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An examination of change in dynamic risk of offending over time among serious juvenile offenders

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Abstract

Purpose—We examine whether and how much risk/need indicators change over time in a sample of serious adolescent offenders and whether changes in risk are related to self-reported and official record reports of offending in the year following assessment.

Methods—Growth curve and multilevel mixed-effects models are used to examine change through age 18 in a sample of 1,354 serious adolescent offenders participating in the Pathways to Desistance Study.

Results—Three primary findings emerge: 1) Compared to the baseline assessment, overall risk/need scores decrease over time. 2) Risk/need does not change in a uniform sequence across domains and time; the form and rate of change differ by domain. 3) Risk/need indicators were related to later offending, with more recent indicators being more powerful for predicting rearrest.

Conclusions—The findings provide empirical support for recent efforts to incorporate routine risk/need assessment into juvenile justice practice. Repeated assessments are likely to identify fluctuations in areas of risk/need that can be used to inform case management and intervention efforts, even for serious offenders.

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Introduction

The expanding body of research on risk and protective factors related to juvenile criminal activity holds considerable promise for improving prevention and intervention efforts in this area (Loeber & Farrington, 1998). Identification of population-wide and developmental stage-related indicators of increased risk (*risk markers*; Kraemer et al., 1997) allows for more focused targeting of intervention resources. This information can ensure that services get to those adolescents who are most likely to benefit from them when they need them. The identification of *risk factors*, i.e., those indicators of increased risk that occur prior to—and whose alteration affect the likelihood of—criminal involvement (Kraemer et al., 1997), hold promise for improving the content of prevention and intervention programs. These identify the types of interventions that are most likely to have an impact, and therefore warrant development. Investigations of protective factors, meanwhile, hold promise for enriching both identification and program content by uncovering a set of untapped factors that could mediate or moderate intervention and prevention efforts.

The juvenile justice system has a compelling interest in incorporating research on risk, need, and protective factors into its standard practice, since the success of juvenile justice efforts rests heavily on focusing appropriate resources on the “right” adolescent offenders. Policy makers and professionals in this area recognize diversion as a laudable goal; trying to “do no harm” by limiting juvenile justice system involvement with adolescents who pose no significant threat to public safety and whose development could be sidetracked by deeper penetration into the justice system. In addition, to be cost effective, these professionals work toward using the most intensive juvenile justice interventions with those offenders highly likely to do continued harm to the community. Finally, in an ideal world, the right adolescents would get the right services. The juvenile justice system would have adolescents and parents engaged in services that address and change the factors related to continued offending or promote the next positive developmental gain in that adolescent. Meeting these challenges all require sorting adolescents according to risks and needs.

Significant progress has been made over the last few decades to implement the ideas of risk, need, and protective factors into juvenile justice system operations. Researchers have developed valid, practical screening and assessment instruments – e.g., the Youth Level of Service/Case Management Inventory (YLS/CMI) (Hoge & Andrews, 2006) and the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2006) – that have been widely endorsed by juvenile justice professionals (Vincent, Guy & Grisso, 2012). Instruments like these gauge the risk of future criminal involvement using evidence-based indicators of an adolescent’s likelihood to be re-arrested or to continue offending. The indicators include both fixed items such as the youth’s age at first arrest, and potentially malleable aspects of life like the level of antisocial peer influence. These instruments are thus meant to identify adolescent offenders with a higher likelihood of future involvement in crime or violence and to provide leads about the types of factors that might be addressed to reduce the risk of future offending. Some instruments also identify protective factors, such as a supportive family, that could guide case management and make interventions more successful. (For a full review, see Vincent, Terry, & Maney, 2009).

This approach recognizes that a full conceptualization of current risk of reoffending has to distinguish and consider risk status and risk state (Mulvey & Lidz, 1995); much like conceptualizations of the fluctuation in any series of behaviors is composed of both random, interindividual effects and fixed, intraindividual effects. Future risk is determined by both pre-existing, *static* characteristics of the adolescent at the time of their involvement with the justice system, and changing, *dynamic* factors in their current and future lives. It recognizes that how an adolescent's life unfolds on certain dimensions might raise or lower their risk of future offending as measured at any given point in time. A current designation of an adolescent as "high risk" or "low risk" does not necessarily mean that a future assessment will produce the same conclusion; aspects of their lives may change for better or worse.

Thus while it seems apparent that assessments should consider dynamic factors to help improve accuracy (a point that remains in contention; see Douglas & Skeem, 2005), it also seems that these assessments have a limited "shelf life." The practical implication of this more dynamic view of risk for future offending is that adolescents need to be reassessed periodically while under supervision of the court. To work effectively over time with an adolescent at high risk for reoffending, juvenile justice professionals need to know which dynamic risk factors have changed and where concurrent case management and intervention efforts should be focused to reduce ongoing risk.

While this approach to risk management seems logical and potentially useful, the eventual payoff from integrating ongoing risk assessment in to juvenile justice practice is still far from clear. There are numerous assumptions and related issues that need to be addressed before we have a blueprint for implementing this highly regarded reform. We do not yet know, for example, how much dynamic risk factors actually change over time, or to what extent these changes are related to persistent offending. Some work among adults has shown that the inclusion of dynamic risk improves the predictive validity of recidivism models, which include only static items to predict recidivism (Brown, Amand & Zamble, 2009; Jones, Brown & Zamble, 2010).

With respect to juvenile offenders, empirical work on changes in dynamic risk factors is very sparse (Bechtel, Lowenkamp & Latessa, 2007). However, one might expect that change occurs at different rates among juvenile as compared to adult offenders given the distinctive quality of adolescence as a period of social, cognitive and emotional development (Scott & Steinberg, 2008). A comparative report of YLS/CMI scores for a single youth demonstrated change in both the overall and subscale scores over a six-month period (Hoge & Andrews, 2004). Others have shown that consideration of dynamic risk factors improves the overall performance of risk assessment instruments with juvenile offenders (Vincent, Perrault, Guy, & Gershenson, 2012), and another has shown that interventions targeted to identified dynamic risk factors reduce re-arrest (Vieira et al., 2009). Knowing more about these processes, however, is at the heart of making juvenile justice interventions more effective.

In an effort to fill these notable gaps in the literature, the current study uses data from the Pathways to Desistance Study to examine patterns of change in risk/need indicators over time. The analyses address two major questions. First, we consider whether and how much risk/need indicators change over time in a sample of serious adolescent offenders. Second,

we assess whether any changes in risk are related to offending. These straightforward questions are at the core of arguments for the utility of using dynamic risk assessment strategies. They have, however, never been examined with longitudinal data in a sample of serious juvenile offenders (the adolescents for whom monitoring of dynamic changes could have the most payoff; Lipsey, 2009).

Methods

The data analyzed here come from the Pathways to Desistance project (“Pathways”). The Pathways study is a large, longitudinal study of serious adolescent offenders from Maricopa County, Arizona, and Philadelphia County, Pennsylvania. The purpose of the study is to examine the mechanisms that influence the ending of antisocial activity within a group of serious adolescent offenders who are making the transition from adolescence into early adulthood (see Mulvey et al., 2004). Given the large amount of reduction in offending that occurs in mid to late adolescence (Laub & Sampson, 2001, this sample provides a valuable opportunity to examine how shifts in risk/need might be related to criminal involvement.

Sample

Across both sites, 1,354 youth were enrolled into the Pathways study between November, 2000 and January, 2003. Enrollment criteria required potential participants to be 14 through 17 years of age (at the time of the study index offense) and found guilty of a serious offense (overwhelmingly felony offenses, with a few exceptions for less serious property offenses, misdemeanor sexual assault, or misdemeanor weapons offenses). Enrollment of males was limited to 15% drug offenders to maintain a heterogeneous sample of serious offenders. However, all females and all youth whose cases were being considered for trial in the adult system were approached if they met the age and adjudicated crime requirements. Additional details regarding the recruitment procedures and sample characteristics can be found elsewhere (see Schubert et al., 2004). The study was reviewed and approved by the institutional review boards of the University of Pittsburgh (the study coordinating center), Arizona State University, and Temple University (data collection sites).

Interviews

After providing informed consent, youth enrolled in the Pathways study completed a baseline interview at the point of enrollment into the study and subsequent “time point” interviews at 6-month intervals for the first three years and yearly thereafter through seven years. These interviews collected information on the adolescents’ behavior and life experiences during the prior six months or past year. Specifically, the time-point interviews assessed status and change across multiple domains, such as individual functioning, psychosocial development and attitudes, family and community context, and relationships. A portion of this interview used a life calendar approach (Caspi et al., 1996; Horney, Osgood, & Marshall, 1995) to capture the nature, number, and timing of important changes in the life circumstances of these youth, one of the major goals of the study. On average, these interviews took two hours to complete, and participants were paid for their participation. Over the course of the study, retention rates were high, with an average of 90% of research participants interviewed at each point.

All interviews were completed using a computer-assisted format and were conducted in a facility, the participant's home, or a public place (e.g., local library). To encourage honesty, attempts were made to conduct the interview out of the hearing range of other individuals. If other individuals were within hearing distance, respondents were given the option to enter their responses on a keypad without answering verbally. Participants were also informed of the confidentiality protections provided to the study by a Department of Justice statute governing this type of funded research.

Measures

Risk indicators—We constructed time-varying risk indicator scores to reflect each study participant's status in specific risk domains measured at interviews done while he/she was under the age of 18. These were based on responses to interview items in each six-month interview up through 36-months (no youth was under age 18 past the point of the 36-month interview). The risk domains assessed mimicked the content of the Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 2006). These domains (listed in Table 1) cover a range of areas (e.g., substance use, peer relations, attitudes) which have been shown to be strong predictors of continued juvenile offending in the general literature as well as studies using the LSI/CMI (Becthel, Lowenkamp & Latessa, 2007). Scores from each domain were summed into an overall risk score for the adolescent at each available interview.

Despite its theoretical grounding in prior work on the LSI/CMI, the scoring method used for the current study is notably different from that used for the YLS/CMI. With the YLS/CMI, the level of risk, need, and responsivity is rated according to the presence or absence of a range of indicators for that domain. The rater uses multiple sources (e.g., interview, records and psychological tests) to guide the rating. Normative data for a variety of subgroups (e.g., community and custodial samples split by gender) are available to assist in interpretation of YLS/CMI risk score.

In contrast, the risk indicator for the current study is derived from combining information from the Pathways study interview data. For each domain (e.g., family), we chose an appropriate set of items or instrument scores in the Pathways data that would tap the same construct rated by a person filling out the YLS/CMI. For instance, a rater of the family domain on the YLS/CMI might consider relationships with parents, parental supervision and discipline. For our scoring of the family dimension, we considered the adolescent's scores on parental monitoring and warmth. So while the domains rated by the YLS/CMI and our scoring system were the same, the method and information relied upon to assess each domain differed.

The method for combining information and scoring each dimension also differed. In our coding of risk scores, we derived scores that reflected the adolescent's score relative to the entire Pathways sample. Specifically, scores in each domain (e.g., family or peers) are based on their position relative to the grand mean, for that domain, across all participants across all of the waves of interviews up to and including 36 months. Within each wave and for each component going into the domain score, a dichotomous marker was created for each subject to indicate whether the score was greater than one standard deviation above the grand mean

(except where otherwise noted in Table 1). In other words, cases were coded as “at risk” for an indicator within a domain if the raw score was worse than approximately 84% of the other Pathways study participants scores on that indicator over the entire 36-month follow-up period. The domain score was then calculated as the number of relevant indicators for that domain that were coded as “at risk”, i.e., greater than one standard deviation above the grand mean (except where otherwise noted in Table 1). A cumulative risk score was also calculated; simply the total number of indicators coded as “at risk” across all the domains, a common approach in the developmental/life-course criminology literature more generally (see Piquero, Farrington, & Blumstein, 2007). For both the domain and cumulative risk totals, a higher score indicates higher risk. Both the subscale and cumulative risk total score were prorated to account for components that were not available for some cases (e.g., missing ratings of mother warmth and hostility when mother not present).

It is important to note that, given these differences in the calculation and calibration, our risk scores are not comparable to scores that would be derived from administering the YLS/CMI. There are no set cut-off values for determining risk. The risk scores used for the Pathways sample reflect the relative values of risk indicators in light of the range of risk scores seen in the sample over the follow-up period. As such, they indicate when an adolescent is scoring higher on risk indicators than the average, but they do not convey an objective standard of risk in relation to juvenile offenders more broadly.

Self reported offending—We used a modified version of the Self-Report of Offending (SRO; Elliott, 1990; Huizinga, Esbensen, & Weiher, 1991) scale at each interview to measure the adolescent’s involvement in antisocial and illegal activities. The scale was composed of 22 items listing different serious, illegal activities (e.g., entered or broken into a building to steal something, taken something from another person by force, used a weapon). The research participant indicated whether he/she had done any of these activities over the recall period covered by the interview. This allowed for a calculation of a variety score which represents the proportion of endorsed items divided by the number of questions answered (Osgood, McMorris, & Potenza, 2002; Thornberry & Krohn, 2000). In the current analysis, we used the variety scores from recall periods that are 6 months and 12-months post the calculation of a risk score as outcomes. A total variety score and variety scores reflecting aggressive and income offending were tested separately.

Re-arrest—We used official records of re-arrest as an additional measure of recidivism to account for the potential bias related to self-reported offending. Indicators of a re-arrest prior to age 18 were based on official court records of a petition in the study jurisdiction. Indicators of re-arrest after age 18 were based on FBI records; these records would be relevant in the current paper only if the recall period extended past age 18. The number of petitions/arrests falling in each recall period was based on the date of the arrest/petition as compared to the date range covered in each recall period. In the current analysis we use the number of petitions/arrest from recall periods that are 6 months and 12-months post the calculation of the risk score.

Analyses

Data analyses were directed toward two goals. First, they described the patterns of risk over the follow-up period. A population-averaged growth curve model was used here to test how the mean risk level changes over time for the adolescents in the Pathways sample. This was done by examining “population-averaged” effects, using SAS Proc Glimmix to test generalized estimating equations (GEEs). This approach was taken because a) we were interested in the mean response modeled explicitly as a function of time and b) the outcome variable, total risk score, was a count of the number of risk parameters endorsed, making it a non-normal, Poisson-type variable. The dependency between the measures of risk is accounted for by the robust estimation of the variances of the parameter estimates (Hu, Goldberg, Hedeker, Flay, & Pentz, 1998).

Second, analyses tested the strength of the associations between the risk indicators and the two measures of subsequent offending, i.e., self-reported offending and official arrests. We used multilevel mixed-effects negative binomial regression with robust standard errors to examine the effect of risk on recidivism at six months and one year post risk score calculation. This method was selected because of the nested design of the data and because the outcomes (SRO variety score and re-arrest) are count variables with a non-normal distribution. In step one, the baseline risk score was examined as a predictor of SRO offending and re-arrest outcomes collected at the one-year follow-up assessment. Prior offending or re-arrest was controlled for in this analysis by including individuals’ corresponding SRO or re-arrest information collected at the time of the baseline assessment. Next, risk scores collected during the 6-month follow-up were used to predict these same 1-year outcome variables. As with the baseline data, SRO or re-arrest data (corresponding to the outcome of interest) collected at the time of the six-month follow-up were used to control for prior offending. Finally, to examine incremental predictive ability, baseline and six-month follow-up risk scores were examined simultaneously as predictors of the SRO and re-arrest outcomes collected during the one-year follow-up. Analyses were performed using STATA version 10.0 (StataCorp, College Station, Texas).

Results

Risk Growth Curve Models

The pattern of total risk scores over the follow-up periods is illustrated in Figure 1. The observations plotted reflect values calculated with a control for the proportion of time that an adolescent spent in an institution during each time period (see Piquero et al., 2001). While the average expected risk score at baseline (Time 0) starts off quite high, this average value of the risk score decreases dramatically from baseline to one-year later (Time 2). After this time point, the average value of the risk score levels off, with a second decrease in scores around the two-year post baseline time point (Time 4).

We tested linear, quadratic, and cubic models for their adequacy at portraying these changes in risk scores over time. In all of these analyses, each successively more parameterized model produced a significantly better fit to the time trend. In other words, the cubic model fit better than the quadratic model, which fit better than the linear model. Given that the

cubic model improved model fit over the quadratic model ($\chi^2(1) = 124.16, p < .001$), the overall pattern can be described with this higher level model in further detail. As noted above, we control for proportion of time in a secure facility at each time point.

Tests of the statistical fit of different growth models support the significance of the cubic function over the observation period. The negative effect of linear growth ($\beta = -0.70, SE = 0.03, p < .001$) suggests that the total risk score decreased at the beginning of the time period. The positive effect of quadratic growth ($\beta = 0.22, SE = 0.01, p < .001$) suggests a deceleration in the rate of change (i.e., the average risk score initially decreased and then began to slightly increase), while the negative effect of cubic growth ($\beta = -0.02, SE = 0.00, p < .001$) suggested that the deceleration gradually diminished overtime. Overall, average total risk is decreasing as time from baseline increases, suggesting that average baseline risk score is much different from the score three years later.¹

Using the same methods, additional growth curves were generated for each of the domain risk scores. Although generally showing consistent downward trends, there were some different amounts and forms of change over time. Five of the eight domains (prior and current offenses, family characteristics/parenting, education/employment, peer relations, substance abuse) showed significant ($p < .001$) linear, quadratic, and cubic trends downward over time; one domain (leisure/recreation) had a significant ($p < .05$) linear and quadratic, but not cubic, trend downward. Two domains (personality/behavior and attitudes/orientation), showed no significant shifts over time; their mean values were flat over the observation periods.

Multilevel fixed effects model

Table 2 displays the results of the multilevel mixed-effects negative binomial regressions. Set 1 provides results for the baseline and six-month risk scores predicting SRO and rearrest outcomes at the 1-year follow-up period when controlling for prior levels of offending or arrest. These results demonstrate that even after accounting for prior offending and arrest, both the baseline and 6-month risk score remain significant predictors ($p < .01$) of these 1-year outcomes. In addition, the β value for the six-month risk score is slightly higher for each outcome.

Examination of Set 2 indicates that after controlling for the overlap between baseline and six-month risk scores, each provides unique explanatory ability toward the prediction of the SRO offending total and subscales (p 's $< .01$). The β value for the six-month risk score is again slightly higher for each of these self-report outcomes. However, after accounting for overlap between these risk scores, the baseline risk score was not a significant predictor regarding the one-year arrest outcome. The six-month risk score was significantly predictive of the one-year arrest outcome, even accounting for the baseline risk score.²

¹These models were also conducted two different ways to check whether or not the adolescents who were contributing to the curve at the end time points were driving the higher order effects of the model. First, we fitted a curve for adolescents who had a value for all seven time points ($n = 136$) and found that the parameter estimates and shape remained the same as the results presented above. Second, we looked at a full information maximum likelihood estimation of the above models and found similar results. Thus, we were convinced that the slight alteration of cases contributing to each time point observation did not affect the overall shape, and we retained the model above as descriptive of the overall trend.

Discussion

There is substantial appeal to the idea of considering dynamic risk variables for juvenile offenders, and practice seems to be moving in this direction. The argument for endorsing this practice rests on the idea of adequately capturing and considering significant shifts in the psychological make-up of adolescents as well as relevant changes in social context. However, empirical evidence indicating the utility of reassessing an adolescent's risk is not available; belief in the importance of dynamic risk factors has largely been a matter of faith. It remains unknown how much adolescent offenders' risk factors change over time, or whether these changes are related to increased or decreased likelihood of offending, primarily because of the lack of longitudinal data, especially regarding serious adolescent offenders.

This study takes an initial, solid step toward filling this gap in the literature. Using a rich, longitudinal data set, the study constructs risk indicators that reflect the domains found in the YSL/CMI, the most commonly used assessment instrument currently in the field. This study is not, however, a test of the performance of the instrument itself, since the data and scoring methods used are not derived from the administration of the YSL/CMI. It is, however, a solid test of the validity of the domains tapped by this instrument for their shifts over time and their relation to later offending. In addition, the study uses a sample of serious adolescent offenders observed repeatedly during their time as juveniles. This group represents a salient group for policy purposes and a stringent test of whether risk indicators might change markedly over time. Given that many of these adolescents may be more set in their ways than other adolescents found in the juvenile justice system, observing change in risk and testing its relation to offending provides a stringent "test of concept" about the utility of assessing and monitoring dynamic risk indicators.

Several findings from these analyses demonstrate that there is potential value in considering shifts in risk indicators over time. First, it appears that risk scores for adolescents in the Pathways study changed over time. The scores generally depart more from the baseline with each successive interview, as would be expected if the scores are capturing dynamic risk and if actual changes on these indicators are occurring over time. Furthermore, overall risk scores decrease over time. The calculated risk scores at each follow-up interview generally decrease as time passes. The highest scores across the whole recall period occur near the time of disposition, indicating that these adolescents have lower levels of risk as they move away from their time in court. The adolescent's situation seen in court appears to be the worst portrayal of their likely risk, at least during the time window investigated in the current study. The pattern is clearly for adolescents to be at decreased risk over time, indicating possibly less need for close supervision and intensive interventions as they start to transition out of mid-adolescence.

²Since the re-arrest values were heavily skewed toward zero at each time point, analyses were also conducted after dichotomizing this outcome into a "Yes/No" variable. Results from these analyses were in line with those provided by the MENBREG analyses and are not presented here. Analyses were also conducted separately for each of the eight subscales of the risk measure. Due to space limitations, these results are also not reported here. Results of these analyses are available from the study authors upon request.

Second, some domains shift significantly and others do not. Though all of the domains in which risk was assessed could be considered “dynamic,” not all of them changed in the same way over time. Risk scores in domains that are most likely to change in adolescence, such as the influence of antisocial peers, showed the most change up to age 18, while those in more stable domains, such as antisocial attitudes (for example, callousness, lying, and cynicism) showed little movement. These differences in change over time suggest that some domains may have more potential for positive change over this period.

The patterns observed initially indicate that psychological, attitudinal risk indicators do not show much fluctuation over time, and, at least in this sample of offenders, may be rather “set” by the time of their involvement with the court. This does not mean that some appropriate interventions (such as cognitive behavior therapies; Lipsey, 2009) may not have a positive, and powerful, effect on shifting these indicators of risk and thus reduce offending. The patterns observed here simply indicate that the overall shift in the level of these indicators across the whole sample of offenders may not be a reasonable expectation, short of these types of interventions.

Third, the risk indicators had a significant relationship with measures of later offending, and the more current risk indicators had stronger relationships to the offending outcomes. This set of results supports the idea that updated risk assessments can provide more valuable information about subsequent offending and could hold promise for improving the effectiveness of probation and court practice. It is especially important to note that the risk indicators from a year prior did not contribute significantly and independently to predicting arrest in particular, once the risk indicator scores from six months prior were considered. In essence, knowing the more concurrent risk indicators had enough relevant information to make the prior risk indicator scores irrelevant. If monitoring for the likelihood of future arrest, it appears that considering more current risk indicator scores is a significant improvement over the practice of simply considering the previous scores.

As pointed out earlier, a goal of juvenile justice is to match the level and type of intervention with the risk profile of the adolescent involved in the system. Logically, it seems that determining this allocation of resources requires ongoing evaluation of the risk and case-management needs of adolescents under court supervision. While considerable progress has been made in the development of tools for assessing risk and need, the challenge of determining *how much* these tools might improve practice remains (National Research Council, 2012).

The results presented here contribute a piece to this effort. They show that shifts in dynamic risk are a reality, even for serious adolescent offenders over their juvenile careers, and that more contemporaneous assessments show a benefit for assessing the likelihood of arrest. These findings represent an important contribution to the knowledge base required to develop a juvenile court system that uses risk assessment to target interventions more effectively. As well, they offer a challenge to those criminological theories that emphasize the static nature of risk of reoffending; it seems that there must be a place for persons, lives, and circumstances to change and for consideration of how these dynamic changes affect offending over time.

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Research Highlights

- There is a call to consider dynamic risk/need indicators in juvenile assessments.
- We examine how much risk/need indicators change over time and their relation to offending.
- Overall risk scores decrease over time, but not all domains of indicators shifted equivalently.
- Risk indicators were related to later offending, with more recent indicators being more salient.
- Repeated assessment of selected risk indicators would be useful for intervention planning.

Figure 1.
Change over time in total risk score for the full sample (controlling for time in a secure facility)

Table 1**Risk Indicator Components**

Domain	Components	Definition of “risk”
Prior & Current offenses	Age at first arrest	Greater than 1 SD above the sample mean
	Number of prior petitions	3 or more prior convictions”
	Self reported offending: aggressive	Greater than 1 SD above the sample mean
	Self reported offending: income	Greater than 1 SD above the sample mean
Family Characteristics/Parenting	Parental Knowledge	Greater than 1 SD above the sample mean
	Parental Monitoring	Greater than 1 SD above the sample mean
	Parental Hostility: Mother	Greater than 1 SD above the sample mean
	Parental Warmth: Mother	Greater than 1 SD above the sample mean
Education/Employment	Work Orientation	Greater than 1 SD above the sample mean
	Grades	Greater than 1 SD above the sample mean
	Bonding with Teachers	Greater than 1 SD above the sample mean
	Suspended/Expelled	History yes/no
Peer Relations	Antisocial Peer Behavior	Greater than 1 SD above the sample mean
	Antisocial Peer Influence	Greater than 1 SD above the sample mean
	Gang Involvement	Gang Involved yes/no
Substance Abuse	Occasional Drug Use	Use at the rate of no more than 1× per week or meets the definition for chronic drug use
	Chronic Drug Use	Use at the rate of 2 – 3 × per week or more.
	Chronic Alcohol Use	Use at the rate of 2 – 3 × per week or more.
	Drug Dependence	Greater than 1 SD above the sample mean
	Alcohol Dependence	Greater than 1 SD above the sample mean
	Drug Social Consequences	Greater than 1 SD above the sample mean
	Alcohol Social Consequences	Greater than 1 SD above the sample mean
	Routine Activities	Greater than 1 SD above the sample mean
Leisure/Recreation	Grandiosity	Greater than 1 SD above the sample mean
	Impulse Control	Greater than 1 SD above the sample mean
	Suppression of Aggression	Greater than 1 SD above the sample mean
	Thrill Seeking	Greater than 1 SD above the sample mean
	Temperance	Greater than 1 SD above the sample mean
	Remorselessness	Greater than 1 SD above the sample mean
Attitudes/Orientation	Lying	Greater than 1 SD above the sample mean
	Manipulation	Greater than 1 SD above the sample mean
	Dishonest Charm	Greater than 1 SD above the sample mean
	Callousness	Greater than 1 SD above the sample mean
	Moral Disengagement	Greater than 1 SD above the sample mean
	Legal Cynicism	Greater than 1 SD above the sample mean

Risk Scores at Baseline and 6-month Follow-up as Predictors of Offending at 1-year Assessment

Table 2

	Risk Score at Baseline				Risk Score at 6-month Follow-Up			
	B	SE B	P	95% CI	B	SE B	P	95% CI
Set 1								
T3 SRO Total Score	.061	.010	.000	.04-.08	.090	.009	.000	.07-.10
T3 SRO Aggressive Offending	.069	.009	.000	.04-.08	.072	.009	.000	.05-.09
T3 SRO Income Offending	.110	.024	.000	.06-.15	.129	.014	.000	.10-.15
T3 Re-arrests	.032	.010	.002	.01-.05	.042	.010	.000	.02-.06
Set 2								
T3 SRO Total Score	.052	.008	.000	.03-.06	.081	.008	.000	.06-.09
T3 SRO Aggressive Offending	.053	.008	.000	.03-.07	.085	.009	.000	.06-.10
T3 SRO Income Offending	.086	.014	.000	.05-.11	.120	.014	.000	.09-.14
T3 Re-arrests	.008	.013	.516	-.01-.03	.040	.014	.004	.01-.06