I do not let my feelings control me.	(0)	(1)	(2)	(3)
I do not care about doing things well.	(0)	(1)	(2)	(3)
I seem very cold and uncaring to others.	(0)	(1)	(2)	(3)
I easily admit to being wrong.	(0)	(1)	(2)	(3)
It is easy for others to tell how I am feeling.	(0)	(1)	(2)	(3)
I always try my best.	(0)	(1)	(2)	(3)
I apologize (“say I am sorry”) to persons I hurt.	(0)	(1)	(2)	(3)
I try not to hurt others’ feelings.	(0)	(1)	(2)	(3)
I do not feel remorseful when I do something wrong.	(0)	(1)	(2)	(3)
I am very expressive and emotional.	(0)	(1)	(2)	(3)
I do not like to put the time into doing things well.	(0)	(1)	(2)	(3)

The feelings of others are unimportant to me.	(0)	(1)	(2)	(3)
I hide my feelings from others.	(0)	(1)	(2)	(3)
I work hard on everything I do.	(0)	(1)	(2)	(3)
I do things to make others feel good.	(0)	(1)	(2)	(3)

Appendix C Weinberg Adjustment Inventory

Please respond to each statement by thinking about how you usually have felt or acted during the past twelve months by selecting one of the choices.

	False	Somewhat False	Not Sure	Somewhat True	True
Doing things to help other people is more important to me than almost anything else.	(1)	(2)	(3)	(4)	(5)
I'm the kind of person who will try anything once, even if it's not that safe.	(1)	(2)	(3)	(4)	(5)
People who get me angry better watch out.	(1)	(2)	(3)	(4)	(5)
I should try harder to control myself when I'm having fun.	(1)	(2)	(3)	(4)	(5)
I often go out of my way to do things for other people.	(1)	(2)	(3)	(4)	(5)
I can do things as well as other people can.	(1)	(2)	(3)	(4)	(5)
I do things without giving them enough thought.	(1)	(2)	(3)	(4)	(5)
I enjoy doing things for other people, even when I don't receive anything in return.	(1)	(2)	(3)	(4)	(5)
If someone tries to hurt me, I make sure I get even with them.	(1)	(2)	(3)	(4)	(5)
I like to do new and different things that many people would consider weird or not really safe.	(1)	(2)	(3)	(4)	(5)
I become 'wild and crazy' and do things other people might not like.	(1)	(2)	(3)	(4)	(5)
If someone does something I really don't like, I yell at them about it.	(1)	(2)	(3)	(4)	(5)
Before I do something, I think about how it will affect people around me.	(1)	(2)	(3)	(4)	(5)
When I'm doing something fun (like partying or acting silly), I tend to get carried away and go too far.	(1)	(2)	(3)	(4)	(5)
I say the first thing that comes into my mind without thinking enough about it.	(1)	(2)	(3)	(4)	(5)
I pick on people I don't like.	(1)	(2)	(3)	(4)	(5)

I try very hard not to hurt other people's feelings.	(1)	(2)	(3)	(4)	(5)
I lose my temper and 'let people have it' when I'm angry.	(1)	(2)	(3)	(4)	(5)
I make sure that doing what I want will not cause problems for others.	(1)	(2)	(3)	(4)	(5)
I stop and think things through before I act.	(1)	(2)	(3)	(4)	(5)
I say something mean to someone who has upset me.	(1)	(2)	(3)	(4)	(5)
I think about other people's feelings before I do something they might not like.	(1)	(2)	(3)	(4)	(5)
When someone tries to start a fight with me, I fight back.	(1)	(2)	(3)	(4)	(5)

Appendix D
Peer Delinquency

During the past twelve months, how many of your friends have...	None of them	Very few of them	Some of them	Most of them	All of them
Purposely damaged or destroyed property that did not belong to them?	(1)	(2)	(3)	(4)	(5)
Hit or threatened to hit someone?	(1)	(2)	(3)	(4)	(5)
Sold drugs?	(1)	(2)	(3)	(4)	(5)
Gotten drunk once in a while?	(1)	(2)	(3)	(4)	(5)
Gotten high on drugs?	(1)	(2)	(3)	(4)	(5)
Carried a knife?	(1)	(2)	(3)	(4)	(5)
Carried a gun?	(1)	(2)	(3)	(4)	(5)
Owned a gun?	(1)	(2)	(3)	(4)	(5)
Gotten into a physical fight?	(1)	(2)	(3)	(4)	(5)
Been hurt in a fight?	(1)	(2)	(3)	(4)	(5)
Stolen something worth more than \$100?	(1)	(2)	(3)	(4)	(5)
Taken a motor vehicle or stolen a car?	(1)	(2)	(3)	(4)	(5)
Gone in or tried to go into a building to steal something?	(1)	(2)	(3)	(4)	(5)
Suggested that you should go out drinking with them?	(1)	(2)	(3)	(4)	(5)
Suggested or claimed that you have to get drunk to have a good time?	(1)	(2)	(3)	(4)	(5)
Suggested or claimed that you have to be high on drugs to have a good time?	(1)	(2)	(3)	(4)	(5)
Suggested that you should sell drugs?	(1)	(2)	(3)	(4)	(5)
Suggested that you should steal something?	(1)	(2)	(3)	(4)	(5)
Suggested that you should hit or beat someone up?	(1)	(2)	(3)	(4)	(5)
Suggested that you should carry a weapon?	(1)	(2)	(3)	(4)	(5)

Appendix E Parental Supervision

How much does [Parent] try to know who you spend time with?

- (1) Doesn't try at all
- (2) Tries a little bit
- (3) Tries a lot
- (4) Tries extremely hard

How much does [Parent] really know who you spend time with?

- (1) Doesn't know at all
- (2) Knows a little bit
- (3) Knows a lot
- (4) Knows everything

How much does [Parent] try to know how you spend your free time?

- (1) Doesn't try at all
- (2) Tries a little bit
- (3) Tries a lot
- (4) Tries extremely hard

How much does [Parent] really know how you spend your free time?

- (1) Doesn't know at all
- (2) Knows a little bit
- (3) Knows a lot
- (4) Knows everything

How much does [Parent] try to know how you spend your money?

- (1) Doesn't try at all
- (2) Tries a little bit
- (3) Tries a lot
- (4) Tries extremely hard

How much does [Parent] really know how you spend your money?

- (1) Doesn't know at all
- (2) Knows a little bit
- (3) Knows a lot
- (4) Knows everything

How much does [Parent] try to know about where you go right after school or work is over for the day?

- (1) Doesn't try at all
- (2) Tries a little bit
- (3) Tries a lot
- (4) Tries extremely hard

How much does [Parent] really know about where you go right after school or work is over for the day?

- (1) Doesn't know at all
- (2) Knows a little bit
- (3) Knows a lot
- (4) Knows everything

How much does [Parent] try to know about where you go at night?

- (1) Doesn't try at all
- (2) Tries a little bit
- (3) Tries a lot
- (4) Tries extremely hard

How much does [Parent] really know about where you go at night?

- (1) Doesn't know at all
- (2) Knows a little bit
- (3) Knows a lot
- (4) Knows everything

Do you live with [Parent]?

- (1) Yes
- (5) No

How often do you have a set time to be home on school or work nights?

- (1) Never
- (2) Sometimes
- (3) Usually
- (4) Always
- (97) NA (don't live with caretaker)

How often do you have a set time to be home on weekend nights?

- (1) Never
- (2) Sometimes
- (3) Usually
- (4) Always
- (97) NA (don't live with caretaker)

How often does [Parent] know what time you will be home when you've gone out?

- (1) Never
- (2) Sometimes
- (3) Usually
- (4) Always
- (97) NA (don't live with caretaker)

If [Parent] is not at home, how often do you leave a note, call, or communicate with [Parent] in some way about where you are going?

- (1) Never
- (2) Sometimes
- (3) Usually
- (4) Always
- (97) NA (don't live with caretaker)

Appendix F Neighborhood Conditions

You mentioned earlier that you lived at [ADDRESS] for the longest time period in the past twelve months. Thinking about the neighborhood around that address, how often does each of the following occur within your neighborhood?

	Never	Rarely	Sometimes	Often
1. Cigarettes on the street or in the gutters?	(1)	(2)	(3)	(4)
2. Garbage in the streets or on the sidewalk?	(1)	(2)	(3)	(4)
3. Empty beer bottles on the streets or sidewalks?	(1)	(2)	(3)	(4)
4. Boarded up windows on buildings?	(1)	(2)	(3)	(4)
5. Graffiti or tags?	(1)	(2)	(3)	(4)
6. Graffiti painted over?	(1)	(2)	(3)	(4)
7. Gang graffiti?	(1)	(2)	(3)	(4)
8. Gangs (or other teen groups) hanging out?	(1)	(2)	(3)	(4)
9. Abandoned cars?	(1)	(2)	(3)	(4)
10. Empty lots with garbage?	(1)	(2)	(3)	(4)
11. Condoms on sidewalk?	(1)	(2)	(3)	(4)
12. Needles or syringes?	(1)	(2)	(3)	(4)
13. Political messages in graffiti?	(1)	(2)	(3)	(4)
14. Adults hanging out on the street?	(1)	(2)	(3)	(4)
15. People drinking beer, wine or liquor?	(1)	(2)	(3)	(4)
16. People drunk or passed out?	(1)	(2)	(3)	(4)
17. Adults fighting or arguing loudly?	(1)	(2)	(3)	(4)
18. Prostitutes on the streets?	(1)	(2)	(3)	(4)
19. People smoking marijuana?	(1)	(2)	(3)	(4)
20. People smoking crack?	(1)	(2)	(3)	(4)
21. People using needles or syringes to take drugs?	(1)	(2)	(3)	(4)

Appendix G IRB Approval

ACTION ON PROTOCOL CONTINUATION REQUEST



Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
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TO: Paul Frick
Psychology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: October 4, 2016

RE: IRB# 3650

TITLE: Crossroads: Formal versus informal processing in the juvenile justice system

New Protocol/Modification/Continuation: Continuation

Review type: Full Expedited **Review date:** 10/4/2016

Risk Factor: Minimal Uncertain Greater Than Minimal

Approved **Disapproved**

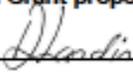
Approval Date: 10/4/2016 **Approval Expiration Date:** 10/3/2017

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 151

LSU Proposal Number (if applicable): 43721

Protocol Matches Scope of Work in Grant proposal: (if applicable) Yes

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –

Continuing approval is **CONDITIONAL** on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE:** Make sure to use bcc when emailing more than one recipient.

*All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>

Vita

Emily was born in Ft. Benning, Georgia and raised in Georgia, North Carolina, Idaho, and Germany. She obtained a Bachelors of Science Degree in psychology with a minor in criminal justice from University of North Florida in 2014. Following graduation, she moved to Washington, D.C. to receive full-time research training as Laboratory Manager for Dr. Abigail Marsh's Laboratory on Social and Affective Neuroscience at Georgetown University. In 2016, she joined the Clinical Psychology PhD program at Louisiana State University under Dr. Paul Frick in the Developmental Psychopathology Lab.

