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## NIJ GRANT: FINAL SUMMARY OVERVIEW

NIJ Grant #2014-R2-CX-0018

Project Title: Rational Choice, Deterrence, and Identity: Modeling Life Course Transitions and Desistance

Project Period: January 1, 2015 to December 31, 2017

Principal Investigator: Ross L. Matsueda

### **Project Purpose and Goals**

Using longitudinal survey data, we specify models of life course transitions, offender decision-making, and crime, to answer four research questions: (1) Under what conditions do high-risk young adults undergo life course transitions, such as high school graduation, transitioning to work, becoming a parent, cohabiting, and marrying? (2) Do the effects of life course transitions constitute turning points in criminal careers, and if so, under what social conditions? (3) What are the causal mechanisms—changing peers and gangs, changing perceived costs and returns to crime, changing perceived opportunities, or changing criminal identities—that explain why life course transitions affect desistance. (4) Can we identify, from our empirical models, the specific conditions under which a treatment intervention is likely to succeed?

Aspects of the theoretical framework we adopt for this project were published in two *Encyclopedia* articles. The first reviews a rational choice theory of criminal behavior, which specifies a utility function from the work of Gary Becker, and shows how that implies policy implications for deterrence, and modifying the returns to crime. Matsueda and Grigoryeva (2014) then contrast this utility theory with a limited rationality perspective popularized by Clarke and Cornish. They then review macro and micro research on rational choice and deterrence and conclude by discussing negative externalities from sanctioning, including

stigmatization. The second focuses on a Bayesian updating theory of the formation of perceived risk of sanction. Here Kreager and Matsueda (2014) begin outlining the probability theorem of Thomas Bayes, showing how prior subjective beliefs about probability are updated using observed data, which results in a posterior probability. After applying this theorem to updating perceived risk of sanction, they contrast it with a competing theory of heuristics, in which actors are assumed to use shortcuts, rules of thumb, and satisficing to arrive at posterior probabilities. They then review empirical research in criminology, which generally supports the notion of Bayesian updating of sanction risks.

### **Project Design, Subjects, and Methods**

We focused on data from the Denver Youth Survey (DYS), a longitudinal study of delinquency, crime, and drug use. The sample is representative of neighborhoods at high risk of delinquency, where high risk is defined as residing in socially disorganized, high-crime neighborhoods. Using vacancy and completion rates, the investigators selected 20,300 of 48,000 enumerated households, drew a stratified probability sample of households proportional to population size, and then used a screening questionnaire to identify respondents aged 7-8, 9-10, 11-12, 13-14 or 15-16 years old (Esbensen and Huizinga 1990, 1993). This yielded a total of 1,528 completed interviews in the first wave, constituting a completion rate of 85% of eligible youths. Beginning in 1987 and ending in 1998, ten waves of data were administered annually, with one exception—there was a three-year gap between 1990 and 1993. These data were used in a number of analyses, to which I now turn.

### **A Rational Choice Model of Deterrence, Intentions, and Drug Use**

In this analysis, Matsueda, Kreager, and Lanfear (2018) build on Matsueda et al.'s (2006) study of deterrence and rational choice by focusing on illegal drug use and examining behavioral

intentions as a mediating variable in the deterrence process. Using a random-effects Tobit model, they find support for a Bayesian learning model of the perceived risk of arrest for drug offenses: the ratio of arrests to drug offenses is positively and monotonically related to perceived risk; for those never arrested, number of drug offenses is negatively and monotonically related to perceived risk. Furthermore, in Tobit models of intentions to use drugs in the future measured on probability scales, both perceived risk of arrest and psychic returns to drug use (excitement and being seen as cool by friends) are significantly related to intentions to use drugs. The effects of returns to crime (excitement and being seen as cool) have stronger effects than the costs of crime (perceived risk). Finally, using random effects negative binomial models with lagged regressors, the authors find that, holding drug intentions constant, psychic returns and perceived criminal opportunities predict future self-reported drug offenses. That is future drug use is increased by perceived excitement from using drugs, unaffected by perceived risk of arrest, and strongly increased by perceived opportunities to use drugs and get away with it. Thus, deterrence works at the intentions stage, whereas psychic returns operate both at the intentions stage and the actual drug use stage.

### **An Acquired Taste: Context and Cognition in a Sequential Model of Marijuana Use**

In this analysis, Matsueda and Kreager (2018) test an integrated rational choice model of addiction with a symbolic interactionist theory of becoming a marijuana user derived from Howard Becker. Following Becker, the authors specify a four-stage model of marijuana use: initiation, continuation, transition to regular use, and leaving regular use. They estimate discrete-time complementary log-log event history models of the hazard to each transition with time-varying covariates. In general, they find, like previous research, that the peer context is key for each stage of marijuana decisions, including associating with friends who smoke marijuana and

socializing with friends in situations in which alcohol and marijuana are used. Furthermore, they find that initiation into marijuana smoking is driven by marijuana-smoking peers, being seen as cool by peers for smoking marijuana, and reduced by high self-esteem and having a parent who has never been arrested for drug offenses. Attitudes toward marijuana are irrelevant for initiation, but as Becker argues, are important for continuation and regular use, as youth require justifications for future use. The transition to regular use is affected by access to a dealer, impulsivity, and expectations from excitement. The transition out of regular use is less likely for users with marijuana using friends and those who exhibit impulsivity.

### **Motherhood and Desistance: Exploring Causal Mechanisms**

This analysis builds on earlier work by Kreager, Matsueda, and Erosheva (2010), which found that theft, violence, and drug use were less likely for women after they became mothers. This paper uses fixed-effects panel models to find that, unlike the transition to motherhood, the transition to fatherhood exerted no effect on desistance from crime. The analysis then turns to testing hypotheses about the causal mechanisms by which motherhood reduces criminality. Drawing from ethnographic research on inner-city motherhood, Matsueda et al. (2014) hypothesized that motherhood causes changes in their reference groups—from partying and drug using delinquents—to non-delinquents, such as other young mothers. They also hypothesize that motherhood may change identities away from identities as a rule-violator or “bad” kid, and may increase self-esteem, both of which may be associated with less crime and drug use. The fixed effects models find that nearly three-quarters of the effect of motherhood on crime is explained by the joint effects of delinquent peers, reflected appraisals, and self-esteem.

### **Gang Organization and Gang Identity: An Integrated Theory of Disengagement from Gangs**

This analysis uses discrete-time complementary log-log event history models of the hazard of disengaging from gangs. It tests the hypothesis that, controlling for low self-control, disengagement from gangs is less likely when the gang is strongly-organized and the gang member has a strong gang identity. A total of 226 DYS individuals eleven years of age and older report gang membership. Laverso and Matsueda (2018) use data from waves 3 to 10, which results in a sample of 200 persons and 361 person-years. The study uses multiple indicators of gang organization, gang identity, and low self-control, consistent with previous research. Confirmatory factor models reveal that gang organization, gang identity, and self-control are each unidimensional constructs. The analysis, which includes time-varying covariates, finds that low self-control is related to violent offending and drug sales by active gang members, but is not associated with leaving the gang. Instead, disengagement from the gang is explained by weak gang organization and weak gang identity.

### **Adolescence, Empathy, and the Gender Gap in Juvenile Offending**

In this analysis, the central thesis is that women are encouraged to develop greater empathic ability than men, which helps explain gender differences in offending. In gender and social psychological studies, research finds gender differences in empathy: Traditionally, women tend to be more oriented to relationships with others and tend to be more empathic, whereas men tend to be more oriented to individualism and achievement. O’Neill (2018) argues that such differences may help explain why men commit more crimes than women. However, she takes a life course perspective in arguing that gender differences in empathy arise in the transition from childhood to adolescence.

O’Neill finds that empathy is the same for boys and girls at age seven, but for both boys and girls, empathy increases from age seven to ten—at a greater rate for girls. From age 10-15,

empathy continues to increase slightly for girls, but decreases for boys. After age 15 empathy levels off for both boys and girls, leaving girls with substantially higher empathy scores by age 18. O’Neill then models this in a multivariate model using non-linear quadratic and cubic terms to fit the trend. To test whether empathy has different effects on different offense types, in particular, victimless crimes versus other offenses, O’Neill uses four lagged indices of self-reported crime: victimless crimes, fraud, theft, and violent crime. She finds that, in bivariate negative binomial models, lagged empathy is negatively and significantly related to all four crimes types—victimless crime, fraud, theft, and violent crime. However, in multivariate models that control for age, income race, family structure, and previous grade point average, empathy still has a negative and significant effect on fraud and theft, but not on victimless crime or violent crime. The null effect on victimless crime was expected: since there is no victim, using empathic ability to consider the consequences of the crime on others is rendered moot. The null effect on violence is interesting. Kate speculates that it could be that violence is often victim-precipitated and impulsive acts, which short-circuit the role of empathy and role taking. Finally, she tests the extent to which gender differences in empathy help explain the gender gap in offending. As expected, empathy explains little of the gap in violence or victimless crime. It does explain a substantial portion of the gender gap in theft (40%), and a nontrivial portion of the gender gap in fraud (18%).

### **Work and Crime: A Causal Treatment Effects Survival Model**

This analysis uses panel data from the National Supported Work Demonstration Project (NSW), an \$82.4 million study that randomly assigned 5,005 chronically unemployed addicts, drop-outs, and offenders to Supported Work or a control group. The original evaluation failed to find an overall treatment effect. Some evidence was found for treatment heterogeneity:

Supported Work appeared to reduce offending among early referrals to the program, drug addicts, and older participants. During the course of the experiment, there were substantial departures from randomization as some experimentals quit their jobs, while some controls got jobs on their own.

This paper uses an instrumental variable approach to modeling departures from randomization within survival models of desistance, which raises challenging statistical and methodological issues. Some members of the treatment group quite their Supported Work jobs and some members of the control groups obtained jobs on their own. Using the new model, Jun et al. (2016) reevaluate the substantive results of the experiment on offending. The preliminary results largely replicate previous research on the NSW dataset: Overall, there is no significant treatment effect, but the treatment did appear to work for offenders age 35 and older. Given the age-crime curve shows that crime peaks in late adolescence and early adulthood, and then slowly declines throughout the remainder of the life course, our results suggest that providing jobs to ex-offenders and drug addicts speeds up the desistance process for older offenders.

### **Trajectory Models Revisited: Assessing Recent Simulation Studies**

With the importance of life course criminology, criminologists have been recently preoccupied with different ways of modeling latent group trajectories of offending. A controversy in the literature has developed over the use of group-based trajectory models, growth mixture models, and growth curve models, including leading methodologists such as Nagin, Land, Sampson, Raudenbush, Curran, and Muthén. A number of simulation studies have attempted to adjudicate among such models. The most prominent simulation study was published by Warren et al., in the *American Journal of Sociology*, which found that different trajectory models produced different results for the same simulated dataset. In this analysis,



Martin et al. (2016) argue that the difference in results of the models is dependent on how well the model's assumptions correspond to the data generating process underlying the observed dataset. After fitting several models to simulated data, the authors consider a new model, a segmented logistic model that fits the simulated data from Warren et al. well. The authors discuss the relative merits of this model with other group based trajectory models.

### **Implications for Criminal Justice Policy and Practice in the United States**

The major contribution of this project is to the basic scientific understanding of crime and desistance in a variety of contexts. Nevertheless, the project results do have some implications for criminal justice policy. Our analyses of motherhood and desistance suggests that, among girls and adolescents in severely disadvantaged neighborhoods in Denver, becoming a mother provides meaning in life, pulls them away from troublesome peers, increases their self-esteem, and helps alter their identities as “bad” girls and women. The result is a reduction in drug use, alcohol use, and illegal behavior. A policy implication here is not to advocate for childbearing at a young age, but rather to work to provide alternative conventional ways of providing meaning and self-esteem to these young women. This could be through programs that seek to tie them closer to schools and that try to provide meaningful work in ways that overcome their bleak future prospects.

Our analyses of deterrence and drug use suggests that perceived risk of arrest reduces the likelihood of forming intentions to use drugs. In models of future drug use, however, when intentions are held constant, perceived risk does not show a significant effect on drug use. Therefore, the threat of sanction deters future drug use indirectly, by reducing drug intentions. If we look at the reward side, we find that perceived excitement from drugs has a particularly strong effect on both intentions and drug using behavior. Finally, opportunities to use drugs

exerts the strongest effects on future drug use. These results suggest that policies for reducing drugs may want to focus more on reducing opportunities for using drugs—perhaps by reducing the supply and availability of drugs—and perhaps less on the threat of punishment. Finally, our results suggest that the risk of arrest has a stronger deterrent effect on drug intentions than risk of jail, which is consistent with previous work showing that certainty is more important than severity in the deterrence process.

Finally, our analyses of work and crime, which control for non-compliance in the National Supported Work Demonstration data, suggests that non-compliance does not appreciably alter results. We find, like previous research, that Supported Work jobs overall did not reduce self-reported crime, and that treatment reduced crime for older offenders. Recall that Supported Work jobs were primarily low-wage jobs in the secondary sector of the labor market in the mid-to-late 1970s—such as washing cars, digging ditches, working construction—this positive treatment effect suggests that work programs may be a viable way of reducing crime when administered to older offenders.

## Project Papers Completed and In-Progress

- Grigoryeva, Maria S., and Ross L. Matsueda. 2014. "Deterrence, Rational Choice, and Crime: Sociological Contributions." In *Encyclopedia of Criminology and Criminal Justice*, edited by G. Bruinsma and D. Weisburd. New York: Springer-Verlag.
- Kreager, Derek A., and Ross L. Matsueda. 2014. "Bayesian Updating and Crime." In *Encyclopedia of Criminology and Criminal Justice*, edited by G. Bruinsma and D. Weisburd. New York: Springer-Verlaag.
- Matsueda, Ross L., Maria Grigoryeva, Richard Callahan, and Derek A. Kreager. 2014. "Motherhood and Desistance: Exploring Causal Mechanisms." Presented at the Annual Meetings of the American Society of Criminology, Atlanta, GA.
- Leverso, John, and Ross L. Matsueda. 2017. "Gang Organization and Gang Identity: An Integrated Theory of Disengagement from Gangs." Submitted to *Journal of Quantitative Criminology*.
- Martin, Bryan D., Ross L. Matsueda, and Elena A. Erosheva. 2014. "Trajectory Models Revisited: Assessing Recent Simulation Studies." Presented at the Annual Meetings of the American Society of Criminology.
- Matsueda, Ross L., Derek Kreager, and Charles C. Lanfear. 2018. "A Rational Choice Model of Deterrence, Intentions, and Drug Use."
- O'Neill, Kate K. 2018. "Adolescence, Empathy, and the Gender Gap in Juvenile Offending." Submitted to *Criminology*.
- Matsueda, Ross L., and Derek Kreager. 2018. "An Acquired Taste: Context and Cognition in a Sequential Model of Marijuana Use."
- Hwang, Jun, Ross L. Matsueda, Elena A. Erosheva, and Christopher Uggen. 2016. "Work and Crime: A Causal Treatment Effects Survival Model." Paper presented at the Annual Meetings of the American Society of Criminology.
- Matsueda, Ross L. 2018. "Rational Choice, Identity and Decision-Making." Paper prepared for presentation at the Indiana University Identity Conference, Department of Sociology, University of Indiana, Bloomington, April 13-14.