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Assessing Youth Early in the Juvenile Justice System

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Abstract

Unnecessary involvement in the juvenile justice system generally results in negative long-term outcomes (Annie E. Casey Foundation, 2008). The problem lies in determining when involvement is unnecessary and when it is necessary. A juvenile's path to detention often begins years prior. Research indicates that unnecessary court involvement may contribute to worse outcomes, which can ultimately culminate in detention (Holman & Ziedenberg, 2006). Youth who are formally processed through court are more likely to be under closer supervision, which, in turn, increases their chances of being caught violating curfew, missing school, or committing another technical violation. To test the effect of system involvement, we examined youth enrolled in two early intervention programs: Juvenile Diversion, which involves formal processing and services, and Early Assessment, a process designed to screen youth out of system involvement. Only low-risk, juvenile law offenders are eligible for either of these two programs. Using propensity score analysis we examined whether youth who participated in Early Assessment were less likely to recidivate than their peers who participated in the Juvenile Diversion Program. Our findings indicate that, 24 months after program completion, Early Assessment participants were significantly less likely to have a new law violation compared to youth who participated in Juvenile Diversion.

Introduction

From 1994 to 2009, juvenile crime decreased significantly nationwide, yet rates of adjudicating and detaining youth rose steadily (Annie E. Casey Foundation Website, 2008; Bouffard & Bergseth, 2008; Knoll & Sickmund, 2011; Knoll & Sickmund, 2012; Puzzanchera & Adams, 2011). According to Puzzanchera and Adams (2011), levels of juvenile crime fell 50% between 1994 and 2009. Trends in detaining juveniles did not follow suit (Annie E. Casey Foundation, 2010). Even as late as 2008, thousands of youth sat in detention and other confined settings. On any given night "an estimated 400,000 youngsters cycle through juvenile detention centers; and nearly 100,000

youth are confined in juvenile jails, prisons, boot camps, and other residential facilities" (Annie E. Casey Foundation, 2008, p. 3). Roughly 40% of all detained youth are held for nonviolent offenses (e.g., status offenses, probation violations, low-level property offenses; Annie E. Casey Foundation, 2013), making the United States a country that treats adolescent offenders more harshly than almost any other industrialized nation (Steinberg, 2013). Unnecessary detention is not an effective use of resources. Researchers have repeatedly documented that when juveniles are detained for low-level offenses detention does not have a deterrent effect, but may actually increase recidivism (Annie E. Casey Foundation, 2008; Mendel, 2011). In addition, detention is a costly intervention, with states spending an estimated $5.7 billion annually to detain youth, most of whom could be safely managed in the community (Holman & Ziedenberg, 2006). If juvenile detention is unnecessary, ineffective, and costly, why then do we rely on juvenile detention as our primary intervention for juvenile crime in the United States? Many jurisdictions are in the process of reforming their juvenile justice systems to address these contradictory and damaging trends.

Research confirms that the practice of detaining juveniles for relatively low-level offenses is both ineffective and detrimental (Frazier & Cochran, 1986; Holman & Ziedenberg, 2006; Kenny, Lennings, and Munn, 2008). Potential iatrogenic consequences range from reinforcement of violent attitudes due to association with other high-risk youth (Ryzin & Dishion, 2013), mental health concerns (Teplin, Abram, McCelland, Dulcan, & Mericle, 2002) and sexual health issues (e.g., increases in sexually transmitted diseases; Aalsma et al., 2012). Increases in violent behavior and subsequent law violations have also been cited as results of detaining low-risk juveniles (Mendel, 2011; Tonry, 2007). Holman and Ziedenberg (2006) note a variety of individual-level negative outcomes that flow from detaining youthful offenders, including: (a) poor mental health outcomes; (b) barriers to education and, (c) obstacles to future employment. In addition, adolescents are commonly more vulnerable to negative influences, particularly salient, maladaptive peer pressures (Fried & Reppucci, 2001; Steinberg & Scott, 2003). Youth who have been detained also have worse legal outcomes than those who have not. Harsher legal penalties are more prevalent for youth who have been previously detained. Frazier and Cochran (1986) examined the severity of court outcomes among nearly 10,000 delinquent youth. They found that detained youth, regardless of offense seriousness, referral status, and various demographic variables, experienced much harsher outcomes at later decision-points in court-processing than did similarly situated youth who were not detained.

The Annie E. Casey Foundation has been on the forefront of efforts to reform juvenile detention and is active in roughly 36 states to advocate for evidence-based alternatives for low-risk youth. They argue that many low-risk youth end up in detention because other systems (e.g., education, mental health) cannot provide appropriate services (Annie E. Casey Foundation, 2010). Generally, however, detention reform focuses on the youth at the "deep end" of the system. The path to detention begins with the first law violation; relatively few reform initiatives and studies focus on that very first interaction youth have with the legal system. Research has demonstrated that official processing of a juvenile law violation may be the least effective means of rehabilitating juvenile offenders.

Petrosino, Turpin-Petrosino, & Guckenburg's (2010) study presents the most comprehensive analysis of the impact of formal court processing on delinquent youths' future offending. They examined 29 juvenile justice studies to determine whether formal processing of juvenile offenders reduces subsequent acts of delinquency. Their meta-analysis included 7,304 juvenile records over a 35-year period (Petrosino, et al., 2010). Formal processing included youth who were charged in juvenile court, adjudicated,

or placed on probation. Youth who were formally processed were compared to those who were diverted from the system to other services or who were released without any requirements. Although the results were not uniform across each of the 29 studies, the general findings of the meta-analysis were startling: processing a juvenile through formal juvenile court proceedings appears to result in later acts of delinquency. "Rather than providing a public safety benefit, processing a juvenile through the system appears to have a negative or backfire effect" (Petrosino et al., 2010, p. 38).

Net Widening: Not All Youth Need Intervention

While Petrosino's (2010) research supported alternatives to formal processing, it did not support a policy of diverting youth who would not otherwise have been processed, or net widening. In other words, researchers were not in favor of diverting all youth, but only youth who needed intervention.

Why does net widening happen? Some of the behaviors that we now criminalize in our juvenile justice system are behaviors that used to be tolerated to some degree by society (American Psychological Association, 2008; Dupper, 2010; Snyder 1998). Many researchers cite the myth of juvenile violent offenders, perpetuated by the media, as the underlying reason for the rapid increase in juvenile court processing (Dembo, Wareham, & Schmeidler, 2005; Haegerich, Salerno, & Bottoms, 2012; Greene & Evelo, 2013; Muschert, 2007; Snyder, 1998). More recent legal cases and reform efforts point to a systemic misunderstanding of adolescent development as the source of this net widening. For example, a recent study conducted by Allen, Trzcinski, & Kubiak (2012) found that not only were participants' views of adolescent development predictive of how they believed juveniles should be treated in the justice system, but attitudes toward adolescent development explained more variance in how juveniles should be treated than any other demographic construct. Taking adolescent development into account, evaluators and stakeholders should inquire whether: (a) the youth requires any intervention or whether the process brings juveniles into the system unnecessarily, and (b) whether the intervention is a developmentally appropriate response designed to reduce recidivism.

Adolescent Development

According to the Annie E. Casey Foundation (2008), "behavioral research has proven that children and adolescents are far less able than adults to gauge risks and consequences, control impulses, handle stress, and resist peer pressure" (p. 2). Similarly, Cauffman and Steinberg (2000) have reported that socially responsive decision making is significantly more common among young adults than adolescents. Although the 1980s and 1990s were increasingly focused on protecting the rights of the community over the rights of the juvenile defendant (Fried & Reppucci, 2001), developments in adolescent neuroscience are now returning to emphasizing the juvenile. In a recent Supreme Court case, the Court noted that adolescent deficiencies in executive functioning and their inability to consider long-term consequences made certain legal consequences unconstitutional. Writing for a 5-4 majority, Justice Elena Kagan wrote, "Mandatory life without parole for a juvenile precludes consideration of his chronological age and its hallmark features—among them, immaturity, impetuosity, and failure to appreciate risks and consequences" (*Jackson v. Hobbs,* 2012). The Court ruled that mandatory life without parole is unconstitutional for juvenile defendants (*Jackson v. Hobbs,* 2012; Steinberg, 2013).

In addition to a juvenile's inability to fully appreciate long-term consequences and the legal ramifications, decades of research support the notion that participation in delinquency is commonplace during adolescence and that most young offenders will cease any law-breaking tendency as part of the normal maturation process (Matsuda, 2009; Snyder, 1998; Gottfredson &

Hirschi, 1990). Given all of the negative aspects of juvenile detention, and the fact that most youth will naturally cease delinquent acts without intervention, it becomes imperative for our systems to differentiate between youth who are behaving in a manner consistent with normative development, and youth who may be displaying atypical behaviors consistent with psychopathology and future criminal offending.

While it is harmful to overtreat youth, it is also potentially harmful if youth who need services are not identified and offered intervention early enough. Too often youth with mental health needs, learning disabilities, or poor support and structure in their homes go unidentified and may end up deeply entangled in our juvenile justice systems (Cocozza & Skowyra, 2000). A delicate balance exists between identifying youth early enough without overreacting and criminalizing normal youth development and experimentation. In short, our systems need to be able to assess which youth require serious legal interventions and which will benefit most from community-based intervention, or no treatment at all.

Formal and Informal Methods of Diverting Juveniles

Many jurisdictions operate formal programs that allow youth to divert a minor law violation by sending the youth through a diversion program in lieu of formal court processing. In Nebraska, like many states, a county attorney may refer a juvenile to diversion prior to filing a petition in court. There are also informal methods of diverting youth out of the system. A prosecutor may simply dismiss the case for lack of evidence or because they do not believe it should be prosecuted. Prosecutors may use other informal methods such as holding on to a case to allow the youth's family time to set up services or to see if the youth has any subsequent law violations. Whether because of public perception, victim rights, or political implications, prosecutors often do not track the number of cases they handle informally.

Diverting Youth Prior to System Involvement

Formal juvenile diversion is often built upon principles of restorative justice (U.S. Department of Justice and Office of Juvenile Justice and Delinquency Prevention, 2009). Youth referred to diversion are generally thought to be diverted from the formal process of juvenile court, but diversion clearly falls within part of the processing decision, albeit very early on in the process. Some jurisdictions are now exploring ways to keep youth out of the system altogether. In Lancaster County, Nebraska, the chief juvenile prosecutor worked with the local diversion program to identify youth who could be diverted prior to diversion. The county attorney implemented a process designed to screen out low-risk juvenile law offenders charged with misdemeanors. This process became known as the Early Assessment Process. The stakeholders involved in the Early Assessment Process used a bifocal approach by considering both short- and long-term consequences. Collaborative planning for this project included representatives from juvenile diversion, juvenile probation, the public defender's office, the city and county attorneys' offices, private and nonprofit providers, and the juvenile detention facility. The goal of this collaborative undertaking was to identify, very early in the juvenile process, which youth required further intervention and which youth had sufficient community supports to be diverted away from official processing, sometimes without any intervention. After receiving the citation or referral from law enforcement, a staff of the county attorney contacted the youth and guardian by phone. This was generally done within 10 days of the law violation, and the staff conducted a brief screening using the Nebraska Youth Screen (NYS), an abbreviated version of the Youth Level Services/Case Management Inventory (YLS/CMI).[1] Based upon the screening, the prosecutor chose to dismiss, divert, or file the case in court.

[1] The YLS is derived from the Level of Service Inventory Revised (LSI-R), a standardized risk assessment for adult offenders created by Andrews and Bonta (1995). There are a number of studies that demonstrate the predictive validity of the YLS/CMI, linking the relationship between recidivism and YLS/CMI scores.

This new approach generated some concern when it was initiated in 2009. Would providing additional information to the prosecutor result in net widening, thereby leading even more youth to be drawn into the system? More specifically, by focusing on young offenders, would even younger juveniles be pulled into the juvenile system? Because youth are sometimes given only one opportunity at diversion, another concern was whether youth offered prediversion would later be ineligible for diversion. Perhaps the most salient question was whether such a minimal intervention would, in fact, have any impact. Would youth who received only a phone call be likely to disregard the system as inconsequential, and be more likely to engage in future law violations? For purposes of this article, we examined only the long-term research question of whether youth who were screened out were more likely to commit a new law violation.

Similarities and Differences of the Programs

The Early Assessment Process and Juvenile Diversion are fairly similar in the characteristics of the youth they accept, as well as the types of law violations committed by referred youth. They are different, however, in the amount of resources required to run the program. The key programmatic differences between the two programs are:

1. Youth referred to the Early Assessment Process generally only speak with a juvenile justice professional over the phone, while youth enrolled in Juvenile Diversion have ongoing meetings over a series of months.
2. Youth referred to the Early Assessment Process are screened using a brief assessment tool called the Nebraska Youth Screen (NYS), an adaptation of the Youth Level Services/Case Management Inventory (YLS/CMI). Youth in Juvenile Diversion complete the YLS/CMI and may have more in-depth evaluations and therapeutic requirements based on the results.
3. Youth referred to the Early Assessment Process generally do not have to complete any requirements, whereas youth in Juvenile Diversion are required to complete a number of requirements such as educational classes, community service, paying restitution, or written assignments.
4. Youth who go through Juvenile Diversion must pay a fee.

Method

Because the Early Assessment Process and Juvenile Diversion have been in operation since 2009 and 1994, respectively, random assignment to treatment and control groups was not possible. As a result, selection bias presented a potential methodological problem. For example, youth referred to the Early Assessment Process may have been less likely to recidivate to begin with—due to age, the type of law violation, etc.—than youth referred to Juvenile Diversion. Fortunately, there are several options available to minimize selection bias.

Random selection is the most effective way to minimize selection bias. By randomly assigning individuals to a treatment or control group, it can be assumed that individuals in each group are similar in all respects. The only difference will be whether or not they are assigned treatment. Unfortunately, as is the case with the present data, perfect random selection is not always possible. However, other alternatives exist that allow researchers to address selection bias. Traditional matching techniques have frequently been used in the past to ensure that treatment and control groups are equivalent when randomization is not possible; however, the more covariates used in traditional matching, the more difficult it becomes to create a perfect match (Guo & Fraser, 2010). In other words, a perfect match is easy if you are matching on one item, such as age. However, if a researcher tries to match an individual in their treatment group to an individual in their control group using several characteristics

(age, race, and marital status), it becomes more difficult to find a perfect match. Propensity score matching (PSM) can be used to address this problem.

Propensity score matching (PSM) was developed by Rosenbaum and Rubin (1983) and is another possible way to ensure that treatment and control groups are similar. PSM simplifies matching by creating a single item on which matches can be made. This item is known as the propensity score (Guo & Fraser, 2010). A propensity score is the probability of being assigned to a treatment group, given a set of observed covariates (Apel & Sweeten, 2010; Guo & Fraser, 2010; Rubin, 2001).[2] Basically, the propensity score encapsulates and summarizes a variety of covariates in a single score (Guo & Fraser, 2010). Once a propensity score is generated, it can be used to match individuals in the treatment group with individuals in the control group. Instead of matching treatment cases to control cases based on a variety of individual covariates, treatment and control cases are simply matched using a single propensity score (Guo & Fraser, 2010).

Furthermore, because the propensity score is a summary of those many covariates, individuals with similar propensity scores can be considered "comparable, even though they may differ on values of specific covariates" (Guo & Fraser, 2010, p. 130). If analyses are limited to individuals with similar propensity scores, selection bias can be largely reduced as a result. When individuals in the treatment and control group are matched based on their propensity scores, the two groups are similar and are considered to be "balanced." Therefore, if it can be demonstrated that the treatment and control groups have been balanced via PSM, selection bias should be largely eliminated (Guo & Fraser, 2010). In other words, given the propensity score, treatment assignment is independent of the other covariates (Guo & Fraser, 2010). Because PSM has been established as a useful tool for simplifying matching and eliminating selection bias, we chose to use PSM in this study.

PSM is increasingly being used by researchers in the criminal justice field to explore differences between groups of individuals. To elaborate, PSM has been effectively used to study offending populations (see for example, Boduszek, 2013; Duwe & Goldman, 2009; Grady, Edwards, Pettus-Davis, & Abramson, 2013; Jolliffe & Hedderman, 2012), including youthful offenders (see for example, Caldwell, 2011; Cuellar, McReynolds, & Wasserman, 2006; Fagan, 2008; Loughran et al., 2010; Nagin, Cullen, & Jonson, 2009; Petitclerc, Gatti, Vitaro, & Tremblay, 2013). For example, Peticlerc and colleagues (2013) used PSM to compare youth processed through the juvenile justice system with those who were not. They found that youth processed in the juvenile justice system were more likely to be convicted of later crimes as adults than were similar youth who were not processed. As a further example, Loughran and colleagues (2010) used PSM to explore recidivism among delinquent youth. Specifically, they compared differences in recidivism among youth who were transferred to adult court and those who were not. They demonstrated that the effect of transfer to adult court on recidivism was dependent on the type of charge. The present study will add to a growing body of research that utilizes PSM to research youthful offenders.

Procedure

Data on individual youth involved in Early Assessment were provided by the Lancaster County Attorney's office (n = 2,475). This dataset included all youth screened for Early Assessment since the program began in January 2009. Many of the variables included in the original data provided by the Lancaster County Attorney's office were case processing variables (e.g., time contact was attempted), and were not used for matching. Instead, the covariates used to generate the propensity score included demographic- and

[2] For more details on the origins of the equations used in generating the propensity score, please see Rosenbaum and Rubin's (1983) article. For further in-depth discussion of the application and function of these equations, see Guo and Fraser (2010).

offense-specific data, explained as control variables below.

Data on individual youth referred to Juvenile Diversion from 2004 to 2011 (n = 7,093) were provided by CEDARS Youth Services, a nonprofit agency contracted by the Lancaster County Attorney and Lincoln City Attorney to serve youth eligible for Juvenile Diversion. Early Assessment was designed as part of a continuum of juvenile services; consequently, some youth had been sent through the Early Assessment Process and then later committed a law violation and were referred to Juvenile Diversion. For comparative purposes, we divided youth into two comparison groups: (a) Early Assessment only and (b) Juvenile Diversion only. Youth who completed both programs were not included in this analysis.

Recidivism data was collected by a staff member within the Lancaster County Attorney's office. The staff member examined recidivism data by entering each youth's name into the Lancaster County Attorney's case management system and searching for law violations that resulted in a juvenile or criminal petition being filed (post program completion). Because well over 9,000 individual youth were included in the Juvenile Diversion and Early Assessment datasets, it was not practical for the staff member to generate reports for every youth. Therefore, we provided a random list of names, drawn from all participants in each group. Specifically, a random sample of 400 youth who participated in Juvenile Diversion and a random sample of 400 youth who participated in Early Assessment were selected from the data provided. The staff member then provided recidivism data for these specific youth.

Participants

One youth in the Juvenile Diversion group and one in the Early Assessment group had incomplete or missing data and were eliminated from the sample, leaving a final sample of 798 total youth who had participated in either Early Assessment (n = 399) or Juvenile Diversion (n = 399). Descriptive statistics of the sample are available in Table 1.

Table 1. *Descriptive Statistics*

Variable	Mean	Std. Dev.	Min.	Max.
Age	14.435	2.365	7	20
Gender	0.624	0.485	0	1
Race/Ethnicity				
Black	0.143	0.350	0	1
Hisp	0.040	0.196	0	1
White	0.627	0.484	0	1
Other	0.190	0.393	0	1
Offense Type				
Person	0.257	0.437	0	1
Property	0.452	0.498	0	1
Weapons	0.020	0.140	0	1
Drugs/Alcohol	0.190	0.393	0	1
Traffic	0.005	0.071	0	1
Other	0.075	0.264	0	1

Youth in the final sample were, on average, 14.4 years old. Most (62.4%) youth were male. White youth made up the largest racial group in the sample (62.7%). In addition, 14.3% of sampled youth were Black, 4.0% were Hispanic, and the remaining 19.0% were categorized as some "other race." Approximately 45% of sampled youth had committed a property offense, while approximately 26% of the sample had committed a person-related offense. An additional 19% of offenses fell into the drugs/alcohol category. Very few youth committed weapons-related (2.0%), traffic (0.5%), or other (7.5%) offenses.[3]

Data Analysis Plan

Program assignment was coded as a simple dichotomous variable. Youth who were referred to Early Assessment were coded as "1" and youth referred to Juvenile Diversion were coded as "0."

Recidivism was defined as any law violation charged, or filed on, by the Lincoln City Attorney

[3] For detailed notes on the coding of offense types, see the Appendix.

or Lancaster County Attorney after resolution of a youth's initial law violation (the violation that brought the youth to Early Assessment or Juvenile Diversion). Recidivism was measured as a dichotomous variable at three distinct time periods: 12 months, 24 months, and long-term/any recorded recidivism. For each time period, a code of "1" indicated that the youth had reoffended and a code of "0" indicated that the youth had not reoffended within the specified time period.

Several additional covariates were included in the analyses, such as age (measured in years) and gender (females were coded as "0" and males were coded as "1"). Race was coded as a series of dichotomous indicator variables, including White, Black, Hispanic, and Other. Because of the very small number of youth who fell into the Asian, Native American, and Other categories, these three groups were collapsed into one "Other" race variable. This "Other" category was left out of the analysis as the reference group. Several dichotomous indicator variables were also created to indicate the type of offense a youth committed. Specifically, variables for person, property, weapons, drug and alcohol, traffic, and other offenses were created. The "other" category was the reference group. Each of these control variables are used to generate a propensity score on which the youth in our sample were matched. A propensity score is literally a score that takes into account matching characteristics of a youth. As stated above, this allowed us to isolate the treatment effects.

We began our analyses by estimating the propensity score for each individual case. Next, youth assigned to Early Assessment were matched with those assigned to Juvenile Diversion. Specifically, we used nearest neighbor matching. Nearest neighbor matching is a strategy used to match an individual from the treatment group with an individual from the control group. A match is created between two individuals when "the absolute difference of propensity scores is the smallest among all possible pairs of propensity scores" (Guo & Fraser, 2010, p. 146). This simply means that youth in the treatment group were matched to an individual in the control group whose propensity score was most similar to their own. We also implemented a caliper restriction. Caliper matching helps to weed out "bad matches" (Caliendo & Kopeinig, 2008). A caliper is basically a restriction placed on how much the propensity score of two cases can differ in order to be considered a match (Caliendo & Kopeinig, 2008; Guo & Fraser, 2010). The smaller the caliper, the more similar two cases must be in order to be paired together. We chose to use a caliper of .05.

We then checked for balance across the covariates both before and after matching. Subsequently, we used Stata to calculate the average treatment effect for treated youth (ATT). If the ATT is significant, then program participation is responsible for a significant change in the dependent variable (Guo & Fraser, 2010). In other words, if the ATT is significant, then participation in Early Assessment is responsible for any changes in recidivism.

Results

After matching youth who participated in Early Assessment and Juvenile Diversion, we assessed the balance among the matches. Recall that when selection bias is present, treatment and control groups will be different based on something other than treatment assignment. When selection bias is controlled for, treatment and control groups are considered well balanced (i.e., individuals in both groups are considered similar and matched in all respects, with the exception of whether or not they were assigned treatment). As a result, we test for balance in our sample in two ways. First we compare the treatment and control groups before any matching has been done, and test to see whether they are balanced across a variety of covariates. Next, the two groups are examined again, this time after they have been matched based on the propensity score. If the two groups are similar (i.e., well balanced) there will be no significant differences

Table 2. *Achieving Balance Among Diversion and Early Assessment Youth: Pre- and Post-Matching* t-tests

Variable	Unmatched sample			Matched Sample		
	Early Assessment	Diversion	*p*	Early Assessment	Diversion	*p*
Age	13.063	15.812	0.000*	13.484	13.470	0.910
Gender	0.629	0.618	0.749	0.610	0.549	0.099
Race/Ethnicity						
Black	0.188	0.098	0.000*	0.165	0.198	0.249
Hisp	0.025	0.055	0.030*	0.025	0.014	0.281
White	0.657	0.595	0.075	0.670	0.643	0.436
Offense Type						
Person	0.341	0.173	0.000*	0.346	0.401	0.126
Property	0.484	0.422	0.081	0.467	0.440	0.457
Weapons	0.028	0.013	0.131	0.025	0.008	0.081
Drugs/Alcohol	0.083	0.296	0.000*	0.091	0.088	0.897
Traffic	0.008	0.003	0.318	0.008	0.000	0.083

*$p < .05$

between treatment and control groups on any of the covariates. Table 2 displays results from the pre- and post-matching *t*-tests for the covariates in the study.

The results of our test for balance indicate that prior to matching on the propensity score, youth referred to Early Assessment and Juvenile Diversion, while similar in some respects, were significantly different along several key variables. Table 2 demonstrates that before matching on the propensity score, the treatment and control groups were relatively well balanced in terms of gender, the distribution of White youth, and offense types (property, weapons, and traffic offenses). In other words, there were no significant differences between youth in either group based on these individual covariates. However, Early Assessment participants and Juvenile Diversion participants were significantly different in terms of age, type of offense (person, drugs/alcohol), and race.

Specifically, before matching on the propensity score, Juvenile Diversion participants were significantly older than Early Assessment participants (mean age of 15.81 and 13.06, respectively). In addition, more Black youth and significantly fewer Hispanic youth were in Early Assessment compared to Juvenile Diversion. Furthermore, more youth committing offenses against a person were in the Early Assessment group while more drug and alcohol offenders were in the Juvenile Diversion group. There were no significant differences in terms of the other covariates. However, after matching (see Table 2), the treatment and control groups were well balanced across all covariates; no significant demographic differences existed between the two groups based on any of the measured covariates. Ultimately, there were 364 treatment cases and 297 control cases on the common support[4] which were included in our analyses.

The results are displayed in Table 3. After balancing on the covariates, we used Stata (version 11.0) to estimate the average treatment effect for the treated youth (ATT).

Note that Table 3 gives the *t*-statistic both before and after matching based on the propensity score. This illustrates the importance of

[4] Cases on the "common support" are those cases that were able to be matched with one or more cases in the comparison group based on their propensity scores (Guo & Fraser, 2010).

Table 3. *Results from Propensity Score Matching Analyses*

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
Re-Offense at any time	Unmatched	0.150	0.490	-0.340	0.031	-11.02
	ATT*	0.159	0.475	-0.316	0.083	-3.79
	ATU	0.492	0.424	-0.067	.	.
	ATE			-0.204	.	.
Re-Offense at One Year	Unmatched	0.088	0.128	-0.040	0.022	-1.84
	ATT*	0.091	0.069	0.022	0.046	0.48
	ATU	0.114	0.279	0.165	.	.
	ATE			0.086	.	.
Re-Offense at Two Years	Unmatched	0.128	0.254	-0.126	0.028	-4.58
	ATT*	0.135	0.143	-0.008	0.061	-0.13
	ATU	0.222	0.306	0.084	.	.
	ATE			0.033	.	.

* ATT is the Average Treatment Effect for the Treated. In this case, the treated participants are those who received Diversion.

correcting for selection bias. Recall that prior to matching, selection bias was evident in our sample. Thus the *t*-statistic in the unmatched sample may show a significant result where none exists. The ATT is the average treatment effect for the treated and is calculated after the data were balanced and selection bias was addressed.

A significant *t*-statistic for the ATT indicates that program participation accounts for a significant difference between the treatment and control groups in terms of the dependent variable. The commonly accepted critical value for a *t*-statistic is 1.96. Any *t*-value above 1.96 is significant. While the relationship between recidivism and participation in Early Assessment vs. Juvenile Diversion was examined at three time periods (12 months, 24 months, and long-term/any recidivism), a significant difference existed only at time period three: long-term recidivism. As shown in Table 3, the *t*-statistic for long-term recidivism was significant after matching ($t = 3.79$). In sum, youth who participated in Early Assessment, when compared to youth who participated in Juvenile Diversion, were less likely to recidivate over the long term.

The difference in recidivism patterns was not due to referral patterns. For example, one might consider the fact that youth who complete Early Assessment still have an opportunity to complete Juvenile Diversion. Thus, by definition, these youth should have a lower number of charges filed by the county attorney. However, to reiterate, youth were excluded from the sample if they had been referred to both programs—we considered only youth who had gone through one program or the other. Consequently, we know that differences in recidivism were not related to subsequent referrals to Juvenile Diversion. There was no difference in the recidivism rates of youth in each group when measured at 12 months or 24 months.

Limitations of this Study

Because the propensity score is estimated only from known, observed covariates, it may be that important variables were omitted from these analyses. It is possible that the inclusion of different covariates in the analyses could change our results. For example, where a youth lives (youth ZIP Code) or the location of the crime could conceivably affect a youth's recidivism. However, we could match only on covariates that were included in both the Early Assessment dataset and the Juvenile Diversion dataset.

Omitting these hypothetical variables could result in hidden bias that might account for the significant relationship between long-term recidivism and Early Assessment participation (Guo & Fraser, 2010; Morgan & Winship, 2007). Therefore, we conducted a sensitivity analysis to determine how much hidden bias would be necessary before the relationship between recidivism and Early Assessment participation became nonsignificant.

In this analysis, gamma, which represents the degree to which hidden biases change the odds of belonging to the treatment group (Guo & Fraser, 2010) became significant at approximately 3.4. Thus, it is likely that these results are fairly resistant to hidden bias. In other words, our results are not primarily due to any hidden bias; it is likely that youth referred to Early Assessment are, in fact, significantly less likely to recidivate than their peers in Juvenile Diversion.

Discussion

The Early Assessment Process implemented in Lancaster County appears to reduce recidivism when participating youth are compared to youth in Juvenile Diversion. These effects are significant for recidivism beyond 24 months after program completion. These results present an unexpected pattern, as juvenile justice programs often find pronounced immediate effects that dwindle over time. That is, juveniles may improve behaviors while enrolled in a program, but the effects decrease over time. For example, in Juvenile Diversion programs researchers often report that youth refrain from committing new law violations while enrolled. This effect may last for months after program completion, but recidivism rates often increase the longer a youth is out of the program. It may be that the inclusion of covariates that include time in the analyses could explain the pattern of longitudinal success.

Future research should incorporate additional individual-level variables. Although the sensitivity analysis indicates that our results are fairly robust, it is conceivable that the inclusion of different individual-level covariates in the analyses could change our results. For example, where a youth lives (youth ZIP Code, location of crime) could conceivably affect a youth's recidivism. However, we could only match on covariates that were included in both the Early Assessment dataset and the Juvenile Diversion dataset.

Our study found less intervention resulted in better outcomes for youth over time. Similar to the study of Petrosino et al. (2010), we found that formal processing may increase delinquency. Consequently, there may be system-level variables that contribute to this finding as well. That is, youth who were referred to formal Juvenile Diversion had higher rates of recidivism 2 years after they completed the program than youth who were screened out by a phone call. Lower recidivism may be related to informal processing and speaking with an actual person, instead of receiving a letter from the county attorney in the mail. The human interaction may increase positive perceptions of juvenile justice professionals, including law enforcement, thus resulting in lower rates of new law violations. Future research should include juveniles' perceptions of the juvenile justice system before and after diversion programming. In addition, surveying family members' perceptions of the legal system could be advantageous given research regarding social modeling and the adoption of violent attitudes (Akers & Jennings, 2009).

Although there is minimal contact between youth involved in the Early Assessment Process and the juvenile justice system, these brief but deliberate contacts appear to demonstrate positive effects. Although the higher dosage interventions involved in the diversion process are well intentioned, it is possible that these classes, assessments, and community service time, among other requirements, may produce few gains, and even iatrogenic outcomes. Juvenile justice practitioners may benefit from collaborative problem solving across disciplines (e.g., social work, mental health, law) in order to

create the most comprehensive Early Assessment screening process for low-risk youth.

Although interpretation of these results may suggest that minimal intervention is more effective, we urge practitioners to exercise caution before extending these initial results to all youth. This study, however, does highlight the importance of accurate assessment early in a youth's exposure to the juvenile justice system. Not all the aspects of diversion programming may be necessary for youth who have minor law violations. It may also be beneficial to perform an outcome evaluation of diversion program elements, to determine which interventions are proven effective, and to modify or eliminate interventions that do not generate promising results. The same procedure could be completed for the various aspects of the Early Assessment process in order to determine precisely the most effective method for contacting and screening out young offenders. When effective factors are identified, youth could be required to complete several diversion activities that have been deemed effective.

Recent research has also emphasized that providing individuals with choices can lead to increases in perceived control (Insei, Botti, DuBois, Rucker, & Galinsky, 2011). Adolescents could also be allowed to choose activities from an empirically validated pool of interventions that are most appropriate for their needs. Finally, the Early Assessment process should also be evaluated in larger, more diverse contexts in order to further validate our findings.

Overall, Early Assessment appears to preliminarily offer an effective method of screening out those youth who (a) require minimal intervention and (b) are unlikely to recidivate. In this era of dwindling budgets and cutbacks, programs that are both efficacious and cost effective are critical. Future research could include matching across a greater number of variables and a follow-up longitudinal study to confirm recidivism findings. In the meantime, efforts should be made to promote this straightforward and cost effective model as an evidence-based practice.

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APPENDIX

Table A: *Coding of Offense Type*

Person	Sexual Assault, Domestic Assault, Child Neglect, Assault, Sexual Abuse, Assault and Weapons Discharge, Assault and Vandalism, Disturbing the Peace, Disturbing the Peace and Vandalism, Disturbing the Peace and Trespassing, Disturbing the Peace by Fighting, Disturbing the Peace and Indecent Exposure, Indecent Exposure and in a Park After Hours, Disturbing the Peace by Phone, Disturbing the Peace and Assault, Assault by Mutual Consent, Robbery, Intimidation by Phone Call, Public Indecency
Property	Forgery, Negligent Burning, Aid and Abet Shoplifting, Shoplifting, Arson, Aid and Abet violation of city code 9.04.010, Steal Money or Goods, Aiding a Theft, Attempted Theft, Burglary, Aid and Abet Burglary, Concealed Merchandise, Larceny, Theft of Services, Theft from a Building, Theft by Deception, Theft by Receiving, Theft by Unlawful Taking, Unauthorized Use of Financial Device, Unauthorized Use of Motor Vehicle, Vandalism, Criminal Mischief, Aid and Abet Criminal Mischief, Possession of Stolen Property
Weapons	Use of a Destructive Device, Vandalism/Carry Concealed Weapon, Discharge Weapon, Bomb Threat, Carry Concealed Weapon, Discharge BB Gun in City Limits, Discharge Weapon in City, Explosives Threats
Drugs/Alcohol	Minor in Possession, Possession of Narcotic with Intent to Deliver/Robbery, Possession of a Legend Drug, Possess or Attempt to Obtain Legend Drugs, Possession with Intent to Deliver a Controlled Substance, Provide Tobacco to Minor, Sale of Prescription Drug, Consuming Alcohol in Public Open Container, Maintain Disorderly House and Possession of Marijuana and Paraphernalia, Possession of a Controlled Substance, Possession of Drug Paraphernalia, Possession of Marijuana, Possession of Tobacco
Traffic	Careless Driving/No Operator's License/No Seatbelt, Driving Without a License, POP Violation/Traffic Signal Violation
Other	Trespassing, Trespassing/False Information, Littering, Obstruct Government Operations, Obstructing Driver, Open Burning/Trespassing, Possession of Fireworks, Possession of Illegal Fireworks, Discharge Fireworks Where Prohibited, Enter a Park After Hours, Failure to Comply, False Information, Inmate of a Disorderly House, Resisting Arrest, Switch Tags, Urinate in Public, Body Art Practitioner Permit Required - No Parental Consent for Body Art on Minor