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RISK ASSESSMENT IN MONTANA: RISK FACTORS PREDICTIVE OF JUVENILE
OFFENDER RECIDIVISM

BY

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B.A., University of Montana, Missoula, MT 2002

Thesis

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Risk Assessment in Montana: Risk Factors Predictive of Juvenile Offender Recidivism

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Juvenile offender recidivism is a pervasive problem affecting the juvenile justice system, communities, families and the adolescent offender. This research was designed to identify risk factors that demonstrate a statistically significant relationship to recidivism and to assess their predictive strengths. The Back on Track! (BOT) risk assessment instrument was used to collect data from 864 juvenile offenders in 22 judicial districts in Montana. Specifically, juveniles who received a referral/citation within a 12 month time period were included in the final analysis (N= 230, 29.6% recidivism rate). Using Moffitt's (1993) life-course persistent theory and Gottfredson and Hirschi's (1990) general theory of crime, two hypotheses were investigated. It was predicted that the age of first offense and impulsivity/self-control would be significant risk factors predictive of juvenile offender recidivism. In addition to demographic items, several other theoretically-driven independent control variables were selected for the analysis. Findings from the binary logistic regression model revealed support for only one research hypotheses. *Impulsivity/self-control* surfaced as a statistically significant predictor of recidivism while *age of first offense* did not. Notably, the annual combined income of the household (SES) appeared to mediate the relationship between age of first offense and recidivism. In addition to the hypothesized findings, several other risk factors with significant relationships to recidivism were found. Results also suggested that being of male gender, and youth who were physically abused, had runaway or been kicked out of the home, and believed in fighting to resolve conflict were at an increased risk of reoffending. Contrary to pre-model predictions, a youth's *academic performance* and their admiration for *antisocial peers* did not achieve statistical significance. Possible explanations for this finding include ineffective item measurements, unreliable self-report data from youth, and the moderating effects of other control variables in the model. Ultimately, the identification of predictive risk factors should guide policy makers and evidence-based practice programs in designing specific case management plans to treat delinquent offenders and reduce recidivism. Implications for future research and suggestions for specific evidence-based practice programs are also discussed.

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I would also like to thank my family and friends for their support and encouragement the last two years of attending graduate school. Some people understood what I was doing and studying in school, others did not, but nonetheless their interest in this journey was motivating and has meant a lot to me.

Finally, I would like to dedicate this thesis research in the memory of my late Grandmother, Dr. Mary “Ann” Kinsey. Unfortunately, Ann passed away from cancer when I was twelve years old leaving behind a large family that included seven daughters and seventeen grandchildren at the time. Impressively, Ann received her Master’s Degree and Doctorate of Education while raising seven girls on a ranch in New Mexico, eventually taking a teaching position at MSU Billings. Since I was so young when she was alive, I did not fully understand what a wonderful and unique individual my grandmother was. One of many fond memories was when I went to visit my grandparents in Bigfork, MT when I was eight years old. The phone rang at their house and I picked it up; the person asked if “Dr. Kinsey was there?” I replied, “No, you must have the wrong number” and hung up the phone. Ann asked me who had called, and I said somebody with the wrong number because they were looking for a Dr. Kinsey. She replied with a smile, “you know...that’s me,” and I remember being confused because I had never heard of my Grandmother operating on anyone before. To this day, her loving presence is greatly missed and I am proud to share this accomplishment with her.

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The juvenile justice system is charged with ensuring public safety by identifying and attending to the treatment needs of delinquent youth. The process of identifying “at risk” youth and predicting future offending behaviors has been gaining more momentum as a proactive approach in delinquency prevention efforts. Such efforts promise to substantially benefit the community, families, and the juvenile justice system. For example, some level of predictive accuracy could inform preventative treatment practices, correctional strategies, and increase the monetary savings from crime reduction (Putnins 2003). In addition to the monetary benefits, Posner (1985) argues that reducing juvenile delinquency would also minimize the social costs accrued by offending behaviors. Juvenile offender recidivism negatively impacts victims, their families, close friends and most directly, the individual youth. All costs combined, interrupting and addressing the criminal behavior of one 14 year old youth could save an estimated 1.5 to 2 million dollars (Book, Thomas and Steinke; Skeem, Scott and Mulvey 2014). Intervening early and aggressively may also disrupt criminogenic propensities that may become stabilized, and difficult to alter past childhood. The severity of offending behavior can also increase with age, further investing the youth into a criminal pathway and increasing their risk of reoffending in adulthood (Mulder et al. 2012). The impact of juvenile offender recidivism has become a public burden that highlights system failures at all levels of government, community, and family (Trupin et al. 2011).

The first step in reducing juvenile recidivism is identifying risk factors affecting the youth’s behavior, and increasing their likelihood of participating in delinquent behavior. A risk factor is something that precedes an outcome, but also is related to that outcome in specific ways. Risk factors can co-occur within and between environmental domains and

often function in a cumulative fashion” (Tanner-Smith et al. 2013:95; Stouthamer-Loeber et al. 2002). A risk factor could be anything that affects the youth in an adverse way by altering their perceptions, emotions, and subsequently their behaviors. For example, maladjusted youth with emotional, and often mental, deficits are often exposed to environmental conditions more conducive to offending behavior. Juveniles can also be exposed to risk-related conditions prior to birth, throughout infancy, and into early childhood through unstable living environments (family, peer, school, etc.). Consequently, disadvantaged youth with propensities towards chronic offending behaviors greatly reduce their chances of experiencing a conventional, pro-social lifestyle. Ultimately, youth who chronically offend are missing out on key educational, occupational and developmental opportunities that may insulate them from recidivistic behavior.

This study focuses on determining which risk factors are predictive of juvenile offender recidivism in Montana using the Back on Track! (BOT) risk assessment instrument. This research is designed to explore variables within risk domains that are the strongest predictors of recidivism. According to the Office of Juvenile Justice and Delinquency Prevention (OJJDP), there is not a singular risk factor that is predictive of recidivism. Rather, several risk factors are combined together to increase the likelihood of delinquency occurring. Predictive risk instruments have become scientifically validated assessment tools using empirical methodologies to predict the risks and assess the rehabilitative needs of offending populations. As Upperton and Thompson (2007) note, systematically analyzing the variables in a risk assessment instrument increases the likelihood of identifying future offending behaviors. Using a variety of risk instruments,

several studies have primarily focused on substance abuse (Putnins 2003, 2005), adolescent neglect (Ryan, Williams and Courtney 2013), juvenile homicide (Vries and Liem 2011), residential placement (Phares, Thomas and Steinke 2004) and sexual offenses (Edwards and Beech 2004). This paper uses a previously unstudied data set of first time juvenile recidivists in Montana and will incorporate all risk factors found in the BOT instrument. Findings from the current research will have the practical benefit of informing policy makers and juvenile justice officials concerning the impacts of specific risk factors and recidivism risk. This information could then be used to guide efforts that may potentially reduce juvenile offender recidivism at the state and local level.

Review of the Literature

Juvenile recidivism research has received widespread support within government and academia as a means of combating this pressing social problem. Given the adverse effects of juvenile recidivism on the juvenile justice system, communities and the family, research has focused on identifying specific risk factors predictive of delinquent behavior. Arguably the most important contribution to juvenile delinquency research and the prediction of reoffending behavior was conducted by Glueck and Glueck (1950) in their study, *Unraveling Juvenile Delinquency*. Using matched samples, the Gluecks primarily found the socialization variables of parental attachment, supervision, and other family processes to be the strongest predictors of delinquency and future offending risk (Laub and Sampson 1988). Research has also found that reducing reoffending behavior entails pinpointing which disruptions to a juvenile's development are the most problematic, and are most strongly associated with the risk of recidivating. Youth who repeatedly offend

may be externalizing their negative behaviors as a coping mechanism in reaction to their improper development (Laub and Sampson 2003; Stewart, Livingston and Downey 2008). Therefore, identifying problematic behaviors and deficits in a child's social development is the first step in creating a prevention strategy that addresses the specific negative behaviors associated with delinquency, and the inclination towards future offending.

Similar to the Glueck's findings, studies have also demonstrated that children experiencing developmental deficits are more at risk of developing patterns and "trajectories" conducive to delinquency and recidivism (Piquero 2008; Shaw, Lacourse and Nagin 2005; Stewart, Livingston and Downey 2008). Individuals who commit many offenses in one age range are more likely to commit many offenses in another age range (Farrington and Loeber 2013). In a study of 1,517 Pittsburg area boys in the first, fourth and seventh grades, results indicated that disruptive behaviors were the most common factors involved with the initiation of offending (Loeber et al. 1991). Results also indicated that youth ages 7 to 10 had high levels of initiation behavior that escalated to more serious offenses when their behaviors remained constant. Studies have also found that "boys first convicted at the earliest ages tended to become the most persistent offenders as adults" (Farrington 1979:12). Moreover, research has found that early onset offenders are experiencing several risk factors, thus creating a high probability of sustaining stable, criminal careers (Farrington and Loeber 2013). In general, risk factors that increase the youth's propensity to offend at a young age will continue to influence the youth's behavior during maturation and into young adulthood. Recidivism literature, however, also indicates that most juveniles who receive a referral/citation will not

reoffend (Baglivio 2009). The small portion of juveniles who reoffend continue to reoffend even after preventative treatments and corrective strategies have been implemented to rehabilitate them (e.g., the chronic 6% of juvenile offenders). The identification of specific risk factors associated with persistent juvenile offending is the first step in developing a strategy that reduces recidivism.

Probably the most seminal study to date on juvenile offender recidivism is a meta-analysis of 23 published studies (reporting on 15,265 juveniles) by Cottle, Lee and Helibrun (2001). The researchers measured risk factors across eight environmental domains related to delinquent behavior. Their results indicated that previous offending history was the strongest predictor of recidivism followed by risk factors associated with delinquent peers, family conflict and conduct problems. In a comprehensive study by Loeber and Stouthamer-Loeber (1986), results indicated that family variables (e.g., parental monitoring) were the strongest predictors of delinquency and recidivism risk.

Parenting behaviors were also found to be the most significantly correlated variables to delinquency in a meta-analysis by Hoeve et al. (2009). In a study by Ryan, Williams and Courtney (2013), child neglect surfaced as the strongest predictor of delinquency and a propensity towards re-offending behavior. Similarly, using a sample of 1,147 youth from the Netherlands, Mulder (2010) concluded that child neglect, physical abuse, a lack of parenting skills/availability, delinquent peers, and a non-interest in school were significant risk factors. Several studies have also specifically focused on the effects of substance use, community placement, incarceration, treatment programs and their effect on recidivism risk (Edwards and Beech 2004; Hamilton et al. 2007; Putnin 2003, 2005; Unruh, Gau and Waintrup 2009). Juvenile delinquency and recidivism literature has

generally agreed that family, peer, school, community, and mental health are risk domains consistently found to be known correlates of offending behavior and recidivism.

Life-Course Persistent Theory and Recidivism

This paper will use Moffitt's (1993) life-course persistent (LCP) theoretical model to effectively explain why some juveniles are at an increased risk of recidivistic behaviors. LCP youth are only a small percentage of the juvenile offending population, however they offend at much higher rates than their peers throughout adolescence and into adulthood (Caspi, Elder Jr. and Bem 1987; Cottle, Lee and Heilburn 2001; Farrington 1979; Farrington and Loeber 2013; Nagin, Farrington and Moffitt 1995; Moffitt 1993, 1997; Tanner-Smith, Wilson and Lipsey 2013). Moffitt (1993:22) states that "children who are at risk of persistent delinquency can be identified early in life." Therefore, youth who begin offending at an early age, have a "jump start" to offending propensities, and an increased risk of negative behaviors conducive to recidivism occurring. There are several components to Moffitt's LCP theory, however age and its association with delinquency risk offers an effective approach.

Moffitt's theory suggests that juveniles who offend early in life are often affected by neuropsychological deficits (brain functions) that are linked to the onset and stabilization of antisocial behaviors. An unborn child's neural development may be negatively affected by the mother's poor decision making skills (e.g., nutrition or drug use) and further complicated by a difficult delivery (Belbot 2003; Raine et al. 1994; Synder and Sickmund 2003). Infants may continue to suffer neural deficits (cognition, learning, temperament, motor coordination) when unskilled and emotionally absent parent[s]

deprive the infant of proper nutrition and affection (Allen-Hagen 1991; Caspi et al. 1987; Catalano and Hawkins 1996; Monahan et al. 2013; Raine 1996). Toddlers and children lacking verbal skills and executive learning abilities may be “inattentive, irritable, impulsive, deficient at expressing themselves, or slow at learning new things” thus increasing their offending risk (Moffitt 1993:681). As such, developmentally delayed youth with antisocial, and pathological personalities are at an increased risk of criminally offending at a young age with continuing behaviors throughout adolescence.

LCP theory posits that offenders begin their criminal careers at an early age and show patterns of continuity, stabilization, and progression to more serious offending behaviors (Gretton 1991; Moffitt 1993; Lober, Keenan and Zhang 1997). Moffitt (1993:679) suggests there are “changing manifestations of antisocial behavior: biting and hitting at age 4, shoplifting and truancy at age 10, selling drugs and stealing cars at age 16, robbery and rape at age 22, and fraud and child abuse at age 30.” She argues that as different offending opportunities are presented across the developmental life-course, antisocial individuals will continue to “lie at home, steal from shops, cheat at school, fight in bars, and embezzle at work.” Throughout childhood, adolescence and into young adulthood, LCP offenders develop a criminal pathway that is invariant to corrective changes (Farrington and Loeber 2013). One study found that the life-course persistent pathway for youth between the ages of 3 and 13 was predicted by “difficult temperament, neurological abnormalities, low intellectual ability, reading difficulties, hyperactivity, poor scores on neuropsychological tests, and slow heart rate” (Moffitt et al. 2002:181). As the research suggests, juvenile delinquents who recidivate, some repeatedly, began

their criminal trajectories early in childhood (early onset) with worsening effects throughout adolescence, and into adulthood (Loeber and LeBlanc 1990).

LCP theory also importantly notes that persistent offending occurs when high-risk children are situated in high-risk environments at a young age (Moffitt et al. 2002). A child's cognitive deficits and difficult temperaments may transition into a behavioral continuity that is highly resistant to change and restricts their "social options" (Raine 1996; Raine, Brennan and Mednick 1994). More generally, LCP offenders have disrupted maturational processes inhibiting their normative development (Piquero 2008; Moffitt 2006). Delays in developmental maturity often inhibit the mitigating effects of protective factors that could insulate the youth from antisocial tendencies. As a result, antisocial behavior in delinquent youth becomes a continuous latent trait that affects the probability of participating in delinquent and recidivistic behavior early in life.

Identifying criminogenic pathways which began during childhood and persistent into adulthood will help identify juveniles at an increased risk of recidivating. Moffitt's LCP theory offers a comprehensive approach that accounts for offending behaviors that begin early in life, stabilize, and continue throughout the life-course. As Tanner-Smith (2013:91) suggests, "any discussion of risk factors for crime must consider not only the differential impact of risk factor domains of socialization but also the possible developmental specificity and/or generality of different risk factors across key developmental stages in the life-course." LCP theory is a developmental theory that consistently argues that the entrenchment of antisocial behaviors (deficits) that begin at a young age will repeatedly predispose youth to offending opportunities. Recidivism risk is more likely to occur when juveniles have been exposed to a "rough start" early in life.

General Theory of Crime and Recidivism

Gottfredson and Hirschi's (1990) general theory of crime (low self-control theory) posits that an individual's propensity to offend and participate in criminal behavior is due to low self-control that has been established in early childhood. The theory suggests that individuals exhibiting low self-control think in the short-term, pursue quick, immediate and pleasurable outcomes, are self-centered, thrill seekers, impulsive, do not anticipate consequences, and lack future insight beyond the present moment (Gottfredson and Hirschi 1990; Schreck 2006; Turanoviv and Pratt 2012; Wright and Beaver 2005). Self-control theory is particularly applicable to adolescents because they are particularly susceptible to behavioral impulses that are conducive to delinquent offending and recidivism risk. In addition, adolescents are dealing with hormonal, emotional, physical, and mental changes that contribute to low self-control. Impulsive youths lack the proper decision making skills when confronted with adverse or irritating situations, therefore increasing their risk of criminally offending (Pratt, Turner and Piquero 2004; Hawkins et al. 2000). Gottfredson and Hirshchi have developed a self-control model that can consistently account for patterns in persistent childhood and adolescent offending. Longitudinal recidivism research is an effective approach that can identify offending patterns throughout the juveniles life-course (Pratt et al. 2004). Much like Moffitt's theoretical model, self-control theory offers convincing explanations of adolescent deficits that evolve into impulsive behaviors conducive to recidivistic behavior.

The theory also suggests that adolescents with low self-control will be more inclined to participate in law breaking behavior because they fail to calculate the costs and

benefits of their decision making process (Gottfredson and Hirschi 1990; Hawkins, Lishner and Catalano 1985; Schreck 2006). Low self-control hampers an adolescent's ability to rationally weigh decisions, such as provoking a confrontation, and the negative consequences that may follow. Adolescents with low self-control refrain from any type of structure that creates impediments to restrict their freedoms, or rules requiring conformity. Adolescents seeking immediate gratification are not only stubborn, but they "don't like settings that require discipline, supervision, or other constraints to their behavior" (Turanovic and Pratt 2012:4). Impulsive adolescents that behave erratically often isolate themselves from prosocial networks, and begin to associate with peer groups that reinforce their negative behaviors (Schreck 2006; Ozbay 2008). As a result, impulsive adolescent behaviors become stabilized over time, increasing the risk of those behaviors becoming persistent and resistant to change. Maladjusted adolescents have a developmental deficit that restricts normalized cognitive assessments and reflections that could potentially mitigate their propensity towards antisocial behavior and subsequently recidivism risk (Farrington 1991a; Moffitt 1993; Schreck 2004, 2006). Gottfredson and Hirschi (1991:123) have postulated that developed "personality traits attribute to the continuity in criminal conduct, and criminal predispositions early in life."

Low self-control theory presents a comprehensive approach that accounts for behavioral variations during a limited time frame, such as childhood and adolescence. Low self-control is an individual characteristic established early in life that increases a juvenile's propensity to participate in juvenile delinquency and recidivistic behaviors (Schreck 2004). In addition, these criminal acts are not just isolated events and specific to one type of crime. Juveniles with low self-control are versatile in their offending

behaviors and enabled by the diversification of different offending opportunities across time (Farrington and Loeber 2013). Subsequently, juveniles with low self-control also do not anticipate the negative consequences and effects produced by their behavior. Low self-control is also closely associated to family factors, such as inconsistent parental involvement, low levels of parental attachment, and a dysfunctional socialization process. A child's self-control can be attributed to the success, or lack of success, by the parental figures in establishing the appropriate parameters of a positive, prosocial environment and other protective factors (Gottfredson and Hirschi 1990; Belbott 2003; Hawkins et al. 2000). Different social environments require the youth to have a malleable set of social skills that allow them to adjust to varying situations. Juveniles with low self-control and impulsive tendencies "slip" into a social disadvantage and have a compromised social understanding of conventional behavior (Tanner-Smith et al. 2013), thus increasing the risk of delinquent behavior and recidivism.

Additionally Gottfredson and Hirschi (1990) state that parents must reinforce the ability of children to resist situational temptations and regulate transitory impulses. Proper parental management practices should instill self-restraint, and inhibitory functions that serve to insulate the youth from impulsive tendencies and thus recidivism risk. Although low self-control theory did not address biological influences and criminality, new research is finding low self-control to be a heritable trait (Wright and Beaver 2005). In addition to proper neural development, self-control is increasingly being linked to genetic predispositions that are exacerbated by adverse environmental conditions (e.g., home life, school, community). Difficult children with low self-control are often raised by a parent or parents who also exhibit low self-control and antisocial

behaviors. The genetic heritability of impulsive and antisocial behaviors between parents and their children creates an unstable rearing environment that can be mutually inflammatory when emotions are not regulated consistently (Wright and Beaver 2005).

Lastly, it should be noted that Moffitt's theorization of personality traits, such as *low constraint* and *negative emotionality*, share many similarities to Gottfredson and Hirschi's low self-control theory. Moffitt goes on to suggest that youth experiencing both low constraint and negative emotionality are predisposed to being more "crime-prone." In a study by Caspi et al. (1995), findings suggested youth with low constraint and negative emotionality felt stressed, were impulsive, and were quick to use anger and aggression in response to adversity. Moffitt's most significant contribution to the concept of self-control was the Dunedin longitudinal study, which spanned over 30 years. Individuals were followed from birth to mid-adulthood; findings suggested the regulation of self-control was a key behavioral trait correlated with quality of life across relationships, employment, and successful outcomes. Adolescent subjects with low self-control were found to have poorer health, problems at school, use substances, and self-select into delinquent environments. These conditions affect the individual's quality of life, and subsequently their risk of criminal behavior (Moffitt, Poulton and Caspi 2013).

Current Focus

This study examines the effects of age and self-control and their relationship to juvenile delinquency and recidivism risk. In particular, is *age of first offense* and *impulsivity/self-control* statistically significant risk factors predictive of a recidivating offense occurring? Using the BOT risk assessment instrument, this research focused the

re-offending behavior of first time juvenile recidivists in Montana. Montana is one of twelve states in the country that does not gather or report statistics on juvenile recidivism (Pew Charitable Trust 2014). This study contributes to existing juvenile recidivism literature, while also improving the empirical knowledge of Montana's juvenile offending populations. Using life-course persistent and self-control theoretical explanations, the following hypotheses were investigated:

Hypothesis 1: Age of first offense will be a significant predictor of juvenile offender recidivism risk.

Hypothesis 2: Impulsivity/self-control will be a significant predictor of juvenile offender recidivism risk.

Although not a focus in this study, Gottfredson and Hirschi (1990) argue that *self-control*, in addition to *age of first offense*, is a static personality trait that is invariant to change. However, research has shown that dynamic risk factors (changeable) are the most effective for targeting current delinquency with specific and intensive interventions. For example, certain behavioral changes are telling of either improvements or detriments towards an adolescent's treatment progress (Andrews et al. 2006; Baglivio and Jackowski 2012). As such, a majority of evidenced-based programs chart the behavioral progress from treating dynamic risk factors. Juvenile delinquency literature suggests that treatment planning and prevention strategies should take into account both static and dynamic risk factors (Andrew, Bonta and Wormith 2006; McGrath and Thompson 2012; Putnins 2005).

Method

Instrument

The Back on Track (BOT) actuarial instrument is closely modeled from the Washington State Juvenile Court Assessment (WSJCA) risk instrument implemented in 1999. The WSJCA is an empirically-validated risk assessment instrument designed to predict a juvenile offender's risk of re-offending (Baglivio 2009). Before the BOT and several other actuarial instruments became validated research tools, assessments were a combination of professional discretion and subjective clinical judgments prone to classification error (Baglivio 2009). Recently, the generational shift towards using sound scientific research designs and empirical methods to predict levels of risk has become the "reliable standard" in juvenile criminology and recidivism research. The literature also suggests that risk assessments instruments should be tailored to the jurisdiction where it will be used to better measure targeted populations.

The BOT assessment also incorporates static, dynamic, and protective (positive) factors into the domain items. Using a combination of risk and protective factors allows the BOT to maintain flexibility in adjusting to dynamic factors that could effect the risk score (Baglivio 2009). Dynamic risk factors (e.g. peer associations, conduct problems, mental health, and substance abuse) can change rapidly and influence the variance in assessments. For example, re-assessment of a youth could show an increase in protective factors thus allowing counselors and probationary staff to note when progress is being achieved (Barnoski 2004). Through effective case management planning, a juvenile's risk profile can be monitored and "customized" to treat their individual rehabilitative needs as behaviors improve or regress.

To increase the reliability of data collection, personnel administering the BOT should have a thorough familiarity of domain measures, risk theory, and techniques used for successful interviewing. Assessment training ensures that staff becomes knowledgeable with the conceptual basis for asking certain questions and how item responses should be recorded. After completing the interview, staff electronically transfer the youth's answers into BOT software. Diligent and skillful application of the BOT assessment enables consistent scoring accuracy while also improving the instruments predictive strength. The pre-screen assessment contains 46 items (questions) designed to assign the juvenile a preliminary risk score. Compiled scores are used to create a "risk profile" for the youth that is low, moderate, or high-risk to re-offend. Youth with a score that places them in the moderate or high-risk categories are then given the BOT full assessment. The full assessment instrument contains all the pre-screen items in addition to more comprehensive analysis (126 items across 12 domains) administered through an in-depth interviewing process (see Appendix A).

Sample

The data for this study were obtained from the Montana Supreme Court's Office of the Court Administrator (OCA) in Helena, MT for first time offending youth cited from January 2008 to December 2013. The sample consisted of juveniles that were categorized as medium or high-risk during the pre-screening process and were given the full BOT which also incorporates needs assessment criteria. Only juveniles that received the full assessment within the first 30 days of their intake date were included in the sample size (N = 1042). The 30 day time parameter was established by the OCA as a

quasi “quality control” measure, to gather useful data from youth within a timely manner, and to promptly initiate any possible treatment strategies. An additional sample requirement was that all juveniles were given a full 365 days to be included in the recidivism sample. This approach gave all juveniles an equal amount of time (chance) to reoffend. Ultimately 178 juveniles were eliminated from the sample because they were not in the system for a full 12 months from their intake date. The final sample size of 864 juveniles was used in the current analysis.

Measures

Independent Variables. The goal of this research was to determine if *age of first offense* and *impulsivity/self-control* were independent risk factors predictive of juvenile offender recidivism. However, several other independent variables (control variables) were selected for the analyses to be included in the regression model. The following independent variables were representative item measures from all twelve BOT domains, excluding employment. Individual items were chosen based on significant bivariate correlations to the dependent variable, component loading percentages (variance) from common factor analysis scaling, and they represent key theoretical concepts found in criminological theory. Several of the independent variables chosen in this analysis were also found to be significant predictor variables in similar studies.

Age of First Offense (Hypothesis 1). The age of onset/first offense variable was drawn from twelve items in the Record of Referrals domain (previous offending index). Age and previous offending history have proven to be robust predictors of future offending behavior (Cottle, Lee and Heilburn 2001). Age, as suggested by Hirschi and

Gottfredson (1990) could be the “master variable” used in theories to explain criminality. The youth could be categorized into five categories. Youth *over the age of sixteen* were coded as a 5, *age sixteen* = 4, *age fifteen* = 3, *ages thirteen to fourteen* = 2, and youth *under the age of thirteen* = 1.

Impulsivity (Hypothesis 2). The impulsive/low self-control variable was drawn from eleven items in the Attitudes/Behaviors domain. The item chosen for the regression model asks whether the youth is “impulsive; acts before thinking.” The item was operationalized and coded as 1 = *Uses self-control; usually thinks before acting*, 2 = *Some self-control; sometimes thinks before acting*, 3 = *Impulsive; often acts before thinking*, and 4 = *Highly impulsive; usually acts before thinking*. Higher scores indicate that the youth is more impulsive and acts before thinking about possible consequences and end results.

Academic Performance. The school and education variable was drawn from eleven items in the School History domain. The item chosen for the regression model measures the “youth’s academic performance in the most recent school term” using GPA. Academic performance was operationalized and coded as 5 = *Honor student (mostly As)*, 4 = *Above 3.0 (mostly A’s and B’s)*, 3 = *2.0 to 3.0 (mostly B’s and C’s, no F’s)*, 2 = *1.0 to 2.0 (mostly C’s and D’s, some F’s)*, and 1 = *Below 1.0 (some D’s and mostly F’s)*. Lower scores indicated a lower GPA and poor academic performance.

Current Structural Activities. A youth’s choice of free time and activity selection was drawn four items in the Use of Free Time domain. The item chosen for the regression model measures the youth’s “current interest and involvement in structured recreational activities.” The item was operationalized as *youth participating in structured and*

supervised pro-social community activities, such as religious group/church, community group, cultural group, club, athletics, or other community activity. Items choices were coded as 0 = *None*, 1 = *Currently interested but not involved*, 2 = *Currently involved in one activity*, and 3 = *Currently involved in two or more activities*. Higher scores indicated the youth was more interested in participating in structured activities.

Admires Antisocial Peers. The peer relationships variable was drawn from four items in the Relationships domain. The item chosen for the regression model asks whether the youth “currently admires/emulates anti-social friends.” The item was operationalized and coded as 0 = *Does not admire*, 1 = *Somewhat admires, emulates antisocial peers*, and 2 = *Admires, emulates antisocial peers*. Higher scores indicated the youth admires and wants to emulate their antisocial peers (i.e., peer approval).

Runaway or Kicked Out. The family conflict/dynamics variable was drawn from sixteen items in the Family History and Current Living Arrangements domain. The item chosen for the regression model asks whether the “youth has run away or been kicked out of the home.” The item was operationalized as “times the youth did not voluntarily return within 24 hours, including incidents not reported by or to law enforcement.” Item choices were coded as 1 = *Has not runaway or been kicked out*, 2 = *Has runaway, been kicked out within the last four months*, and 3 = *Is currently kicked out of home or is a runaway*. Higher scores indicate increased family conflict and dysfunctional family dynamics resulting in the youth fleeing the household.

Current Alcohol Use. The alcohol usage variable was drawn from ten items in the Alcohol and Drug History domain. The item chosen for the regression model asks

whether the youth “is currently using alcohol.” The item was dichotomous and coded as 0 = *No, not using alcohol* and 1 = *Yes using alcohol*.

Current Drug Use. The drug usage variable was drawn from the same ten items in the Alcohol and Drug History domain. The item chosen for the regression model asks whether the youth “is currently using drugs.” The item was dichotomous and coded as 0 = *No, not using drugs* and 1 = *Yes using drugs*.

Abused By Family Member. The mental health variable was drawn from thirteen items in the History and Current Mental Health status domain. The item chosen for the regression model asks whether the youth has a “history of physical abuse.” The item was operationalized as *incidents of abuse, whether or not substantiated, but excluding reports proven to be false*. Item choices were coded as 0 = *Not a victim of physical abuse*, 1 = *Physically abused by a family member*, and 2 = *Physically abused by someone outside of the family*.

Belief in Fighting. The aggressive behavior/physicality variable was drawn from six items in the Aggression domain. The item chosen for the regression model asks if the youth “believes in fighting and physical aggression to resolve a disagreement or conflict.” The item was operationalized and coded as 1 = *Believes physical aggression is never appropriate*, 2 = *Believes physical aggression is rarely appropriate*, 3 = *Believes physical aggression is sometimes appropriate*, and 4 = *Believes physical aggression is often appropriate*. Higher scores indicate the youth is more aggressive, physical (rather than verbal), and has a low threshold for conflict.

Dealing With Difficult Situations. The social skills variable was drawn from eleven items in the Skills domain. The item chosen for the regression model asks how the youth

“deals with difficult situations.” The item was operationalized as a situation that (*includes making a complaint, answering a complaint, dealing with embarrassment, dealing with being left out, standing up for a friend, responding to frustration, responding to failure, dealing with contradictory messages, dealing with accusation, getting ready for a difficult conversation, and dealing with group pressure*). The item choices were coded as 1 = *Lacks skills in dealing with difficult situations*, 2 = *Rarely uses skills in dealing with difficult situations*, 3 = *Sometimes uses skills in dealing with difficult situations*, and 4 = *Often uses skills in dealing with difficult situations*. Higher scores indicated the youth has the ability to use pro-social skills to deal with trying situations that could create high stress or anxiety.

Control Variables. The model included three demographic control variables that have demonstrated a relationship to previous offending history, impulsivity, and recidivism in previous research (Cottle, Lee and Heilburn 2001; Piquero, Jennings and Farrington 2010; Pratt and Cullen 2000). Gender was coded as 0 = *Female* and 1 = *Male*. Race/ethnicity consisted of 1 = *White*, 2 = *American Indian or Alaska Native*, 3 = *Asian*, 4 = *Black or African American*, 5 = *Hispanic or Latino* and 5 = *Other*. Social economic status was operationalized using the *annual combined income* item coded as 1 = *Under \$15,000*, 2 = *\$15,000-\$34,999*, 3 = *\$35,000-\$49,999* and 4 = *\$50,000 and over*.

Dependent Variable. Recidivism was the dichotomous/binary outcome variable. A success was coded 0 = *did not recidivate*, and a failure was coded 1 = *recidivated*. The dependent variable was constructed using misdemeanor and felony referrals as a two item index representing a recidivating offense. Recidivism was defined as any referral incurred by the juvenile within 1 year of an intake or previous BOT assessment being

administered (first subsequent offense after intake date). Referrals accumulated by the youth were operationalized as offenses that the youth admitted to, resulted in a conviction, diversion, deferred, adjudication, or any deferred disposition. Referrals are included in the analyses regardless if the matter was handled formally, informally or resulted in a adjudication; status offenses were not considered a recidivism.

Theoretical Explanations for Additional Independent Variables

This study uses Moffitt's LCP and Gottfredson and Hirschi's self-control theories to support the research hypotheses. However, the following criminological theories were also used to support the remaining independent (control) variables included in the regression model.

Academic Performance. School is an influential risk domain that can affect the attitudes, behaviors, and emotionality of youth throughout childhood and adolescence. School environments can create negative and undesirable experiences for youth by creating strains that can inhibit their educational development, and encourage misbehavior (criminal coping). Agnew's (2001) general strain theory (GST) would posit that juveniles who underachieve, receive low grades, alienate classmates, dislike teachers and think of school as a boring, yet hostile environment may criminally offend as a way to "equalize" their perceived feelings of unjustified mistreatment. Therefore, offending and recidivism risk may increase when youth are experiencing a variety of stresses and negative strains from the goal blockage associated with receiving poor grades and underachieving academically (loss of valued stimuli).

Physically Abused by Family. Youth experiencing physical abuse at home or by a family member are at an increased risk of externalizing their strains from mistreatment through criminal coping behaviors (Agnew 1992, 2001; Brezina 1998, 1999; Piquero and Sealock 2000). GST emphasizes the presence or absence of stimuli that create the negative strains youth experience from harsh parental punishments, loss of parental attachments, and weak emotional bonds (i.e., maltreatment). An unhealthy family life involving abusive behaviors also minimizes the informal social controls created from positive relationships. Hirschi's (1969) social bonding theory also adds that youth lacking strong attachments and emotional connections to their parents or abusive family members are more likely to commit delinquent acts. Physical abuse may increase recidivism risk by exerting a high magnitude strain on the juvenile further attenuating the lack of attachment to ineffective parents who may also lack proper self-control (Brezina 1998).

Runaway or Kicked Out. Both GST and Hirschi's (1969) social bonding theories provide robust explanations for how running away or being kicked could covariate with recidivism. Inequalities or unjust treatment perceived by the youth may be externalized through coping mechanisms, such as anger which could possibly contribute to a youth's urge to runaway, or escape a negative/noxious situation (Piquero and Sealock 2000). Adolescents that have been "kicked out" of the home are experiencing strains from a severely weakened parent-child relationship [bonds] and are at risk of coping through criminal behavior (Hollist, Hughes and Schaible 2009). Additionally, youth that have runaway find themselves in an empowering, yet compromising situation that creates more resentment and anger toward their parents (Averill 1982). As a result, negative feelings

towards parental figures often manifests into emotional coping behaviors (e.g., retribution), that increase delinquency and recidivism risk.

Belief in Fighting. Several theoretical concepts can effectively explain how a youths' belief in fighting to resolve conflict increases the likelihood of criminal behavior and recidivism occurring. GST would posit that anxiety, stress and anger could compel an adolescent to react aggressively to a situational strain, resulting in an assault/fight (Aseltine, Gore and Gordon 2000; Averill 1982; Mazerolle and Piquero 1998). Gottfredson and Hirschi's (1990) general theory of crime suggests that individuals with low self-control, are impulsive, insensitive and "physical," rather than verbal, and are at an increased risk of offending behavior (e.g., fighting). Moffitt's (1993) LCP theory would argue that a belief in fighting is associated with adolescents who exhibit entrenched anti-social and negative biological traits reacting adversely to the social environment. Youth who are developmentally disadvantaged and possess difficult temperaments will create opportunities for delinquency and recidivism risk to occur (Piquero and Tibbetts 1996).

Current Interest in Structured Activities. An adolescent's use of free time and leisure can create an environmental condition that is more conducive to delinquency occurring. Cohen and Felson's (1979) routine activities and lifestyles theory contends that offending behavior increases when a motivated offender, a suitable target, and the lack of capable guardianship converge in time and space. Therefore, a youth's interest and participation in supervised pro-social community events, church groups, athletics and other structured activities decreases their exposure to elements that could prompt or "entice" criminality. Participating in supervised activities improves guardianship, minimizes target

attractiveness and diminishes the motivation to offend by removing the spontaneity of unplanned offending behavior from “unoccupied” amounts of free time (Finkelhor and Asdigian 1996). Furthermore, supervised and structured pro-social activities provide youth with opportunities to engage in positive socialization while limiting their exposure to the risks of unstructured environments.

Dealing With Difficult Situations. The development of positive, pro-social communication skills reduces an adolescent’s risk of reacting adversely to “difficult” situations. Moffitt’s (1993) developmental life-course theory suggests that deficits in verbal and executive functioning progress into entrenched anti-social traits increasing a youth’s criminogenic tendencies. For example, dealing with difficult conversations, frustration, responding to failure, being left out, and feeling embarrassed may provoke anti-social youth to respond with negative, delinquent outcomes. Additionally, Gottfredson and Hirschi’s (1990) self-control theory contends that the propensity to commit crime is the result of inadequate parental socialization practices that initiate weak self-controls and anti-social values, limiting the effect of proper social development (Pratt and Cullen 2000; Nagin and Patternoster 1993). Socially disadvantaged youth lacking prosocial skills will be at an increased risk of criminally coping as a mediating solution.

Current Alcohol and Drug Use. Numerous studies have found an adolescent’s substance use (i.e., drugs and alcohol) to have a robust, positive correlation to delinquency (Elliot, Huizinga and Menard 1989; Hawkins, Lishner and Catalano 1985; Loeber, Stouthamer-Loeber and White 1999). Individual traits theories would argue that the development of conduct problems and negative emotionality is associated with a youth’s difficulty in moderating their impulses, therefore increasing the risk of substance

use. Previous research has also found that the onset of mental health issues (e.g., ADHD) has been associated with substance use and a greater likelihood of delinquency occurring (Dembo et al. 1998; Loeber et al. 1999). Problematically, youth with biological impairments and neurological deficits become further disadvantaged when using alcohol or drugs as a coping mechanism. Gottfredson and Hirschi's (1990) control theory suggests youth lacking proper self-regulation and impulse control may use substances as a means to achieve "quick thrills" and participate in sensation-seeking behaviors that subsequently increase delinquency risk.

Admires Antisocial Peers. A youth's association with delinquent or anti-social peers can predispose them to conditions often favorable to delinquency. Sutherland's (1939, 1947) differential association theory is a learning theory that explains how youth find approval, reinforcement, and rationalizations for delinquent behavior from anti-social peers they respect. This attitude further increases the adolescent's chances of learning criminal motivations and participating in recidivistic behaviors. In his theory, Sutherland suggests that an adolescent will learn and model delinquent behavior by emulating anti-social friends who encourage violation of the law. Using "techniques of neutralization," juveniles ignore moral codes and justify their participation in deviancy as more beneficial than law-abiding, legitimate behavior (Sykes and Matza 1957). Therefore, juveniles that *admire* and want to *emulate* their anti-social peers reduce their chances of experiencing pro-social relationships and mitigating the effects of delinquent motivations.

Gender, Race and SES. Numerous studies, research literature and criminological theories have found demographic variables to be significant predictors of criminal offending propensities (Cottle, Lee and Heilbrun 2001). Individual traits and biosocial

theories of crime have often been used to investigate the gender gap in delinquency. Findings have consistently found that males criminally offend at much higher rates than females, and are disproportionately represented in the juvenile justice system. Males may be subject to different parenting styles, conflict within peer groups, socialization strains and differential treatment in the juvenile justice system. Again, GST helps explain how racial/ethnic and differences in SES may influence the types, frequency and severity delinquent behavior. Scholars have suggested that living in disadvantaged areas, goal blockage, the lack of socially desirable goods, and economic hardships becomes stressors and strains that covariate with offending behavior (Sampson and Wilson 1995; Thornberry 1973). Socioeconomic status (SES) has proven to be a robust indicator of increased risk associated with the delinquent behavior. Low-income families do not experience the same access to services, educational or economic opportunities, or the means to acquire socially desirable goods. Furthermore, low SES youth may be living in crime-prone communities or neighborhoods thus increasing their exposure to criminal elements and the influence of delinquent peers (Thornberry 1973).

Analytic Strategy

In order to examine the relationships between independent predictor variables and the dichotomous outcome variable of recidivism, binary logistic regression analysis was used. First, the hypothesized variables *age of first offense and impulsivity* were selected into the model. Numerous studies have found age and impulsivity to be significant predictors of delinquency and recidivism risk (Cottle, Lee and Heliburn 2001; Turanovic and Pratt 2012). Second, additional independent variables were selected into the model

that represented other environmental risk domains associated with recidivism. The process involved using bivariate correlations to reduce (consolidate) the nearly 200 predictor variables found in the twelve BOT domains by looking for statistically significant relationships to recidivism. The initial data reduction consisted of identifying significant variable correlations at the .05 level. The remaining variables were then selected at the .01 significance level, further reducing the number of eligible indicators with strong relationships to the outcome measure (see Table 1).

Third, nine exploratory scales were constructed using variable measures in the BOT to assess the individual strengths of predictor items aggregated into the scales. Findings indicated the amount of explained variance among correlated items in the index, revealing the item's ability to explain or represent the scale as a key theoretical construct or domain concept. Results from the common factor analysis using scaled measures were then analyzed and compared to items chosen at the bivariate level, checking for any similarities in significance. This strategy was used as a methodological "check" on the variable reduction process at the bivariate level in hopes of mitigating any possible selection bias. Additionally, all scales had Cronbach Alpha's $> .75$ and KMO's $> .65$. The common factor analysis indicated that several, but not all, items chosen at the bivariate level had Eigen values > 1 and were loading the most significantly. This analysis suggests that particular item or items in the scale (e.g., 4-12 items) were explaining a majority percentage of the measurable strength within the construct. These findings indicated that using that particular scaled variable was negligible. However, if there were multiple items in the scaled measure with significant explanatory value, the choice to use the scaled variable in the regression model may be more beneficial. This

study also had a large enough recidivism sample size to support the fourteen independent variables based on the statistical assumption of needing at least ten sample units per covariate in the regression analysis (N = 228).

Table 1. Results of bivariate correlations between risk factors & recidivism (n = 864)

Risk factors	R	p-value
Gender	.068*	.046
Race	.012	.719
Household income	-.140***	.000
Age at first offense	-.163***	.000
Academic performance	-.170***	.000
Interest in structured activities	-.160***	.000
Admires/emulates antisocial peers	.119***	.000
Runaway/kicked out of home	.161***	.000
Currently using alcohol	.037	.274
Currently using drugs	.065	.057
Physically abused by family	.126***	.000
Impulsive/self-control	.210***	.000
Belief in fighting/aggression	.234***	.000
Dealing with difficult situations	-.145***	.000

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

Fourth, independent control variables were selected based on their association to criminological theory. Several different theories were used to explain the variables relationship to delinquency and recidivism risk (e.g., general strain, social learning, social bonding, life course, routine activities and control theories). All of the variables chosen for the current research have been previously used in similar juvenile offending and recidivism risk studies. Therefore, selected variables were 1) theoretically driven, 2) significant at the bivariate level, 3) conceptually representative using factor analysis, and 4) validated in the research literature. Although significant inter-relationships between

the independent variables were not investigated in this study, the results are presented in a correlation matrix (see Appendix B).

Results

Independent variables selected for this study were theoretically derived items that represented key environmental risk constructs related to juvenile delinquency. The strength of the modeling design is dependent on how well each explanatory item holds its influence (association) to the outcome variable net all other variables in the model. The current study explored whether the hypothesized variables of *age of first offense* and *impulsivity* would surface as significant risk factors related to juvenile offender recidivism after controlling for several other known delinquency and recidivism risk factors. The model controlled for the following demographic variables: *gender*, *race* and *SES*. The current sample lacked ethnic diversity, most likely the effect of Montana's rural population, therefore contributing to a primarily homogenous demographic profile (*White*=81.6%, *American Indians* 12.1%, all *Others* combined 5.5%, see Table 2). Additionally, 91(10.5%) of the cases were excluded from the original sample size due to missing data, 67 cases from the education variable, leaving 773 juveniles eligible to be included in the regression model. Removing the education variable from the model was an option to recover missing data, however, the item is an important conceptual control, and domain construct to include in risk analyses. Ultimately, 256 (29.6%) juveniles recidivated (see Table 3). However, an additional 28 juveniles were excluded from the final regression model due to missing data, leaving 228 eligible youth in the final recidivism sample.

Table 2. Demographic statistics (n = 864)

Variables	Min.	Max.	Mean	SD	F	%
Age	8	18	14.986	1.712		
Gender						
Female					268	31%
Male					596	69%
Race/Ethnicity						
White					720	83.3%
American Indian					99	11.5%
Asian					2	0.2%
African American					12	1.4%
Hispanic/Latino					25	2.9%
Other					6	0.7%

F = Frequency.

Reliable regression modeling assumes that predictor items are independent measures absent of significant multicollinearity. The independent variables selected for the regression were well suited for the analysis. The Hosmer and Lemeshow goodness-of-fit = .795, with 1.0 being the maximum value for the estimate, was a robust fit and well beyond the acceptable limit of .05. The Chi-square (4.639 and df 8) indicates a minimal amount of variance is being lost between the observed and predicted values in the model. This suggests the independent variables did not “over or under” predict the amount of recidivism that occurred at any significant level. Therefore, any suspected correlations between the independent variables that could possibly bias the estimates (i.e., multicollinearity) in the model have been reduced (Leung and Yu; Turanovic, and Pratt 2012). In addition to the goodness-of-fit test, Nagelkerke R Square, prediction/classification accuracy tables and Chi-square divided by the degrees of

freedom were used to test the model’s predictive accuracy and ability to account for variance (Bunch, Clay-Warner, and Lei 2012). There was nearly a 2% increase in prediction accuracy between the classification tables once the predictors were added to the model (72.3%). Classification table values above 65% are considered to be acceptable and values > 70% are desirable. Nagelkerke R Square (i.e., pseudo R²) is the commonly used test in binary logistic regression for determining the explained variance in the dichotomous dependent variable. The pseudo R² for this model was .150 indicating 15% of the variance in the dependent recidivism variable was explained by the risk predictors (explanatory items) in the model.

Table 3. Recidivism frequencies between offense type and gender in 1 year (n = 256) 29.6%

Offense type	F	%
None	521	60.3%
Status/Technical/City	87	10.1%
Misdemeanor	218	25.2%
Felony	38	4.4%
Gender		
Female	67	26.2%
Male	189	73.8%

Note: Status offenses (n = 87) were not included as a recidivism in the analysis.

Hypothesis 1

Table 4 indicates the frequency of answer choices, and two descriptive statistics for the item measure in Hypothesis 1. The first research hypothesis predicted that *age of first offense* would be a significant risk factor predictive of juvenile offender recidivism. Results did not support this hypothesis and indicate (see Table 3) that *age of first offense* only approaches statistical significance ($b = -.123$, $p = .108$, $OR = .885$). As expected, *age of first offense* was also negatively correlated to recidivism, demonstrating the

predicted direction of the relationship. Although this item did not reach significance, the odds ratio suggests there is a 12% reduction in recidivism for every year older the youth becomes. Results from Hypothesis 1 do not allow rejection of the null, and only partially supports the age component of Moffitt’s LCP theory that argues age of onset offending is a correlate of juvenile delinquency. Further, these results only moderately support existing literature that suggests younger juvenile offenders are at a significantly increased risk of participating in future offending behaviors (Cottle, Lee, and Heilbrun 2001).

Table 4. Response frequencies for hypothesized variable 1 (n = 864)

Age of First Offense	F	%
Under 13	179	20.7%
13 to 14	276	31.9%
15	175	20.3%
16	133	15.4%
Over 16	101	11.7%

Mean= 2.654, SD= 1.285

Hypothesis 2

Table 5 indicates the frequency of answer choices, and two descriptive statistics given for the item measure in Hypothesis 2. The second hypothesis predicted a significant positive association between *impulsivity/self-control* and *recidivism* risk. The findings support this prediction and allow rejection of the null hypothesis. While holding all other independent risk factors constant, *impulsivity* achieved a statistically significant effect ($b = .239$, $p = .046$, $OR = 1.270$). The odds ratio suggested *impulsivity* exerted a 27% increase in recidivism when the youth scored a value/unit higher on the *impulsivity/control* measure. Gottfredson and Hirschi’s self-control theory was used in this model, and results lend full support to the theory. However, contrary to their claim

that self-control is an unchangeable risk factor, this variable is commonly considered a dynamic risk factor that can be modified with intervention/prevention strategies. It is also important to note that self-control/impulsivity was measured using only one item in this study. According to the literature, self-control is commonly measured using several variables to effectively capture the item construct (Grasmick et al. 1993).

Table 5. Response frequencies for hypothesized variable 2 (n = 864)

Impulsivity/self-control	F	%
Uses self-control	184	21.3%
Some self-control	376	43.5%
Impulsive	212	24.5%
Highly impulsive	92	10.6%

Mean= 2.245, SD= .9083

The findings in Table 6 indicate additional risk factors that were found to be significant covariates of recidivism risk in the model. Youth that have *run away or been kicked out* of the home, have been *physically abused by family*, *believe in fighting* to resolve conflict, and are of *male gender* exhibited robust positive relationship to juvenile offender recidivism. Most notably, youth that have *runaway or been kicked out* of the home were 1.7 times more likely to recidivate ($b = .529$, $p = .009$, $OR = 1.697$); a 70% increase in recidivism. Youth *physically abused by a family member* were also 1.7 times more likely to recidivate ($b = .547$, $p = .016$, $OR = 1.728$); a 73 % increase in recidivism. The above mentioned variables were also found to be significant predictor variables to recidivism in a seminal meta-analysis of juvenile recidivism risk by Cottle, Lee and Heilbrun (2001). Youth who *believe in fighting* and physical aggression as appropriate ways to settle conflict are almost 1.4 times more likely to recidivate ($b = .324$, $p = .003$,

OR = 1.383), a 38 % increase in recidivism. Gender, as expected, was positively correlated to recidivism. Males were 1.5 times more likely to recidivate than females ($b = .433, p = .023, OR = 1.542$). However, similar to most studies, males were over-represented in the general sample (69%) and in the recidivism sample (74%).

Results also included several variables that were negatively, yet not significantly, correlated to recidivism. There was a 13% *reduction* in recidivism when the youth's interest in *structured activities* increased by 1 value in the item (question) choices ($b = -.142, p = .098, OR = .867$). Unexpectedly, there was a 20% *reduction* in recidivism when youth (somewhat or does not) *admire or emulate anti-social peers* ($b = -.229, p = .138, OR = .795$). This finding is counter to previous studies and criminological theory and will be further analyzed in the Discussion section of this paper. *Race* did not have a significant effect on recidivism, and the negative beta correlation does not allow for a meaningful interpretation of the weak association ($b = -.050, p = .615, OR = .952$). Contrary to pre-model expectations, a youth's *academic performance* did not achieve a significant correlation to recidivism suggesting only a 12% reduction in recidivism ($b = -.129, p = .198, OR = .879$). Academic performance was the strongest bivariate correlate to recidivism out of fourteen other items in the School Domain, and was predicted to be strongly associated with recidivism risk in the regression model. As such, several items in the model may be effecting the association between the school variable and recidivism, minimizing the items predictive strength. Finally, although *household income* (SES) did not reach statistical significance ($p = .114$), the odds ratio (.863) indicates there is a 14% reduction in recidivism for every unit of increase in annual combined income. The research literature has consistently found lower household income levels to have a

significant association with increased levels of delinquency and recidivism risk (Cottle, Lee and Heilburn 2001; Nagin et al. 1995; Sampson and Laub 1993).

Results also include three risk factors with non-significant correlations or meaningful odds ratios associated with recidivism. Contrary to previous research, *current alcohol use* was not significantly associated with recidivism risk in the current study ($b = -.023$, $p = .920$, $OR = .977$). During bivariate pre-model analysis, *current alcohol use* demonstrated only a moderate to weak relationship with misdemeanor recidivism ($r = .052$, $Sig .013$). Despite these findings, some studies have found alcohol to be a covariate of delinquency and recidivism risk (Ryan, Williams and Courtney 2013). Similarly, *current drug use* was also “washed” to non-significance in the model ($b = .112$, $p = .560$, $OR = 1.118$), yet had a moderate association with only felony recidivism at the bivariate level ($r = .061$, $Sig .071$). Drug usage was also included in the model as an important environmental risk factor found to have an effect to juvenile recidivism risk (Putnins 2003, 2005). However, the low correlations between substance use and recidivism found in this study are similar to the meta-analysis by Cottle, Lee and Heilbrun (2001) that also used “first time” recidivist data. This particular finding may suggest that moderate usage of particular substances is not a significant contributor to recidivism risk. Lastly, the variable used to measure the youth’s social skills, *dealing with difficult situations*, also had a non-significant association with recidivism that also changed relationship direction in the regression ($b = .039$, $p = .716$, $OR = 1.039$). Although this item’s direction also changed similarly to the *antisocial peers* variable, the result could be interpreted as less meaningful.

Table 6. Results of binary logistic regression: risk factor effects on recidivism risk (n = 228)

Risk factors	B(SE)	p-value	Exp(B)
Gender	.433(.191)	.023*	1.542
Race	-.050(.098)	.615	.952
Household income	-.148(.093)	.114	.863
Age at first offense	-.123(.076)	.108	.885
Academic performance	-.129(.100)	.198	.879
Interest in structured activities	-.142(.086)	.098	.867
Admires anti-social peers	-.229(.155)	.138	.795
Current alcohol use	.023(.230)	.920	.977
Current drug use	.112(.192)	.560	1.118
Runaway/kicked out of home	.529(.201)	.009**	1.697
Physically abused by family	.547(.227)	.016*	1.728
Impulsivity/self-control	.239(.120)	.046*	1.270
Belief in fighting/aggression	.324(.109)	.003**	1.383
Dealing with difficult situations	.039(.106)	.716	1.039

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

Exp(B) = odds ratio, (SE) = standard error.

Discussion

The purpose of this study was to test the hypotheses that *age of first offense* and *impulsivity/self-control* would be significant risk factors predictive of juvenile offender recidivism. Using a representative sample of juvenile delinquents from 22 judicial districts in Montana, the research analysis was guided by criminological theory and previous research designs. This paper adds to existing juvenile recidivism literature while also contributing unique findings specific to Montana's juvenile offenders. This research addresses an existing gap in literature that tests the effects of LCP and self-control theory when applied to juvenile offender populations from rural, and non-urban areas. In addition to the hypothesized findings, results also revealed several other risk factors that are statistically significant contributors to juvenile offender recidivism.

Results support Hypothesis 2, and demonstrate a moderately robust relationship to

recidivism thus providing support for Gottfredson and Hirschi's general theory of crime. In contrast, Hypothesis 1 was not statistically significant, and was only moderately associated with recidivism. Results for the hypothesized variables and other significant independent risk factors are discussed in further detail below.

Hypothesis (1) Age of First Offense

Age of first offense has consistently been shown to be a significant risk factor predictive of juvenile offending in the delinquency literature, and recent meta-analyses (Cottle, Lee and Heilbrun 2001). The findings suggest age of first offense is associated with recidivism (OR = .88) however, the item did not reach statistical significance. This result moderately supports Moffitt's (1993) LCP developmental theory postulating that problematic behaviors and emotional disorders of disruptive youth begin early, and often worsen with age. Consistent with the Gluecks (1950) findings, Hypothesis 1 also suggests that ineffective parenting techniques and unstable living environment increase a youth's likelihood of being persistently involved in delinquency. The younger juveniles start their offending behaviors, the more likely they will continue to offend along an unchangeable pathway. The onset of problematic behaviors at a young age increases the difficulty of developing interventions that intersect, or mitigate the negative effects from those behaviors. As expected, some variables slightly affected the relationship of age to recidivism risk with SES being one of the strongest mediators. As such, taking the SES variable out of the model brought age of first offense into ($p < .05$) significance and a stronger odds ratio.

Hypothesis (2) Impulsivity/Self-control

The results pertaining to Hypothesis 2 allow rejection of the null hypothesis and supports Gottfredson and Hirschi's low self-control theory. Juveniles who self-reported as impulsive, or had difficulty controlling their behaviors, were significantly more likely to recidivate. Although this finding was only significant at the .05 level, mediating effects from *belief in fighting* may have minimized some of the item's predictive strength. This research is consistent with Gottfredson and Hirschi's (1990) self-control theory that suggests individuals who like to take risks, are thrill-seekers, short-sighted, and act impulsively before they think, are at an increased risk of participating in delinquent behavior. Moreover, a propensity towards impulsive behavior is established during infancy, and further stabilized and reinforced throughout childhood. The research literature has also found that children with low self-control often have parents who also have trouble controlling their erratic, impulsive behaviors (Hoeve et al. 2009; Ryan et al. 2013). Low self-control juveniles will have the tendency to react adversely and without forethought to the possible outcomes and consequences of their actions. Youth lacking the ability to self-regulate may also become socially marginalized into peer groups that continue to encourage and reinforce their impulsivity and poor decision-making. Consistent with theory and the research literature, this study highlights impulsivity and self-control as statistically significant item measure that should be included in risk assessment analysis.

In addition to the hypothesized results, several other key findings also emerged. First, youth that have *runaway or been kicked out* of the home and experienced *physical abuse by a family member*, were 1.7 times more likely to be recidivate. Consistent with

theory, this finding may suggest that a considerable amount of family conflict is occurring in certain households, and juveniles are adversely affected by the associated strains (Agnew 1991). These particular youth may be experiencing emotionally traumatic events that, in turn, create conflicted feelings, resentment and acute feelings of anger. Combined, anger and negative emotionality facilitate conditions more conducive to delinquent coping and recidivistic behavior. The literature also suggests that childhood and adolescent maltreatment significantly contributes to weakened social bonds and the lack of attachment to parents and family members (Brezina 1998; Piquero and Sealock 2000). Juveniles who have felt a “loss,” or diminished value associated with their intimate personal relationships will often find conditions more favorable to delinquency. Seriously disruptive events (physical abuse, and getting kicked out) reduce trust, while increasing the youth’s levels of anxiety, stress and the need for retribution to equalize the perceptions of unjust treatment. Youth displaced from the home, and suffering from weakened attachments may also seek the approval of antisocial peers in criminogenic environments (Hirschi 1969). Ultimately, *family conflict* is a construct consisting of several highly significant risk factors that are strongly correlated to juvenile offender recidivism.

Second, the analysis indicated that youth who *believe in fighting* and physical aggression as an appropriate way to resolve conflict are significantly more likely to participate in recidivism (approached $p < .001$). This result suggests there is a 38% increase in recidivism when a youth’s answer choice increases by 1 value on the item measure (e.g., never appropriate to often appropriate). Consistent with both Moffitt’s LCP and Gottfredson and Hirschi’s self-control theory, this finding reveals that

aggressive youth are physical rather than verbal, unable to tolerate frustration, incapable of processing consequences, and are emotionally calloused. Adolescents who react with physical violence when confronted with adverse or uncomfortable situations, have an increased likelihood of criminally offending. Fighting, by nature in these instances, can be considered a delinquent offense by definition. Not only are aggressive youth already committing a delinquent act by proxy, the juvenile is further at risk of committing additional criminal offenses. As the results and previous literature suggest, physically aggressive youth may lack the social skills necessary to process the awkwardness of a confrontation and do not choose the appropriate pro-social technique to handle the situation effectively.

Contrary to pre-model predictions based on the literature and bivariate significance, a youth's *current interest in structured activities* was not a significant correlate of recidivism. The variable's relationship to recidivism occurred in a theoretically expected negative direction, and reveals only a 13% *reduction* in recidivism when the youth has an interest in participating in supervised, structured activities (e.g., church group, community groups/functions, athletics etc.). Using Cohen and Felson's (1979) routine and lifestyle theory, participating in structured activities removes the juvenile from the potential risks of coming into contact with suitable targets, provides capable guardianship and minimizes their motivation to offend. Delinquency literature has also consistently found that adolescents' use of leisure and free time is associated with criminality. When youth are exposed to large amounts of unsupervised "idle time," some youth will have the propensity to take advantage of offending opportunities that are presented. In addition, a youth's lack of interest in pro-social activities further reinforces any antisocial

behaviors, and diminishes the impact of informal social controls that can act as a deterrent to delinquent activity (Hirschi 1969). Furthermore, supervised and structured activities increases the opportunities for youth to establish emotional and social bonds with adult authority figures, while also encouraging social skills through pro-social networking.

Unexpectedly, findings revealed that youth *who admire or emulate their anti-social peers* was not a significantly correlated risk factor, and exhibited a counter-intuitive, inverse relationship to recidivism. Contrary to statistical methodology suggesting the item should follow the bivariate level direction (positive), *admires or emulates antisocial peers* revealed a positive relationship to recidivism. Additional analysis included removing predictor items from the model in an attempt to specify which variable was confounding, and changing the item's correlation direction. Results were inconclusive suggesting that several explanatory/independent variables, possibly in combination, are exerting a strong effect on the variable. Other possible explanations for this result could be multicollinearity between predictor items or the variable becoming a "suppressor" when the item is added to the model.

This result is counter-intuitive because juveniles that admire or want to emulate their antisocial peers learn the antisocial norms and negative personality traits of their peers, while practicing the skills necessary to increase their offending capabilities. Furthermore, Sutherland's (1939, 1947) differential association theory argues that youth spending a significant amount of time in intimate, antisocial peer groups are missing out on opportunities to cultivate positive, pro-social relationships with teachers, coaches, teammates or to strengthen emotional bonds with their parents or siblings. Antisocial

peers often increase a youth's motivation to offend by making targets more attractive and reduce the amount of capable guardianship needed to deter the delinquent activity. In addition, Moffitt's LCP theory posits that the development, entrenchment, and continuity of anti-social behaviors places youth on a path to persistent offending behaviors and recidivism risk. Although this variable was confounded in the model by the other predictors, the odds ratio still suggests a significant association with recidivism, and is an important finding. However, according to the research literature and criminological theory, this variable should have a positive relationship to recidivism and therefore the result should be interpreted with caution.

Several variables in the analysis had neither a significant p-value, nor odds ratio, suggesting a considerably weak or mild association to recidivism. Expectedly, *race* maintained non-significance in the regression model. Whites were disproportionately represented in the recidivism sample (82%), followed by American Indians (13%) minimizing the effect of any racial or ethnic differences that could effect overall recidivism rates. A youth's *current alcohol use* was not significantly related to recidivism at the bivariate level, and was also not statistically significant in the regression model. A large percentage of youth may be using alcohol to some extent, however, it is possible only a small amount of those youth are abusing alcohol in a ways conducive to criminality. A youth's *current drug use* did not have a significant p-value, but the odds ratio indicates that there is a 15 % increase in recidivism when juveniles are using some type of narcotic. Although this research finding was weak, similar studies have found current drug use to be more significantly associated with delinquency and recidivism risk (Putnins 2003). Surprisingly from the Skills domain, *dealing with difficult situations* had

a non-significant association to recidivism and the direction of the relationship also changed. The significant bivariate relationship to recidivism in the pre-model ($r = -.145$, $p = .000$) was possibly mediated by peer, self-control and aggression variables in the regression analysis. Several other variable combinations may have also moderated the item's relationship to recidivism in the regression, contrasting the significant and inverse relationship achieved at the bivariate level.

Finally, this study also highlighted the “gendered gap” in juvenile delinquency and recidivism risk. Consistent with theory and the literature, *gender* was a moderately significant risk factor related to recidivism, net all other control variables. As an expected finding, males were 1.5 times more likely to recidivate than females, and occupied almost 70% of the full sample, and 75% of the recidivism sample. It is well documented that males are disproportionately represented in the juvenile justice system, and significantly more inclined to participate in all forms of criminal offending.

A majority of the independent variables (9 items) did not reach statistical significance; however, all the items are practically significant, and known correlates of delinquency found in criminological theory. Moreover, all the independent variables had robust bivariate correlations to recidivism in pre-model analyses, and were also used as predictor variables in previous studies. Variables that did not achieve statistical significance in the regression analysis were likely mediated by other predictor items in the model thus moderating their covariation to recidivism. Importantly, these results suggest that risk factors, in various combinations, affect a juvenile's propensity towards recidivism risk and the findings can help guide the appropriate treatments strategies.

Limitations

Although this study successfully highlighted risk factors predictive of juvenile offender recidivism, several limitations must be noted. First, the current research used only “first time” juvenile recidivists in the analysis. Recidivism is the repeated relapse or habitual continuation of criminal offending behavior, and therefore any inferences from the results must be interpreted with caution. That is, no reliable conclusions can be drawn regarding patterns or trajectories of offending behavior because the data are based on a single recidivating offense. It is possible that youth may have recidivated several times within the twelve month time parameter set in this study, yet the current findings are only based on data from the first recidivating offense. Hypothetically, this suggests that a youth could have been cited for multiple offenses when the BOT was administered but the offenses were considered as a “single” recidivating offense (duplicates in the sample). Nonetheless, this study can be considered the first step in establishing longitudinal analyses that charts the youth’s offending behavior beyond the specified twelve months.

Another limitation involves item measurements for three variables in the analyses. First, the operationalization of impulsivity and low self-control (Hypothesis 2) could have been stronger. According to Harold Grasmick and his colleagues’ (1993) scaled measure of self-control, the concept includes a number of distinct dimensions, including risk seeking, simple tasks, physical activities, self-centeredness, and temper. The addition of measures similar to the items in Grasmick’s scale would create a more valid measure of self-control/impulsivity.

Second, *age of first offense* was also limited in its ability to capture age as a complete item measure. For example, item answer choices in the BOT range from *Under 13* to *Over 16*. Although the literature and theory suggests adolescence (ages 13-18) are prime offending time frames, this study might have benefited from “breaking down” the *Under 13* age group. Consistent with LCP theory, problematic and disruptive childhood behaviors are established early in life and worsen with age, thus increasing offending risk. Gottfredson and Hirschi (1990) argue that low self-control is established in youth ages 4-6 years. A useful addition to the item measure is to possibly add a category where the youth’s actual age is marked if they were “lumped” into the *Under 13* category.

Third, another limitation is the variable measurement for *race*. In the BOT, race was operationalized using five items that represented White, American Indian, Hispanic, Black, and Other youth respectively. Race is a categorical (nominal) variable most often measured dichotomously when assessing the individual strength of each racial group as a predictor item to recidivism. Using dummy variables and a binary coding system is the correct methodological approach when exploring the association of race to recidivism risk. For example, when trying to determine whether being Hispanic (coded 1) was a significant predictor of recidivism, all other categorical variables of race need to be coded as 0. This process ensures that each reference group (race variable) of interest in the analysis would be representative of the coefficient in the model. Although *race* was not a variable of interest in the current study, recoding the variable may have revealed a more significant relationship to recidivism risk and possibly affected other findings in the regression model.

Lastly, a more standardized and structured scaling process might have increased the reliability of item analysis when choosing items for the regression model. Although independent variables chosen for the model were theoretically representative and significant at the bivariate level, scales often capture the risk measures more accurately. The present study used domain constructs similar to the BOT, however, some of the items in the scales were “borrowed” variables from several of the BOT domains. For example, using only the 11 items in the Attitude/Behavior domain for a scaled attitudes measure would have increased the reliability of component loading percentages found using common factor analysis. Therefore, the benefits of creating a scaled variable using only item measures specific to that BOT domain could minimize any possible scaling and measurement inconsistencies. In short, the scaling analysis would have been a more effective research method if the process was standardized particular to the BOT and its specific environmental domain measures.

Future Research

A majority of offending and recidivism literature has focused on adult criminality leaving a sizeable gap in the quantity of published studies investigating juvenile recidivism risk. Future research will benefit from devoting more attention to exploring other risk factors and predictive variables that may influence juvenile recidivism, thus furthering our existing knowledge. Concerning Montana’s juvenile delinquent populations, future research would benefit from implementing longitudinal data collection methods. Longitudinal studies will provide officials with a more definitive picture of which risk factors are consistently proving to be predictive of a juvenile’s

inclination to reoffend. Charting or graphing longitudinal offending data may begin to reveal trends, offending trajectories and behavioral patterns that are repeatedly associated with certain juvenile demographics, characteristics and offending typologies. On a similar note, research might benefit from analyzing *each* recidivating offense (referral) the juveniles accrue when the BOT is being administered. It is possible that certain recidivating offenses may increase the likelihood of another (similar or different) type of offense from occurring. For instance, patterned analysis could possibly reveal that juveniles cited for simple assaults may be more inclined to have a second recidivating offense of, possibly, burglary or arson.

Additionally, future research efforts have the potential to highlight risk factors that are culturally specific to the state's minority populations (American Indians) and female populations. Although the findings from this study primarily represent white, male juvenile offenders, a more comprehensive analysis of ethnic and gendered offending patterns in Montana would also benefit juvenile recidivism literature. Furthermore, the present study used the BOT risk assessment instrument and findings are representative of the measures used in this particular instrument. Future studies using the BOT in Montana, and the replication of previous studies, will increase the ability of policy makers and practitioners to generalize findings from the state's juvenile offending populations. Using a more standardized definition of what constitutes a recidivating offense, misdemeanors/felonies and not status offenses, would also increase the reliability of future research findings using the BOT when investigating recidivism as an outcome measure.

Finally, in consideration of item measures, future research can benefit from ensuring particular measurements (e.g., antisocial peer influences and mental health) are capturing the construct effectively. During the interviewing process, questions may need further clarification, and some words to be more explicitly defined for youth unfamiliar with the concept or terminology used. Data collection methods using the BOT should be standardized across all of Montana's judicial sampling districts to ensure reliability. Systematic interviewing techniques and transcription of the answer choices will increase the quality of the data collected, and therefore the reliability of any future findings.

Conclusion

This study demonstrates that *impulsivity/self-control* is a significant risk factor associated with recidivism, while *age of first offense* is only moderately associated. Pre-model analysis focused on choosing explanatory independent variables that were theoretically driven, highly significant at the bivariate level and also explained a majority of the variance (component loadings) in exploratory scales. In addition to one of the hypothesized results, four other variables in the model surfaced as significant risk factors of recidivism. Youth that have *runaway or been kicked out* of the home, have been physically *abused by a family member*, *believe fighting* is appropriate to resolve conflict, and being of *male* gender were all important risk factors correlated to recidivism. Similar to previous studies, individual factors, family, and improper socialization were significant environmental domains that exert a strong influence on a juvenile's propensity towards recidivism risk (Cottle, Lee and Heilbrun 2001).

The results from this study also support Gottfredson and Hirschi's assertion that low self-control significantly increases a youth's propensity towards offending behavior. Established early, some youth will develop negative personality traits from their inability to regulate transitory impulses conducive to delinquency risk. Similarly, *impulsive* youth often experience maltreatment from inexperienced and neglectful parents further compromising their normative development and access to protective factors. Findings also revealed that, although not statistically significant, *age of first offense* is an important risk factor to consider in recidivism analyses. Age, as a concept, is only a partial component of Moffitt's LCP theory, however, juveniles who begin to criminally offend at a young age are at an increased risk of participating in persistent offending behaviors. Youth with development deficits are often situated in high risk environments, increasing their exposure to delinquent offending opportunities across their life-course. Juveniles that begin to offend at an early age continue in their entrenched, antisocial behaviors and increase their propensity towards delinquency, and recidivism risk.

This research adds to existing delinquency and recidivism literature, while also identifying unique data results specific to Montana and its juvenile offending populations. Results from this study may address gaps in previous studies, and encourage future risk prediction analyses that will expand the current juvenile offender recidivism literature available. Future research will also benefit our understanding of the risk factors associated with recidivism, and help officials identify the most effective measures for reducing the negative effects of recidivism on the juvenile, families, and the community.

Suggestions for Evidence-Based Practice

This study found empirical evidence that suggests certain risk factors are significantly associated with an increase in juvenile recidivism risk. The next step involves taking known risk factors found in the research and implementing treatment strategies to reduce the risk. Evidence-based practice tries to achieve reductions in delinquency and recidivism by targeting the specific risk factors or problematic behaviors affecting the youth (Lispsey et al. 2010). One specific program guide, *Blueprints for Healthy Young Development*, reports on treatment programs that have been evaluated based on their ability to sustain positive effects after youth have completed the program. Programs that use strong research designs and have proven to be effective at reducing delinquency are called “Model Programs,” while “Promising Programs” have only shown encouraging results (Blueprints 2015).

Using the risk factors found to be predictive of juvenile offender recidivism in this study, some suggestions for evidence-based practice are offered using only “Model Program” criteria from Blueprints.. While the current research findings are not generalizable to all juvenile offending populations, evidence-based practice is broadly applicable, and could be useful across all of Montana’s judicial districts and surrounding communities. The following programs range in cost from affordable and less expensive, to highly expensive. Some of the programs would involve the consideration of several funding strategies to initiate and maintain the program effectively, especially in Montana’s smaller towns and rural areas.

Parent Management Training-Oregon Model (PMTO)

Parent Management Training-Oregon Model (PMTO) is a multisystemic treatment program. These programs have proven to be effective family-based interventions that provide intensive family therapy to modify problematic behaviors. This program specifically addresses risk factors associated with youth that have been 1) *physically abused by family*, 2) *have runaway or been kicked out of the home*, 3) *believe in fighting to resolve conflict*, 4) *lack proper self-control*, and 5) *have attitudes favorable towards antisocial behavior*. Although not all the risk factors in this research were statistically significant, all the variables are “practically” significant, and PMTO effectively address many these needs. Most importantly, the findings in this paper suggest that family conflict significantly affects the juvenile’s offending propensities. Intensive parent/family-based interventions such as PMTO could minimize these associated risks by aggressively targeting problems within the family environment.

PMTO is an expensive program (\$600,000-\$800,000/year) and may be cost prohibitive in smaller towns. However, this program would be more applicable in Montana’s larger towns such as Missoula, Bozeman, Kalispell, Great Falls, Helena, Butte, and Billings. Dependent of the level of services required, therapists could then also serve smaller outlying areas and communities that are be unable to afford the program’s yearly operation costs.

Positive Action (PA)

An equally effective, yet less expensive option is Positive Action (PA). PA is a classroom-based prevention program that improves school climates by enhancing

positive behaviors, self-control, and the emotional regulation of students. This program address the significant risk factors in the current study by increasing students' *interest in structured activities*, their regulation of *impulsive* behaviors, minimizing their *belief in fighting* to resolve conflict, and reducing youths' *antisocial peer associations*. Findings from the BOT have the potential to reveal which communities, and possibly the specific school districts, that could benefit the most from implementing PA for at-risk youth. Research has consistently shown that treatment strategies are the most effective when they target youth in risk domains such as their family/home, community, and school environments (Lipsey et al. 2010). In conjunction with PTMO, PA could treat at-risk youth in two domains (family and school) thus maximizing intervention/prevention options, and establishing continuity in the youth's treatment plan. Importantly, this program is a less expensive treatment strategy compared to other Model Programs, and could be an affordable option for Montana's smaller school systems.

Appendix A

Pre-screen		
Domain #	Domain Name	# of Questions
1	Record of Referrals	12
2	Social History	21
3	Attitude/Behavior Indicators	6
Total		39

Full Assessment		
Domain #	Domain Name	# of Questions
1	Record of Referrals	12
2	Gender	1
3A	School History	4
3B	Current School Status	11
4A	Historic Use of Free Time	2
4B	Current Use of Free Time	3
5A	Employment History	4
5B	Current Employment	4
6A	History of Relationships	2
6B	Current Relationships	6
7A	Family History	5
7B	Current Living Arrangements	16
8A	Alcohol and Drug History	6
8B	Current Alcohol and Drugs	4
9A	Mental Health History	8
9B	Current Mental Health	5
10	Attitudes/Behaviors	11
11	Aggression	6
12	Skills	11
Total		121

Source: Patrick McKay 2014 [Baglivio 2009]

Appendix B

Significant intercorrelations between independent variables [risk factors] in the analysis (n = 864)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Recidivism = 1	---	.068 *	.012	-.056	-.170 **	-.160 ***	.119 ***	.161 ***	.037	.065	.126 ***	.210 ***	.234 ***	-.145 ***
Gender = 2		---	-.030	.059	-.011	.033	-.049	-.140 ***	-.077 *	-.005	-.028	.010	.052	-.012
Race = 3			---	-.146 ***	-.040	-.008	-.008	.082 *	.017	-.050	.043	.016	.044	-.015
Income = 4				---	.095 **	.106 **	-.031	-.060	.011	.015	-.155 ***	-.095 **	-.062	.091 **
Academic Perf. = 5					---	.344 ***	-.321 ***	-.224 ***	.021	-.037	-.121 **	-.351 ***	-.308 ***	.289 ***
Struct. Activities = 6						---	-.316 ***	-.267 ***	-.116 **	-.139 ***	-.068 *	-.308 ***	-.262 ***	.250 ***
Peers = 7							---	.298 ***	.173 ***	.198 ***	.133 ***	.498 ***	.419 ***	-.392 ***
Runaway = 8								---	.139 ***	.188 ***	.051	.233 ***	.231 ***	-.223 ***
Alcohol = 9									---	.334 ***	.002	.082 *	.089 **	-.085 *
Drugs = 10										---	-.018	.088 *	.070 *	-.048
Abused = 11											---	.166 ***	.202 ***	-.146 ***
Impulsive = 12												---	.453 ***	-.545 ***
Fighting = 13													---	-.383 ***
Situations = 14														---

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

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