ABSTRACT

Title of Document: ONE FOOT IN, ONE FOOT OUT: TOWARDS UNDERSTANDING THE LEGAL AND ILLEGAL WORK OVERLAP

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Extant literature investigating the relationship between legal and illegal work is expansive, spanning various disciplines using a wide array of methodological specifications. Despite this expansiveness legal and illegal work has traditionally been viewed as tradeoffs whereby legal work is seen as a catalyst to moving away from illegal work. However, bifurcation of legal and illegal work captures only one facet of the relationship between the two. For example, participating in legal and illegal work contemporaneously has been discussed by a number of scholars and has been observed in empirical studies. But detailed investigation into the legal and illegal overlap has been scant. By using the Pathways to Desistance Study, there were three main goals of the current study. The first goal was to document the heterogeneous patterns of legal and illegal work and how they overlap over time. Second, I examined if legal economic opportunities were associated with membership in illegal work trajectories, conditional on membership in legal work trajectories. The

third goal was to consider if the legal and illegal overlap was associated with key criminal career dimensions: frequency of offending and offending variety. Results showed that there are heterogeneous patterns in both legal work and illegal work and the way in which they were linked. There was some support for the relationship between legal economic opportunities and membership in a higher illegal work group. The legal and illegal overlap was associated with a lower frequency of offending and endorsement of fewer types of instrumental crimes. Results were discussed in terms of implications for theory and future research.

ONE FOOT IN, ONE FOOT OUT:
TOWARDS UNDERSTANDING THE LEGAL AND ILLEGAL WORK OVERLAP

By

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Dedication

For my family.

Simon, I could not have done it without you.

Mom, you were with me every step of the way.

Emile, you are my sunshine.

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CHAPTER 1: INTRODUCTION

Over thirty years ago, Sviridoff and Thompson (1983) were among the first to describe the complex nature of the relationship between legal and illegal work. They interviewed 61 adult, male prisoners from New York City's Rikers Island about their experiences prior to and after incarceration. Sviridoff and Thompson (1983) found three main types of relationships between legal and illegal work: Work that averts crime, occurs when work and crime are mutually exclusive activities (although the respondents reported considerable illegal income during periods when they were not working). For individuals in this group, legal and illegal work tended to have the effect of dampening involvement in the other and therefore Sviridoff and Thompson (1983) argued that more or better work opportunities might be effective as a crime deterrent for members of this group. Work that is concurrent with crime, occurs when work and crime were not mutually exclusive activities. Legal and illegal work can overlap for a number of reasons: For some in this group, work had become a way of expanding or enhancing illegal activities. For others, legal and illegal work simply did not interfere with each other. Work could also be used as a cover or expansion for illegal work. Discouraged workers are individuals who have given up on legitimate work altogether and immersed themselves in illegal work. Given their findings, Sviridoff and Thompson (1983: 208; 212) urged researchers and program developers to "acknowledge the extreme variety that remains regardless of attempts at simplification… the concept of an automatic opposition between employment and crime is a false one."

Today, the literature on legal and illegal work is expansive, spanning various disciplines using a wide array of methodological specifications. Despite this expansiveness, scholars have largely focused on examining how work averts crime. That is, legal and illegal work have traditionally been viewed as tradeoffs and legal work is seen as a catalyst to moving away from illegal work or in the case of intensive adolescent work, can induce problem behavior among adolescents. Unfortunately, emphasis on the opposition between legal and illegal work captures only one facet of how legal work is associated with illegal work. For example, participating in both legal and illegal work contemporaneously has been discussed by a number of scholars and has been observed in empirical studies but detailed investigation into legal and illegal overlap has been scant. The purpose of this study is to fill this important gap in our knowledge about the relationship between legal and illegal work by examining an understudied phenomenon – the overlap between legal and illegal work.

The dearth of attention on the overlap between legal and illegal work is not without consequence. First, more attention to the legal and illegal overlap can provide a broader theoretical understanding of the nature of crime generally and moves away from what Laub and Sampson (2001:13) call "simplistic, rigid offender/non-offender categories." Many traditional criminological approaches, with some exceptions, have focused on the mutual exclusivity of legal and illegal activities. Notable exceptions include rational choice perspectives and Matza's (1964) theory of drift. The second chapter will discuss these theoretical perspectives, and others that directly tackle the dual nature of legal and illegal work in detail. To be sure, it is not the case that

traditional theories cannot account for such behaviors but in general, there is a strong tendency for theoretical and empirical work to emphasize the differences between legal and illegal work.

Second, it is rare for offenders to be involved in stable, legal work for extended periods of time. As Sampson and Laub (2005) point out employment is the type of event which is frequently recurring—people repeatedly move in and out of employment over the life course. Similarly, scholars have established that there are within-individual changes over time in offending (Horney and Marshall, 1991; Horney. Osgood and Marshall, 1995; Nagin and Land, 1993). Thus, it is not uncommon for offenders to participate in both legal and illegal work, and oftentimes overlapping the two (Freeman, 1999). Understanding the factors that are associated with membership between legal and illegal work can contribute to both theory and policy effectiveness.

Third, the legal and illegal overlap might be associated with quantitatively and qualitatively different offending patterns than engaging in illegal work only. Specifically, the legal and illegal overlap might be associated with differences in key criminal career dimensions, such as offending frequency and offending variety. It is important to examine the relationship between participation in legal and illegal work and criminal career dimensions, because it can shed light on where the legal and illegal overlap is situated in the criminal career. For example, a lower frequency of offending might suggest that the overlap is associated with less commitment to the criminal milieu and even perhaps is an intermediate step in the desistance process Similarly, if offending during periods of the overlap is associated with engaging in

different types of offenses compared with engaging in illegal work only, it can be informative for both theory and policy.

Finally, a better understanding of the legal and illegal work overlap has important policy implications. Employment has been identified as a key factor in the desistance process and successful reintegration (Sampson and Laub, 1993; Uggen, 2000). Thus, millions of dollars annually are invested in custodial and non-custodial employment programs (Uggen and Wakefield, 2008). Even with such an investment, the effectiveness of non-custodial employment programs is equivocal. Visher, Winterfield and Coggeshal (2005) examined eight experimental evaluations of non-custodial employment programs and found that overall all eight of the interventions had no significant effect on likelihood that the participant would be re-arrested. Wilson, Gallagher and MacKenzie (2000) meta-analyzed 33 experimental and quasi-experimental evaluations of education, vocation, and work programs and found that participants recidivate at a lower rate than non-participants. The results however were greater for education programs than work programs. The limitations of the studies made it difficult to attribute the positive effects to the program. In his overview of the economics of crime, Freeman (1999) stated that contrary to the expectations of many analysts and the public, joblessness is not the overwhelming determinant of crime. He argued that perhaps one of the major reasons why the relationship between joblessness and crime is not strong is that crime and legitimate work are not exclusive activities.

Examination of the legal work and illegal work overlap can potentially provide insight into the heterogeneous treatment effects of work. Studies of the casual

effects of employment on subsequent criminal behavior of individual programs have largely relied on evaluating randomized experimental designs and suggest that employment has differential effects on offending depending on age, types of crime and social roles. Uggen (2000) used data from the National Supported Work Demonstration Project to estimate event history models to examine the effect of work on self-reported recidivism. Uggen found significant effects of work only for offenders age 26 or older. Recently, Uggen and Shannon (2014) found that supported work programs reduce robbery and burglary but not cocaine or heroin use. Work also tends to have stronger effects for offenders who are married or have children (Uggen, Manza and Behrens, 2004). What these findings suggest is that estimating the mean impact of particular work programs in the form of a singular, singular population average treatment effect (PATE) learned from an experimental intervention on the population as a whole is perhaps misleading, or at minimum obfuscating important response heterogeneity among different individuals. In fact, some of the key questions of interest to policy makers concern factors that condition the success of social programs (Heckman and Smith, 1995). This is observed in the work evaluation literature. When researchers look at moderating effects, there is evidence that work programs can be effective under certain circumstances. Therefore, understanding the heterogeneity in treatment effects is potentially helpful to unraveling the effectiveness of work programs.

Taken together, the relationship between legal and illegal work can be multifaceted. Extant theoretical and empirical literature has focused heavily on what Sviridoff and Thompson (1983) call work that averts crime, or how legal work moves

individuals away from illegal work. Yet, researchers have long observed that a good number of individuals engage in both legal and illegal contemporaneously. Despite this consistent observation, inquiry into the nature of the legal and illegal overlap has been limited. This dearth in inquiry has important consequences for both theory and policy. Theoretically, expanding the conceptualization of the nature of legal and illegal work can reveal novel patterns in criminal behavior. In terms of policy, research into the dual nature of legal and illegal work can potentially inform criminal justice policies regarding the processing of individuals who are arrested but also have a legal job. Moreover, it can shed light on the heterogeneous effects of work programs.

The Current Study

The goal of the current study is to take the first steps at understanding the legal and illegal work overlap by placing this phenomenon as a key subject of inquiry. Because the phenomenon has yet to be examined systematically, the first step is to descriptively document population heterogeneity in patterns of legal and illegal. To do this, I estimated group based trajectory models of legal work and illegal work and to model their joint evolution, I conducted dual trajectory model analysis. Second, I examined whether legal economic opportunities are related to the conditional probabilities between legal and illegal work trajectories. Finally, because engaging in both legal and illegal work can be differentially related to key criminal career parameters, I examined the relationship between engaging in the overlap and offending frequency and offending variety. As such, the goal of the present study is to answer three main research questions:

1. Are there heterogeneous patterns of legal work and illegal work? What is the heterogeneity in joint development of legal and illegal work?

2. How are legal economic opportunities related the probability of membership in illegal work, conditional on legal work?

3. How is participation in the legal and illegal work overlap associated with offending frequency and offending variety?

To answer these research questions I used the Pathways to Desistance Study, a unique dataset from a longitudinal sample of serious adolescent offenders. The Pathways study contains detailed measures that are related to participation in legal and illegal work, such as demographics, perceived economic opportunities, and local life circumstances. Importantly, I observed monthly participation for both legal and illegal work over 84 months, which is advantageous for consistent estimation of group based trajectory models.

CHAPTER 2: LITERATURE REVIEW

Prior Conceptualizations of Legal and Illegal Work

Despite the documented prevalence of the legal and illegal overlap, this section will demonstrate that most of the prior literature is focused on examining how legal work moves offenders away from illegal work. Although the focus of the current study is on individual patterns of legal and illegal work, it is important to highlight that macro-level studies also view legal work as moving away from illegal work. In his review Bushway (2011) clearly articulated this position by stating that the reason why unemployment has a positive effect on illegal work is because it increases motivation for individuals who are unemployed.[1] Studies examining the effects of employment have focused on aggregate crime rates and the role of macroeconomic conditions and have revealed small effects of unemployment rates on property crime (e.g. Arvanites and Defina, 2006; Bushway, 2011). Empirical findings also support the legal and illegal work polarization: Rosenfeld and Fornago (2007) measured the relationship between business cycles and crime by examining consumer sentiment and property crime and found an inverse relationship. Raphael and Winter-Ebmer (2001) estimated the effects of unemployment rates and seven felony offenses in the United States. They found significant positive effects of unemployment on property offenses, but no effects on violent offenses.

[1] Cantor and Land (1985) similarly argued that the relationship between employment and crime can operate through a motivational effect, where unemployed individuals are motivated to commit crime because they are out of work and need to fulfill their financial needs. However, the relationship between employment and crime can also operate through routine activities, which predicts that individuals who are unemployed are less likely to spend time in public places and therefore less likely to be victimized.

On the individual level, the relationship between legal and illegal employment is a topic of theoretical debate that revolves around selection mechanisms that explain why individuals who are unemployed also commit a disproportionate share of crime in the population. Some scholars have argued that legal and illegal employment are inversely related due to a reflection of underlying characteristics in the population, such as low self-control (Gottfredson and Hirschi, 1990), cognitive and non-cognitive skills (Heckman, Stixrud and Urzua, 2006), and early personal and family factors (Caspi et al., 1998), whereas other scholars give a causal role to legal employment. Notably, Sampson and Laub (1993) argue that quality work can serve as a turning point in a criminal career. The stronger the ties to work, the less likely an individual would engage in illegal work. Legal work can serve as structure for one's routine activities and serve as a platform to form or strengthen conventional social bonds. As a result, individuals involved in quality legal work would naturally move away from illegal work. Alternatively, scholars have argued that cognitive changes occur prior to legal employment and legal employment facilitates, sustains and reinforces the desistance process (i.e., Giordano, Cernkovich and Rudolph, 2002; Maruna, 2001; Paternoster and Bushway, 2009). The important point to underscore for the purposes of the current study is that prior work conceptualizes legal and illegal work as separate and rarely coinciding. As such, the focus of extant theoretical dialogue is on the causal relationship and temporal ordering of how legal employment moves individuals away from illegal work.

A potential limitation of prior theoretical work is that the conceptualization of the relationship between legal and illegal work is unnecessarily narrow. Therefore it

is not clear whether the findings described in previous studies effectively capture the complex nature of legal and illegal employment. While the empirical and theoretical literature provides important insight into the impact that legal work has on illegal work, this picture may be somewhat limited. For example, Sampson and Laub (1993) examined a sample of males born around the Great Depression and followed them through 45 years of age. Sampson and Laub's central thesis is that involvement in quality employment generates conventional social capital, which are resources embedded in relationships and can bind individuals to societal institutions. They clearly convey their stance on the relationship between legal and illegal work by stating "We believe that adults, regardless of delinquent background, will be inhibited from committing crime to the extent they have social capital invested in their work and family lives" (p. 141). In a follow-up qualitative analysis, Laub and Sampson (2003: 46) remain consistent with their position stating that "strong ties to work can lead to desistance from crime". Despite this conceptualization of the legal and illegal work relationship, Laub and Sampson's (2003) findings unraveled a more complex relationship. They found a group of individuals who did not resemble neither desisters nor persisters and called them intermittent offenders. Laub and Sampson (2003) note that such complexities emerge because of longitudinal data coming from multiple sources.

Giordano and colleagues' (2002) theory of cognitive transformation is another example of how theories of desistance can be dampened by exclusively focusing on how legal work moves offenders away from illegal work. Giordano et al.'s (2002) theory is less structural than the age-graded theory of informal social control. For

Giordano et al. (2002), cognitive change is required before desistance can occur. To examine their theory, they conducted interviews with 127 institutionalized delinquent girls and 127 institutionalized delinquent boys. Their key measures included job stability, attachment to spouse, and attachment to children and their outcomes were self-reported offending and arrest histories. Quantitative findings showed that the effect of job stability on offending was weak, although coupled with marriage in a "respectability package", the effects were stronger. It is unclear in the analysis how individuals who reported being involved in both legal and illegal work were categorized. Interestingly, Giordano et al. (2002) noted that a majority of the respondents in their sample resided in households with total incomes below the poverty line and most of those employed also earned under-the-table wages. This observation suggests that it is likely that many of the respondents in their sample also engaged in legal and illegal work at the same time.

Recent work by Skardhamar and Savolainen (2014) attempt to disentangle the role of employment in offending by looking at the timing of employment in the desistance process but also followed in the tradition of polarizing legal and illegal work. They examine the occurrence of criminal offending (yes/no) in a given month before and after the entry into employment (also as a binary indicator). After conducting spline regressions and group based trajectory models to examine the timing of entry into employment, they do not find support for the work as a turning point hypothesis. Instead Skardhamar and Savolainen (2014) found that illegal work declined prior to finding legal work. Yet it is important to note that there are important methodological concerns about the convergence of their models with

limited cross-sectional power. Consistent with prior literature, their conceptualization of the legal and illegal work dichotomy is clear in their conclusions. They observed that a "typical path to employment involves a period of criminal inactivity lasting two years or more…and most individuals experience no meaningful reductions in criminal activity after employment" (p.287).

The concept of intermittency, or the stopping and restarting of one's criminal career (Piquero, 2004), is yet another example of the separation of legal and illegal work. Glaser (1964) examined the rehabilitative efforts of prison and parole agencies and provided an extensive discussion on variations on post-release trajectories. In doing so, Glaser argued that criminal careers almost always follow a zig-zag path. That is, criminals go from crime to non-crime. Laub and Sampson (2003) also moved beyond persistence and desistance and discussed the intermittent offender. Among the sample of Glueck men, Laub and Sampson note that there were intermittent offenders who followed a zig-zag pattern of crime over the life course. Laub and Sampson (2003) note that the patterns of intermittency are complex but what emerged from the life histories is that intermittent offending is often associated with neighborhood influences where conventional and criminal influences exist side-by-side. Alcoholism was also strongly associated with an erratic pattern of offending. Laub and Sampson found that alcoholic men would exhibit inconsistent offending and engage in offending during episodes of intoxication. Related to the current study, Laub and Sampson's findings suggest that there are external factors that impact individual differences which may be important to the understanding heterogeneity in the sample.

Although not extensive, treatment of the intermittency of offending is relevant here because it departs from the traditional offender/non-offender categories. However, intermittency differs from the topic of the current study – contemporaneous legal and illegal work – because it explains the breaks or pauses in offending, with the break or pauses sometimes being several years long (Baker et al., 2013; Barnett et al., 1989). For example, Barnett et al. (1989) analyzed data from a sample of London males to examine the long-term accuracy of classifying offenders into frequents and occasionals (on the offenders' 25th and 30th birthdays). The authors found that for a few of the men, after several years without convictions they were reconvicted. Horney et al. (1995) examined month by month variation in crime participation among a cohort of felons incarcerated in Nebraska and found that gaps in loss of conventional social capital and increased drug use predicted the odds of offending.

The evidence from labor market experiments also suffer from the conceptual rigidity of polarizing legal and illegal work. These studies are concerned with assessing the effectiveness of in-prison vocational training programs and work-release programs for their ability to reduce recidivism rates for ex-prisoners. As such, the research is primarily limited to studies assessing whether employment decreases the odds of recidivism. For example, in their meta-analysis of eight studies using random assignment experimental designs, Visher et al. (2005) examined the effects of non-custodial employment services for ex-offenders in employment programs. Outcomes of the eight studies were largely self-reported recidivism and/or arrest. The results revealed that the eight interventions had no significant effect on the probability that participants would be rearrested. The weak effects of employment programs have

been echoed in more recent reviews (i.e. Bushway and Apel, 2012; Crutchfield, 2014). The generally weak effects of employment programs are perhaps partially due to the fact that a considerable number of parolees that get re-arrested are employed at the same time. For example Petersilia (2005) has noted that among parolees, reconviction and re-incarceration rates are high despite employment generally being a provision of the individuals' parole. Research suggests that the effect of work programs on reoffending is conditioned by a number of factors (i.e. Uggen, 2000; Uggen and Shannon, 2014). Therefore, understanding the heterogeneity in patterns of legal and illegal work and factors that contribute to how the two are linked can shed some insight into the effectiveness of employment programs across heterogeneous subpopulations of offenders.

To summarize, the vast majority of theoretical and empirical work on legal and illegal work have conceptualized legal work as a catalyst away from illegal work. Theoretical dialogue on the role of legal work in the desistance process tends to assume that work is positively associated with the desistance process and the area of contention is in the timing of legal work within that process. Evaluations of labor market experiments have similarly neglected the idea that legal and illegal work can occur contemporaneously. This disregard could be a reason why there are relatively weak effects of employment programs on recidivism.

Perspectives That Consider the Legal and Illegal Work Overlap

Two classic examples of literatures that do not polarize legal and illegal work are the white collar crime and organized crime literatures. White collar crime and organized crime inherently have legal work and illegal activities intertwined.

Sutherland coined the concept of "white collar crime" to highlight the fact that crimes are committed by individuals in all social classes. Sutherland (1949) defined white-collar crime as "crime committed by a person of respectability and high social status in the course of his occupation." Although Sutherland's definition has been widely criticized due to inconsistency and ambiguity, Sutherland drew attention to both the status of the offender and the location of the offense (the workplace). Clinard and Quinney (1973) further clarified the concept of white collar crime into two types: corporate crime and occupational crime. They focused their definition of corporate crime on illegal behaviors that are committed by employees of a corporation to benefit the corporation, company, or business. In contrast, they defined occupational crime as "violations of legal codes in the course of activity in a legitimate occupation." Since Sutherland and Clinard and Quinney, a number of scholars refined the definition of white collar crime, focusing on the offender subtypes and/or offense types. Nonetheless, the commonality among extant definitions of white collar crime is the emphasis on the importance of offender status and power (Simpson, 2012).

Similar to white collar crime, there is not a universal definition of organized crime. However, unlike white collar crime, organized crime is not always characteristic of a legal work and illegal activities. Maltz (1976) for example notes that although there are many good reasons for organized crime groups to diversify into legitimate businesses, not all criminal organizations have legitimate enterprises in addition to their illegitimate enterprises. Nonetheless, it is common for an "organization" to not be exclusively involved in illegal market activities and also be involved in legal enterprises (Paoli, 2002). The task force on organized crime in 1967

and the President's Commission noted that crime organizations use illegitimate methods along with legitimate businesses and labor unions to forward their interests (Schelling, 1971). According to Hagan (1983) one of the key dimensions of organized crime is that criminal organizations have the ability to penetrate legitimate businesses. Even though the legal and illegal overlap are inherent in both white collar crime and to a lesser extent organized crime, the focus of the current study differs because the offenses considered here are characteristic of regular street offenses rather than offenses specifically associated with power and status in the workplace or part of an organized criminal network.

In addition to the white-collar and organized crime literatures, two theoretical perspectives that move away from offender/non-offender categories are the rational choice/economic perspective and Matza's theory of drift.

Rational Choice Perspectives

The basic premise of the rational choice perspective is that people, including offenders, are rational actors. The rational choice perspective can be traced back to Bentham (1789) and his presentation of human nature. In the introduction to *the Principles*, Bentham argued that humans are governed by two drives – pleasure and pain. Pleasure and pain operate through the notion of utility. That is, activities that bring pleasure provide utility whereas those that bring pain provide disutility, this is also known as the hedonistic calculus. From the rational choice perspective, humans will engage in activities that bring the most utility. Prominent scholars who have brought the rational choice perspective to the contemporary study of crime are Gary Becker (1968) and Cornish and Clarke (1986).

A foray into economics of criminal behavior was the work of Becker (1968). Becker specifically rejected the idea of motivations for criminal behavior based on explanations other than choice and argued that criminal behavior does not need to be explained with special theories such as psychological theories or the inheritance of special traits. A simple extension of the economist's usual analysis of choice is all that is required to explain criminal behavior. Becker re-introduced the notion of expected utility. Becker (1968) asserted that a person commits an offense if the expected utility to him/her exceeds the utility he/she could get by using his/her time and other resources at other activities. Becker noted that in the decision to engage in crime, individuals consider the costs and benefits of both crime and non-crime activities. Clarke and Cornish (1985) also presented the rational choice perspective as an alternative view to other strict dispositional theories and environmental theories. In their book, *The Reasoning Criminal*, Cornish and Clarke (1986) argued that rather than general and global explanations, criminological explanations should be more crime specific and consider situational factors. Cornish and Clarke also argued that the rational choice approach requires a fundamental distinction regarding criminal involvement and criminal events. Criminal involvement refers to the process whereby individuals choose to become involved, persist in or desist from offending. Criminal events on the other hand primarily concern immediate circumstances and situations.

The rational choice perspective is especially beneficial for understanding the legal and illegal work overlap because it assumes that criminal behavior requires no special motivation and behavior is a product of the utility of an individual’s actions. An important implication of the rational choice perspective is that criminals respond

to incentives just like non-criminals – an individual's decision to engage in illegal work is not qualitatively different from his/her decision to engage in legal work. Through this lens, all things being equal, the action with the greatest utility will be selected among alternatives. Therefore, the decision to commit crime will be influenced by the financial returns it offers in comparison to competing legal opportunities, at the margins. Cornish and Clarke's differentiation between criminal involvement and criminal events is also relevant for the current purposes because it highlights that factors that affect whether or not an individual participates in illegal work generally can differ from the frequency of engaging in illegal work to due to situational circumstances. For example, Freeman (1996) observed that depending on available opportunities, disadvantaged youth shift back and forth between low-wage labor markets and crime, often engaging in both at the same time.

Time allocation models are an application of the rational choice perspective. The objective of time allocation models is to explain how an individual allocates his/her time between various activities (Sjoquist, 1973), for instance work and leisure in its simplest form. Such as housework Becker (1965), women in the labor market (Mincer, 1962), education and training (Becker, 1962) and leisure and home production (Gronau, 1977). Extensions of the time allocation model have been made to crime. These models view individuals as deciding to allocate time with illegal activity as one possible way to allocate one's time and participation in each activity is associated with gains and costs from each respective activity. Factoring into the decision to participate in illegal activity are the expected incentives and expected risks of the respective behaviors and the choice between legal and illegal work to

maximize expected utility. Ehrlich (1973) was among the first economists to examine the time allocation model in terms of legal and illegal activity by incorporating punishments and rewards for both legal and illegal activities. Ehrlich (1975) also presented participation in illegal activities as an occupational choice whereby individuals decide how to optimally allocate their resources under uncertainty rather than specify each activity as decision between mutually exclusive activities. Ehrlich (1975) argued that the decision to engage in illegal activity is not inherently an either/or choice. Rather individuals combine various legal and illegal activities or switch from one to another throughout their lifetime. To test that offenders are in fact incentive based, Ehrlich examined variations in index crimes across a number of states in the US in 1940, 1950 and 1960 and found that participation in crime was associated with the gains and costs of criminal activity. Specifically, Ehrlich found that shifts in legitimate labor-force participation, an indicator of time spent in the legitimate market, were inversely related to shifts in property offenses. These results suggest a substitution effect of legal work and illegal work.

Since Ehrlich, a number of economists have also extended time allocation models to legal and illegal activities. Heineke (1978), for example, developed a time allocation model whereby the allocation of time to legal activities is independent of allocation of time to illegal activities but allocating time to illegal activities is dependent on legal activities. Schmidt and Witte (1984) developed a more complex model of time allocation, which allows for an individual's level of utility to differ depending on the time allocation and wealth or income. Moreover, Schmidt and Witte

allow for leisure time to vary and affect utility, depending on legal or illegal work. Notably, Grogger (1998) examined the responsiveness of youth crime to labor market incentives. Grogger (1998) utilized data gathered from the 1980 crime section of the National Longitudinal Survey of Youth (NLSY) in a time allocation model of crime participation. Grogger (1998) observed that almost everyone in his sample worked in the legal labor market and thus "the goal of [his] model should be to explain crime in a world in which almost everyone works on the labor market" (p. 759). As such, Grogger (1998) assumed that an individual will choose to work if the market wage offer exceeds the reservation wage. That is, an individual will choose to commit crime if the returns to crime for the first hour of activity exceed the reservation wage. There are two primary implications of this assumption. First, consumers choose how much time to spend participating in criminal activities and then how much time to spend working in the legitimate labor market. Second, the consumer optimizes his utility through legal wage offers and criminal returns. Grogger found that an increase in the legal wages reduced the crime participation rate, suggesting that young men are responsive to wage incentives.

Time allocation models are helpful in examining the legal and illegal overlap because they conceptualize crime as a form of work. For example, Grogger (1998: 758) noted, "consumers decide how much crime to commit and how much to work on the market as a function of their returns to crime…an hour spent committing crime causes no more disutility than an hour spent working." Time allocation models also place both legal and illegal work into one model, and generally examines how individuals maximize their utility by engaging in the optimal number of hours for

each activity. Despite this, time allocation models of legal and illegal work have not gained much traction in criminological discourse for several reasons. First, as previously mentioned, there has been little theoretical and even less empirical attention devoted to examining the legal and illegal overlap. Models directly accounting for the possibility that individuals can be engaged in both legal and illegal work simultaneously would not be at the center of inquiry if the focus of the criminological discourse has been on explaining differences between offenders and non-offenders. Second, unlike models that explore consumer's allocation of time, usually between work, leisure and home production (i.e. Gronau, 1977), development of time allocation models of legal and illegal work have been hindered by lack of data. Much of the empirical research conducted on the economics of crime has utilized data from the NLSY 1979. However, there are drawbacks to the NLSY. The 1979 NLSY contained a special module that asked respondents whether they committed specific types of crimes during 1979 and how much of their income was derived from crime. However, the illegal income based measure is crude – respondents were asked what fraction of their income came from crime (none, very little, about one fourth, about one-half, about three-fourths, or almost all). Further, the NLSY does not contain information regarding the number of hours spent engaged in illegal work or attitudes towards risk.

Delinquency and Drift

Matza (1964) is arguably the most notable scholar who devoted much of his time to refuting the traditional delinquent/non-delinquent distinction. The primary purpose of Matza's theory of drift was to modify the positivists' portrayal of the

delinquent. Positivists negated the notion of free-will and criminal behavior took the form of hard determinism. Matza (1964) believed that delinquency was not pre-determined by radically different constitutional, personal, or socio-cultural factors, but rather "men vacillate between choice and constraint… most men, including delinquents are neither wholly free nor completely constrained but fall somewhere in between" (p.8:27). Instead, Matza (1964) observed that the nature of delinquency was not permanent but rather intermittent and transient. Delinquents are both capable and involved in conventional roles and activities who are intermittently involved in delinquency. According to Matza (1964), most individuals are distracted or restrained by convention from committing offenses. However, episodically, he/she is free to drift into delinquency. While the state of drift is not a sufficient condition for delinquency, it is a necessary one. Once in drift, individuals have free will and are likely to choose delinquency due to subcultural influences. To be sure, during most of a delinquent's life, and for almost all of the lives of more conventional youth, he/she may not choose to commit an offense. But when an offense does occur, Matza's drifting delinquents use learned neutralization techniques, which makes the offense morally tenable. To make the offense possible, they rely on past criminal experiences (preparation) or are found in extenuating circumstances, which simultaneously releases moral constraints and prompts individuals to gravitate towards delinquent peers.

Matza's theory of drift is helpful in understanding the legal and illegal work overlap for several reasons. First, Matza (1964) argued that holding onto rigid theoretical assumptions can induce researchers to ignore discrepancies or patterns that

may be observed in the empirical world and can result in losing what is essential in the character of the delinquent enterprise. Although, Matza was referring to the positivist school assumptions, this statement suggests that theoretical assumptions, in general, can serve as blinders to observed empirical realities. In the current context, engaging in legal and illegal work contemporaneously is a well-documented phenomenon but is not conducive to certain theoretical assumptions. Second, Matza discussed the intertwined nature of conventional and unconventional traditions or cultures. He argued that a "subculture of delinquency stands between convention and crime, committed to neither, influenced by both….the subculture of delinquency itself is a synthesis between convention and crime and that the behavior of many juveniles, some more than others, is influenced but not constrained by it" (p. 48). This portrayal of the overlap between conventional and deviant subcultures lays the groundwork for the idea that values and customs do not have to be solely conventional or deviant – it is possible for individuals to hold both. Finally, Matza placed emphasis on intermittency of delinquency, but has also made reference to the simultaneity of conventional and unconventional activity. For example he stated "Concomitant with his illegal involvement, he actively participates in a wide variety of conventional activity…he is committed to neither delinquent nor conventional enterprise" (p.28). Although Matza's theory is often evoked to describe intermittent/zig-zag offending (i.e. Laub and Sampson, 2003; Piquero, 2004), it is clear that his theory is relevant for explaining why individuals engage in both conventional activities and crime.

Ethnographic Work

Contemporaneous participation in legal and illegal work has also been depicted in number of ethnographic works. These ethnographic works provide an in-depth look at communities where the lines between legal and illegal work is blurred. They also provide insight into the mechanisms that allow individuals to be involved with both legal and illegal work. While there are several notable works that shed light into the legal and illegal work overlap, two prominent pieces are Whyte's *Street Corner Society* (1943) and Sullivan's (1989) *Getting Paid*.

Whyte's (1943) work is especially useful because it depicts the community of Cornerville, an Italian slum, which upon first glance can be classified as socially disorganized. However Whyte observed that what appears to be disorganized can be a form of differential social organization, which is in fact highly organized and integrated. There are two types of young men in Cornerville: the cornerboys and the college boys. The corner boys congregate on the corners and street and make up the majority of the lower end of the community whereas the college boys are a small group of boys with promising upward mobility attained through education. The influential individuals in Cornerville however are the racketeers and politicians. Illegal gambling and bootleg liquor outlets were highly organized and meshed with the legal businesses in the community. Whyte (1943) noted that many of the rackets in the community invested in a "large number of legitimate enterprises…from the racketeer's standpoint there are several advantages to having legitimate business interests...The racket functions in Cornerville as legitimate businesses function elsewhere. The racketeer patterns his activity after the businessman and even strides

to gain respectability so that he may become accepted by society at large as he is accepted in Cornerville" (p. 146). Many of the cornerboys aspired to become involved with the rackets and often referred to their low-level involvement as work. For example, Whyte observed that the racketeers perform the important function of providing employment for a large number of men, in all their activities – legal or illegal.

In *Getting Paid,* Sullivan (1989) placed greater emphasis on structural constraints than Whyte. Sullivan (1989) was dissatisfied with traditional explanations of criminal behavior, which includes biological, psychological, and subcultural. Sullivan emphasized the economic aspects of criminal behavior. Sullivan's work revealed that many young men face restricted economic opportunities and look to crime as a way of "getting paid". The semantics of "getting paid" demonstrates that these young men view crime as a means of work. Further, many of the men are very conscious and deliberate in their actions regarding what kind of activities they engage in. Sullivan (1989) developed an interactionist approach to crime whereby values are embedded in community contexts (which do not differ dramatically from the wider society but are more specific to local life circumstances). For Sullivan, structure and context mixes with individual diversity and human agency.

Sullivan (1989) conducted a comparative ethnography of three neighborhoods in Brooklyn, New York: BaBarriada, Projectville and Hamilton Park and applied segmented labor market theory to inform the portrayal of the different career paths within each of the neighborhoods. Segmented labor market theory suggests that there are at least two labor markets: primary, which includes steady and well-paying

employment and secondary, which includes low-wage jobs, informal work, and crime. Activities in the secondary market must be alternated as none of the activities alone are sufficient to make a living. Sullivan noted that the seriousness of criminal activity was dependent on the availability of access to local opportunities. For neighborhoods like LaBarriada and Projectville, where the opportunities were limited, drug dealing was a career for youth and adults alike. However in Hamilton Park, a predominately white neighborhood, where there was access to legal jobs for most of the youths, drug dealing was a way to supplement legal wages. Similar descriptions to Sullivan's have been offered among various ethnic groups, in different cities. For example, among inner city males in Philadelphia (Anderson, 1999), Puerto Rican youth in Chicago (Padilla, 1992), and youth in Manhattan (Fagan, 1992).

Ethnographic studies have implications for the current study because they move beyond individual level factors and point to the fact that economic structural constraints can allow individuals to view crime as a valid form of work. The choice between legal and illegal work is partially dependent on opportunities and are interchangeable. That is, youth who have structural constraints readily shift between legal and illegal work making the elasticity of the supply of crime high. Moreover, the notion of constrained choice is underscored in these ethnographic accounts of inner city youth. Fagan (1992) for example discusses how youth involved with drug dealers can have further incentive to have a legal job. Factors such as expanding social capital (both conventional and criminal), building human capital, and investing in a contingency plan if dealing does not work out (Fagan, 1992).

In general, theoretical and empirical literature tend to polarize involvement in legal and illegal work. Specifically, legal work is conceptualized as a factor that helps individuals move away from illegal work. Empirical observations however show that the relationship between legal and illegal work is much more complex. In line with Sviridoff and Thompson's (1983) observations over thirty years ago, a good number of individuals engage in legal and illegal work concurrently. Examining the complex nature of legal and illegal work can potentially be fruitful for expanding the understanding of the nature of crime in general and could potentially inform help with understanding of the effectiveness of employment programs.

Research Question One: What We Know about the Legal and Illegal Work Overlap

Although a number of scholars noted that it is not uncommon for legal and illegal work to coincide (e.g. Fagan, 1992; Freeman, 1999; Reuter et al., 1990), discussions of the legal and illegal work overlap are limited in scope and usually arise from secondary findings and not from the main research questions. Previous studies provide valuable aggregate rates of prevalence of involvement in both legal and illegal work but they tend to be within smaller samples, such as snowball drug dealing samples. Given that involvement in both legal and illegal work is fairly common and has important consequences for contemporaneous involvement, detailed and systematic inquiry into the legal and illegal work overlap is essential.

Freeman (1999: 3543) examined employment and criminal activity among disadvantaged youths in the 1980s and observed that the majority of individuals who participate in the illegal sector simultaneously derive income from legitimate jobs and argued that the legal and illegal work dichotomy is an oversimplification. He noted

the various ways that legal and illegal work can overlap: "The border between illegal and legal work is porous, not sharp. Some persons commit crimes while employed – doubling up their legal and illegal work. Some persons use their legal jobs to succeed in crime. Some criminals shift between crime and work over time, depending on opportunities." Some young people may view criminal activities as an attractive alternative to legitimate labor market opportunities. These youth may consider all available economic opportunities, both legal and illegal, in the labor market. In a sense, they are entrepreneurs, choosing the combination of criminal and legitimate activities that produces the highest expected utility, accounting for the possibility of arrest and incarceration and the social stigma associated with crime.

Witte and Witt (2000) discussed traditional economic models and similarly noted that the dichotomy between either criminal activity or legal activity is an oversimplification. They also recognize that individuals could engage in criminal activities while employed since legal work can provide have greater opportunities to commit crime. Some offenders may choose to supplement work income with crime income in order to satisfy their needs. They go on to further argue "one problem with most work and crime models is that they assume both activities are mutually exclusive. This may be a problematic assumption when considering disadvantaged youth. The fact that a youth can shift from crime to an unskilled job and back again or can commit crime while holding a legal job means that the supply of youths to crime will be quite elastic with respect to relative rewards from crime vis a vis legal work or to the number of criminal opportunities" (p. 11). Horney et al. (1995) examined short-term intra-individual changes in crime in response to life circumstances, such as

employment, drug use and marriage. Using a sample of incarcerated male felons from the Nebraska Department of Corrections, they found that surprisingly, the odds of committing a property crime increased by 28% in the months when men worked. They rationalized their findings by stating that legal employment can potentially provide increased opportunities to commit property crimes such as theft, forgery or fraud in the workplace.

Correctional scholars have also documented that there is a substantial legal and illegal work overlap. Lynch and Sabol (2001) looked at the characteristics of the prison re-entry population and noted that two-thirds of the offenders were employed prior to prison entry. Recently, LaVigne (2014) noted that many offenders had employment before they were incarcerated and upon release, offenders actively want and seek legal employment. Beyond obtaining employment, which many eventually do (Western, 2002); job retention is a key factor in the desistance process. LaVigne (2014) argued that policy makers acknowledge that the vast majority of offenders do not pursue illegal activities on a full-time basis; most hold down some form of legal employment. One reason for returning to crime after incarceration is that former prisoners earn relatively low wages and supplement their income with illegal work. LaVigne (2014) noted that parolees who earned less than $7 per hour were twice as likely to return to prison compared to those who earned more than $10 an hour. Work is likely to be a key element of most effective reentry programs, but expanding the types of inquiry regarding the precise nature of work in desistance is required to identify its role in the desistance process. Given the obstacles to finding stable employment, it is also likely that many ex-inmates who work will continue to engage

in a mix of legal and illegal activities (Piehl, 2003). Therefore, even though work programs appear to be effective for some individuals, continuation of illegal work may be a reality.

In addition to scholars discussing the legal and illegal overlap, there have been empirical observations, across various samples, that show legal and illegal work often take place during the same period. Table 1 summarizes the literature that has documented the phenomenon of engaging in both legal and illegal work contemporaneously. Two striking results emerge from Table 1. First, the prevalence of the legal and illegal overlap is non-negligible. Approximately 20% of the samples across the studies were involved in both legal and illegal work. Second, there is remarkable consistency across studies regarding the prevalence of the legal and illegal work overlap. Using data from the National Supported Work Demonstration Project, which consists of ex-addicts, ex-offenders, and young school dropouts, Thompson and Uggen (2010) reported that approximately 27% of the sample reported receiving earnings from a combination of legal and illegal income. Viscusi (1986) found that 24% of inner-city youths who reported engaging in criminal behavior also had legal jobs. Similarly, Fagan (1992) looked at the legal and illegal monthly income of inner city youth from two neighborhoods in New York. In addition to income from illicit activities, approximately 25% of the youth in his sample earned money from formal sources. Reuter and colleagues' (1990) findings that about 60% of the drug dealers in their sample reported working fulltime and selling drugs is much higher than what is reported in the other studies. One possible reason is that Reuter's sample consisted of adult males where employment is commonplace, as opposed to the

adolescent or young adult samples in the other studies. These studies provide important accounts of the prevalence of individuals who engage in legal and illegal work, and demonstrate that participation in legal and illegal work is not uncommon. Curiously however, no study to date has focused on systematically examining the contemporaneous nature legal and illegal work.

Table 1. Prevalence of Contemporaneous Legal and Illegal Work

Study	Data source	Sample	Measures	Findings
Sviridoff and Thompson (1983)	Misdemeanants scheduled for release from the New York City Correctional facility (1978)	61 adult males incarcerated at Riker's Island	Qualitative reports of involvement in legal employment and criminal offending	Work that is concurrent with crime is common (no percentage given)
Viscusi (1986)	NBER Survey of Inner-City Black Youth (1979-1980)	2,358 Black youth (15 to 24 years old)	Employed: current employment Criminal income in past month	20% monthly overlap
Reuter, MacCoun and Murphy (1990)	Drug dealers in Washington, DC (1988)	168 probationers in Washington, DC with recent history of drug dealing	Employed: earned money from legitimate source Earned money from selling drugs	80% some employment 60% employed full time Target period (6 months before entering probation)
Fagan (1992)	Snowball sample from Washington Heights and Harlem (1988-1989)	452 drug sellers Washington Heights 551 drug sellers Central Harlem	Formal and informal work Income from drug selling	Washington Heights : 27% (lone-sellers) 32% (group-sellers) Central Harlem : 23% (lone-sellers) 18% (group-sellers) Monthly overlap
Grogger (1998)	National Longitudinal Survey of Youth (1980)	1,134 males (17 to 23 years old) neither in school or in military	Employed: positive weeks worked in 1979 Earned any income from crime in 1979?	23% annual overlap
Thompson and Uggen (2010)	National Supported Work Demonstration (1975-1979)	4,927 ex-offenders, ex-addicts, and youth dropouts	Earned income from legal job and earned income from illegal work	27% monthly overlap

This section provided a summary of work that has recognized that legal and illegal work do indeed overlap. Even though some scholars argue that looking at legal work as a transition away from crime is an oversimplification and have provided commentary on the various ways that legal and illegal work can overlap, knowledge is limited to aggregate prevalence rates. The current study moves beyond aggregate prevalence rates to answer the first research question by explicitly considering heterogeneity in participation in legal and illegal work.

Research Question Two: Legal Economic Opportunities and Participation in Legal and Illegal Work

Participation in legal work and participation in illegal work are central processes within young offenders' entry into adulthood. Entry into illegal work as a consequence of limited legal economic opportunities has been well established (i.e. Crutchfield and Pitchford, 1997; Edelman, Holtzer and Offner, 2006; Sullivan, 1989). According to Crutchfield and Pitchford (1997: 93), "the pattern of one's employment or lack of employment influences the degree to one's criminal involvement". For example, they argue that marginal employment or transitory employment can in fact facilitate criminal opportunities. The prior research question focused on documenting the heterogeneous patterns of legal and illegal work, which involved estimating the trajectories of legal and illegal work, allowing for both patterns to change over time. Additionally research question one examined the interrelationship between legal and illegal work with dual trajectory analysis, which provides conditional and joint probabilities of membership between the legal work groups and illegal work groups. The current research question considers if legal economic opportunities are related to

the conditional probabilities between the legal and illegal work groups established in research question one.

Reduced legal economic opportunities have consistently been cited as a key correlate of engaging in illegal work. Ethnographic work elucidates the idea that individuals engage in illegal work because of the structural constraints, such as neighborhood deprivation and blocked legal opportunities. Sullivan (1989) for example draws attention to the secondary labor market which is characteristic of low-wage jobs, informal work, and crime. Sullivan (1989) observes that engaging in criminal activity was dependent on the availability of access to local legal opportunities. These structural constraints are associated with a form of adaptation which allows individuals to view crime as a valid form of work. Thus, legal and illegal work tends to be interchangeable, depending mainly on opportunities that are available. Horowitz (1983) studied Chicanos residing in an impoverished Chicago community. She found that even though members of the community value involvement in legal work, many of them remain engaged in illegal work. This is because there are few good opportunities so it is acceptable to be involved in illegal activities to supplement legal wages. The young men in Horowitz's study hedge their bets for future success by remaining in illegal work, regardless of their legal work status. Thus, the lack of legal opportunities in one's neighborhood should be associated with a higher probability of membership in a relatively high illegal group.

The strain perspective has historically focused on the role of blocked legal economic opportunities in acquisitive crimes and is therefore important to the current study. Drawing from Emile Durkheim's work on suicide (1897), Merton (1938; 1968)

argues that society is separated into two parts: structure and culture. The culture of American society is centered on monetary wealth yet society is structured in a way that does not allow the same opportunities for all individuals to achieve monetary wealth, especially in the lower levels of the social structure. The disjunction between the emphasis on monetary success and the limited opportunity structure causes society to be anomic. More specifically, Merton hypothesized that the disjunction between expectations and aspirations propel individuals into deviance. Cloward and Ohlin (1960) are perhaps the most direct in their discussion of how blocked access to legitimate opportunities varies across communities, and how this blockage increases the likelihood of antisocial activities. General strain theory broadened the scope and posited that strains, events or conditions disliked by individuals, is a psycho-social phenomenon that stems from various sources, including economic strain (Agnew, 2006).

A number of studies demonstrate that economic dissatisfaction is associated with income generating crime. For example, Cernkovich and colleagues (2000) found that among Whites, dissatisfaction with one's economic situation and unemployment was associated with a higher likelihood of engaging in economic crimes. Recently Rebellon et al. (2009) conducted a randomized experiment with college students to examine the relationship between economic strain and likelihood of theft. The authors found that individuals who experienced a disjunction between expected and actual outcomes experienced negative emotionality (anger) and reported a significantly higher likelihood of committing theft from an employer.

The anomie tradition is particularly relevant for the current study. Merton (1968) underscores the notion of relative deprivation, which can be thought of as people's perceptions of their well-being relative to comparable others. That is, reference groups most commonly come from the same social groups and individuals that a person has direct social interaction with. For Merton, it is insufficient to examine objective factors such as poverty or inequality, and instead we must try to consider the factors that regulate the relationship between objective and subjective status. Agnew et al. (1996) suggests that "dissatisfaction or strain may occur at all class levels, and [this] may help to explain the weak effect of stratification measures on crime. Agnew argues that "Although one's 'objective' position in the stratification system is important, one's subjective interpretation of that position may be even more important" (p. 695). As such, pecuniary success affects individuals in all social strata, from the well-to-do to the impoverished. This underscores two important points. First, *perceptions* of legitimate opportunities and the expectations/aspirations gap are subjective measures that should be more relevant to membership in illegal work, rather than objective deprivation. Second, the expectations/aspirations gap should be positively related to illegal work regardless of one's legal work status.

Second, an individual's legal work status is important to consider when examining the economic expectations/aspirations gap and instrumental offending. Although Merton (1938; 1968) focuses on economic crimes in the lower class, he acknowledges that innovation exists even at the top of the economic levels. He cites American robber barons, who were at the top of American social strata but nonetheless committed white collar crime. Merton (1968: 198) also discusses

respectable middle-class individuals who commonly engaged in "off the record crimes". It is important that legal work should be considered when estimating the probability of engaging in illegal work because both legal and illegal work present a means to the goal of economic success and can be substitutes or complements to achieving the "American Dream". In fact, previous studies show that engaging in both legal and illegal work results in greater income than participating exclusively in legal or illegal work. Reuter et al. (1990) also found that drug dealers who were also working a legal job made more than those who were only dealing and recently Thompson and Uggen (2012) found that offenders who engaged in both legal and illegal work earned *more* money than those who worked only legally or only illegally. When individuals begin to innovate, they use the most expedient means, including crime, to pursue goals.

Only a few studies have considered strain in instrumental offending and have accounted for legal employment but the measures of legal employment were not very detailed. Burton et al. (1994) examined the relationship between the expectations/aspirations gap, perceptions of blocked economic opportunities and relative deprivation and self-reported instrumental offending among adults. Results suggest that blocked economic opportunities, relative deprivation significantly predicted adult instrumental offending. They account for annual household income and it did not surface as significant. Baron (2004) also used relative deprivation as predictors of strain: the level of respondents' satisfaction/dissatisfaction with their monetary status and respondents' to give an overall ranking of themselves relative to others in society. Results indicated that the monetary dissatisfaction predicted

property crime, while the second more inclusive operationalization predicted property and violent crime. The study controlled for unemployment but it was not significantly related to the outcomes.

The current study examines the disjunction between economic expectations and economic aspirations as an indicator of legal economic opportunities and a blockage of legitimate goals. It is expected that the greater the disjunction between economic expectations and economic aspirations will be associated with a greater probability of membership in a higher illegal work compared with lower illegal work groups. Horowitz (1983: 160-164) discusses the notion of the American dream in an inner city Chicago neighborhood:

> "The acceptance of hard work is consistent with both the American dream and the honor code. For the former hard work is instrumental to success; for the latter it is critical so that a man can support his family in order to retain his authority and respect of others…working a traditional job is viewed as the correct means to earn a living. Some people use illegal means to supplement income and, while not considered the proper means to obtain a living, they are often regarded as ethically neutral, that is, situationally adaptive."

The quote above suggests that even though an individual subscribes to the conventional means of obtaining the American dream, blocked opportunities can increase the probability of engaging in illegal work in addition to legal employment and therefore both should be considered when assessing the relationship between legal economic opportunities and illegal work.

To be clear, research question two is not a test of anomie/strain theory but rather is guided by the idea, originally forwarded by Merton (1968), that the economic "expectations and aspirations" gap is associated with greater probability of criminality. I extend this idea by positing that the greater the disjunction between

economic expectations and aspirations should be related to the probability of belonging to a group with a high probability of engaging in illegal work *conditioning* on legal group membership. Put another way, the relationship between legal and illegal work should be conditioned by legal economic opportunities, which is operationalized in three ways: neighborhood conditions, perceived legal opportunities and the disjunction between economic expectations and aspirations.

Although emphasizing legal economic opportunities, I also acknowledge other factors might be important to account for when considering the relationship between legal and illegal work. For example, individual level factors such as impulse control and future orientation are also likely be associated with the conditional probabilities of legal and illegal work. Impulse control is a personality trait often associated with risk taking and can provide additional incentives to illegal work besides monetary returns (e.g., Katz, 1988; Wood et al., 1997). Further, individuals who are low in impulse control tend to have "hesitation over risky monetary prospects even when they involve an expected gain" (Rabin and Thaler, 2001: 219). Research on risk aversion suggests that individuals who are adverse to thrill or risk are less likely to embark on activities that are less certain (Holt and Laudry, 2002; Lattimore and Witte, 1989). There are few activities that are inherently more risky than illegal work. McCarthy and Hagan (2001) examined a sample of homeless youth and found that risk preferences were associated with income from drug selling. Risk-adverse youth made the least amount of income from drug selling.

Future orientation can also play an important role with different pathways to legal and illegal work. Future orientation is a term that has been used to loosely

describe the ability of an individual to think about, plan for and have control over future circumstances (Steinberg et al., 2009). Studies investigating individual differences in future orientation suggests that individuals who have weaker orientation to the future tend to engage in more risky and delinquent activities (Cauffman et al., 2005; Robbins and Bryan, 2004; Steinberg et al., 2009). While more risky, the payoffs to illegal work are likely to be more immediate and lucrative compared to the legal work that many offenders have. Thus although the illegal incentives are lucrative or structural impediments are present, individuals who are risk adverse are less likely to be involved with illegal markets. Conversely, individuals with weak future orientations may not need strong illegal incentives to engage in illegal work in addition to legal work.

Early offending onset is associated with longer and more prolific offending careers (LeBlanc and Frechette, 1989; Moffitt, 1993). Early offending onset is also associated with early contact with the criminal justice system (Delisi, 2006), making it difficult to obtain legal employment. Early onset is also associated with a host of analogous antisocial behaviors, making it more difficult to retain legal employment. It is therefore reasonable to assume that early onset would reduce the probability of being in a stable legal employment trajectory.

Fatherhood is a transition that many men experience as transformative (Laub and Sampson, 2003). On one hand, parenthood may reduce criminal behavior by increasing pressure for social conformity, such as for employment and provision of adequate housing and care for the child. For example, Kerr et al. (2011) find that criminal activity decreased following the birth of men's first biological child.

Recently, Yule, Pare and Gartner (2014) interviewed incarcerated women about their criminal activities post motherhood and found having children reduces women's involvement in criminal activities. On the other hand, children can create an imperative for financial resources that some individuals cannot accommodate legally. In this situation, parents may be inclined to engage in illegal work to supplement their legal income. In their analysis of 566 women from the Toledo Adolescent Relationships Study, Giordano et al. (2011) find that the effect of motherhood on offending is conditioned by socio-economic status and cognitive factors. For example they show that more highly disadvantaged young women are less likely to reduce their criminal behavior after becoming parents than are more advantaged young women.

Parental social position is highly correlated with an individual's well-being and own socioeconomic standing (Huurre, Aro and Rahkonen, 2003). There are a variety of mechanisms linking socio-economic status to child well-being. Most applicable to the current study is high parental socio-economic status can provide individuals with a number of resources and assets such as social capital (resources achieved through social connections) (Burt, 1997) and financial capital (Bradley and Corwyn, 2002). Therefore, young individuals who have higher parental social status tend to have better economic opportunities and less likely to resort to illegal work to supplement their legal wages.

In sum, past research suggests that legal economic opportunities play an important role in why individuals look to illegal work in addition to legal work. For example, ethnographic works and the anomie/strain tradition argue that structural

factors and blocked legal opportunities can push individuals to engage in illegal work, despite already having legal work. Research question two examines the relationship between legal work and illegal work by considering whether or not legal economic opportunities condition the conditional probabilities between legal work and illegal work. In addition to legal economic opportunities, I recognize that other factors can impact the relationship between legal and illegal work patterns. For example, an individual's social bonds to children or individual factors such as age of onset, impulsivity or future orientation can all be related to the conditional probabilities of legal and illegal work.

Research Question Three: The Legal and Illegal Overlap and Offending Frequency and Offending Variety

Embarking on different pathways with respect to legal and illegal work may also have unique contributions to patterns of stability and change of offending over time. The criminal career perspective is uniquely well suited to examine the outcomes of the legal and illegal overlap. The suitability of a criminal career perspective is exemplified by Blumstein, Cohen and Hsieh (1982: 5) who stated the criminal career perspective "does not imply that offenders necessarily derive their livelihood exclusively or even predominately from crime; instead, the concept is intended only as a means of structuring the longitudinal sequence of criminal events associated with an individual in a systematic way." Key criminal career dimensions include initiation (onset), continuation (persistence), frequency of offending, crime type mix (escalation, offending variety), and the cessation of the behavior (desistance) (Piquero, Farrington and Blumstein 2003). Research question three examines the relationship between criminal career dimensions and the legal and illegal overlap. In

particular, frequency of offending and offending variety will be examined. Looking at the quantitative (frequency) and the qualitative (variety) nature of offending can offer insight into if and how participation in the legal and illegal overlap is different from participation in illegal work only. Such initial insights are important for situating the legal/illegal overlap within the criminal career.

Frequency of Offending

The frequency of offending of individuals who are engaged in crime often is referred to as a rate, λ (Blumstein et al, 1986). Since Wolfgang et al.'s (1972) seminal study that found that a small proportion of offenders commit the vast majority of crimes, frequency of offending is one of the key dimensions in the criminal career because of its methodological and policy implications. A number of earlier studies focused on using of self-reports to estimate λ for adult offenders (i.e. Chaiken and Chaiken, 1982; Greenwood, 1982; Horney and Marshall, 1991) and have similarly found that a small number of offenders are responsible for a disproportionate number of crimes. Identification of high-rate offenders is of great interest to policy makers – by identifying and selectively incapacitating these high-rate offenders, scarce resources can be used more efficiently (Horney and Marshall, 1991). Further, estimating the number of crimes that would be prevented if an offender was incapacitated is a key concern for cost-benefit analyses of incarcerating offenders.

Examining the relationship between frequency of offending and the legal and illegal overlap is important because theoretically, it is not clear whether participating in legal and illegal work is associated with a lower offending rate than engaging in illegal work only. Participation in both legal and illegal work can be an intermediate

step in the desistance process. Laub, Nagin, and Sampson (1998) observed that, desistance is a gradual and cumulative process. Although they spoke of the effect of a good marriage on crime, their comments are applicable to legal employment. They note that the effect of a good marriage takes time to appear and slowly inhibit offending. Nagin and Paternoster (1994) had a similar argument. They argued that the strengthening of social bonds develops over time and is akin to the process of investment whereby small increments to the bond gradually accumulate to transform a once fragile bond to a strong bond. More recently, Van Der Geest et al. (2011) examined the relationship between employment and the development of criminal careers in a sample of Dutch high-risk males. They found that among adolescent limited offenders, there was an association between being employed and reduced offending. That is, there were gradual and long-term effects of legal employment. In this way, legal work would shift offenders away from illegal work but the effects will be gradual and there would still be observations of engaging in illegal work.

On the other hand, legal employment can provide further opportunities for illegal work. It is possible that legal employment complements illegal work. For example, Reuter et al. (1990) observed that drug dealers who sold frequently were more likely to hold a legal job compared to occasional sellers, suggesting that legal work and drug selling are complements to one another. Similarly, Mars and Gerald (1982) examine individuals in various trades who use their positions for illegal gain. They argue that for some individuals, the alternative economy is too large and lucrative to ignore and it makes more sense from an economic perspective to engage in both legal and illegal behavior (see also Miller and Gaines, 1997). In this case,

legal work facilitates offending and therefore the relationship between engaging in the legal/illegal overlap and offending frequency should be positive.

With regard to policy, considering offending frequency has a direct relationship to resource implications. The most recent recidivism patterns show that within three years of release, approximately three quarters of prisoners are rearrested and about half of prisoners are incarcerated because of a new crime for which they received another prison sentence, or because of a technical violation of their parole (Bureau of Justice Statistics, 2014). However, correctional scholars have observed that (LaVigne, 2014; Lynch and Sabol, 2003) that it is unlikely that many offenders who are arrested, are solely engaged in criminal activities – it is likely to have legal employment at the time of arrest. Therefore, research into the frequency of offending and the overlap between legal and illegal work can provide valuable information regarding the appropriate response to offenders who are rearrested.

Offending Variety

Blumstein et al. (1988) noted that inquiry into the qualitative nature of offending is an important empirical question. They argued that the extent to which offenders display specialization or versatility in crime types and the extent offenders escalate in the seriousness of their offending has important theoretical and policy implications. Theoretically, investigation into offending variety can be informative since some of the seminal theories in the field of criminology make specific predictions about the extent to which specialization exists (i.e. Gottfredson and Hirschi, 1990; Moffit, 1993; Sutherland, 1947). Investigations into the qualitative

nature of offending can also inform policies surrounding incarceration and correctional treatment (Sullivan et al., 2006).

In general, findings from criminal career research suggest that there is some evidence of specialization and ample evidence of versatility in offending (Bursik, 1980; Chaiken and Chaiken 1982; Piquero et al. 2007; Wolfgang et al. 1972). However, with a growth in analytic methods scholars have found a higher degree of specialization than was suggested in earlier work (i.e. Osgood and Schreck, 2007; Sullivan et al., 2006). More recently research suggests that the tendency towards offending versatility is conditioned by a number of factors. For instance, specialization varies along with factors like an individual's age, age of onset and offending frequency (Blumstein et al. 1986; Piquero 2000). The relationship between age of onset, offending frequency and specialization is an important one because a number of developmental criminologists have consistently speculated that offenders who have an early age of onset frequent offenders are more likely to be engaged in both greater offending frequency and tend to be involved in a diverse array of offense types (LeBlanc& Loeber, 1998; Loeber & LeBlanc, 1990; Moffitt, 1993). Empirical studies have supported this argument and found that high-rate offenders are more likely to engage in a diverse offending repertoire compared with low-rate offenders (i.e. Chaiken and Chaiken, 1982; Spelman, 1994).

Scholars have also considered how local life circumstances such as employment and marriage relate to offending versatility. Sullivan et al. (2006) found that marriage had no relationship with offending versatility. However individuals who worked at any point during the 36 month study period were more likely to score

higher on the diversity index. McGloin et al. (2007) examined local life circumstances and the extent to which local life circumstances affect specialization/versatility among a sample of incarcerated felons. The authors found that marriage was related to less diversity whereas substance use was related to increased diversity. They did not find that employment was related to offending specialization/versatility. Recently, Jennings et al. (2014) found that among a sample of sex-offenders, those who were married were significantly more likely to specialize compared with unmarried sex offenders. There were no effects for the participants who were employed.

The current study considers the qualitative nature of offending in two ways. First, I examined whether or not engaging in the legal/illegal overlap is associated with a greater proportion of instrumental crimes compared to engaging in illegal work only. On one hand, if engaging in illegal work concurrently with legal work is a rational process, it is reasonable to assume that individuals would only engage in instrumental crimes to supplement their income. The material considerations of potentially losing one's job due to an arrest or conviction for a non-instrumental offense would weigh heavily on the offending decision (Cornish and Clarke, 1987). On the other hand, if the overlap is no different from being involved in illegal work only, engaging in illegal work is simply part of a larger offending repertoire. Each of these scenarios would require a very different set of responses from criminal justice decision makers. The former potentially suggests that illegal work is taken on because of financial strains and low legal wages and therefore calls for wage increases in the low wage sector would be appropriate. Recall, La Vigne's (2014) observation that

parolees who earned less than $7 per hour were twice as likely to return to prison compared to those who earned more than $10 an hour. The latter suggests that increases in legal wages may not be a driving factor in reducing the legal and illegal work overlap.

Second, I consider whether or not engaging in both legal and illegal work is associated with a greater variety of instrumental crimes. From a network perspective, participating in both legal and illegal work can foster both conventional and criminal social capital. Extended networks can place individuals in unique positions to forward their criminal interests. For example, Morselli et al. (2006) argue that offenders require both strong ties and weak ties to be successful. Strong ties are relationships that involve larger time commitments whereas weak ties are relationships that require little maintenance or commitments (Granovetter, 1973). Engagement in legal work can also shift an offender's routine activities and provide new social ties and opportunity structures for engaging in a wider array of instrumental crimes.

One of the fundamental functions of criminal career research is to describe patterns of criminal offending (Brame, Paternoster and Bushway, 2004). Systematic inquiry into the relationship between the legal/illegal overlap and criminal career dimensions is valuable because it sheds light into where the overlap might be situated in the criminal career and can reveal differential patterns of criminal offending. For example, if the overlap is associated with a gradual reduction in offending frequency, this might suggest that the overlap is intermediate step in the desistance process. However this process would not be evident if offending is measured in terms of arrests or participation/no participation in illegal work.

CHAPTER 3: DATA AND METHODS

The Pathways to Desistance Study

To examine the nature of the legal and illegal overlap and answer my three research questions, I use the Pathways to Desistance Study (Mulvey et al., 2004). The Pathways to Desistance Study is a longitudinal examination of the transition from adolescence to young adulthood in a sample of serious adolescent offenders. The adolescents were found guilty of a serious offense (mostly felony offenses) in the juvenile or adult court systems in Maricopa County, Arizona or Philadelphia County, Pennsylvania during the recruitment period (November, 2000 through January, 2003). The Pathways study captures several important domains of the participants' lives including antisocial behavior, psychological development, and experiences with the criminal justice system. Importantly, it is among the few longitudinal studies that attempt to capture rich descriptions of each participant's legal and illegal income generating activities.

A total of 1,354 participants were enrolled, and were between the ages of 14 and 17 years at the time of committing the offense. The adolescents were selected for the study after a review of court documents indicated that they had been found guilty of a serious offense, such as felony offenses (Schubert et al., 2004). To ensure that there was no overrepresentation of drug offenders, the researchers capped the drug offenders at 15% of the sample at each of the sites. Once the adolescents agreed to participate in a baseline interview, informed consent was obtained from the juveniles and their parents or guardians. Approximately 67% of participants who were

approached agreed to enroll in the study (attempted enrollment divided by enrollment). The retention rate was 84% at the completion of the study (after 84 months).

The interviews took place in the participants' homes, libraries, other public places, or in facilities. Trained interviewers used computer-assisted interviews and read each question to the participant and the respondent entered their answer on a key pad. Respondents were encouraged to provide honest answers, and confidentiality was assured by confidentiality protections. Data were collected at ten consecutive follow-up interviews. The first six interviews correspond to six-month observational periods over 36 months and the remaining interviews are twelve-month observational periods.

In addition to the time point interviews, monthly information regarding income-generating activities, employment, self-reported offending, education and romantic relationships were collected. The researchers modeled the construction of the interviews after the life calendars developed by previous investigators (i.e. Caspi et al., 1996; Horney et al., 1995). Researchers for the Pathways study specifically asked participants to first recount salient events which occurred in the recall period (e.g. birthdays, deaths) and this information remained visible to the participant as an anchor point for the timing of events in each of several life calendar domains. This approach takes advantage of the research on how to generate accurate accounts of past events (Belli, 1998; Bradburn, Rips, and Shevell, 1987).

Measures

Participation in legal work: is a binary variable that indicates that the participant was engaged in legal work during the recall period. Legal work is defined as a job where an individual receives a paycheck and taxes are withheld. Participants were asked a gateway question: Do you currently have a paying job? Have you had a paying job at any time over the past N months? The interviewer connected the answers to the correct months in the calendar. An affirmative answer was coded as "1" participated in legal work for the calendar month.

For the purposes of the current study, legal work also included activities in which participants were paid under the table. Participants were asked "In the past N months, have you earned money where you were paid 'off the books' or 'under the table' or on the 'DL' (down low)? By this we mean jobs for which you are paid cash and are not reporting this income on tax forms. This could include things like cleaning houses and child care". This was included because it was not until month 60 and onwards that the Pathways to Desistance study coded under the table activities separately.

Participation in illegal work: Participants were asked "Have you made money in other ways over the past N months, including from activities that are illegal?" If the respondent answered in the affirmative, the interviewer asked a follow up question: "You mentioned that you had made money during the past N months from ways besides working. Did you make any money during this month from activities that are illegal?" If the respondent answered in the affirmative again, he/she was asked if they engaged in particular offenses. Respondents who endorsed selling stolen property,

selling drugs, stealing merchandise, gambling, prostitution, or other illegal activities during the month, then that month will have a value of "1" Yes, and will be "0" No.

Criminal career measures:

Instrumental offending rate: Offending rate was calculated by dividing the total number of instrumental crimes a participant endorsed by the number of months the participant was in the community and was not in a secure detention facility. The instrumental crimes include: 1) entered or broken into a building to steal something, 2) stolen something from a store, 3) bought, received, or sold something that you knew was stolen, 4) used checks or credit cards illegally, 5) stolen a car or motorcycle to keep or sell, 6) sold marijuana, 7) sold other illegal drugs (cocaine, crack, heroin), 8) prostitution, 9) taken something from another by force, using a weapon 10) taken something from another by force, without a weapon (Huizinga, Esbensen and Weihar, 1991).

Because drug selling can be associated with several transactions a day (Jacobs, 1996), it can skew self-reported offending rates. Thus, I included a measure of instrumental offending rate, but removed self-reported drug selling (marijuana and other illegal drugs) from the list of offenses.

Offending variety: I use two measures to capture the qualitative nature of offending. The first measure is the proportion of instrumental crimes over all crimes. The numerator was the count of instrumental crimes endorsed by the respondent (broke in to steal, shoplifted, bought/received/sold stolen property, used check/credit card illegally, stole car or motorcycle, sold marijuana, sold other drugs, prostitution, took something by force with a weapon, took something by force without a weapon). The

denominator was the count of the number of all crimes endorsed by the respondent. These include the instrumental crimes in the numerator plus destroyed/damaged property, set fire, shot someone and the bullet hit the victim, shot at someone but the bullet did not hit the victim, beat up someone which resulted in serious injury, been in a fight and beat someone as part of gang.

The second offending variety measure is the instrumental offending variety proportion; a proportion in which the numerator is the number of instrumental offenses which were committed and the denominator is the 10 instrumental crimes listed above.

Legal Economic Opportunities:

There are three main concepts that tap into legal economic opportunities.

Neighborhood conditions: Neighborhood conditions was included as an indicator of legal economic opportunities because scholars frequently note that disorganized neighborhoods are high in both unemployment and crime (Rose and Clear, 1998). This measure considers the physical and social environment surrounding the participant's home (Sampson and Raudenbush, 1999). The measure comprises of a scale consisting of 21 items to which participants respond on a 4- point Likert scale ranging from "Never" to "Often," with higher scores indicating a greater degree of disorder within the community. The value is the mean of all 21 items in the scale. The higher the value, the greater the disorder. The items on the scale include items that tap into physical disorder and social disorder. The physical disorder items included: cigarettes on the street or in the gutters, garbage in the streets or on the sidewalk, empty beer bottles on the streets or sidewalks, boarded up windows on buildings,

graffiti or tags, graffiti painted over, gang graffiti, abandoned cars, empty lots with garbage, condoms on sidewalk, needles or syringes and political messages in graffiti. The social disorder items included: gangs (or other teen groups) hanging out, adults hanging out on the street, people drinking beer, wine or liquor, people drunk or passed out, adults fighting or arguing loudly, prostitutes on the streets, people smoking marijuana, people smoking crack and people using needles or syringes to take drugs. It is expected that the higher the neighborhood disorganization, the higher the probability that participants will belong to a high illegal work group.

Perceptions of legal opportunities: There are four items that tap into a respondent's perceptions of legal opportunities for legal work in his/her neighborhood (Eccles, Wigfield and Schiefele,1998). The items include: 1) In my neighborhood, it's pretty easy for a young person to get a good-paying, honest job 2) In my neighborhood hard to make money without doing something illegal 3) Not much opportunity to succeed as kids from other neighborhoods 4) Employers around here often hire young people from this neighborhood. Perceptions of legal opportunities should be inversely related to membership in high illegal work groups.

Aspirations/expectations: The extent to which economic expectations fall short of economic aspirations is used as an indicator of legal economic opportunities. I use three items that capture the disjunction between economic expectations and economic aspirations: How likely/important to have a good job or career, how likely/important to earn a good living and how likely/important to provide a good home for your family. In the Pathways study, participants responded on a 5-point Likert scale ranging from "Not at all important/Poor" to "Very important/Excellent". Higher

scores for aspirations and expectations indicate greater optimism concerning future opportunities and/or success. Lower scores for "expectations fall short" indicate greater congruence between these perceptions (Menard and Elliott, 1996). It is expected that the greater the disjunction between economic expectations and aspirations the higher the probability of membership in a high illegal group.

Control Variables:

Gender: I control for gender because males and females have differential patterns of participating in the labor market (Altonji and Blank, 1999). The majority of the participants were males (87%).

Site: The extent to which individuals have opportunities to engage in legal work can be associated with their locale. I therefore control for site. Approximately 52% of participants resided in Philadelphia and the remainder resided in Phoenix.

Ethnicity: Ethnicity is commonly an important factor in opportunities for legal employment (Western, 2002). Respondents self-reported their ethnicity based on six ethnic groups result: White, Black, Asian, Native American, Hispanic, and Other. The measure was recoded in four categories: White, Black, Hispanic and Other.

Age of onset: Age of onset was a self-reported measure of initial participation in 22 different types of offenses. Individuals were asked "How old were you when you first did x?" The average age of first offense was 14.9 years.

Relationship status: Prior research has suggested that marriage is related to offending frequency and specialization (i.e. Laub, Nagin and Sampson, 1998; McGloin et al., 2006). Because marriage is relatively rare among the participants in this sample, I considered whether they were involved in a serious romantic relationship.

Respondents were asked if he/she was involved in a serious relationship at any point over the past N months? These relationships included boyfriend/girlfriend/and spouses.

Children: The relationship between having children and offending is not as clear as the relationship between marriage and offending. Some researchers have found that attachment to one's child is negatively associated with offending (Landers et al., 2014), whereas others found that offending behavior does not decrease after having children (Stouthamer-Loeber and Wei, 1998). Respondents were asked to report the number of living children in the recall period. Answers ranged from 0 to 4.

Parental social position: Because parent's can provide individuals with social capital and resources, I account for parental social position. Parental social position was based on a formula that took into account parental occupation and parental education (Hollingshead, 1971). Higher scores indicate higher social position.

Peer delinquency: Deviant peers can impact the legal/illegal overlap by providing opportunities to commit illegal work (Paternoster, 1989). The respondents were asked "During the last six months how many of your friends have engaged in the following activity?" The peer delinquency measure is the mean rating of the prevalence of friends who engaged in 12 behaviors ranging from damaging property, selling drugs to aggravated assault. Participants responded on a 5-point Likert scale ranging from "None of them" to "All of them"? (Thornberry et al., 1994).

Impulse control: This measure is the mean of 8 items. The items asked participants to rank how much (1= False to 5= True) their behavior in the past six months matches a series of statements (i.e. I do things without giving them enough thought, I stop and

think things through before I act, I should try harder to control myself when I'm having fun). Higher scores indicate a greater degree of impulse control.

Future orientation: Future orientation was measured by a mean of 8 items, which is a subset of the Future Outlook Inventory developed by Cauffman and Woolard (1999). The Future Outlook Inventory asks participants to rank from 1 to 4 (1= Never True to 4= Always True) the degree to which each statement reflects how they usually are (e.g., I will keep working at difficult, boring tasks if I know they will help me get ahead later). Higher scores indicate a greater degree of future consideration and planning.

Drug dependency: Heavy drug use can create an impetus to commit instrumental crimes (Uggen and Thompson, 2001). Therefore I control for drug dependency, which is count of symptoms in the recall period attributed to drug use (i.e. "Have you wanted drugs so badly that you could not think of about anything else?") (Chassin, Rogosch, Barrera, 1991). If a participant endorsed at least one of the items, he/she was coded as being drug dependent.

Instrumental offending frequency: In addition to being a key outcome in research question three, I control for offending frequency when examining the relationship between the overlap and offending variety. The mean monthly instrumental offending rate was 84.04. Due to skewness, I used the logged monthly instrumental offending rate.

Description Statistics of Key Outcomes

Before exploring any potential population heterogeneity (RQ1), the first step of the current study was to examine descriptive, global summary measures of legal

work, illegal work, and how they overlap. Table 2 provides a summary of the demographic breakdown of the participants in the Pathways study, pooled across individuals and across 84 months. Table 2 illustrates that approximately 87% of the sample are male. In terms of ethnicity, 40% are Black, 33% are Hispanic and about 20% are White. Approximately 52% of the participants were located in Philadelphia and the remaining participants were located in Phoenix.

Table 2. Descriptive information (person-months)

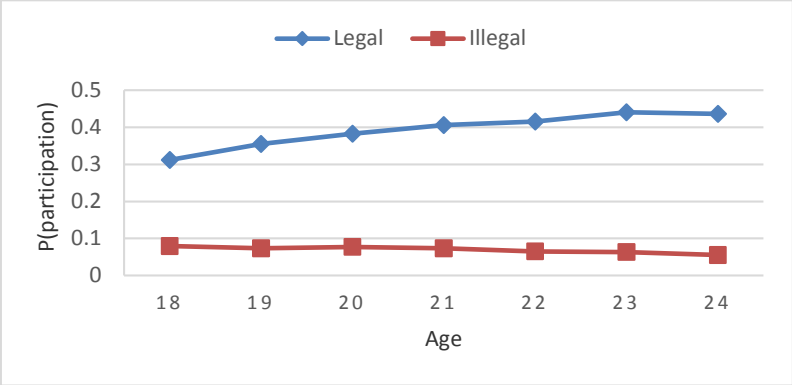
Variable	Mean	Median	Standard deviation	Min, max
Trajectory outcomes:				
Monthly participation in legal work	.380	-	-	0, 1
Monthly participation in illegal work	.072	-	-	0, 1
Legal only	.363	-	-	0, 1
Illegal only	.054	-	-	0, 1
Both legal and illegal	.018	-	-	0, 1
No work	.563	-	-	0, 1
Demographics:				
Male	.866	-	-	0, 1
Ethnicity				
White	.198	-	-	0, 1
Black	.417	-	-	0, 1
Hispanic	.334	-	-	0, 1
Other	.050	-	-	0, 1
Site				
Philadelphia	.521	-	-	0, 1
Phoenix	.478	-	-	0, 1

To examine the prevalence of legal and illegal work, four mutually exclusive categories were created: legal work only, illegal work only, both legal and illegal work, and no work. Here, the units of observation were person-months. On average, there was a 36% monthly prevalence of legal work only. As expected, the prevalence

of engaging in illegal work only and both legal and illegal work was much smaller, with approximately 5% and 2% of person-months respectively.

Figure 1 illustrates the probability of participation in any legal work and any illegal work, by age. As expected, the probability of engaging in any legal work increased over the course of the study period. However the probability of engaging in any illegal work remained relatively consistent over the course of the study period, suggesting that these two types of endeavors are not purely substitutes.

Figure 1 Probability of Any Monthly Participation by Age



Figures 2 to 6 show the probability of engaging in any legal work and illegal work broken down by gender, site, and race. Figure 2 indicates that at age 18 participation in legal work was slightly higher for females (35%) compared to males (30%). However male participation rose monotonically over the age profile whereas female participation in legal work rose until about age 20 and then slightly declined. Male and female participation in illegal work (Figure 3) followed the same declining pattern but males participated in illegal money generating activities at a higher prevalence than females.

Figure 2 Monthly Participation in Legal Work by Gender

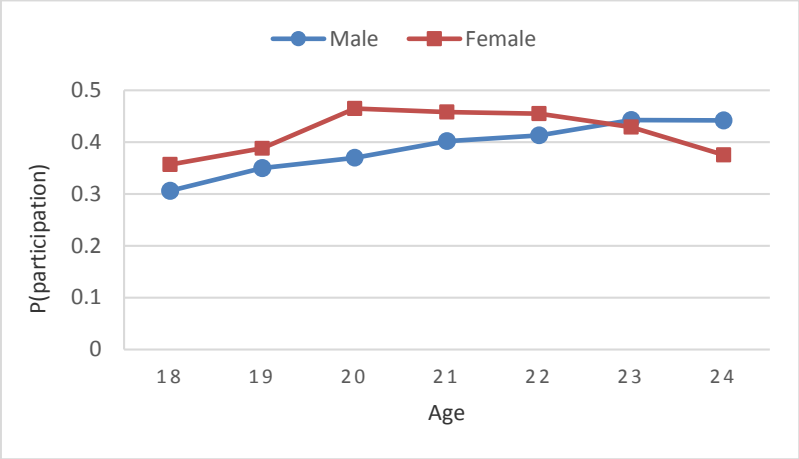
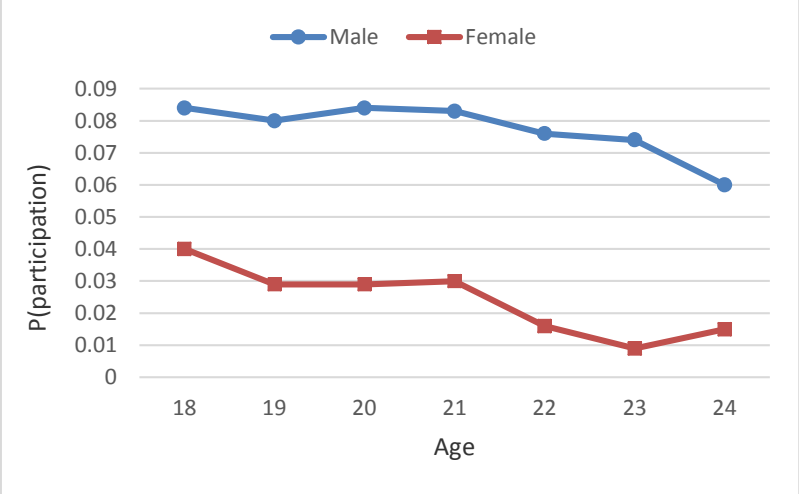


Figure 3 Monthly Participation in Illegal Work by Gender



In terms of site differences, Figure 4 shows that participation in legal work was slightly higher in Philadelphia than in Phoenix. Participation in illegal work was very similar between participants in Philadelphia and participants in Phoenix at age 18 but slightly diverged so that participation in illegal work in Philadelphia was slightly higher than in Phoenix by the end of the study period.

Figure 4 Monthly Participation in Legal Work by Site

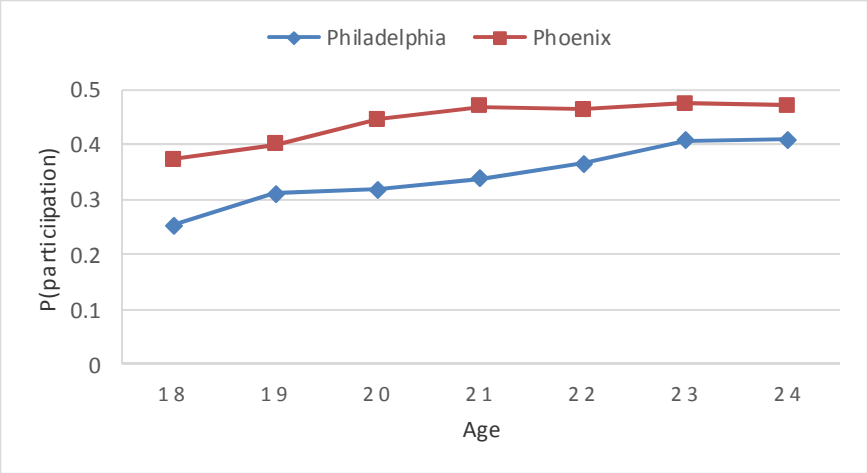
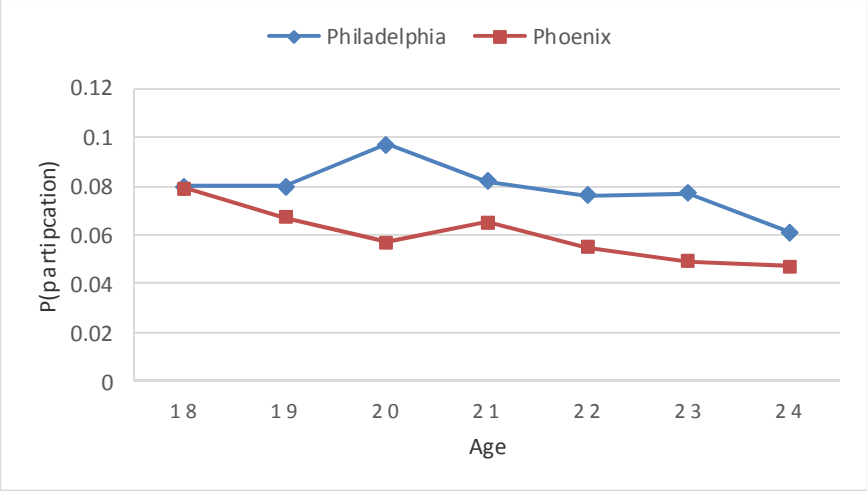


Figure 5 Monthly Participation in Illegal Work by Site



When I examined the racial differences in participation in legal work, results showed that at age 18, Whites had over twice the probability of involvement in any legal work than Black participants (45% vs. 22%), with Hispanic participants falling in between (Figure 6). All three races increased participation in legal work, with the differences becoming less pronounced over time. The probability of participation in

illegal work differed greatly across races. Although the probability of engaging in illegal work (10%) was the greatest for whites at age 18, Whites had the sharpest decline and had the lowest probability of engaging in illegal money generating activities by age 24. Blacks also declined over the age profile but only slightly (8% at age 18 to 6% by age 24). Interestingly Hispanic participation in illegal work remained relatively stable at approximately 6% (Figure 7).

Figure 6 Monthly Participation in Legal work by Race

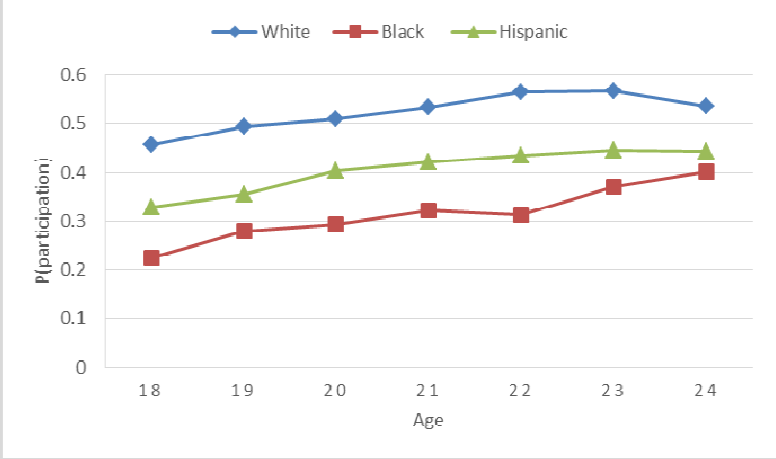
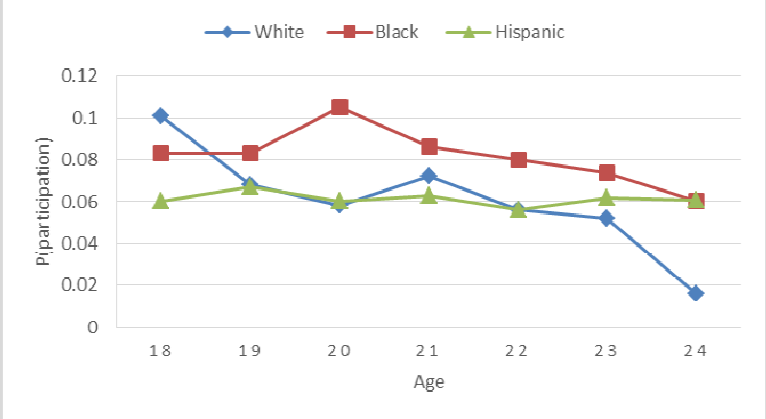


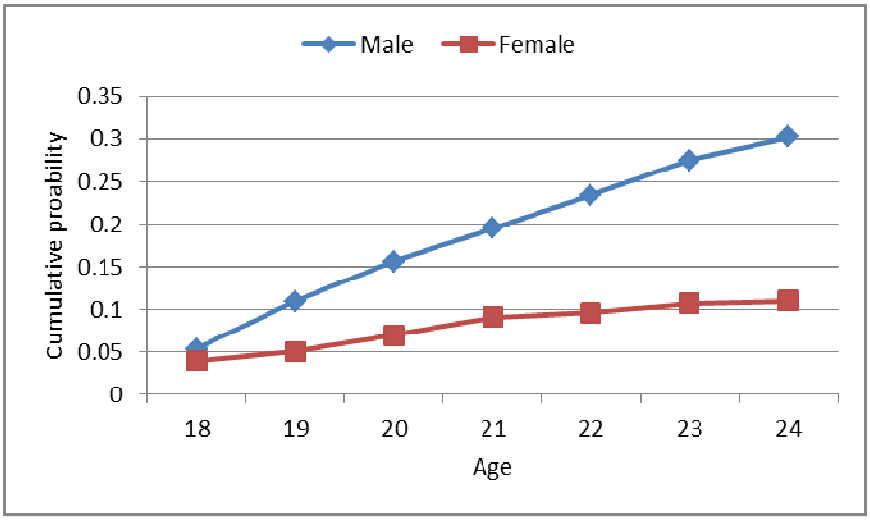
Figure 7 Monthly Participation in Illegal Work by Race



I examined the probability of engaging in both legal and illegal work by plotting the cumulative probability of engaging in both by gender, site and race.

Figure 8 shows that at age 18, males and females had similar probabilities of engaging in the overlap; however males' cumulative probability increased much more rapidly and by age 24, approximately 30% of males engaged in both legal and illegal work at least once. In comparison, only about 11% of females self-reported engaging in legal and illegal work by the age of 24.

Figure 8. Cumulative Probability of Engaging in Both by Gender



Comparing the cumulative probability of engaging in both legal and illegal work between Philadelphia and Phoenix (Figure 9) revealed that there was very little difference between the study sites. Figure 10 shows the *cumulative* probability of participating in both across the three race categories. Whites had the highest probability of engaging in the overlap across the entire age profile. Hispanic participants had the lowest probability of engaging in both legal and illegal work. Overall, results suggest that by age 24, approximately 20% of participants earned money both legally and illegally in the same month, at least once.

Figure 9 Cumulative Probability of Engaging in Both by Site

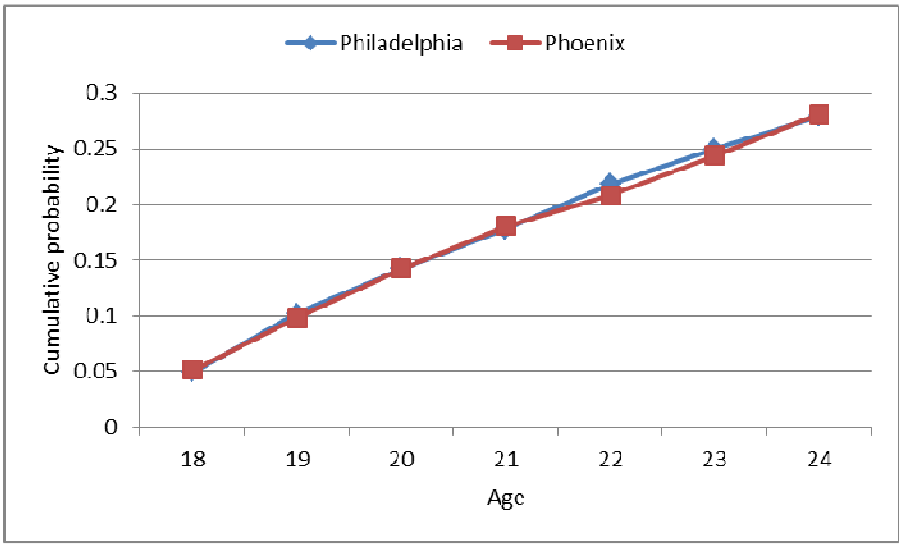


Figure 10 Cumulative Probability of Engaging in Both by Race

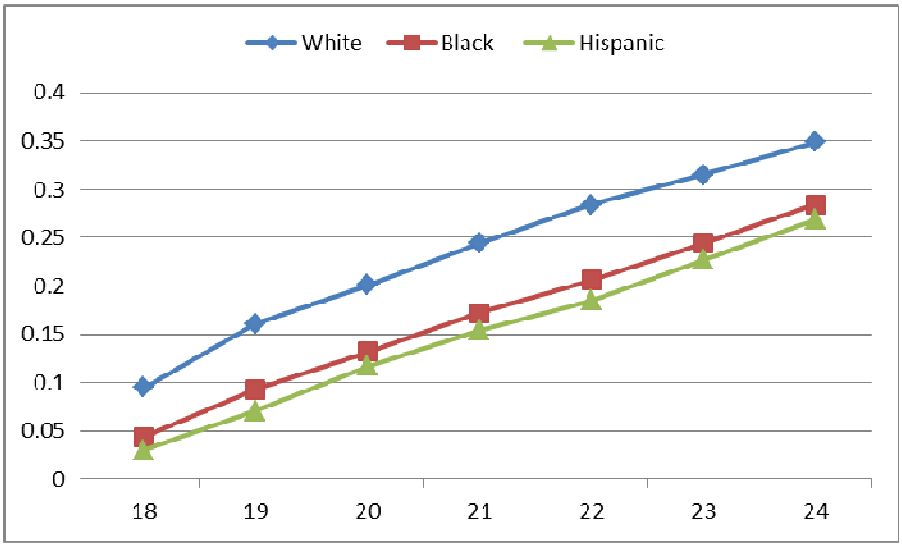


Table 3 presents the distribution of three mutually exclusive states: legal work only, illegal work only and both legal and illegal work and the number of months participants reported engaging in each of the states. The unit of analysis here is across

persons. Approximately 20% of participants reported being engaged in the legal and illegal overlap at least once and over 6% reported engaging the both legal and illegal work 5 or more times during the study period. Participation in illegal work only was more common, with 35% of participants engaging in illegal work only during at least one month. Conversely, about 84% of engaged in legal work only at least once.

Table 3. Prevalence of Engaging in Mutually Exclusive Work States (Across Individuals)

Number of months	Both		Illegal only		Legal only	
	Frequency	Cum. %	Frequency	Cum. %	Frequency	Cum. %
0	1,071	79.1	873	64.48	214	15.81
1	67	84.05	59	68.83	48	19.35
2	54	88.04	48	72.38	40	22.3
3	30	90.25	58	76.66	34	24.82
4	27	92.25	27	78.66	39	27.7
5	20	93.72	35	81.24	49	31.31
6	27	95.72	33	83.68	34	33.83
7	10	96.45	23	85.38	32	36.19
8	9	97.12	17	86.63	32	38.55
9	5	97.49	14	87.67	35	41.14
10 +	34	100	167	100	797	100

As mentioned in the literature review, transitions between legal work and illegal work is common. Therefore it is important to note that a considerable number of participants engaged in both legal work and illegal work, but at different months. In fact, 472 of 1320 (35.8%) participants engaged in legal and illegal work at different points in the study period. These participants are interesting because their patterns of legal and illegal work depart from traditional offender/non-offender categories and are akin to intermittent offending discussed by scholars such as Glaser (1964) and Laub and Sampson (2003). Because the focus of the current study is on

contemporaneous participation in legal and illegal work, participation in both legal work and illegal work at different months will not be tackled.

In sum, I have presented general descriptive information on the prevalence of engaging in legal work, illegal work and the overlap of legal and illegal work. Prevalence rates demonstrate that, as expected, there were gender and race differences in the participation of legal work and illegal work. In terms of the overlap, males were much more likely to engage in the overlap than females. Interestingly, Whites were also slightly more likely to engage in the overlap compared to Blacks and Hispanics. There appeared to be little site differences. Although prevalence rates provide an interesting first step at looking at the relationship between legal and illegal work, it does not take into account how patterns of participation might differ across various subpopulations. To account for population heterogeneity, I turned to group based trajectory models. First, I estimated trajectories of participation in legal work. Second, I estimated trajectories of participation in illegal work. Finally to uncover the joint patterns of legal and illegal work, I estimated a dual trajectory model.

Analytic Plan and Models

Each of the three research questions requires a slightly different analytic approach and will be outlined individually below. The current study examines the overlap between legal and illegal work in two main ways. First, I examine heterogeneity in the overlap over time by using semi-parametric group based trajectory models (Nagin, 2005). Group-based trajectory models (GBTM) is an extension of finite mixture modeling for longitudinal data. According to Nagin (1999) GBTM have three purposes: 1) to identify distinctive groups of trajectories, 2)

estimate the proportion of the sample that follows each of the trajectory groups, 3) to estimate an individual's conditional probability of belonging to each of the model's groups, given their longitudinal vector of observations.[2]

Using GBTM is beneficial for a number of reasons. First, it allows me to identify distinctive developmental paths in complex longitudinal data and to capture the heterogeneity of behavior over time. That is, GBTM provides a way to descriptively summarize the patterns of legal work and illegal work without *a priori* assumptions of how many and what the patterns of participation of legal work and illegal might look like. Thus, GBTM allow me to model population heterogeneity in the longitudinal involvement in legal and illegal employment. Population heterogeneity is important to account for because we know that among offenders, there is substantial movement into and out of both the labor force and offending (Uggen and Wakefield, 2008). Employment and offending patterns can reflect subpopulations of which the sources of heterogeneity may not be readily observable. Second, I can use group membership for a variety of further analyses like relating the probability of membership to individual characteristics and circumstances and creating profiles of group members or examining the correlates of group membership. Interest in revealing these subpopulations may be important because it draws attention to the different covariates and outcomes of different developmental trajectories (Nagin and Odgers, 2010). Studying different covariates and outcomes can have the potential to inform specific policies and programs related to

[2] I am careful through this analysis not to reify any of the estimated trajectory groups; instead, I stress that this descriptive technique is purely a descriptive mechanism for exploring population heterogeneity in longitudinal patterns of study outcomes. It is important to note that due to the select nature of the Pathways sample, my findings are specific to this sample and cannot generalized.

incarceration and crime prevention. Finally, an extension of GBTM, dual trajectory analysis, allows for modeling two outcomes by estimating the joint and conditional probabilities of legal and illegal work over time.

Research Question One

My first research question is concerned with extensively documenting the patterns of legal work, illegal work and their overlap over age. As such, GBTM were conducted on participation in legal and illegal work and I used dual trajectory analysis to model the joint evolution of the two. A unique aspect of the Pathways Study is that it contains 84 months of data on participation in legal and illegal work. This is extremely advantageous for estimating GBTM because, like all longitudinal models the asymptotic properties of consistent parameter estimation are more dependent on the number of time points, *T* than the cross-sectional sample size N (Greene, 1999). More intuitively in the present context, this means that population heterogeneity is better revealed by following the sample over a longer, more granular time frame, on top of merely having an adequately large cross-sectional sample (Loughran and Nagin, 2006). To my knowledge there have been no prior studies that have fitted trajectory models on such a fine grained unit of analysis, including studies on criminal involvement.

Analytic Considerations

There were two important analytic considerations prior to estimating the GBTM for legal work and illegal work. The first consideration was whether or not to include the months in which the individuals were under the age of 18. This is an important consideration because of the nature of adolescent work and delinquency.

First, there are restrictions in terms of the hours and types of work adolescents are allowed to engage in. For example, Arizona restricts employment of individuals under age 16 (Arizona's Youth Employment Law) and Pennsylvania restricts employment for individuals under the age of 17 (Pennsylvania Child Labor Act). Second, there has been considerable attention devoted to examining the relationship between adolescent problem behaviors and work, especially intensive work. The conclusion regarding the relationship is still contentious with some scholars arguing that work in adolescence is associated with a host of problem behaviors, including substance use and delinquency (Bachman and Schulenberg, 1993; Greenberger and Steinberg, 1986; Monahan, Lee and Steinberg, 2011). While other scholars argue that once selection effects are accounted for, the positive relationship between intensive work and delinquency disappears (i.e. Apel et al., 2007; Paternoster et al., 2003; Staff et al., 2010).

Given the contention surrounding the relationship between adolescent work and delinquency, I excluded observations where the participant was under 18 years of age. However as sensitivity analysis, I estimated GBTM of legal work and illegal work on the entire sample including observations under the age of 18. In general, the trajectory solutions were very similar for both legal and illegal work, suggesting that omitting the observations under the age of 18 did not impact the number or shape of the trajectory groups.

The second analytic consideration is exclusion of an exposure time correction. Exposure time, or the time that an offender is in the community and not incapacitated, is necessary for calculating unbiased estimates of an individual's offending rate, or λ

(Blumstein and Cohen, 1979). Correcting for exposure time essentially 'adjusts' what the rate would be if the offender was not incapacitated. Essentially, the exposure time correction is used for obtaining a better estimate of lambda, which can affect the true shapes of the trajectory. However, for a logit model, a 'lambda' adjustment is not appropriate given that a participant's participation in legal or illegal work is actually observed. Moreover, the focus of the current study is to uncover heterogeneity and membership between legal and illegal work.

Piquero et al. (2001) specifically investigate the extent to which exposure time correction impacts conclusions about trajectory structures. Using data from the California Youth Authority, they examined the annual arrest rates among parolees from age 18 to 33 and compared estimates with and without adjusting for exposure time. Piquero and colleagues (2001) found that the general shape of the arrest rate trends were robust to exposure time controls. They argue however that controls for exposure time have greatest impact on the most active offenders. That is, the persistent offending group should increase once exposure time is accounted for. As sensitivity analysis, I compared the trajectory solutions with and without the exposure time correction. Similar to Piquero et al. (2001), I found that the overall shape of both the legal and illegal groups were largely unaffected by the exposure time correction. In fact, membership in all the groups was virtually identical.

To examine participation in legal work and participation in illegal work, the binary logit model was expanded to allow the probability to depend on age and group membership:

$$P(y_{it}^{j}=1)=\frac{e^{\beta_0^j+\beta_1^j age_{it}+\beta_2^j age_{it}^2+\beta_3^j age_{it}^3+\beta_4^j age_{it}^4+\beta_5^j age_{it}^5+\varepsilon_{it}}}{1+e^{\beta_0^j+\beta_1^j age_{it}+\beta_2^j age_{it}^2+\beta_3^j age_{it}^3+\beta_4^j age_{it}^4+\beta_5^j age_{it}^5+\varepsilon_{it}}}$$

The above equation represents the most basic version of group based trajectory models. It models a dependent variable over age with a polynomial function (Nagin et al., 2003: 349). Here, y_{it}^{j} the dependent variable for an individual i=1,…,N at time t=1,…,T given membership in group j=1,...,J. Each group's trajectory is defined by the parameters $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and β_5. The three key outputs are: the trajectories themselves, the mixture probabilities (proportion of the sample follows each trajectory) and the posteriors probabilities (the probability of membership in trajectory group j given an individual's longitudinal string of observations, $\mathbf{Y_i}$).

An extension of the basic model is the dual trajectory model, which was developed to examine the developmental course of two distinct but related outcomes (Nagin and Tremblay, 2001). Moreover, the dual trajectory model is used to analyze connections between developmental trajectories of two outcomes that are evolving contemporaneously (i.e., legal and illegal work) (Jones and Nagin, 2007). One advantage of the dual trajectory model over looking at cross-sectional correlations is it provides the capability of examining the linkage between the dynamic unfolding of the two behaviors over the entire observation period (Jones and Nagin, 2007). The chief additional output provided by the dual mode are the *probabilities* linking membership in trajectory groups across the two outcomes For example, these quantities can be thought of as the conditional (i.e., marginal) probability of following a certain legal employment trajectory given illegal work trajectory, and the joint probability of following either trajectory. This method also allows me to directly link these probabilities to specific risk factors (Nagin and Odgers, 2010). By using the

dual model, I examine the developmental course of legal work, illegal work and probability of the two overlapping.

In addition to estimating dual trajectory models of legal and illegal work, I generated profiles of the groups that emerge from the trajectory models. To accomplish this, I used the classify-analyze method (Roeder et al., 1999). That is, I hard-classified the sample into their respective trajectory groups, regardless of classification uncertainty. According to Roeder et al. (1999) if the mean posterior probability for the group, is at least .70 then the classify-analyze method provides a decent approximation. It is important to recognize that the variables occur contemporaneously with the trajectory estimation period and therefore causal inferences cannot be made. Nonetheless, creating group profiles provides insight on how the groups uncovered by the GBTM differ, beyond participation in legal and illegal work. To generate group profiles I calculated the conditional expected value of the set of contemporaneous measures based on trajectory membership.

Research Question Two

Research question two considers the individual level factors associated with the various probabilities[3] between legal and illegal work. The dual trajectory model can be extended to allow the conditional probabilities linking the trajectories of legal and illegal work to vary as a function of individual level factors, or events that occur near the time of transition (Nagin, 2005). In the dual model, I estimate J trajectories of legal work and K trajectories of illegal work, the unconditional probability of membership in each legal work trajectories, $\pi_{j,}$ and the conditional probability of

[3] While it is typical for scholars to use the term "transition" probability to refer to changes in states, I refrain from using the term transition as the legal work trajectories and the illegal work trajectories

membership in in the k^{th} illegal work trajectory given membership in the j^{th} legal work trajectory, $\pi_{k|j.}$ Similarly, it is straightforward to calculate the reverse marginal probabilities, i.e., the conditional membership in legal work trajectory given membership in illegal trajectory, $\pi_{j|k}$. Importantly, this is akin to conditioning on the legal work trajectory when interpreting the coefficients, hence the multiple sets of comparisons. Here, the probabilities are dependent upon $\mathbf{w_i}$, a vector of variables measured at baseline that are hypothesized to be associated with $\pi_{k|j.}$

$$\pi_{k|j}(w_i) = \sum_{k} e^{\gamma_{k|jk}}$$

The parameters of this model which correspond to risk factors are estimated simultaneously with the probabilities via maximum likelihood using a constrained logit function. Interpretation follows a basic generalized logit framework, which is a logistic regression that is extended to outcomes with multiple categories. The generalized logit model fits the ratio of the expected proportion for each category of the dependent variable over the expected proportion of a reference category. The coefficients are interpreted as log odds ratios, just as in the binary logistic model; hypothesis tests and confidence intervals are constructed similarly. Interpretation depends on the outcome category or a reference group.

An important assumption of the above model is that the effects of the variables $\mathbf{w_i}$ are constrained to be equal across all the j trajectory groups in the legal groups. In other words, the effects of the variables on the conditional probabilities to specific illegal groups do not interact with membership in the legal groups (Nagin, 2005). In the current study, I estimate whether or not legal economic opportunities are associated with the probabilities to the various illegal work groups *conditional on*

being in a particular legal work group. Because the model is streamlined to make estimation more feasible, it is assumed that the effects of the variables are the same across all legal groups, though the coefficients can be compared across legal work groups. The intercepts for each probability however varies and thus membership in a particular legal work group can still influence membership in illegal work groups, controlling for other variables.

Research Question Three

Research question three moves away from the trajectory groups and compares engaging in the legal/illegal overlap to engaging in illegal work only on two criminal career dimensions: offending frequency and offending variety. Research question three uses data from the ten recall periods, as opposed to the monthly calendar data. The reason why I do the analyses at the recall level rather than the monthly level is that the measures at the recall level are much richer and thus allow me to control for many of the variables that are important to offending frequency and offending variety. I also conduct the analyses cross-sectionally rather than looking at within individual differences. As a first step, I wanted to explore the relationship between the overlap and criminal career dimensions across persons. By doing cross-sectional analyses I can also increase the number of observations of the overlap and illegal work only. The data are structured the data in a way that the units of analysis are the recall periods, which are nested within individuals. A person has potentially up to 10 observations, depending on how many observational periods the participant was under the age of 18 and how many recall periods he/she reported being engaged in the illegal work. Because observations are nested within individuals and all subjects have

multiple observations, I adjust for inter-individual correlations and clustering of observations within larger units.

The frequency of offending is measured

$$\ln(freq_i) = \beta_0 + \beta_1 overlap_i + \boldsymbol{\beta_2 z_i} + \varepsilon_i$$

where $\ln(freq_i)$ is the natural log of the self-reported instrumental offending rate and overlap is an indicator of engaging in both legal and illegal work during the recall period and $\mathbf{z_i}$ is a vector which includes all of the control variables.

Similarly the specialization equation is:

$$spec_i = \beta_0 + \beta_1 overlap_i + \boldsymbol{\beta_2 z_i} + \varepsilon_i$$

where $spec_i$ is the proportion of instrumental crimes over all crimes (or alternatively, the variety proportion of instrumental crimes) and overlap is an indicator of engaging in both legal and illegal work during the recall period and **zi** is a vector which includes all of the control variables. It is important to note that causal interpretation of the measures is difficult to make given the observational nature of these data.

Chapter 4: RESULTS

Research Question One: Heterogeneity in Legal and Illegal Work

Recall the first research question was: Are there heterogeneous patterns of legal work and illegal work? What is the heterogeneity in joint development of legal and illegal work? This question was answered by turning to group based trajectory models to examine differential patterns in the sample with respect to participation in legal work and illegal work over 84 months. A dual trajectory model was estimated to analyze the contemporaneous evolution between legal and illegal work.

Group Based Trajectory Models

Model selection requires determination of the number of groups that best describes the data. Determination of the optimal number of groups is based on an interplay between "formal statistical criteria and subjective judgment" (Nagin, 2005: 61). I followed a two-stage model selection process. First, I followed the lead of D'Unger, Land, McCall, and Nagin (1998) and used the Bayesian information criterion (BIC) as a basis for choosing the optimal number of groups in the mixture model, which requires estimating models with varying number of groups and selecting the largest BIC score. However, the BIC score is not always the best and only criteria for the optimal number of groups. It is best considered in conjunction with judgment of the researcher. For example, sometimes the BIC score continues to increase with the more number of groups and it is prudent to stop when there are no prominent features of the data that are uncovered or when groups are too small to be

of substantive interest. Model selection is a balance between the parsimony of the model and reporting the distinctive patterns in the data (Nagin, 2005).

After determining the number of groups, I focused on the ideal order of the polynomials that specified the shape of each trajectory. Based on Nagin's (2005) advice, I used a preset rule of starting with all quadratics and then adjusting so that the groups contain the highest order term that were statistically significant. Importantly, this adjustment is generally less central to both model identification and my subsequent interpretation than settling on the optimal number of groups. Additionally, the average posterior assignment probabilities for the final five group model are all above 85%, indicating a reasonably low classification error (Roeder, Lynch and Nagin, 1999). Table 4 reports BIC scores for models with four, five and six groups. Although the six group solution had the largest BIC score, the sixth group did not reveal any new substantive patterns in the data.

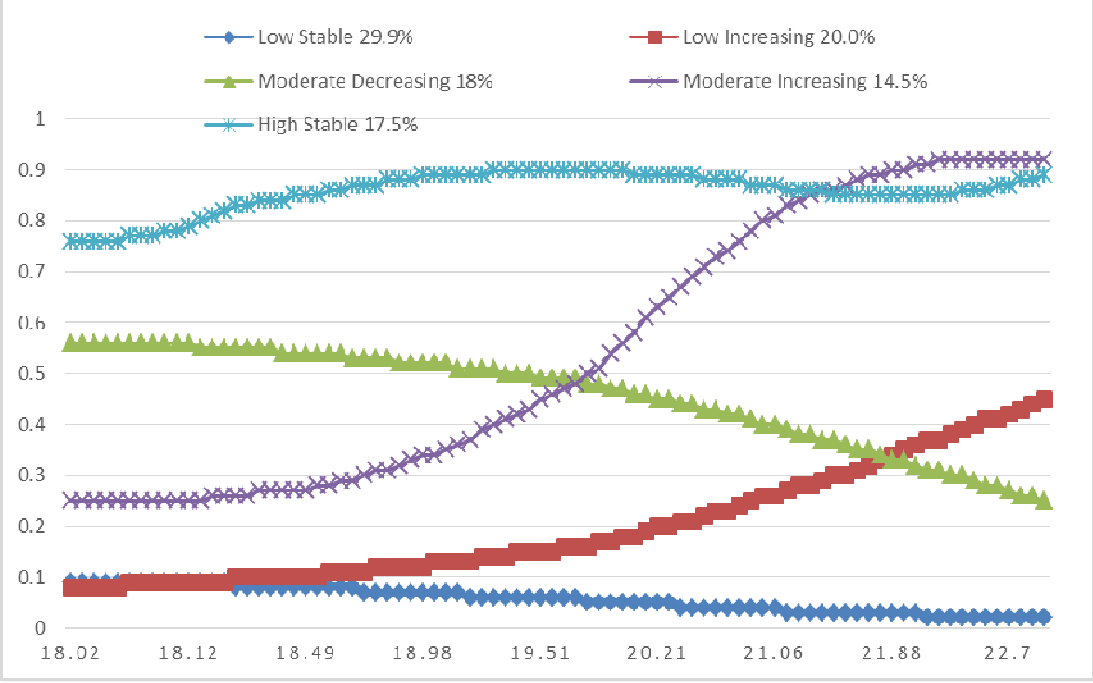
Table 4. Bayesian Information Criterion BIC for Selection of Legal Work Trajectories (n=1320)

	Order	BIC	AIC
4 group	1 2 2 3	-35923.30	-35881.82
	2 2 3 3	-35855.41	-35811.33
	2 2 2 2	-35893.90	-35855.01
5 group	1 1 2 3 3	-35021.21	-34971.95
	1 1 2 2 3	-35076.06	-35029.4
	1 2 3 3 3	-34962.98	-34908.53
	2 2 2 2 2	-35081.69	-35032.43
6 group	2 2 2 2 2 2	-34286.68	-34211.49

Figure 11 illustrates the best solution for the legal work trajectories. As expected, there was a low stable group that maintained a low probability of participating in legal work and comprised almost 30% of the sample. There were two

groups that increased the probability of their participation in legal work: the low increasing and the moderately increasing groups. The low increasing group (20%) started with relatively low participation and slightly increased the probability of participation to a moderate level as they aged. The moderate increasing group (14.5%) began at a low-moderate probability of participation but increased much more drastically than the low-increasing group, to a probability of approximately .90 and appeared to remain high in their legal work participation. Also as expected, there was a group, characterized as high stable that comprised 17.5% of the sample. These individuals' probability of engaging in legal work was consistently high (between .75 and .90) across the study period. Unexpectedly, the moderate declining (14.5%) group emerged. This group began the study period with a moderate level of participation in legal work and actually decreased their probability of engaging in legal work over time.

Figure 11 Trajectories of Legal Work (n=1320)



I followed the same process of choosing the best solution for the trajectories of illegal work participation as I did for the legal work trajectories. Table 5 displays the BIC and AIC for three, four and five groups. I chose the four group solution over the five group solution because the fifth group comprised of a very small proportion of the sample (less than 4%). Similar to the legal trajectory groups, the average posterior assignment probabilities for all four of the illegal groups were above 85%, suggesting good model fit.

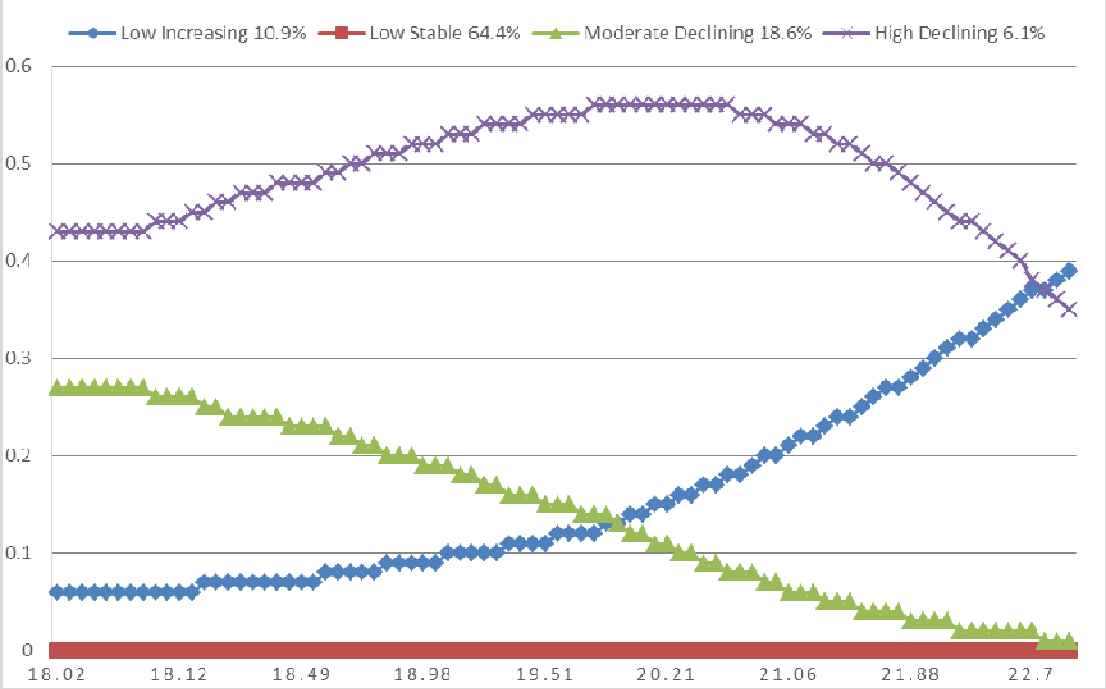
Table 5 Bayesian Information Criterion BIC for Selection of Illegal Work Trajectories (n=1320)

	Order	BIC	AIC
3 group	2 2 2	-14176.8	-14148.3
	1 2 2	-14175.9	-14150
4 group	2 2 2 2	-13539.4	-13500.5
	1 2 2 2	-13628.5	-13592.2
	1 2 3 3	-13632.2	-13590.7
	1 1 2 2	-13627.1	-13593.4
5 group	2 2 2 2 2	-13149.5	-13100.2

As expected, the largest group of the illegal work trajectories was the low stable group, which comprised of 64.4% of the sample (Figure 12). This group did not participate in illegal work across the entire study period. There were two declining groups: the moderate declining group (18.6%) and the high declining group (6.1%). The moderate declining group had a steady and consistent decline in the probability of participation in illegal work across the age profile. This group began with a probability of about .28 at the age of 18 and their probability of participating in illegal work declined to approximately zero by the end of the study period. The shape of the high declining group was non-linear. The high declining group began with a

moderate level of participation in illegal work (about .45) and actually increased their probability of participation in illegal work during their late teens. By their early 20s however; the high declining group decreased their participation markedly from .55 to .35. Interestingly, the "low increasing" group emerged. This group made up 10.4% of the sample and although they started at a low probability of engaging in illegal work, by the end of the study period, their probability of engaging in illegal work surpassed the level of the high declining group.

Figure 12 Trajectories of Illegal Work (n=1320)



To examine how demographic characteristics are related to membership in the various legal and illegal groups, I conducted the classify-analyze method. That is, I hard classified participants into their respective groups and treated the groups as a subsample of the entire sample. Because the mean posterior probability for the group is greater than .70 (which is the case), the classify analyze method provides a good

approximation.[4] Table 6 displays the results of the legal and illegal trajectory groups by demographic characteristics. I conducted an analysis of variance (ANOVA) to test differences between two or more of the means. When comparing across the legal work trajectory groups, there were significant differences between the low stable and high stable groups in terms of gender, race and site. The low stable group consisted of the highest proportion of males whereas the moderately declining group contained the lowest proportion of males. The high stable group contained the highest proportion of Whites and the low stable group had the smallest proportion. Conversely, Blacks made up over 50% of the low stable group and only 19% of the high stable group. There were no differences between the legal trajectory groups in terms of Hispanics. The high stable group was disproportionately made up of participants from Phoenix (70%) and the low stable group was comprised mostly of participants from Philadelphia (59%).

There were significant differences for gender and race between the illegal work trajectory groups. Males made up the highest proportion (96%) of the high declining group and the least in the low increasing group (83%). Blacks made up 55% of the high declining group but only 38% of the low increasing group. Less than a quarter (23%) of the high declining group consisted of Hispanics while the low increasing group made contained 37% Hispanics. There were no significant site differences between the illegal trajectory groups.

[4] The concern with the classify-analyze method is that it does not take into account the uncertainty of group assignment and therefore might produce incorrect inferences. However Roeder et al. (2012) show that if there is little uncertainty about latent class membership, assigning subjects to the latent category produces minimal errors.

Table 6 Trajectory Groups by Demographic Covariates

	Legal work trajectory groups				
	1 Low Stable	2 Low Increasing	3 Mod Declining	4 Mod Increasing	5 High stable
Male*	.908	.844	.834	.853	.842
Ethnicity					
White*	.113	.159	.229	.251	.357
Black*	.529	.446	.416	.350	.193
Hispanic	.307	.358	.325	.340	.387
Site					
Philadelphia*	.593	.549	.558	.507	.293
Phoenix*	.406	.450	.441	.492	.706

	Illegal work trajectory groups			
	1 Low Stable	2 Low Increasing	3 Mod Declining	4 High Declining
Male*	.940	.828	.909	.961
Ethnicity:				
White	.164	.203	.245	.187
Black*	.457	.380	.433	.55
Hispanic*	.321	.367	.283	.237
Site:				
Philadelphia	.571	.491	.529	.600
Phoenix	.428	.508	.470	.400

* Analysis of Variance $p<.05$

Dual Trajectories of Legal and Illegal Work

To unpack the intertwined relationship between legal and illegal work, I turn to the dual trajectory model. Similar to single trajectory models, the dual model allows me to account for population heterogeneity underlying the associations between legal work and illegal work. Above and beyond the estimates associated with single trajectories of legal work and illegal work, the dual model estimates both

conditional probabilities and joint probabilities of legal work and illegal work. . These probabilities are the key additional outputs from the dual model; for the purposes of estimation, starting values for the trajectory shape parameters were obtained from the respective single solutions (Jones and Nagin, 2007).

Figures 13, 14 and 15 graphically display conditional probabilities and joint probabilities of legal work and illegal work (see Table 1, Appendix A for a tabular representation of the estimates). Figure 13 illustrates the probability of membership in a particular legal work group conditional on membership in a particular illegal work group. That is, given membership in a particular illegal group, what is the probability of membership in a particular legal group? It is important however to note that the conditional probabilities do not imply causal or temporal ordering between legal and illegal group membership. Because the probabilities are conditional on membership in a given illegal trajectory group, each column of probabilities in Figure 13 sums to 1.

There are two notable observations in Figure 13. First, there was considerable variation in the conditional probabilities within each legal work group. The probability of membership in a particular legal work group varied greatly depending on membership in which illegal work group. For example, there was a probability of .46 of being in the low stable work group conditional on being in the high declining illegal group. However, the probability of being the low stable work group dropped to only .24 if the membership was in the low stable illegal work group. If converted to odds ratios, membership in the low stable legal group was 2.68 times greater for members of the high declining illegal group compared to members in the low stable

illegal group. The moderately declining legal group emerged as an interesting and an unexpected group. The highest probability of membership in this group was membership in the low stable illegal group (.21). Interestingly, the conditional probability of membership in the moderately declining legal group was 0 given membership in the high declining illegal group.

The second notable observation is that there was considerable variation across the legal trajectory groups. Looking at the first set of columns (Figure 13), we see the probability of being in the low stable legal work groups was the highest (about .45) conditional on participants being in the high declining illegal work group. However, the probability of being in the legal moderate declining group is 0 given being in the illegal high declining group. Looking at the legal groups from left to right, the probability of being in the low stable, low increasing, moderate declining and moderately increasing legal groups conditional on being in the low increasing illegal group decreased monotonically from .35, .30, .11 and .05, respectively. This shows that membership in the low increasing group was differentially related membership in particular legal groups.

Figure 14 displays the results of the probability of being in an illegal work trajectory group conditional on being in a particular legal trajectory group. Similar to Figure 14, there were variations both within illegal groups and between illegal groups. Here, each row of probabilities sums to 1. The conditional probabilities of being in the low stable illegal group were all relatively high because the low stable illegal group comprised of over 64% of the sample. However, there was a .82 probability of membership in the low stable group given membership in the

moderately declining legal group whereas there was a considerably lower probability of membership in the low stable illegal group given belonging to the low stable legal group (.51). In terms of odds ratios, membership in the low stable illegal group was 4.3 times greater given membership in the moderately declining legal group compared to membership in the low stable legal group. There was a .26 probability of membership in the moderately declining illegal group conditional on being in the low stable legal group but only a .10 probability conditional on being in the moderately declining group (an odds ratio of 3.18).

Across illegal groups, membership in the high stable legal group was most predictive of being in the low stable illegal group (.71) and least predictive of being in the high declining illegal group (.06). That is, being in the low stable illegal group was considerable higher than membership in the high declining illegal group given membership in the high stable legal group. Membership in the low stable legal group was associated with a .26 probability of membership in the moderately declining illegal group but only a .09 probability of membership in the high declining illegal group (an odds ratio of 3.88).

Figure 13 Probability of Legal Work Group Conditional on Illegal Work Group

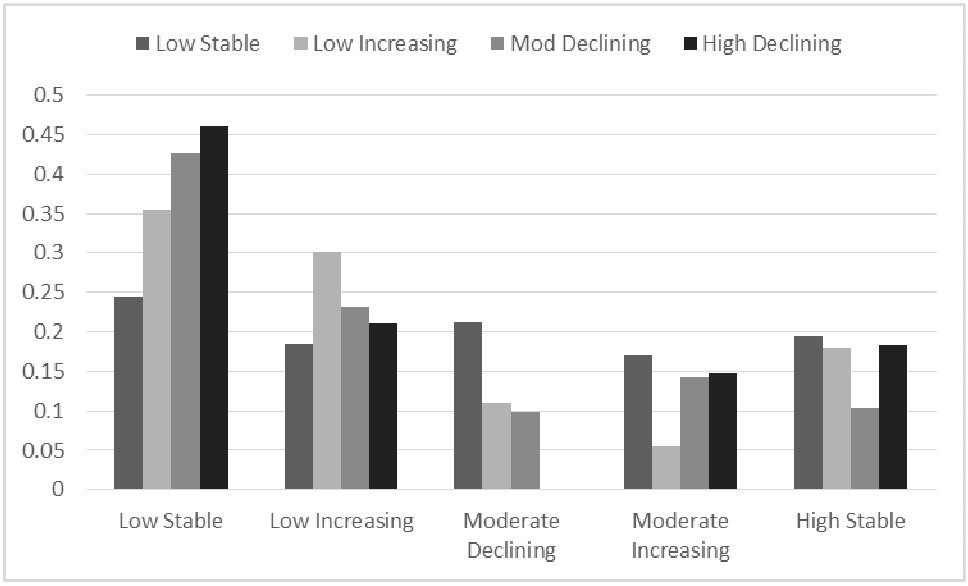


Figure 14 Probability of Illegal Work Group Conditional on Legal Work Group

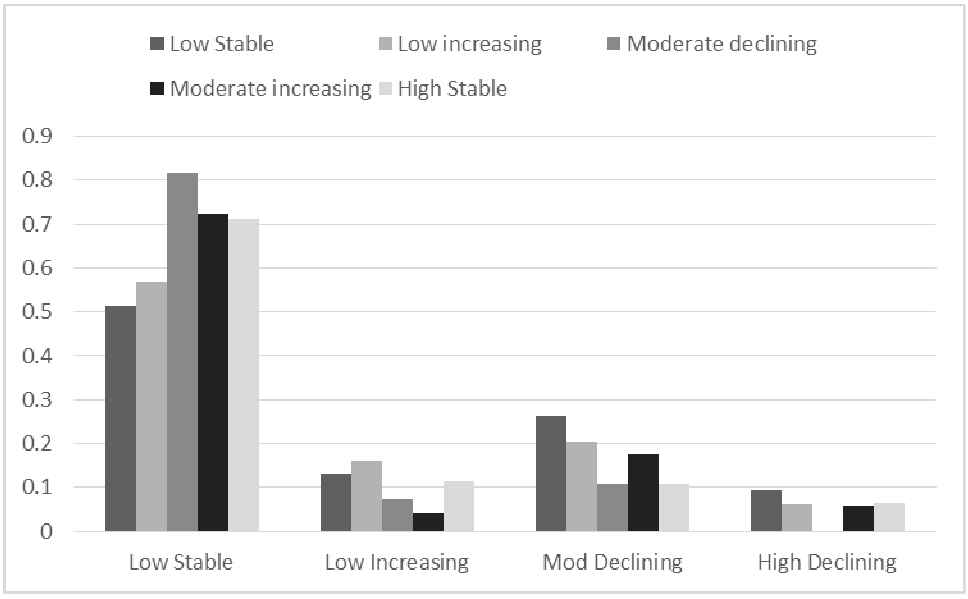
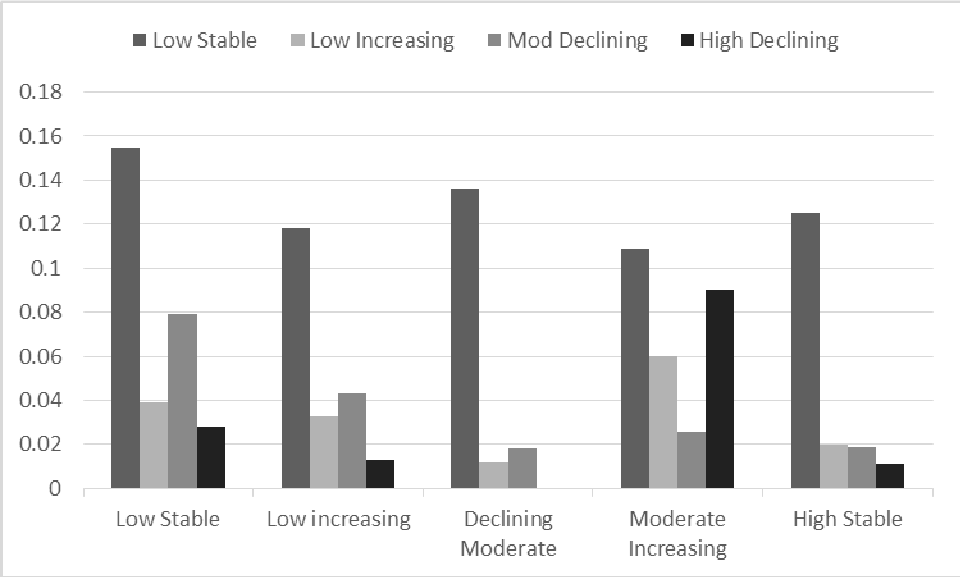


Figure 15 illustrates the results of the joint probabilities of being in the respective legal work and illegal work trajectory groups. The joint probabilities are the probabilities of the co-occurrence between legal and illegal work, unlike the

previous probabilities these are unconditional. Figure 15 displays the probabilities of all the possible combinations of legal and illegal trajectory groups. Thus, all the joint probabilities sum to 1. One noteworthy pattern emerged from Figure 15: there appeared to be opposing patterns of legal and illegal work, characteristic of a mirrored pattern between the two trajectories. More specifically, increased participation in legal work was related to the declining participation in illegal work. For example, there was a .09 probability that the moderate increasing legal group jointly occurred with the high declining illegal group. Similarly, the joint probability of the legal low increasing group and the illegal moderately declining group was .04. The probability of being in both the legal high stable legal group and the low stable illegal group was also relatively high (.12). In contrast, there were parallel pathways between legal and illegal work trajectories. These findings are important because they suggest that it is rare for trajectories of high involvement in legal work to jointly occur with trajectories of high involvement in illegal work.

Figure 15 Joint Probability of Legal Work Group and Illegal Work Group



The goal of the first research question was to take an in-depth look at the descriptive patterns of legal work, illegal work, and how they overlap. I turned to estimating group based trajectories of legal work and illegal work to examine these descriptive patterns while simultaneously taking into account population heterogeneity. Several unexpected patterns emerged. For example the moderate declining group decreased their probability of participation in legal work. To further examine demographic characteristics, I created group profiles of the various trajectory groups. Gender and race were significantly different across at least two of the groups (legal and illegal) while there were site differences only across the legal work trajectory groups. Finally, I estimated a dual trajectory model to examine the various ways that legal work and illegal work can overlap. Overall, results of the dual trajectory model suggest that there was considerable variation in the probability of membership in a particular legal group conditional on being in a particular illegal

group and vice versa. In general however, it was observed that high involvement in legal work was associated with low involvement in illegal work.

Research Question Two: Legal Economic Opportunities

The first research question examined the descriptive patterns of legal work, illegal work and their overlap. In doing so, I estimated a dual trajectory model which estimated the conditional and joint probabilities of legal and illegal trajectory groups. Research question two examined individual level factors that are associated with the various conditional probabilities between legal and illegal work. It is important to note that the model only allows for time stable predictors and thus all the variables were taken from the baseline interview and are not time-varying. The current investigation focused on how economic opportunities measured at baseline might alter the probabilities of being in various illegal work trajectories, conditional on legal group membership. Economic opportunities were measured through three main constructs: The first one is an indicator of neighborhood conditions. This was included because prior literature emphasizes that neighborhood structure can impact the probability of engaging in illegal work, despite engaging (i.e. Freeman, 1996; Sullivan, 1989). Specifically neighborhood disorganization and deterioration can constrain legal economic opportunities and push individuals to engage in illegal work in addition to legal work. It is expected that the greater the neighborhood disorganization, the higher probability of membership in a high illegal group.

The second construct taps into perceived neighborhood opportunities for legitimate work. Prior research suggests that individuals who have few legitimate work opportunities work turn to illegal work as a means to supplement their legal

wages (Horowitz, 1983). Therefore, it is expected that lower perceptions of legitimate opportunities should be positively related to membership into higher illegal work groups, particularly for individuals in lower legal work groups.

The third construct was inspired by anomie/strain theories, which posit that the disjunction between expectations and aspirations can be a source of stress or strain and can push an individual to take on illegal activities (Merton, 1938; 1968). Thus, the items measure the disjunction between economic expectations and economic aspirations. There are two main reasons for inclusion of the strain measures as indicators of legal economic opportunities in the current context. First, as individuals' economic expectations fall short, he/she is more likely to engage in "whatever means necessary" to close the expectations/aspirations gap (Merton, 1968). Membership in a high illegal group, is a way to achieve greater monetary success. Second, the effect of the expectations/aspirations gap should have similar impact on membership in higher illegal groups, regardless of which legal group an individual belongs to. For example, Merton (1938: 680) argues that the "pursuit of pecuniary success" are goals that transcend class lines. Chapter 3 provided a description of all the variables.

Table 7 provides the descriptive statistics on the measures used in the analyses for research question two. All the variables were taken from the baseline interview, which occurred prior to the estimation of the trajectories. It appears that participants generally viewed their legitimate opportunities (at baseline) as relatively low. In terms of expectations and aspirations for success, on average, expectations seem to fall shorter than aspirations, evidenced by the negative signs. The average age of

onset was 14.9 years and parent index of social position was relatively low. At baseline, less than 10% of the participants had children and scored a 2.9 out of 5 on impulse control and 2.3 out of 4 for future orientation.

Prior to estimating the final models for research question two, I tested whether or not the four perceived opportunity items loaded onto a single factor. The items did not load onto one factor, suggesting that they do not belong to one latent construct. I similarly conducted a factor analysis on the three expectations fall short items and results indicated that they did not belong to one factor and therefore, they were retained as single items.

Table 7 . Descriptive Information of Predictors of Conditional Probabilities (n=1320)

Variable at Baseline	Mean	Standard Deviation	Min, Max
Neighborhood conditions	2.348	.754	1, 4
Perceptions of opportunities:			
In my neighborhood easy for young person to get good job*	3.031	1.084	1, 5
In my neighborhood hard to make money w/o doing something illegal	2.889	1.142	1, 5
Not much opportunity to succeed as kids from other neighborhoods	2.429	1.031	1, 5
Employers around here often hire young people from this neighborhood	3.442	.708	1, 5
Expectations fall short			
Important to have a good job or career	-1.255	1.135	-4, 4
Earning a good living*	-1.093	1.012	-4, 2
Providing a good home for family*	-1.016	.989	-4, 2
Controls:			
Male*	.867	-	0, 1
Philadelphia	.521	-	0, 1
Black	.417	-	0, 1
Hispanic	.334	-	0, 1
Age of onset*	14.934	1.635	9.1, 18.42
Parent index of social position*	51.4786	12.166	11, 77
Children	.091	.288	0, 1
Impulse control*	2.954	.952	1, 5
Future orientation*	2.331	.549	1, 4

*p<.10

Extending the dual trajectory model to include covariates in the probabilities linking legal work and illegal work trajectories requires considerable computing resources and therefore I conducted separate bivariate analyses of all the predictors on the probabilities to determine which of the key items and control variables were significantly related to the relationship between legal and illegal work. If the predictor was significant at α=.10, it was included in the final models. Table 7 displays an asterisk beside the variables that were retained for multivariate analyses. Only one of

the four perceived opportunities measures (in my neighborhood easy for young person to get good job) and two out of the three expectations fall short measures (earning a good living and providing a good home for family) were significantly related to the conditional probabilities.

Tables 8 through13 display the results for research question two. There are two main components associated with the main tables (tables 8, 10 and 11. First, there are a set a coefficients for each illegal trajectory group except for the low increasing illegal trajectory. This is because for each trajectory group, the estimate should be interpreted as the effect of the variable on the probability of membership to that illegal work trajectory *relative to* the low increasing illegal trajectory. Second, there are a set of coefficents for $\Upsilon_{\text{illegal group|legal group}}$ for each of the illegal groups. These coefficients represent the intercepts of the probabilities.

Table 8 examines the effect of perceptions of economic opportunities on the conditional probabilities. Model 1 measures the effect of the perception that it is easy for a young person to get a job in his/her neighborhood, measured at baseline, on membership in various illegal work groups, conditional on membership in the particular legal groups. The perception that it is easy for a young person in his/her neighborhood to get a job was marginally significant for membership in the high declining illegal group compared to membership in the low increasing illegal group. Model 2 includes the control variables that emerged as significant in the bivariate analyses. Three of the control variables were significantly related to membership in the low stable illegal group compared to the low increasing illegal group. Males reduce the probability of membership in the low stable illegal group compared to the

low increasing illegal group. Whereas, the higher the parental social economic status and impulse control, the greater the probability of membership in the low stable illegal group compared to the low increasing illegal group. However, parental social economic status and impulse control were not associated with the moderate declining illegal group compared to the low increasing illegal group. The greater the future orientation, the lower the probability of membership in the moderate declining illegal group compared to the low increasing illegal group. The effect of perceptions of opportunities remains not significant except for the high declining illegal group when compared to the low increasing illegal group. The effect however is positive when controls are included in the model and is marginally significant.

Table 8 Membership in Illegal Work Trajectories - Easy to Get a Job

Variable at baseline	Coefficient 1	t-score	Coefficient 2	t-score
Low stable				
Easy for young person to get good job	-0.036	-0.418	0.076	1.027
Controls:				
Male	-	-	-0.828**	-3.105
Age of onset	-	-	-0.073	-1.407
Parent index of social position	-	-	0.019**	2.940
Impulse control	-	-	0.313***	3.529
Future orientation	-	-	0.051	0.346
$\Upsilon_{2\|1}$	-1.263***	-4.006	0.285	0.280
$\Upsilon_{2\|2}$	-1.139**	-3.468	0.492	0.475
$\Upsilon_{2\|3}$	-1.076***	-4.846	1.370	1.300
$\Upsilon_{2\|4}$	-2.794***	-5.774	0.976	0.933
$\Upsilon_{2\|5}$	-2.335***	-5.928	1.606	1.517
Moderate declining				
Easy for young person to get good job	-0.089	-1.253	0.092	0.858
Controls:				
Male	-	-	0.904†	1.730
Age of onset	-	-	-0.099	-1.362
Parent index of social position	-	-	0.012	1.259
Impulse control	-	-	0.183	1.460
Future orientation	-	-	-0.439*	-2.020
$\Upsilon_{3\|1}$	-0.427†	-1.731	-0.410	-0.277
$\Upsilon_{3\|2}$	-0.783**	-2.827	-0.155	-0.103
$\Upsilon_{3\|3}$	-1.519***	0.324	.0362	0.238
$\Upsilon_{3\|4}$	-1.187***	-3.940	-1.406	-0.897
$\Upsilon_{3\|5}$	-1.724***	-5.432	-0.260	-0.170
High declining				
Easy for young person to get good job	-0.186†	-1.696	0.246†	1.804
Controls:				
Male	-	-	1.075	1.405
Age of onset	-	-	-0.075	-0.823
Parent index of social position	-	-	-0.021†	-1.689
Impulse control	-	-	0.123	0.771
Future orientation	-	-	-0.367	-1.296
$\Upsilon_{4\|1}$	-1.163**	-3.214	1.179	0.613
$\Upsilon_{4\|2}$	-1.672***	-3.937	0.897	0.457
$\Upsilon_{4\|3}$	-1.940***	0.439	1.436	0.721
$\Upsilon_{4\|4}$	-2.335***	-4.597	0.846	0.427
$\Upsilon_{4\|5}$	-2.961***	-5.282	0.590	0.296

† p<.10 * p<.05 **p< .01 *** p< .001

low increasing illegal group is the reference group

To illustrate the results of Table 8 further, Table 9 displays the odds ratios and probabilities of membership in the high declining illegal group compared to membership in the low increasing illegal group for each illegal work group. For each unit increase in the perception that it is easy for a person to get a job in his/her neighborhood, the odds of membership in the high declining illegal group compared to membership in the low increasing illegal group is reduced by .544 for the low stable legal group. Looking across the legal groups the effect is lowest for the high stable legal group, which would be consistent with expectations.

Table 9 Change in Odds of Membership from Each Legal Work Trajectory to the High Declining Illegal Trajectory

	Perception that it is easy to get a job				
	Low stable	Low increasing	Mod declining	Mod increasing	High stable
Odds	0.544	0.316	0.388	0.633	0.171

Low increasing illegal group is the comparison group

Table 10 considers the effect of how expectations fall short regarding earning a good living, measured at baseline, is related to the conditional probabilities. Recall that the variable was constructed by subtracting a participant's rating of his/her aspirations of earning a good living from his/her expectations of earning a good living. Model 1 reveals that as expectations of earning a good living fall short, the higher the probability of membership in the high declining illegal group compared to the low increasing legal group. Model 2 includes the control variables and this relationship remains positive and significant. Several control variables were also significant in Table 10. Being male reduced the probability of membership in the low stable and moderate declining groups compared to the low increasing group. But, being male increased the probability of membership in the high declining group

compared to the reference group. The higher the future orientation, the higher the probability of belonging to the low stable group and the moderate declining group compared to the low increasing group. Similarly, the higher the age of onset, the greater the probability of membership in the moderately declining group compared to the low increasing group and the greater the parental social status the lower the probability of being in the high declining illegal group compared to the low increasing illegal group.

Table 10 Membership in Illegal Work Trajectories - Earn a Good Living

Variable at baseline	Coefficient 1	t-score	Coefficient 2	t-score
Low stable				
Earning a good living	0.168†	1.821	0.141	0.143
Controls:				
Male	-	-	-1.435**	-3.299
Age of onset	-	-	0.069	1.150
Parent index of social position	-	-	0.007	0.911
Impulse control	-	-	0.106	1.004
Future orientation	-	-	0.521**	2.734
$Y_{2\|1}$	1.552***	7.364	-0.055	-0.045
$Y_{2\|2}$	1.423***	6.398	-0.241	-0.194
$Y_{2\|3}$	2.047***	7.595	0.239	0.192
$Y_{2\|4}$	2.622***	8.835	1.321	1.024
$Y_{2\|5}$	3.093***	7.456	0.900	0.718
Moderate declining				
Earning a good living	0.158	1.446	0.182	1.593
Controls:				
Male	-	-	-0.573	-1.151
Age of onset	-	-	0.159*	2.139
Parent index of social position	-	-	-0.011	-1.230
Impulse control	-	-	-0.218ł	-1.698
Future orientation	-	-	0.497*	2.216
$Y_{3\|1}$	0.867***	3.629	-0.846	-0.571
$Y_{3\|2}$	0.398	1.482	-1.291	-0.855
$Y_{3\|3}$	0.232	0.644	-1.739	-1.136
$Y_{3\|4}$	0.608	1.639	-0.178	-0.115
$Y_{3\|5}$	1.661***	3.647	-1.300	-0.847
High declining				
Earning a good living	0.335*	2.306	0.289*	1.958
Controls:				
Male	-	-	0.342	0.454
Age of onset	-	-	0.130	1.404
Parent index of social position	-	-	-0.027*	-2.186
Impulse control	-	-	-0.085	-0.529
Future orientation	-	-	0.107	00375
$Y_{4\|1}$	0.030	0.108	-0.896	-0.475
$Y_{4\|2}$	-0.612	-1.715	-1.441	-0.746
$Y_{4\|3}$	-0.230	-0.569	-1.235	-0.637
$Y_{4\|4}$	-0.769	-1.428	-0.746	-0.377
$Y_{4\|5}$	0.358	0.633	-2.054	-1.034

† p<.10 * p<.05 **p< .01 *** p< .001

Low increasing illegal group is the reference group

Table 11 illustrates the odds ratios and the probabilities of membership in the high declining illegal group compared to the low increasing illegal group. For every unit increase in the disjunction between expectations and aspirations regarding earning a good living, the odds of being in the high stable illegal group compared to being in the low increasing illegal group increases by 4.1 for members of the low stable legal group. For members of the high stable legal group, the odds of being in the high stable illegal group increases by 2.3, suggesting that although the effect of the expectations/aspirations gap is consistent for all legal trajectory groups, it is the highest for the low stable legal work group.

Table 11 Change in Odds of Membership from Each Legal Work Trajectory to the High Declining Illegal Trajectory

	Earning a good living				
	Low stable	Low increasing	Mod declining	Mod increasing	High stable
Odds	4.157	3.136	5.376	2.980	2.307

Low increasing illegal group is the reference group

Finally, Table 12 shows the results of the relationship between expectations fall short regarding providing for a good home for your family (measured at baseline) and the probabilities of membership in the various illegal work groups. Model 1 shows that the smaller the expectations/aspirations gap of proving for family, the greater the probability of belonging to the low stable illegal group and the moderately declining illegal group. However, expectations fall short regarding providing for a good home for your family did not differentiate between membership in the high declining group compared to membership in the low stable illegal group. Model 2 includes the control variables and relationship between the expectations/aspirations

gap of proving for family and membership in the moderately declining illegal group remains significant and positive. Again, being male reduces the probabilities of being in the low stable group compared to the low increasing group. The higher the future orientation, the greater the probability of membership in the low stable group and moderately declining group compared to the low increasing group. Age of onset is positively and significantly related to membership in the moderately declining group compared to the reference group. As expected, parental social index at baseline was inversely related to the high declining group compared to the low increasing group.

Table 12 Membership in Illegal Work Trajectories - Providing a Good Home for Family

Variable at baseline	Coefficient 1	t-score	Coefficient 2	t-score
Low stable				
Providing a good home for family	0.219*	2.323	0.160	1.628
Controls:				
Male	-	-	-1.430**	-3.289
Age of onset	-	-	0.066	1.109
Parent index of social position	-	-	0.008	0.981
Impulse control	-	-	0.102	0.965
Future orientation	-	-	0.492*	2.568
$\Upsilon_{2\|1}$	1.606***	7.633	0.051	0.042
$\Upsilon_{2\|2}$	1.470***	6.618	-0.136	-0.110
$\Upsilon_{2\|3}$	2.103***	7.777	0.351	0.281
$\Upsilon_{2\|4}$	3.109***	7.561	1.402	1.085
$\Upsilon_{2\|5}$	2.684***	8.973	1.018	0.809
Moderate declining				
Providing a good home for family	0.259*	2.288	0.245*	2.056
Controls:				
Male	-	-	-0.575	-1.152
Age of onset	-	-	0.155*	2.088
Parent index of social position	-	-	-0.010	-1.121
Impulse control	-	-	-0.217†	-1.684
Future orientation	-	-	0.442*	1.958
$\Upsilon_{3\|1}$	0.972***	4.110	-0.650	-0.437
$\Upsilon_{3\|2}$	0.484†	1.828	-1.110	-0.732
$\Upsilon_{3\|3}$	0.346	0.968	-1.525	-0.991
$\Upsilon_{3\|4}$	1.718***	3.805	-0.028	-0.018
$\Upsilon_{3\|5}$	0.669†	1.775	-1.150	-0.745
High declining				
Providing a good home for family	0.220	1.495	0.134	0.895
Controls:				
Male	-	-	0.366	0.481
Age of onset	-	-	0.123	1.332
Parent index of social position	-	-	-0.026*	-2.132
Impulse control	-	-	-0.084	-0.524
Future orientation	-	-	0.109	0.377
$\Upsilon_{4\|1}$	-0.083	-0.291	-1.021	-0.537
$\Upsilon_{4\|2}$	-0.728*	-2.011	-1.579	-0.811
$\Upsilon_{4\|3}$	-0.378	-0.924	-1.393	-0.713
$\Upsilon_{4\|4}$	0.233	0.415	-0.867	-0.435
$\Upsilon_{4\|5}$	-0.848	-1.559	-2.136	-1.069

† p<.10 * p<.05 **p< .01 *** p< .001

Low increasing illegal group is the reference group

Table 13 shows the odds ratios and the probabilities associated with membership in the moderate declining illegal trajectory group compared to the low increasing illegal group. Recall that the difference between these two groups is that during the middle of the study period (around 20 years old), their trajectories intersect and the probability of engaging in illegal work for the moderately declining illegal group is almost zero by the end of the study period whereas the moderately increasing illegal group had about a .35 probability of engaging in illegal work by the end of the study period. For every one unit change in the expectations/aspirations gap of providing for one's family, the odds of belonging to the moderately declining illegal group compared to the low increasing legal group is decreased by .27. Alternatively, members of the moderately increasing legal group have a 1.2 increase in odds of membership in the moderately declining illegal group compared to the low increasing illegal group.

Table 13 Change in Odds of Membership from Each Legal Work Trajectory to the Moderate Declining Illegal Trajectory

	Providing for your family				
	Low stable	Low increasing	Mod declining	Mod increasing	High stable
Odds	0.666	0.421	0.278	1.242	0.404

Low increasing illegal group is the comparison group

Research question two considered if legal economic opportunities might be related to the membership in particular illegal work groups, conditional on membership in particular legal groups. Drawing from previous literature, I focused on economic opportunities measured by three main concepts: neighborhood conditions, perceived legal opportunities and the discrepancy between one's economic

expectations and economic aspirations. Using an extension of the dual trajectory model, I found that the perception that it is easy for a young person to get a job was inversely related to membership in the high declining illegal group compared to membership in the low increasing illegal group. I also found that two items that capture the disjunction between expectations and aspirations were significantly related to at least one conditional probability: earning a good living and supporting one's family. Additionally, several control variables (male, future orientation, parental socioeconomic index) emerged as significantly related to the conditional probabilities. These results provide preliminary support for arguments laid out my Sullivan (1989) and Agnew (2006) which suggests that the lack of legitimate opportunities and the disjunction between expectations and aspirations are related to the how legal work and illegal work are intertwined.

Research Question Three: The Overlap and the Criminal Career

Research question three considers the legal and illegal overlap and its relation to criminal career dimensions. Specifically, I examine how involvement in the overlap compared to illegal work only is related to the frequency of offending (quantitative nature of offending) and offending variety (qualitative nature of offending).

Table 14 displays the descriptive information for the variables used to answer research question three. The measures are gathered from the recall level and pooled across the study period. The first important thing to note is that the main independent variable is the distinction between engaging in the legal/illegal overlap compared to

engaging in illegal work only. Therefore, the observations are restricted to observations where the respondent self-reported earning money from illegal activities. Table 14 shows that among observations that reported earning illegal money, the sample is evenly split, with about half engaging in the legal/illegal overlap and half engaging in illegal work only. The average age in this select sample was 20 years old and the vast majority were male (94%). Blacks comprised the largest ethnic group (45%) and the average age of onset was about 15 years of age. Although very few observations had children, about half self-reported being in a serious relationship. On average, drug dependency was fairly low but average ratings for deviant peer behavior and slightly high ratings for neighborhood disorder.

Table 14 Descriptive Information on Measures for Criminal Career Outcomes (n=1118 Observations, 515 Individuals)

Variable	Mean	Median	Standard Deviation	Min, Max
Legal and illegal overlap vs. illegal only	.509	-	-	0, 1
Instrumental offending rate (monthly)	84.041	23.076	279.36	1, 5000
Logged instrumental offending rate (monthly)	2.933	3.181	1.860	-2.544, 8.517
Instrumental offending rate no drug (monthly)	10.095	.264	62.024	1, 128
Logged instrumental offending rate no drug (monthly)	.849	.635	1.870	-2.639, 7.525
Instrumental offending proportion	.723	.666	.229	.166, 1
Instrumental offending variety	.266	.200	.176	0.1, 0.9
Individual characteristics:				
Age	20.178	20	1.843	18, 26
Male	.937	-	-	0, 1
Philadelphia	.564	-	-	0, 1
Black	.441	-	-	0, 1
Hispanic	.295	-	-	0, 1
Age of onset	14.986	15.11	1.656	9.1, 18.42
Time varying characteristics:				
Number of children	0.603	0	.917	0, 6
Relationship status	0.499	-	.500	0, 1
Drug dependency	1.728	0	2.685	0, 10
Deviant peer behavior	2.400	2.42	.836	1, 5
Neighborhood conditions	2.608	2.71	.812	1, 4
Intrinsic rewards	2.396	1.57	2.392	0, 10

Table 15 displays the mean and median monthly offending rate by age for observations of both legal and illegal work and illegal work only. Panel A includes all the instrumental offenses in the Pathways data. These offenses include: 1) entered or broken into a building to steal something, 2) stolen something from a store, 3) bought, received, or sold something that you knew was stolen, 4) used checks or credit cards

illegally, 5) stolen a car or motorcycle to keep or sell, 6) sold marijuana, 7) sold other illegal drugs (i.e. cocaine, crack, heroin), 8) prostitution, 9) taken something from another by force, using a weapon 10) taken something from another by force, without a weapon. Panel B displays the frequency rates of instrumental offenses but drug selling (marijuana and other drugs) was excluded. In general, the median rate of instrumental offending was lower for the periods that participants were engaged in both legal and illegal work compared to periods of illegal work only. Consistent with some prior research, frequency of offending appears relatively stable over time for participants who remain criminally active (i.e. Loeber and Snyder, 1990) Panel B reveals that when drug selling is removed from the monthly offending rate, the frequency was greatly reduced. However, the frequency of offending of non-drug instrumental crimes for periods during the legal/illegal overlap remains less than periods of illegal work only.

Table 15 Monthly Rates of Self-Reported Instrumental Offending (Recall Level)

	18 years	19 years	20 years	21 years	22 years	23 years	24 years
	Mean (Median)	Mean (Median)	Mean (Median)	Mean (Median)	Mean (Median)	Mean (Median)	Mean (Median)
Instrumental offending rate							
Legal/illegal overlap	131.45 (19.94)	47.25 (21.53)	42.58 (10.10)	67.90 (13.63)	65.72 (15.25)	97.39 (23.07)	45.37 (17.64)
Illegal only	127.14 (31)	116.24 (38.09)	63.33 (30)	73.45 (26.71)	132.29 (28.69)	40.25 (23.05)	53.60 (30.76)
Instrumental offending rate (no drugs)							
Legal/illegal overlap	14.64 (2.80)	7.70 (.96)	9.43 (1.61)	50.17 (2.12)	38.56 (1.79)	73.37 (1.85)	9.31 (.841) (n<20)
Illegal only	13.73 (2)	14.73 (2.5)	9.06 (2.1)	14.27 (2.63)	14.56 (3.76)	33.73 (.76) (n<20)	8.47 (.88) (n<20)

There were a small number of observations that contained 0, which means that the participant indicated that they earned at least $1 illegally but did not endorse any of the crime types named in the Pathways to desistance study. About 10% of the sample had a value of 0 for the frequency of offending. It is possible that simply removing these observations from analyses would impact the consistency and unbiasness of the OLS estimator, perhaps due to issues with nonrandom sample selection. To explore this possibility, I estimated the same structural model using a Heckman (1976) sample selection correction and tested if the key parameter $\rho = 0$. Here ρ can be defined as the correlation between the error terms in the main equation and the sample selection equation, which should ideally equal zero if sample selection is exogenous.[5] Here I failed to reject the null hypothesis that rho = 0 and therefore I

[5] In the model specification, I did not fit the Heckman model with an exclusion restriction in the first stage, thereby relying on identification from functional form assumptions (Bushway, Johnson and Slocum, 2007). While I recognize the potential limitations of this omission for identification, I note that this test was done purely as a sensitivity check, and I was unable to reject the null, meaning I am not overly relying on potentially fragile parameter estimates from the selection model.

retained the OLS estimates and excluded the observations that contained 0 in the outcome – the instrumental crime rate.

Due to the skew of the instrumental crime rate, I used the natural logarithm of the instrumental crime rate. I present the OLS results predicting logged monthly instrumental crime rate in Table 15. The analyses were conducted in three stages. The first stage looked at the bivariate relationship between being involved in both legal work and illegal work compared to being involved in illegal work only and the monthly instrumental crime rate. The second model includes individual characteristics of the participant and the third model included time-varying characteristics of the participant. Model 1 shows that being in both legal and illegal work compared to illegal work only was significantly related to offending frequency (β=-.676, $p<.001$). This result remains negative and significant across models 2 and 3. Specifically in model three, we can say that being in the overlap was related to lowering the average monthly offending frequency by 5%, holding all else constant. Several other variables emerged as significantly related to offending frequency. Males compared to females were more likely to engage in higher frequency of offending. Interestingly, the more children a participant had, the higher the frequency of instrumental offending. As expected drug dependency and deviant peer behavior was also positively and significantly related to frequency of offending. There were marginal effects for location and race: participants from Philadelphia compared to Phoenix increased the offending frequency and being Hispanic lowered offending frequency. Blacks, age of onset, relationship status, neighborhood conditions and

intrinsic rewards to crime had no significant relationship with the frequency of offending.

Table 16 OLS Model Predicting Logged Monthly Instrumental Crime Rate, Robust SE (n=1025, 568 Individuals)

Variable	Co-efficient (SE)	Co-efficient (SE)	Co-efficient (SE)
Both (illegal only reference category)	-676 (.120)***	-.614 (.118)***	-.573 (.109)***
Individual characteristics:			
Age	-	-.045 (.034)	-.062 (.034)ŧ
Male	-	.776 (.279)*	.862 (.243)***
Philadelphia	-	.007 (.158)	.330 (.173)ŧ
Black	-	.214 (.186)	.174 (.186)
Hispanic	-	-.298 (.189)	-.321 (.187)ŧ
Age of onset	-	-.031 (.044)	-.042 (.040)
Time varying characteristics:			
Number of children	-	-	.136 (.064)*
Relationship status	-	-	-.154 (.116)
Drug dependency	-	-	.101 (.024)***
Deviant peer behavior	-	-	.431 (.072)***
Neighborhood conditions	-	-	.037 (.079)
Intrinsic rewards	-	-	-.015 (.029)
Constant	3.276 (.081)***	3.898 (.978)***	2.724 (.988)**

*p< .05 **p< .01 ***p< .001

Selling drugs is a crime that occurs more frequently than other instrumental crimes (Johnson et al., 1994). Thus, I also looked at the frequency of instrumental offending excluding the two drug selling items (selling marijuana and selling other drugs) to examine whether or not the effect of being engaged in both remained significant even when drug selling was removed (Table 17). Indeed, by removing the drug offenses, being in both legal work and illegal work compared to illegal work only still significantly related to the frequency of offending. That is, being in the overlap is associated with a lower average monthly offending frequency by 4%. Similar to the previous model, being from Philadelphia, drug dependency and deviant

peer behavior are associated with a higher offending frequency above and beyond drug selling.

Table 17 . OLS Model Predicting Logged Monthly Instrumental Crime Rate Excluding Drug Selling, Robust SE (n=597, 327 Individuals)

Variable	Co-efficient (SE)	Co-efficient (SE)	Co-efficient (SE)
Both (illegal only reference category)	-.300 (.159)ŧ	-.441 (.152)**	-.400 (.144)**
Individual characteristics:			
Age	-	-.059 (.045)	-.0377 (.048)
Male	-	-.054 (.272)	-.103 (.298)
Philadelphia	-	-.933 (.230)***	-.520 (.229)*
Black	-	-.132 (.258)	-.193 (.264)
Hispanic	-	-.021 (.240)	.008 (.228)
Age of onset	-	.0425 (.051)	.010 (.047)
Time varying characteristics:			
Number of children	-	-	-.063 (.095)
Relationship status	-	-	-.157 (.145)
Drug dependency	-	-	.082 (.027)**
Deviant peer behavior	-	-	.423 (.091)***
Neighborhood conditions	-	-	.020 (.106)
Intrinsic rewards	-	-	.020 (.032)
Constant	1.017 (.129)***	2.160 (1.275)	.601 (1.321)

*p< .05 **p< .01 ***p< .001

Moving on to offending variety, Table 18 presents the descriptive information of the two measures I use to investigate offending variety: the proportion of instrumental crimes over all crimes and the variety of instrumental crimes, over the age profile. Several results were notable. Frist, the proportion of instrumental crimes hovers around .70, which means that over 70% of the offenses that the participants engaged in were instrumental crimes. Although this appears high, given that all the participants engaged in some form of illegal work to be included in the analyses, it is reasonable. Second, the proportion of instrumental crimes appears similar during periods of the legal/illegal overlap and illegal work only. Third, the proportion of

instrumental crimes was fairly consistent across the age profile. On the whole, the variety proportion of instrumental crimes is slightly higher for the legal/illegal overlap compared to illegal work only. There also does not appear to be a consistent trend across the age profile.

Table 18 Instrumental Offending Variety by Age (n=1118)

	18 years Mean	19 years Mean	20 years Mean	21 years Mean	22 years Mean	23 years Mean	24 years Mean
Proportion of instrumental crimes							
Legal/illegal overlap	.709	.702	.725	.728	.711	.737	.716
Illegal only	.703	.739	.742	.698	.743	.725	.767
Instrumental offending variety							
Legal/illegal overlap	.281	.223	.232	.229	.258	.207	.237
Illegal only	.254	.268	.241	.218	.237	.188	.181

To examine the relationship between the legal/illegal overlap and offending variety, I conducted two ordinary least squares regressions. Instrumental offending proportion was the outcome of the first set of analyses (Table 19). Similar to offending frequency, the analyses were conducted in three stages: the first stage included the legal/illegal overlap, the second included the overlap and individual characteristics and the third stage included all the predictors. Results showed that being engaged in both legal/illegal work compared to illegal work only was not significantly associated with the instrumental offending proportion. In fact only three variables were significantly related to the instrumental offending proportion. Males compared to females had lower instrumental offending proportions. Similarly, deviant peer behavior and intrinsic rewards to crime were inversely related to instrumental offending proportions.

Table 19 OLS Model Predicting Proportion of Instrumental Crimes, Robust SE (n=1118, 515 Individuals)

Variable	Co-efficient (SE) 1	Co-efficient (SE) 2	Co-efficient (SE) 3
Both (illegal only reference category)	-.009 (.015)	-.001 (.014)	-.008 (.015)
Individual characteristics:			
Age	-	.005 (.003)	.005 (.004)
Male	-	-.112 (.030)***	-.086 (.030)**
Philadelphia	-	.008 (.020)	-.014 (.023)
Black	-	.024 (.024)	.019 (.027)
Hispanic	-	-.034 (.021)	-.036 (.022)ł
Age of onset	-	-.001 (.005)	-.005 (.005)
Time varying characteristics:			
Instrumental offending rate (logged)			.002 (.004)
Number of children	-	-	-.004 (.009)
Relationship status	-	-	-.002 (.014)
Drug dependency	-	-	.003 (.002)
Deviant peer behavior	-	-	-.050 (.009)***
Neighborhood conditions	-	-	-.021 (.010)ł
Intrinsic rewards	-	-	-.010 (.003)**
Constant	.728 (.011)***	.716 (.115)***	.982 (.127)***

*p <.05 **p < .01 ***p <.001

Table 20 displays the results of predicting the variety proportion of instrumental crimes. Again, this measures the different types of instrumental crimes an offender was engaged in. The denominator is the 10 aforementioned instrumental crimes and the numerator is the number of those crimes the respondent endorsed. Engaging in both legal/illegal work was inversely related to the number of instrumental crime types an individual endorses (p<.10), even when controlling for individual level and time varying factors. A number of individual factors were significantly related to the variety of instrumental crimes. Age, being from Philadelphia, Blacks and Hispanics were all inversely related the variety of instrumental crimes. As expected, instrumental offending rate and drug dependency were associated with an increase in the variety of instrumental crimes. Similarly,

deviant peer behavior and intrinsic rewards to crime were associated with greater variety of instrumental crimes.

Table 20 OLS Model Predicting Variety of Instrumental Crimes, Robust SE (n=1118, 515 Individuals)

Variable	Co-efficient (SE) 1	Co-efficient (SE) 2	Co-efficient (SE) 3
Both (illegal only reference category)	.001 (.012)	-.021 (.012)ŧ	-.009 (.010)ŧ
Individual characteristics:			
Age	-	-.008 (.002)**	-.003 (.003)
Male	-	.011 (.025)	.020 (.022)ŧ
Philadelphia	-	-.090 (.016)***	-.054 (.017)**
Black	-	-.058 (.019)**	-.051 (.021)*
Hispanic	-	-.055 (.019)**	-.030 (.019)ŧ
Age of onset	-	-.002 (.004)	-.001 (.004)
Dynamic characteristics:			
Instrumental offending rate (logged)			.024 (.002)***
Number of children	-	-	-.004 (.006)
Relationship status	-	-	-.006 (.010)
Drug dependency	-	-	.012 (.002)***
Deviant peer behavior	-	-	.053 (.007)***
Neighborhood conditions	-	-	-.001 (.007)
Intrinsic rewards	-	-	.012 (.002)***
Constant	.265 (.010)***	.575 (.093)***	.149 (.099)

*p <.05 **p < .01 ***p <.001

Summary of Results

To recap, the current study had three main research questions. The first question was: Are there heterogeneous patterns of legal work and illegal work? What is the heterogeneity in joint development of legal and illegal work? To answer this question, I estimated group based trajectory models for legal work and illegal work. The joint development was examined through dual trajectory models. Findings suggest that there are very different pathways of legal work and illegal work over the study period. The relationship between the two pathways seems to largely follow an inverse pattern, suggesting optimistic results in terms of policy implications.

Importantly though, results showed that on the whole, membership in the legal work group is not a strong predictor of the illegal work trajectory group and vice versa.

Drawing on ethnographic work and the anomie/strain traditions and an extension of the dual trajectory model, my second research question examined whether or not legal economic opportunities alter the conditional probabilities between legal and illegal work. Findings suggest that legal economic opportunities (measured as perceived opportunities and the disjunction between economic expectations and economic aspirations) significantly altered the probability of membership in particular illegal groups, conditional on membership on particular legal groups. These findings indicate promising results and suggest that differential legal economic opportunities can potentially impact longitudinal patterns of illegal work.

The last research question examined if participation in the legal and illegal work overlap was associated with the offending frequency and offending variety. Compared to being engaged in illegal work only, involvement in the overlap was associated with lower offending frequency. Although the proportion of instrumental crimes did not differ between engaging in the overlap compared to being involved with illegal work only, engaging in the overlap was associated with fewer types of instrumental crimes. Taken together, results suggest that the relationship between the legal/illegal overlap and criminal career dimensions is an important avenue for further inquiry. It is possible that being involved with the overlap is possibly one path to desistance, given its reduced frequency of offending. However, the qualitative nature of offending during the periods of overlap included both instrumental and non-

instrumental crimes. This suggests that for individuals who engaged in the overlap, instrumental crimes were merely part of a diverse offending repertoire.

Chapter 5: DISCUSSION

Having a good job is supposed to have many important implications for offending. Theoretically, it is supposed to be a key factor in building conventional social capital, provide a sense of accomplishment, organize daily routines and be a source of informal social control (Sampson and Laub, 1993; Uggen, 2000). However, in reality, the relationship between employment and crime is quite complex. According to data from a national study, three-quarters of state inmates reported that they held a job just prior to their incarceration (Lynch and Sabol, 2001). As such, over the last couple of decades there has been a resurgence in custodial and noncustodial work programs. Unfortunately, evidence on the effectiveness of these programs in reducing recidivism is equivocal. To gain a more nuanced understanding of the relationship between legal and illegal work, the current study moved away from polarizing legal and illegal work and examined their interrelated nature, including their contemporaneous participation.

Expanding inquiry beyond the bifurcation of legal and illegal work can provide a number of advantages. For example, investigation into the effect of legal economic opportunities and participation in illegal work has been an important avenue of inquiry for many scholars from the anomie tradition (i.e. Cloward and Ohlin, 1960; Merton, 1968). However, there has been an implicit assumption that as individuals take on illegal work as a result of blocked legal opportunities, they are disengaged from the legal market altogether. Acknowledging that legal and illegal work can both be avenues to achieving financial aspirations would be an important

step in future work on the relationship between legal economic opportunities and illegal work.

Examining the legal/illegal overlap can also help with the further understanding of criminal careers. Blumstein et al. (1988: 2) define criminal careers as "the longitudinal sequence of offenses committed by an offender who has a detectable rate of offending during some period of time." Since then, criminal careers have been characterized by a beginning (onset or initiation), duration (career length), frequency of offending and an end (desistance). Currently, the definition of criminal careers is couched in terms of sequences of discrete stages that are studied independently (Ulmer and Spencer, 1999). Better understanding of the complex relationship between legal and illegal work, including their overlap can help situate the overlap in the criminal career and possibly help better understand movement from one criminal career stage to another.

The current study is one of the first to systematically investigate contemporaneous participation in legal and illegal work. Building on this type of inquiry can be informative not only for theory, but also for policy. For example, the current study uncovered heterogeneous patterns in legal work and illegal work among a sample of individuals who were charged with a felony offense at an especially young age (14 to 17 years old). Because of the select nature of the sample, it would be interesting to examine if the patterns uncovered in the current study are robust across various samples. Further, empirical work suggests that there are heterogeneous effects of custodial and noncustodial work programs. Investment in understanding what factors might condition the relationship between legal and illegal work can be

potentially useful for understanding (non) effectiveness of custodial and non-custodial work programs.

The current study examined the overlap in three different ways. First, I estimated latent trajectory groups of legal work and illegal work. I examined the intertwined relationship between legal work and illegal work by using dual trajectory analysis, which provides three different representations of the linkage between legal and illegal work. One is the probability of membership in each of the legal work trajectory groups conditional on membership in each of the illegal work trajectory groups. The second is the reverse set of conditional probabilities: the probability of membership in each of the illegal trajectories conditional on membership in each of the legal trajectories. Finally, the joint probability of membership in a specific legal trajectory *and* a specific illegal trajectory group was estimated. Second, using an extension of the dual model, I tested if legal economic opportunities were associated with the probability of membership in particular illegal work groups, conditional on membership in particular legal work groups. This allowed me to examine the relationship between legal economic opportunities and longitudinal patterns of illegal work while accounting for longitudinal patterns of legal work. Lastly, contemporaneous participation in legal and illegal work was examined by comparing engaging in the legal/illegal overlap to being engaged in illegal work only on two key criminal career outcomes: offending frequency and offending diversity.

Research Question One: Heterogeneity in Legal and Illegal Work

Because the current study is one of the first studies to systematically examine the overlap between legal work and illegal work, the purpose of research question one was to uncover the longitudinal patterns both legal and illegal work, and how they were linked together over time. The legal work trajectory groups and the illegal work trajectory groups revealed that as expected, most groups increased the probability of participation in legal work and decreased the probability of illegal work over the age profile. However, there were also a couple of pathways that emerged unexpectedly – the moderately declining legal group and the low increasing illegal group. Members of the moderately declining legal group (18%) actually decreased the probability of their participation as they approached the end of the study period and conversely, members of the low increasing trajectory group (11%) increased their participation in illegal work. Demographic profiles showed that both groups had the highest proportion of females but did not differ on any other demographic characteristics. Further investigation into the robustness of these particular groups among other samples would be an important next step.

The dual trajectory analysis also demonstrated that legal work and illegal work unfold in heterogeneous ways. The probability of membership in various legal work groups were very different depending on membership in a particular illegal work group. Two general observations can be made from the results. First, there was an inverse relationship between legal work and illegal work. That is, the longitudinal patterns of legal and illegal work resembled a scissor effect whereby the rise in the probability of participating in legal work was associated with a decrease in the

probability of illegal work. This inverse relationship corroborates with much of the extant literature that posits that legal work is a turning point from illegal work (i.e. Sampson and Laub, 1993; Skardhamar and Savolainen, 2014) and provides an optimistic picture of the relationship between legal work and illegal work.

Even though legal work participation and illegal work participation are inverse, there appears to me an incredible amount of overlap in participation. For example, the joint probabilities of being in both legal groups and illegal groups that had some participation was common. So, although an overall inverse trend can be seen, the trends between legal and illegal work is nuanced and does not comply to discrete states of legal or illegal means of earning money. This is in line with observations made by Freeman (1999) who argues that the lines between legal and illegal work are blurry and porous, rather than distinct and sharp. LaVigne (2014) and Petersilia (2003) also observed that the relationship between legal and illegal work is complicated and oftentimes overlapping.

A second overarching finding gleaned from research question one is that some legal and illegal trajectories have relatively low co-occurrences. For example, the joint probability of membership in the moderate declining legal group and membership in the high declining illegal group was 0. Recall that the moderate declining legal group was a group that emerged as unexpected. It is informative to know that the relationship between the declining legal work participation however was not likely related to a consistently high participation in illegal work.

On one hand, these general findings provide an optimistic picture of the relationship between legal work and illegal work. These findings suggest that, in this

particular sample, legal work and illegal work can be largely viewed as substitutes for one another. Freeman (1987) discusses the notion of substitution and complements in regard to legal and illegal work. He argues that, in the framework of standard labor supply models, if crime is more rewarding than legitimate work, it may substitute for employment and a negative relationship would be observed. Alternatively, a complementary process would be characteristic of legal and illegal work being positively related. Complementary processes are typical in white-collar crime and workplace crime. Future work should examine whether or not rewards from legal work may impact participation in the illegal market (and vice versa) through a substitution effect. Specifically, it would be interesting to ask whether or not individuals are responsive to changing incentives in monetary rewards by assessing participation in both legal and illegal markets.

On the other hand, results from research question one also implies that the tradeoffs between legal work and illegal work might not be monolithic. Although there was a general inverse trend between legal and illegal work participation, there was also considerable heterogeneity in the ways in which legal and illegal work were linked over time. In addition to testing the robustness of the patterns of legal work and illegal work with other samples, important next steps are to consider factors that are related to both the heterogeneity of the singular patterns and factors that are related to how the patterns are interrelated.

Research Question Two: Legal Economic Opportunities

For individuals who are neither fully committed to legal nor illegal markets, many drift between the two depending on the opportunities available at the time. Freeman (1996: 34) for example notes:

> "Many youths combine crime and work or shift between them readily. Because most criminals are self-employed, and because the U.S. job market has considerable flux, crime and legitimate work are not dichotomous choices for most young men. Joe holds a job, robs someone he meets on a dark empty street and sells drugs on the weekend".

Uggen and Wakefield (2008: 204) also note that among past offenders it is common to experience "spells of employment, supplemented by short spells of illegal work". The purpose of research question two was to consider the relationship between legal economic opportunities and the probability of membership in various illegal work groups, conditional on membership in various legal work groups.

There was some support for the notion that perceived legal economic opportunities were related to membership in higher illegal work groups. Three of the perceived legal economic opportunities emerged as significant. The perception that it is easy for a young person to get a job in one's neighborhood increased the probability of membership in the high declining illegal group compared with the low increasing illegal groups. Similarly, the extent to which exceptions fall short of earning a good living increased the probability of membership in the high declining group compared to the lower groups. These findings are consistent with prior work suggesting that structural constraints (i.e. Anderson, 1999; Horowitz, 1983; Sullivan, 1989) are an important consideration for illegal work participation. By accounting for

legal group membership, the findings are also consistent with the arguments of relative deprivation forwarded by Merton (1968).

Interestingly, the disjunction between expectation/aspirations of providing for one's family reduced the probability of membership in the moderately declining illegal group compared to the low increasing illegal group. Unlike the other two perceived legal economic opportunity measures, the relationship with this is not as clear because the differences between the moderately declining illegal group and the low increasing illegal group is not as distinct. Results generally indicate that the greater the expectation/aspirations gap for providing for one's family, the less probable it is that there is a reduction in participation in illegal work by the end of the study period. Research on parenthood and criminal behavior have not produced consistent results. Some studies find that parenthood is likely a catalyst for moving away from criminal behavior (Kerr et al., 2011). Whereas, most other studies do not find evidence that desistance as a consequence of becoming a parent (Blokland and Nieuwbeerta 2005; Giordano et al. 2002; Sampson and Laub, 1993; Wakefield and Uggen 2008). In fact, Wakefield and Uggen (2008) find support for the strain hypothesis that having children increases illegal earnings among criminal offenders.

Although three perceived legal economic opportunity measures emerged as significant, the majority of the measures did not. One possible reason is that the measures were taken from the baseline interview. Indeed perceptions of opportunities are unstable and can shift upwards or downwards as participants enter early adulthood and have experiences in both the legal market and the illegal market. North (2006) for example argues that perceptions are key to innovations that impact economic change.

However perceptions are extremely fragile and continually changing. Another drawback with using baseline perceived legal economic opportunity measures is that that the relationship between strain and deviance should be conditioned by the recency of the stress/strain (Agnew, 1992). By using baseline measures of a dynamic factor, it is likely that I did not capture the proximal effects of perceived economic opportunities. Related, I did not measure a key mediating factor – stress or strain as a result of the expectations/aspirations gap.[6] Nonetheless, the results of the current study provide a promising springboard to further research examining the anomie/strain tradition with an outcome that has yet to be examined: engagement in both legal and illegal work.

Overall, the results from these analyses provide some preliminary support that legal economic opportunities are related to membership in differential illegal work groups. The current study contributes to extant literature by examining the relationship between legal economic opportunities and the probability of engaging in illegal work while accounting for both the heterogeneity in the probability of engaging in illegal work *and* heterogeneity in the probability of engaging in legal work. Differential offending patterns by various subgroups of offenders have been routinely documented (i.e. Moffitt, 1992; Piquero, 2008) and differential patterns of labor market participation have similarly been documented (i.e. Huang et al., 2011; Hynes and Clarkberg, 2005). For example, Moffitt (1993) posits that life course persistent offenders not only offend at a relatively high rate over the life course but

[6] There is some debate as to whether or not the psychological factor is a key component of the anomie/strain tradition. Despite being a central concept for Agnew, Merton argues that he never understood the importance of a psychological variable in his theory of anomie (Cullen and Messner, 2007).

also "fail" across several life domains including education, marriage, and employment. Yet, extant research investigating the relationship between legal economic opportunities and illegal work participation rarely account for this heterogeneity. Failure to account for the heterogeneity can potentially downward bias the estimates as any effects for any subgroup are averaged out.

Research Question Three: The Overlap and the Criminal Career

Although the wealth of criminal careers research would suggest that every conceivable area of research is covered, there are important gaps that remain. One gap is movement towards understanding various patterns of offending. For example, how patterns of intermittency and overlap are situated in the offending career have been understudied. Research question three compared engaging in the legal/illegal overlap to engaging in illegal work only on two key criminal career dimensions: offending frequency and offending variety. For this research question, I moved away from the group-based trajectory models and took a different analytic approach. The dependent variables in research question three were frequency of offending and offending variety. The main independent variable was engaging in the overlap compared to engaging in illegal work only during the recall period (as opposed to monthly observations). The analyses were cross-sectional and focused on between individual differences.

Beginning with the seminal Philadelphia Birth Cohort Studies (Wolfgang et al., 1972) offending frequency has been of key interest to both theorists and policy makers alike. For example, by identifying and selectively incapacitating high-rate

offenders, scarce criminal justice resources can be used more efficiently (Horney and Marshall, 1991). The current study looked at monthly rates of instrumental offending – both including drug selling and excluding drug selling. Findings showed that the frequency of offending during periods of the overlap was significantly lower than during periods of illegal work only. There are potentially two explanations for this finding, although not mutually exclusive they emphasize different mechanisms. First, from a pure opportunity perspective of engaging in illegal work, having a legal job simply reduces the amount of time and the number of opportunities to participate in illegal work. A second explanation is having a legal job is a turning point in the desistance process (Sampson and Laub, 1993). Therefore, the overlap between legal work and illegal work is associated with a deceleration of illegal work because of investment in prosocial bonds. This lines up with Bushway et al.'s (2001) argument that since there is heterogeneity in offending patterns, there may be in fact different pathways to desistance. By measuring the rate of offending over time for multiple groups of offenders, researchers can potentially uncover various patterns in the desistance process. Although the current study used a cross-sectional approach to examining frequency of offending, it provides corroborative evidence that legal employment is associated with lower frequency of engaging in instrumental offending.

In addition to frequency of offending, I considered whether or not engaging in the legal/illegal overlap was differentially related to offending variety. I measured offending variety in two different ways. First, I looked at the proportion of instrumental crimes over all crimes, which provided a measure of how many

instrumental crimes make up the offender's repertoire. I hypothesized that from a rational choice perspective, individuals who have legal jobs would likely only commit instrumental crimes to supplement their income. The disutility of losing one's legal job due to being sanctioned for non-instrumental crimes would deter individuals from committing non-instrumental crimes. The findings however revealed that there were no significant differences in the proportion of instrumental crimes during periods of the overlap and periods of involvement in illegal work only.

Second, I considered whether or not engaging in the legal/illegal overlap was associated with a greater variety of instrumental crimes. From a network perspective, it would be reasonable to hypothesize that engaging in both legal and illegal work would build greater social capital and provide greater opportunities to engage in different types of instrumental crimes. For example McGloin and Piquero (2009) found that offenders who had greater co-offender network redundancy were more likely to specialize in group crime but not when considering both solo and group crimes. Results from the current study showed that being involved in both legal and illegal work was associated with engaging in a fewer types of instrumental crimes.

Taken together, periods of the legal and illegal overlap is characteristic of a lower frequency of offending and fewer types of instrumental crimes. It is possible that, because offending is less frequent during the overlap, offenders only engage in the types of crimes that they are most proficient in. Engaging in fewer types of crimes has been associated with greater criminal skills and criminal returns (Loughran et al., 2013; McCarthy and Hagan, 2001). One way to determine if offenders are engaging in less frequent offending but are more efficient is to examine the monetary returns

for individuals who engage in both legal/illegal work compared to those who engaged in illegal work only. Tremblay and Morselli (2001) spoke of individual efficiency ratios, which are payoffs per crime. For individuals who already have a legal job, the incentives to also engage in illegal work should be higher given that there is an alternate form of income (legal work).

Examining offending frequency and offending variety provided some preliminary information regarding the legal/illegal overlap and criminal careers. However it did not give me a clear picture of how the legal and illegal overlap was situated in a participants' longitudinal sequence of legal and illegal work. To look at this, I examined two respondents' monthly participation in legal work and illegal work over 84 months (Appendix C). The two participants revealed very different patterns in how they navigated through their work states. From 18 to 20 years old, participant one transitioned between legal work and no work, however predominately engaging in legal work. For about one year (11 months) he/she spent engaged in the legal/illegal overlap. Afterwards, participant one returned to stable legal work. It appeared that for this individual, the legal/illegal overlap was an intermediate step in the distance process.

Participant two demonstrated a more erratic pattern than participant one. He/she transitioned in and out of the various work states throughout the entire study period. From 18 to 20, he/she engaged in the legal/illegal overlap for six months. However, between the ages of 21 and 22, participant two was involved with stable legal employment for 17 months. Unfortunately, he/she returned illegal work and engaged in the legal/illegal overlap for 10 months, until the end of the study period.

For participant two, stable employment did not appear to be a turning point. Unlocking these individual longitudinal patterns provide a very small glimpse of looking at how the legal/illegal overlap is embedded in an individual's employment and offending career. By just selecting two participants, it is clear that patterns of legal and illegal work are complex and individualized.

Understanding the various ways in which contemporaneous participation in legal work and illegal work fits into the criminal career is an important avenue of inquiry. For some individuals the overlap might be an intermediate step in the desistance process. Yet for others it might not be associated with the desistance process. The latter is highlighted by Sam Goodman, the thief interviewed by Steffensmeier and Ulmer (2005: 251):

> "It's generally better to have a regular job. That way you have money coming in and won't be under the gun to get cash quickly. It's a cover, too, cause the cops will be less suspicious and all the way down the line you're more likely to get a break. That is why I always told Rocky, the Beck boys, and different ones – get a job, even a part time job. Will keep the parole people happy, too. That, and having a woman. Will think you're settling down and have somebody to get on your case."

This is similar to Carlsson's (2012) findings with intermittent offenders. Carlsson (2012) interviewed male offenders from The Stockholm Life Course Project and found two qualitatively different forms of intermittent offending. The first was characteristic of temporary disruptions or breaks in offending, where the offender ceases offending for a short amount of time but there was no commitment to any long-term change in offending. The other form of intermittent offending was viewed as failed attempts at desistance. This form of intermittency is associated with a desire to leave behind a life of crime.

The current study is among the first to examine heterogeneity in both legal and illegal work. Although in its early infancy, further work into this line of inquiry can potentially provide some insights into issues of the effectiveness of work programs. Over the last 25 years, many programs have been designed and implemented with the purpose of increasing employment and reducing recidivism among ex-offenders. Unfortunately, the conclusions from these evaluations have generally been disappointing (Bushway and Reuter 2002; Uggen et al. 2002). Further examination of the heterogeneity in the patterns of legal and illegal work and the factors that contribute to the heterogeneity can provide insight into why some of these programs did not produce intended outcomes.

Uggen's (2000) reanalysis of the National Supported Work Demonstration Project is an example of how taking into accounting for heterogeneity can provide important insight into the effectiveness of work programs. Uggen divided the sample into subjects 26 years of age and younger and those 27 and older and results revealed that there were significant employment effects for subjects over the age of 27. According to Visher et al. (2005: 302), "the significance of the age of participant in the success of the employment program, is an important step forward in the disappointing 20-year history of job training and employment programs for ex-offenders". Despite these optimistic results, there have been few concerted efforts in identifying other factors that might be associated with the effectiveness of work programs.

Limitations

The current study was a first systematic look at the relationship between legal and illegal work, focusing on their contemporaneous participation. As one of the first systematic studies, it provided an important springboard for future work examining the relationship between legal and illegal work. However, as with most studies, there are limitations associated with the current study.

First, the participants in the Pathways to Desistance Study are a select group of individuals, for whom results cannot be generalized to any other group. Eligibility for the study was contingent on being charged with a felony offense between the ages of 14 to 17. This is advantageous given that it is an offending sample with a high prevalence of problem behaviors, including illegal work. However, it is important to examine the robustness of the patterns uncovered in this sample with other offending samples and general population samples. One dataset that might be a good starting point is the National Supported Work Demonstration project, which was a program that provided basic, transitional job opportunities to individuals who are traditionally difficult to employ: ex-offenders, former drug addicts, women who were long-term recipients of welfare benefits (AFDC), and school dropouts. Similar to the Pathways study, monthly information regarding key dimensions of the respondent's life were collected. Respondents provided information on monthly drug use, income, and crime information at 9-month intervals. All respondents were tracked for at least 18 months, with some respondents tracked for up to 36 months.

The focus of the current study was participation in legal work and illegal work. Considering other characteristics beyond participation would provide

additional information regarding the interrelationship between legal work and illegal work. For example, intensity of participation measured by the time spent in legal and illegal work can provide further insight into how the two activities are intertwined. Similarly, the type of legal work and the type of illegal work that participants engaged in could provide a look into the qualitative nature of the legal and illegal work overlap. Secondary labor markets are characteristic of jobs which require little training, cluster at the low end of the wage scale, have little or no mobility opportunities, and have rapid turnover (Crutchfield and Pitchford, 1997). These secondary labor markets are also characteristic of movement between legal, informal and illegal work (Sullivan, 1989). Thus examining the quality of legal work could provide commentary on secondary labor market processes and contexualize findings regarding dual participation in legal and illegal work.

Finally, research question two examined the relationship between legal economic opportunities and the probability of membership in particular illegal work groups, conditional on membership in particular legal groups. The method used to examine research question two allowed the conditional probabilities between legal and illegal work to vary as a function of legal economic opportunities but the model does not allow for the risk factors to be time varying. Therefore, I used measures of perceptions of legal economic opportunities taken at baseline. The limitation of this is that perceptions of legal economic opportunities are not static and more proximate measures would be ideal. Moreover, I used the disjunction between economic expectations/aspirations as a measure of legal economic opportunities, which has been argued to not be an ideal measure of strain (i.e. Burton et al., 1994). However,

the current study focused exclusively on economic offending and adhered more to traditional Mertonian anomie theory rather than Agnew's general strain theory.

Chapter 6: CONCLUSION

The current study started with the goal of studying what Sviridoff and Thompson (1983) describe as w*ork that is concurrent with crime*, which occurs when work and crime are not mutually exclusive activities. Although the overlap is inherent in white collar crime and organized crime, inquiry into the overlap between legal and illegal work for more common types of offending is scant. The current study is among the first to systematically study the interrelated nature of legal and illegal work, focusing on their overlap. Results from the current study demonstrate that there are heterogeneous patterns in participation in both legal work and illegal work and the ways in which they contemporaneously evolve over time. These results corroborate with Sviridoff and Thompson's (1983) and Freeman's (1999) arguments that the relationship between legal and illegal work is complex. This complexity however has been understated in extant literature, even though there has been a wealth of studies that examine the relationship between work and crime.

Recent work on employment focuses on barriers to obtaining employment (i.e. Kurlychek, Brame and Bushway, 2006; Nakamura and Blumstein, 2009; Pager, 2003). Indeed, ex-offenders face monumental challenges in obtaining legal employment with problems associated with background checks, substance use, poor human capital, and few prosocial connections (Maruna, 2001). However, the current study suggests that there might be considerations beyond getting a job that are important to becoming crime free. Western (2002) argues that most ex-offenders are ultimately able to find employment after release, but the jobs they get offer little wage growth. More than a decade later, LaVigne (2014) similarly noted that "preparing for

a job, even getting hired, often is not enough. Research underscores the importance of sufficient wages and directs our focus to not just job acquisition, but job retention." It is important to continue to investigate the complexities between legal and illegal work. Unpacking these complexities, such as the legal and illegal overlap, can potentially help with understanding why work programs have not been effective at moving offenders away from illegal work, even though theoretically the relationship between legal and illegal work should be an inverse one.

Research on deterrence and decision making can provide an example of exemplary work that investigates a complex phenomenon. Early work on deterrence and crime suggested that there were negligible deterrent effects (Paternoster, 1987). However, as researchers wrestled with conceptual issues and began unraveling the factors that condition the relationship between perceived certainty, perceived severity and offending, the evidence for deterrence became stronger (Nagin, 1998). More recently, scholars of the deterrence doctrine found that aggregating the population downward biases any deterrent effect because there are different kinds of people for whom the relationship between perceived risk and offending operate differently (Pogarsky, 2002). Further, scholars are uncovering that the functional form between perceived risk and offending are non-linear (Loughran et al., 2012). Comparatively speaking, the literature on legal and illegal work is still in its infancy and offers a wealth of potential avenues for future inquiry.

Appendices

Appendix A. Table of Probabilities for Legal and Illegal Work

Probability of legal work group conditional on illegal work group

	Low Stable	Low increasing	Moderate Declining	Moderate Increasing	High Stable
Low Stable	.244	.184	.212	.170	.194
Low Increasing	.355	.302	.110	.054	.179
Mod Declining	.427	.232	.098	.142	.103
High Declining	.460	.210	.000	.147	.183

Probability of illegal work group conditional on legal work group

	Low Stable	Low increasing	Moderate Declining	Moderate Increasing	High Stable
Low Stable	.513	.570	.818	.725	.713
Low Increasing	.130	.161	.073	.040	.113
Mod Declining	.262	.205	.108	.174	.109
High Declining	.093	.062	.000	.059	.064

Joint probability of legal work group and illegal work group

	Low Stable	Low increasing	Moderate Declining	Moderate Increasing	High Stable
Low Stable	.155	.118	.136	.109	.125
Low Increasing	.039	.033	.012	.060	.020
Mod Declining	.079	.043	.018	.026	.019
High Declining	.028	.013	.000	.090	.011

Appendix B. Incentives Associated with the Legal and Illegal Overlap

Ethnographic work and empirical work consistently note the important role that limited economic opportunities in legitimate employment play in an individual's decision to take on illegal work. Fagan (1999) emphasized that economic structural constraints can allow individuals to view crime as a valid form of work. Similarly, Sullivan (1989) applied segmented labor market theory to explain differential work patterns across neighborhoods. Segmented labor market theory suggests that there are at least two labor markets: primary, which includes steady and well-paying employment and secondary, which includes low-wage jobs, informal work, and crime. Activities in the secondary market must be alternated as none of the activities alone are sufficient to make a living. Freeman (1999) observed that among disadvantaged young people in the 1980s that the division between illegal and legal work is not clear cut. Some persons commit crimes while employed – doubling up their legal and illegal work. Some young people may view criminal activities as an attractive alternative to legitimate labor market opportunities. These youth may consider all available economic opportunities - both legal and illegal.

Rational choice perspectives explicitly discuss the notion of incentives: criminals respond to incentives just like non-criminals and therefore an individual's decision to engage in illegal work is not qualitatively different from his/her decision to engage in legal work. Through this lens, all things being equal, the action with the

greatest utility will be selected among alternatives. Thus, the decision to commit crime will be influenced by the financial returns it offers in comparison to competing legal opportunities. This is evident in time allocation models. For example, Ehrlich (1975) argued that the decision to engage in illegal activity is not inherently an either/or choice. Rather individuals combine various legal and illegal activities or switch from one to another throughout their lifetime. Time allocation models regard crime as a form of work. Grogger (1998: 758) notes, "consumers decide how much crime to commit and how much to work on the market as a function of their returns to crime." He further argues that almost everyone in his sample (NLSY) worked in the legal labor market and thus "the goal of [his] model should be to explain crime in a world in which almost everyone works on the labor market" (p. 759). As such, Grogger (1998) assumed that an individual will choose to work if the market wage offer exceeds the reservation wage, which is the lowest wage a person is willing to earn to participate in an activity.

Scholars have also commented on how incentives in the form of wages are an important reason why many ex-offenders return to illegal work. LaVigne (2014) most recently noted that parolees who earned less than $7 per hour were twice as likely to return to prison compared to those who earned more than $10 an hour. This observation is in line with a rational choice perspective and draws attention to the idea of a shifting reservation wage, which Grogger (1998) also highlighted. Western (2002) argued that beyond finding employment, ex-offenders are faced with limited job mobility and get jobs that get offer little wage growth. Low paying jobs that offer

little mobility and opportunities to gain human capital is perhaps the key reasons why ex-offenders return to illegal work.

Incentives in legal and illegal work can have important consequences. For example, success in criminal endeavors can actually encourage persistence in offending. The perceptual deterrence and rational choice literature is that while an inverse relationship between the perceived sanctions is relatively weak compared to the association between perceived rewards and criminal (e.g. Cornish and Clarke, 1986; Paternoster and Simpson, 1993; Loughran et al., 2012; Piliavin et al., 1986). Importantly, these studies suggest is that offenders are highly responsive to rewards from crime. In other words, rewards from crime may have a positive impact on criminal career length. Both Shover and Thompson (1992) and Sommers, Baskin, and Fagan (1994) found that the probability of desistance increases when offenders' expectations for achieving rewards from criminal activity decline. Paternoster and Bushway (2009) examine cognitive appraisals and suggest that commitment towards crime declines as an offender is encounters failures at criminal activity (see also Giordano, Cernkovich, and Rudolph, 2002). Pezzin (1995) found that current and expected illegal earning prospects were negatively and significantly associated with the probability of desistance. Similarly, Shover and Thompson (1986) argued that if the expectations of illegal earnings are high, the likelihood of desistance is lowered.

Examining illegal incentives are particularly important because the legal and illegal work overlap can provide greater returns to crime and incentive to remain involved in illegal work. By remaining in both legal and illegal work, offenders are able to accumulate the necessary skills and experience, or human capital, to be

competitive in both the legal and illegal labor market. Scholars have long documented that conventional human capital results in greater returns in the legal labor force (Becker, 1964; Mincer, 1958). Similarly, offenders with greater criminal capital reap greater returns to crime (Loughran et al., 2013; McCarthy and Hagan, 2001). As such, the study will document the legal and illegal wage rate across the age profile for the various trajectory groups.

Coding of Incentive Variables:

Weekly legal wage rate: Researchers suggest that some offenders supplement their legal income with illegal income (Reuter et al., 1990; Sviridoff and Thompson, 1983). I expect that individuals with higher legal earnings are less likely to be engaged in illegal work. The legal wage rate was calculated by dividing a participant's total reported illegal earnings during the month the total number of weeks worked across all legal jobs. The number of weeks were calculated by multiplying each week the participant worked by 1.3 to account for the fact that all months are not exactly four weeks long (52 weeks in a year / 12 months in a year = 4.333 weeks per month) (Loughran et al., 2013).

Weekly illegal wage rate: According to the rational choice perspective, lucrative illegal earnings will likely create an incentive to participate in illegal work. Similar to the legal wage rate, the illegal wage rate represents the total amount of money made from illegal activities during each month of the recall period by the number of weeks the subject did illegal work across all types of illegal work during each month.

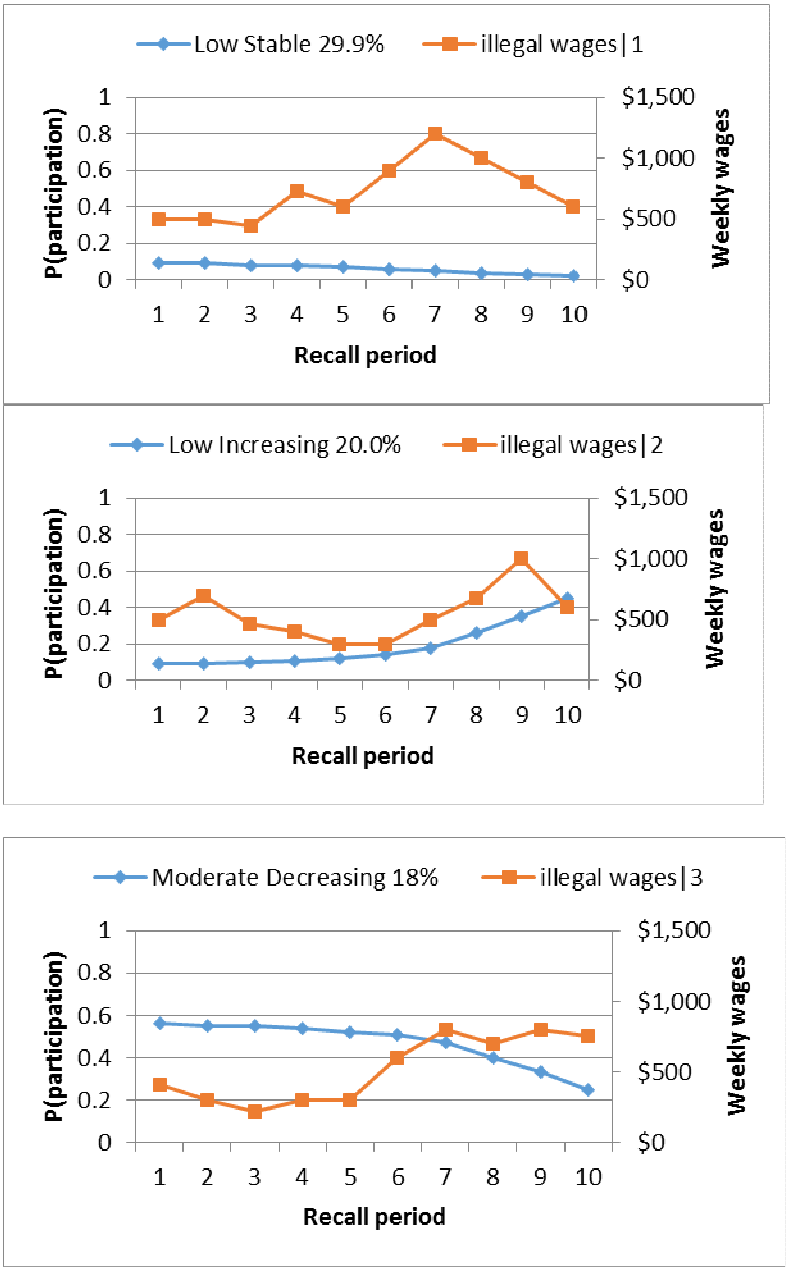
Intrinsic rewards: Intrinsic rewards is the score is a mean score of 7 items. Participants were asked how much 'thrill' or 'rush' is it to do any of the following things: Fighting, robbery with gun, stabbing someone, breaking into a store or home, stealing clothes from a store, vandalism, auto theft. If the youth never participated in any of these things, he/she was asked to rate for how much 'thrill' or 'rush' he/she thinks it would be. The responses ranged from 0 (no fun or kick at all) to 10 (a great deal of fun or kick) (Nagin and Paternoster, 1994).

I plot the incentives associated with the various legal and illegal trajectory groups over time. By juxtaposing the legal work group trajectories and illegal wage rate among members in the legal work group (and vice versa) I can descriptively look at how the incentives in one market are related to participation in the other market. I also consider the intrinsic rewards to crime and how that relates to the individual trajectory groups.

Results

Figure 1 displays the legal work trajectory groups and the median illegal wage rates conditional on membership in the respective legal trajectory group. As expected, the high stable legal group is associated with low illegal wage rates. The moderately decreasing legal group however displays a scissor effect whereby the trends in the probability of participation in legal work crisscrosses with the trend in illegal wage rates. The moderately declining legal group follows a stable pattern with the illegal wage rates until wave 7 and the two patterns diverge – the probability of legal work increases while illegal wage rates decrease.

Figure 1. Median Weekly Illegal Wage Rate by Legal Trajectory Group



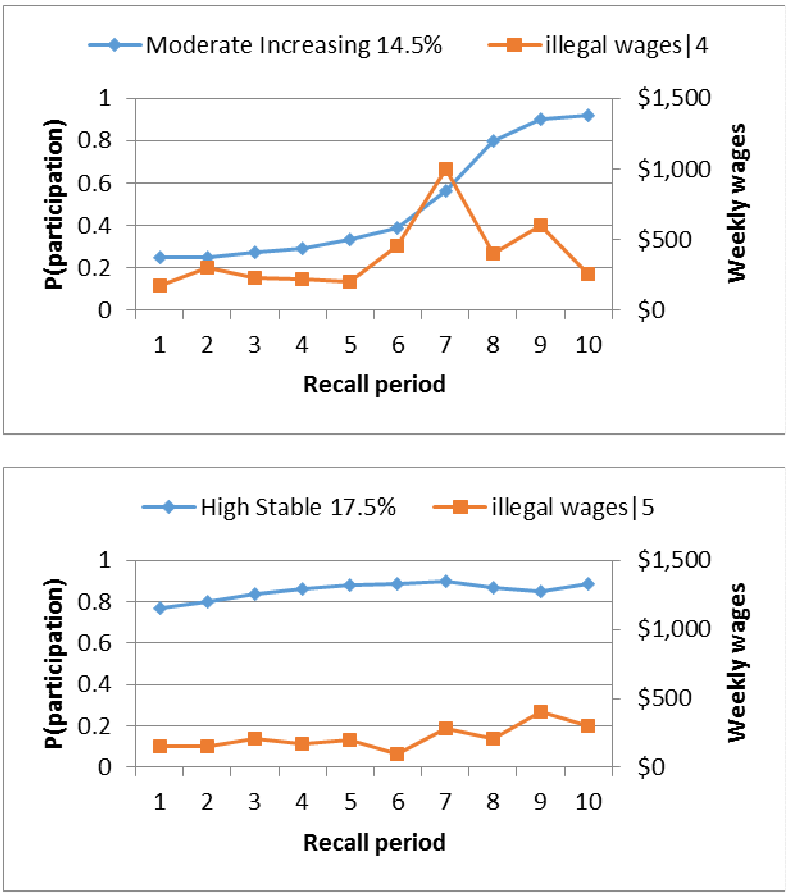
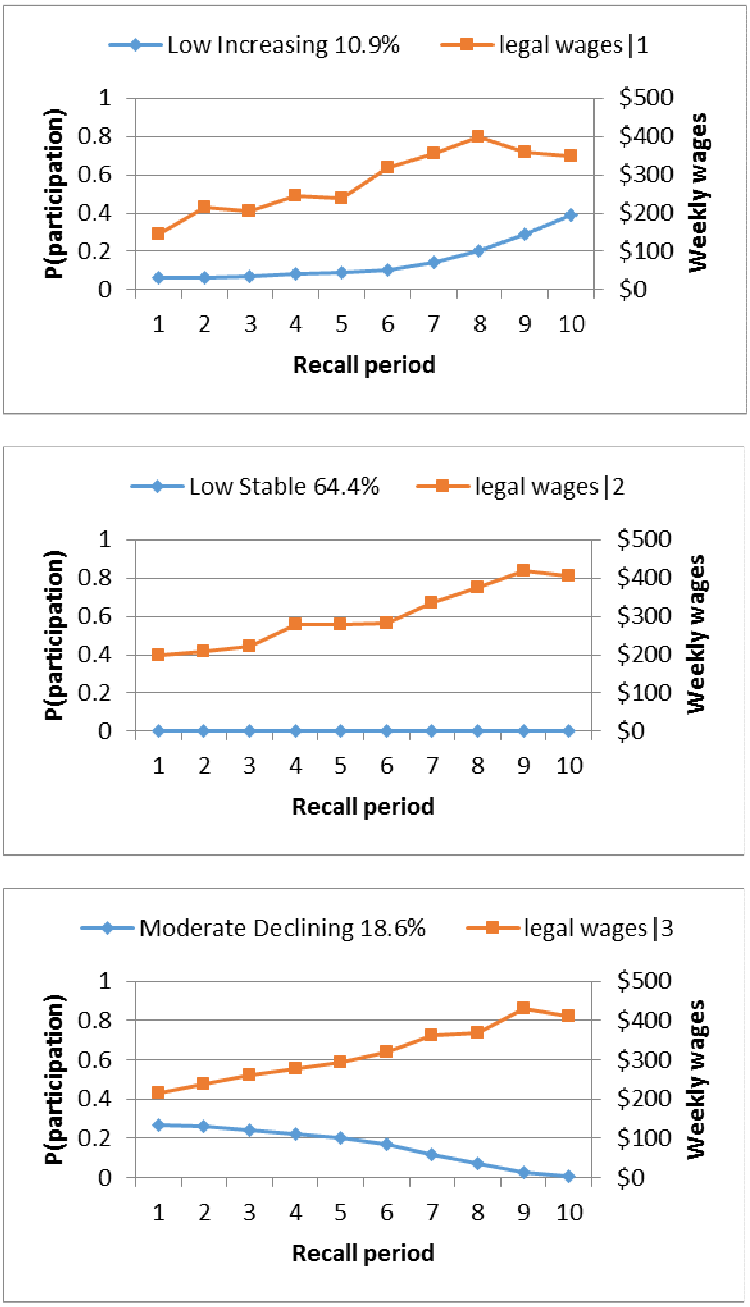


Figure 2 shows the illegal work trajectories and the median legal wage rates conditional on membership in the respective illegal trajectory group. One striking difference between patterns of legal wage rates is that they are remarkably similar across the illegal work groups. This suggests that wages from the legal sector do not co-vary with the probability of participation in the illegal market.

Figure 2. Median Weekly Legal Wage Rate by Illegal Trajectory Group



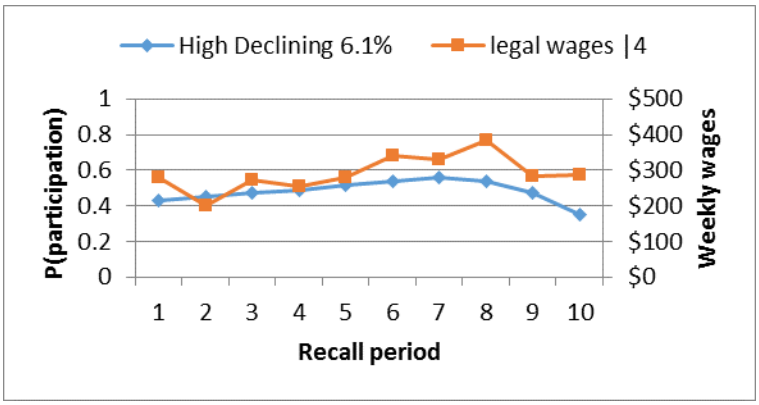
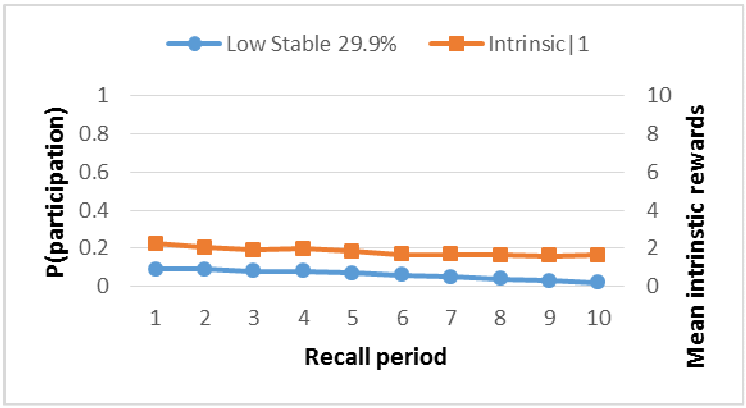
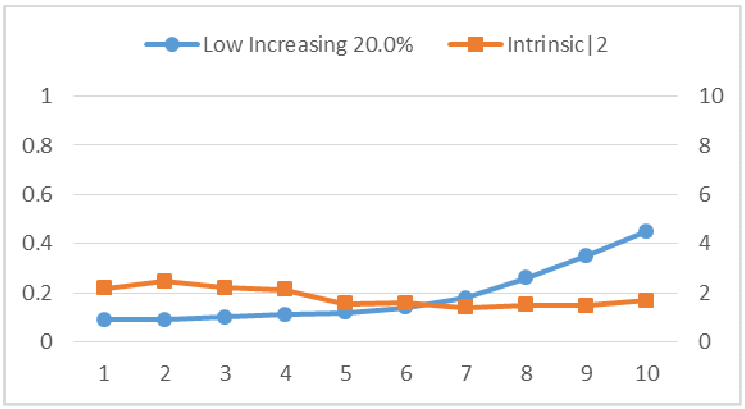


Figure 3 displays the perceived intrinsic rewards associated with various offense types. It appears that the intrinsic rewards to crime remain relatively similar when conditional on legal work trajectory groups. As expected, for the high stable legal group, the average ratings of intrinsic rewards decline as the probability of legal employment increases. Similarly the low increasing legal group slightly declined their average intrinsic reward rating as the probability of legal work increased. The moderate declining group appears to increase their intrinsic reward ratings as the probability of legal work decreased. Thus intrinsic rewards to crime appeared to be inversely related to the probability of participation in illegal work.

Figure 3. Mean Intrinsic Rewards to Crime by Legal Trajectory Group

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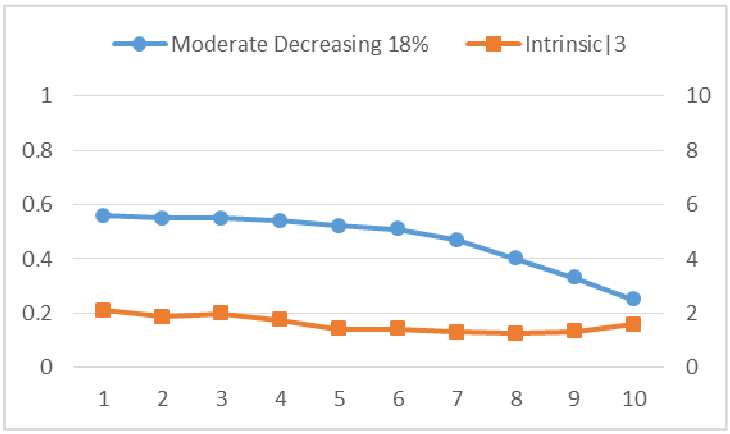
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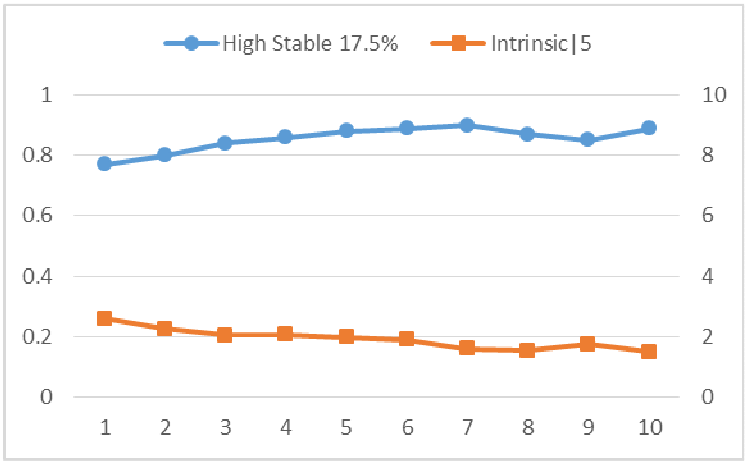
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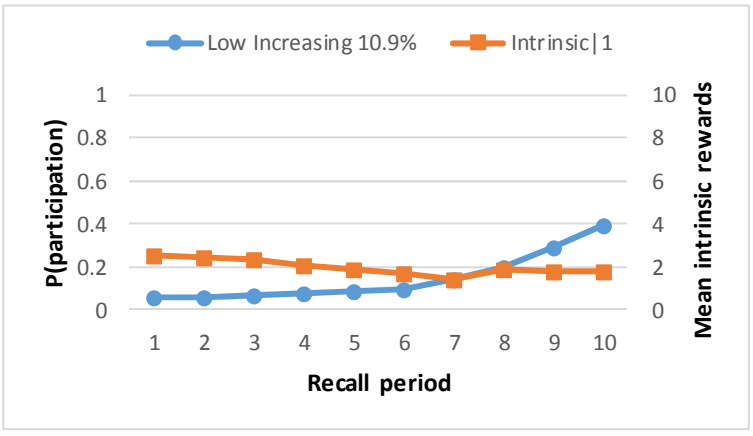
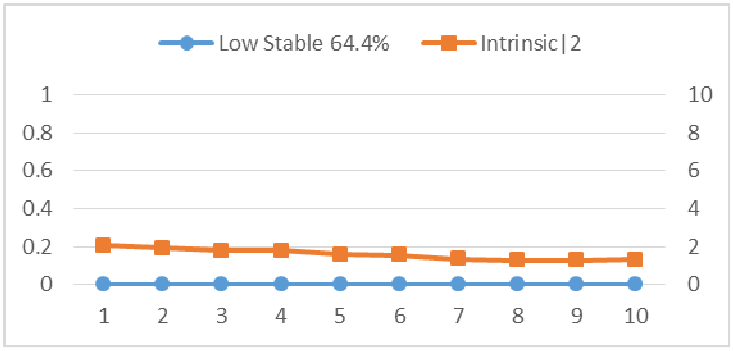
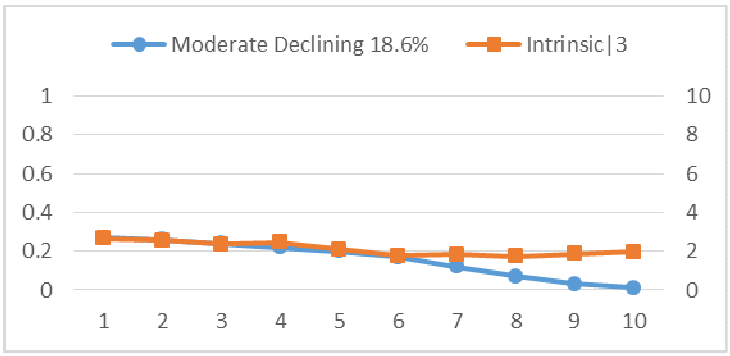
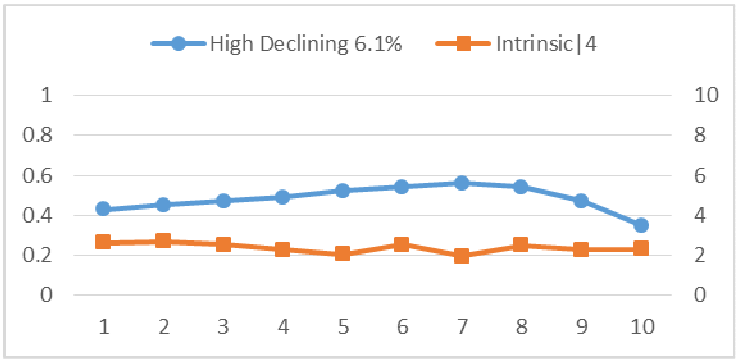
Figure 4 examines intrinsic rewards to crime conditional on illegal work trajectory groups. The high declining group and the moderate declining group had the most stable intrinsic reward ratings of the four illegal work groups (across recall periods). There were slight declines in the mean ratings of intrinsic rewards to crime among members of the low increasing and low stable illegal groups. It is important to note that there was not a lot of variation around the mean intrinsic reward ratings for both legal work groups and illegal work groups.

Figure 4. Mean Intrinsic Rewards to Crime by Illegal Trajectory Group









Summary

Both ethnographic work and rational choice literature emphasize the role of incentives in the decision to engage in both legal and illegal work contemporaneously (i.e. Freeman, 1999; Grogger, 1998; Sullivan, 1989). I took a first step at looking at illegal incentives and participation in legal work and vice versa. I examined two types of illegal incentives: monetary and intrinsic rewards. There were three main findings in these preliminary analyses.

First, legal employment and illegal weekly wages are generally inversely related. That is, higher illegal wages is associated with a lower probability of participation in legal work. Alternatively, legal wages remained unrelated to the probability of participation in illegal work. Legal wages increased over the recall periods for all illegal work groups. Although, the high declining illegal group was

associated with the lowest legal wages out of the four groups. Finally, intrinsic rewards was relatively consistent over time and across both legal and illegal trajectory groups.

Appendix C. Longitudinal Patterns of Work States

Participant 1

Age	18.0	18.1	18.2	18.3	18.3	18.4	18.5	18.6	18.7	18.8	18.8	18.9	19.0	19.1	19.2	19.3	19.3	19.4	19.5	19.6	19.7	19.8	19.8	19.9	20.0	20.1	20.2	20.3	20.3	20.4	20.5	20.6	20.7	20.8	20.8	20.9
Legal Only	1	1	1	0	0	1	1	0	0	0	1	1	1	1	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Illegal Only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Both	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
No work	0	0	0	1	1	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0

Age	21.0	21.1	21.2	21.3	21.3	21.4	21.5	21.6	21.7	21.8	21.8	21.9	22.0	22.1	22.2	22.3	22.3	22.4	22.5	22.6	22.7	22.8	22.8	22.9	23.0	23.1	23.2	23.3	23.3	23.4	23.5	23.6
Legal Only	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1
Illegal Only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Both	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0

Participant 2

Age	18.0	18.1	18.2	18.3	18.4	18.4	18.5	18.6	18.7	18.8	18.9	18.9	19.0	19.1	19.2	19.3	19.4	19.4	19.5	19.6	19.7	19.8	19.9	19.9	20.0	20.1	20.2	20.3	20.4	20.4	20.5	20.6	20.7	20.8	20.9	20.9
Legal only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1
Illegal only	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Both	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
No work	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0

Age	21.0	21.1	21.2	21.3	21.4	21.4	21.5	21.6	21.7	21.8	21.9	21.9	22.0	22.1	22.2	22.3	22.4	22.4	22.5	22.6	22.7	22.8	22.9	22.9	23.0	23.1	23.2	23.3	23.4
Legal only	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Illegal only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Both	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
No work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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