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The Influence of Social Bonds on Recidivism: A Study of Texas Prisoners Paroled Since 2001

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The Influence of Social Bonds on Recidivism: A Study of Texas Prisoners Paroled Since 2001

by

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Dedication

This is dedicated to my wife and to my daughter: Anne Tierney and Juliana Tripodi

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The Influence of Social Bonds on Recidivism: A Study of Texas Offenders Paroled Since 2001

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The present study examines the influence of social bonds on recidivism for a random sample of 250 male offenders released from Texas prisons since 2001. Social bonds are defined as the offender being employed, being married, or seeking educational pursuits. Based on life-course theory, developed by Sampson and Laub (1990), the researcher hypothesized that offenders released from prison who developed attachments (social bonds) would have less likelihood of recidivating than offenders who did not develop attachments (social bonds). Additionally, the researcher hypothesized that recidivists who developed attachments (social bonds) would have longer periods crime-free before re-incarceration than recidivists who lacked attachments (social bonds). The researcher used hierarchical binary logistic regression and Cox proportional hazard modeling to test the hypotheses. Although social bonds did not decrease the likelihood of re-incarceration, Cox proportional hazard modeling found that recidivists who obtained employment upon release from prison had longer periods before recidivating than those

who did not obtain employment. The results indicate that employment may temporarily

motivate offenders released from prison to avoid re-incarceration, but the affects appear

to diminish over time. Social workers providing services to offenders released from

prison should be aware that the influence of employment on desistance from crime might

weaken over time, so they should continuously measure their clients' motivation levels

regarding the desire to avoid re-incarceration.

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Chapter 1

Problem Statement

Incarceration rates in the United States have increased substantially over the past 30 years. This increase is due to many factors, including a higher likelihood that judges and juries will convict and sentence offenders to prison, higher rates of incarceration for drug-related offenses, and mandatory prison sentences that reduce the chances of early release from prison. Mass incarceration started in 1973, and incarceration rates have increased every year since by an average of six percent per year (Travis, 2005). In 1973, slightly more than 200,000 people were in prison; this increased to approximately 2 million inmates in state, federal and private prisons throughout the United States in 2005. The 2005 per capita prison rate was approximately 500 adults for every 100,000 residents, and including jails, slightly over 738 adults for every 100,000 residents, making the United States the global leader in incarceration rates (Travis, 2005).

While the general United States population has increased during the same period, explaining part of the incarceration growth, the increase in inmates far exceeds overall population growth. Along with the increase in the overall population, a general increase in crime rates is another factor that helps explain the recent trend of mass incarceration. Incarceration rates, however, continue to grow even in periods when crime rates are down. For example, during the years 1990-1997, the number of index crimes reported to the Federal Bureau of Investigation (FBI) decreased by over 1.3 million, while the prison population rose by more than 470,000 inmates (Cullen & Sundt, 2000). As Table 1.1 indicates, incarceration rates have increased for all types of crime, but it appears that drug

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crimes account for a large variance of the increase in overall imprisonment rates. The increase in incarceration rates for robbery, burglary, murder, sexual assault, and assault ranged from 66 percent to 361 percent, while the increase in drug crimes increased 930 percent.

Table 1.1: State Prison Population Increase by Offense Type

	1980	1990	2002
Violent Crimes	173,300	313,600	624,900
Property Crimes	89,300	173,700	253,000
Drug Crimes	19,000	148,600	265,100
Public Order Crimes	12,400	45,500	87,500

Source: Harrison, P. M., & Beck, A. J. (2005). *Prisoners in 2004* (Rep. No. NCJ 210677). Washington D.C.: U.S. Department of Justice. Retrieved January 20, 2006, from http://www.ojp.usdoj.gov/bjs/

Some criminologists consider the influx of mass incarceration over the past 30 years a consequence of Martinson's 1974 study that analyzed research assessing the influence of rehabilitation programs on recidivism. Martinson (1974) described the results from 231 evaluations on rehabilitation programs and found that no programs have an influential effect on recidivism. A National Academy of Science panel reviewed Martinson's report and agreed; many consider this the turning point in our culture from an emphasis on rehabilitation to punishment and deterrence (MacKenzie, 2006).

However, many criminologists did not agree with Martinson's finding for the following two reasons: 1) the methodology used in most of the research studies was inadequate, and only a few studies warranted any unequivocal interpretations, and 2) the majority of studies examined programs so poorly implemented they could not be expected to have an effect on future criminal activities (Mackenzie, 2006). Despite these

concerns, however, the term "nothing works" became very popular and influential on both public and professional thinking.

Due to overcrowding in prisons and an increase in the prison population over the past 26 years, more offenders are being released from prison and attempting to make a successful transition from prison back to their communities (Petersilia, 2004; Travis, 2005). Approximately 630,000 offenders are released from prison every year, or approximately 1,700 offenders per day (Austin & Hardyman, 2004; Petersilia, 2004; Travis, 2005). The majority of released offenders are men (91%), and African Americans constitute the largest percentage of all races and ethnicities (47%) (Cullen & Sundt, 2000). The transition for offenders from prison back to their communities has proven difficult. Many released offenders have already attempted this transition and have failed. In 1997, 44 percent of offenders released from prison had prior convictions, and 36 percent of offenders released from prison were re-incarcerated for violating the terms of their parole (Travis, 2005).

The difficult transition offenders encounter when released from prison is evident in the high recidivism rates for this population. The largest known national recidivism study was conducted for the Bureau of Justice and examined criminal recidivism among nearly 300,000 prisoners released from prison throughout 15 states in 1994 (Langan & Levin, 2002). The states included in were Arizona, California, Delaware, Florida, Illinois, Maryland, Michigan, Minnesota, New Jersey, New York, North Carolina, Ohio, Oregon, Texas, and Virginia. Within three years of release, 68 percent of the offenders were re-arrested for a new offense (almost exclusively a felony or serious misdemeanor), 47 percent were reconvicted for a new crime, and 25 percent were re-sentenced to prison

for a new crime. When including committing a new crime *or* parole revocation, almost 52 percent of the offenders released from prison in the 15 states under study were re-incarcerated.

The majority of recidivists in the Langan and Levin (2002) study re-offended in the first year of release. Within the first six months, 30 percent of the offenders were rearrested, and the percentage of offenders that were rearrested increased to 44 percent within the first year, 59 percent within two years, and 68 percent within three years (Langan & Levin, 2002). Re-arrest rates varied by gender, ethnicity, and age. Lagan and Levin (2002) found disparities between various demographic variables; specifically, men were more likely be rearrested (69%) than women (58%), African Americans (73%) more likely than Whites (63%), non-Hispanics (71%) more likely than Hispanics (65%), and younger offenders more likely than older offenders.

Although Langan and Levin's (2002) study certainly contains limitations, none more apparent than the lack of generalizability to states not included in the study, it provides important information on recidivism rates for a large sample of offenders (272,111) that the researchers tracked for three years. Criminologists generally consider a three-year follow-up sufficient because the vast majority of recidivists re-offend during that period (Petersilia, 2003). Another study limitation is that the researchers lacked information on whether the offenders attended in-prison rehabilitation programs, such as vocation/educational training, substance abuse treatment, psychotherapeutic groups, and cognitive/behavioral counseling, all of which are believed to help offenders make a successful transition back to their communities (Travis, 2005).

Texas Incarceration and Recidivism Rates

Similar to national trends, the total number of Texas prisoners has increased dramatically since 1980. There were 28,543 Texas prisoners in 1980 and 168,105 in 2004, more than in any other state. Texas had the second highest incarceration rates in the United States (behind Louisiana) with 694 residents incarcerated for every 100,000 residents, an increase of 248 percent since 1980 when the incarceration rate was 199 residents incarcerated for every 100,000 residents (Watson, Solomon, LaVigne, Travis, Funches, & Parthasarathy, 2002). There are several reasons why the Texas incarceration rates have increased so rapidly over the past 25 years, but Watson et al. (2002) found that admissions in Texas prisons increased primarily because of more arrests for violent and drug crimes, longer lengths of stay in prison, and an increase in felony convictions. As Table 1.2 indicates, the largest groups of offenders released from Texas prisons in 2001 were male (86%), African American (44%), and incarcerated for drug crimes (39%). The mean sentence length for offenders released in 2001 was 6.8 years and the mean time served was 3.4 years (Watson et al., 2002).

TABLE 1.2: Texas Offenders Released in 2001 by Gender, Race/Ethnicity, Type of Crime, and Time Served

55,183 total offenders released

Gender
      86 percent male
      14 percent female

Race/Ethnicity
      44 percent African American
      32 percent White
      24 percent Hispanic

Crime
      39 percent incarcerated for drug crimes
      33 percent for property offenses
      17 percent for violent offenses

Time
      6.8 years: Mean Sentence Length
      3.4 years: Mean Time Served

Source: Watson, J., Solomon, A. L., LaVigne, N. G., Travis, J., Funches, M., &
        Parthasarathy, B. (2004). *A portrait of prisoner reentry in Texas*.
        Washington D.C.: Urban Institute.

Like national recidivism rates, Texas recidivism rates are also quite high. Almost one-third (31%) of offenders released from Texas prisons in 2000 were re-incarcerated, and 28 percent of offenders released in 2001 were re-incarcerated. According to Watson et al. (2002), the highest percentage of released offenders in Texas that recidivated did so their second year out of prison, with nineteen months the mean time between release from prison and re-incarceration. Table 1.3 shows the percentage of offenders released from Texas prisons and the percentage of offenders that recidivated in each specific year following release.

Table 1.3: General Texas Recidivism Rates for 2000 and 2001 Cohorts

	2000 Cohort (35,343)			2001 Cohort (40,239)	
	#	*%*		*#*	*%*
Year 1	3,074	8.7		2,880	7.2
Year 2	4,690	13.3		4,831	12
Year 3	3,279	9.3		3,677	9.1
Total	11,043	31.2		11,388	28.3

Source: Legislative Budget Board (Ed.). (2005). *Statewide criminal justice recidivism
and revocation rates*. Austin, TX.

Table 1.4 provides information on the characteristics of Texas recidivists released from prison in 2000 and 2001. Using Watson et al's (2002) measure of recidivism as re-incarceration for committing a new crime *or* parole revocation, it appears Texas re-incarceration rates are lower than national rates. One reason for lower re-incarceration rates may be Intermediate Sanction Facilities, which are short-term facilities used for offenders who violate conditions of parole. Intermediate Sanction Facilities are sometimes used in lieu of parole revocation and are not counted in recidivism rates despite being a residential facility for offenders who violate their parole. Perhaps offenders who commit a technical violation for a first time or offenders who commit a misdemeanor are placed in an Intermediate Sanction Facility. Placements to Intermediate Sanction Facilities in Texas increased from 8,663 in 2000 to 10,982 in 2004 (Legislative Budget Board, 2005).

Table 1.4: Characteristics of Texas Recidivists

Characteristics of Recidivists		
2000 Cohort		2001 Cohort
Gender		
% male	92.5	92.3
% female	7.5	7.7
Race		
% White	31.3	30.7
% Black	48.7	48.1
% Hispanic	19.9	21.0
Age at Release		
< 24	13.9	16.5
25-29	17.8	17.0
30-34	19.8	19.2
35-39	20.7	20.1
40-44	15.9	15.1
45+	11.9	12.1
Initial Sentence		
Violent	18.0	19.1
Property	37.2	36.6
Drug	32.2	31.1
Other	12.6	12.8

Source: Legislative Budget Board (Ed.). (2005). *Statewide criminal justice recidivism and revocation rates*. Austin, TX.

The number of offenders released from prison per year in the United States has almost quadrupled since 1978; slightly more than 150,000 offenders were released in 1978 and 630,000 in 2000 (Travis, 2005). Because of the increase in offenders released from prison every year, and considering that over 50 percent of these individuals are re-incarcerated within three years (approximately 30 percent in Texas), it is important to understand how life trajectories of recidivists and trajectories of offenders who abstain from continuing a criminal lifestyle differ. Going beyond demographics and identifying post-prison variables that predict recidivism may allow for tailoring programs to more effectively meet offenders' needs, which in turn will create safer neighborhoods, decrease crime rates, and reduce tax dollars spent on incarceration. Moreover, prison employees and social service agencies can implement services that target variables associated with

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offenders desisting from crime, such as employment and education, if that is indeed the case.

When identifying differences between recidivists and offenders that desist from further criminal activity, it is important to recognize occurrences in the life trajectory. Certain events may occur in offenders' lives that decrease the likelihood of continuing a criminal lifestyle. Perhaps offenders that attach themselves to conventional activities, such as employment and marriage, are more likely to abstain from criminal activity because there is more motivation for them to live crime-free. The offenders may recognize that they have more to lose if they continue to commit crimes. Life-course theory provides a conceptual framework for understanding how and why offenders desist from committing additional crimes by suggesting that social bonds such as employment, educational pursuits, and marriage decrease the likelihood of further criminal activity (Sampson & Laub, 1990; Sampson & Laub, 1993).

The goal of life-course theory is to better understand the stability and changes in criminal and deviant behavior (Akers & Sellers, 2004). The present study assesses the primary elements of life-course theory on recidivism for a random selection of 250 Texas male offenders released from prison since January 1, 2001. Social bonds are operationalized using the following three variables: 1) the offender being employed, 2) the offender being married, and/or 3) the offender participating in educational pursuits.

It is important to note that lack of social bonds does not necessarily indicate individual pathology, although this is indeed the case for some recidivists. Just as important as individual pathology is the fact that many released offenders lack opportunities for employment and education when they return to their communities. For

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example, Travis (2005) found that the majority of offenders are released to the poorest zip codes in the country, and these neighborhoods have minimal resources, lack of employment and educational opportunities, and subsequently recidivism rates for these offenders are higher than for their higher income counterparts.

The goal of the present study is to go beyond the influence of demographic variables and recidivism for Texas offenders released from prison (Ekland-Olson & Kelley, 1992; Watson et al., 2002) by analyzing post-release variables such as employment, marital status, and educational pursuits (social bonding variables). The study's specific aim is to asses the influence of social bonding variables on recidivism and recidivists' time crime-free in the community based on the attachments to social bonds offenders develop upon release from prison. To reach this aim, the study will test the following hypotheses:

1) Offenders released from Texas prisons that develop attachments (social bonds) will have less likelihood of recidivating than offenders released from Texas prisons that lack attachments (social bonds).

    1a: Offenders released from Texas prisons that obtain and maintain employment will have less likelihood of recidivating than offenders released from Texas prisons that do not obtain and maintain employment.

    1b: Offenders released from Texas prisons that are married will have less likelihood of recidivating than offenders released from Texas prisons that are not married.

1c: Offenders released from Texas prisons that are participating in educational pursuits will have less likelihood of recidivating than offenders released from Texas prisons that are not participating in educational pursuits.

2. Recidivists that develop attachments (social bonds) will have longer periods crime-free upon release from prison than recidivists that lack attachments (social bonds).

Chapter 2

Literature Review

Chapter 2 discusses the foundations of life-course theory, the theoretical framework guiding the study on criminal recidivism. Before discussing the origination of Sampson and Laub's (1993) life-course theory, a brief description of the self-control theory is needed (Gottfredson & Hirschi, 1990). After discussing the development of life-course theory, this chapter provides information on Sampson and Laub's original life-course theory studies and other research analyzing the influence of specific life-course variables on abstaining from criminal activity; namely, employment and marital status.

Self-Control Theory

Sampson and Laub (1993) developed life-course theory in response to Gottfredson and Hirschi's (1990) self-control theory (also known as the general theory of crime), which postulates that once a person develops a propensity toward crime, external social forces have little association with criminal behavior. The self-control theory is ontogenetic, meaning that the propensity to engage in crime is present at an early age, stable throughout life, and unaffected by later life events (Warr, 2002). Gottfredson and Hirschi describe self-control theory as a general theory that explains all individual differences in the propensity to commit crime. More specifically, the self-control theory asserts that individuals develop high or low levels of self-control before ten years of age based on parental attachment; individuals with high self-control are less likely to engage in future criminal acts, while those with low self-control are more likely to become

persistent offenders (Gottfredson & Hirschi, 1990).   According to the self-control theory, if parents are properly attached to their children, supervise them closely, and punish deviant acts, the child will develop self-control and be less likely to commit crimes later in life (Akers & Sellers, 2004). Theoretically, people with higher levels of self-control are more likely to understand the long-term consequences of their actions than individuals with lower levels of self-control (O'Connell, 2003).

Furthermore, Gottfredson and Hirschi (1990) discuss implications of the consistent correlation between age and crime. Crime usually begins to increase throughout the teenage years, peaks around 18 years of age, and then generally decreases so that only individuals with high criminal propensities commit crimes. Gottfredson and Hirschi believe that the relationship between crime and age is invariant across time, across groups within the same society, and across all types of criminal behavior (Akers & Sellers, 2004). Gottfredson and Hirschi declare that the influence of age on crime explains all other known correlations and causes of criminal behavior, and differences between persistent offenders and desisters. Gottfredson and Hirschi differentiate between crime and criminality by defining crimes as short-term, circumscribed events and criminality as relatively stable differences across individuals in the propensity to commit crime. In summary, Gottfredson and Hirschi believe that while crime declines with age, criminality remains relatively stable over the life course and is based on childhood attachment. Moreover, Gottfredson and Hirschi believe that the amount of self-control that a person develops in childhood remains stable throughout life.

Akers and Sellers (2004) believe there is a severe limitation in the self-control theory literature, namely, the inability to differentiate between low self-control and the

tendency to commit crime. Researchers often operationally define low self-control with actions that correlate with criminal behavior, such as adolescents' drinking alcohol and smoking cigarettes. In order to produce effective research on the self-control theory, researchers need to operationally define low self-control with measures that are not themselves predictors of criminal behavior.

Pratt and Cullen (2000) conducted a meta-analysis of 21 studies assessing the relationship between low self-control and crime. As expected, they found a consistent relationship between low self-control and crime throughout the 21 studies: subjects with low self-control were more likely to be criminal offenders. Low self-control, however, only accounted for 19 percent of the variance in criminal offending. Subsequently, Pratt and Cullen concluded that while low self-control is an important predictor of criminal behavior, they disagree with Gottfredson and Hirschi's claim that low self-control is the primary cause of crime (Akers, 2004).

Life-Course Theory

Several research studies over the past 13 years have supported sociogenetic criminology, which states that events such as marriage, full-time employment, and education have a pronounced affect on criminality (Bartusch et al., 1997; Horney, Osgood, & Marshall, 1996; Paternoster & Brame, 1997; Sampson & Laub, 1993; Simons, Johnson, Conger, and Elder, 1998; Uggen, 2000; Warr, 1998). The underlying theory of sociogenetic criminology is the life-course theory, which Sampson and Laub adapted from Elder (1985) and brought to criminological research. Proponents of the life-course perspective theorize that bonding with families, work, and communities reduces criminal behavior over the life-course regardless of delinquent and antisocial backgrounds. Life-

course theory's organizing principles are life-course perspective and social control theory (i.e., crime and deviance result when an individual's bond to society is weak or broken) (Elder, 1985; Sampson & Laub, 1990).

The guiding framework in the life-course perspective is the idea of trajectories and transitions. A trajectory is a pathway or line of development over an individual's lifespan (Sampson & Laub, 1990). Trajectories refer to long-term patterns and sequences of behavior. Transitions, also known as turning points, refer to specific life events that can alter one's trajectory path. For example, an offender who gets married or becomes a full-time employee may alter his trajectory of criminal behavior and abstain from further criminal behavior. Simply put, trajectories are long-term patterns of development and transitions are occurrences that have the capacity to alter trajectories.

Sampson and Laub (1990, 1993) agree with Gottfredson and Hirschi (1990) that early childhood experiences, such as a lack of appropriate attachment to parents or guardians, theoretically sets an individual on a trajectory with an increased or decreased likelihood of engaging in criminal behavior. Proponents of sociogenetic criminality, however, generally believe that transitions such as marriage, education, or employment can act as turning points, which modify an individual's trajectory and influence the likelihood of criminality (Sampson & Laub, 1990). Turning points in the life-course are also known as informal social control, since their effects hypothetically control counterproductive behavior that leads to arrest and conviction.

While Sampson and Laub agree that criminal propensities, such as a lack of self-control, are important factors in understanding the development of criminality, they depart from Hirschi and Gottfredson's assumptions in two ways: 1) Sampson and Laub

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recognize that while most individuals who engage in criminality as adults have high levels of criminal propensity as children, most juvenile delinquents who demonstrate propensities to commit crimes do not become criminals in their adult years, and 2) while self-control theorists believe that individual differences remain stable over the life course, Sampson and Laub believe that social bonds in adulthood to family and employment explain changes in criminal behavior despite childhood propensities (O'Connell, 2003).

Ultimately, the goal of life-course theory is to better understand the stability and changes in criminal and deviant behavior at different life stages (Akers & Sellers, 2004). This can be attained by studying the changes within individuals and the influence of major life-course transitions such as marriage and employment (Warr, 2002). Laub and Sampson (2003) argue that persistence in crime is explained by a lack of these informal social controls and a subsequent lack of structure, routine activity, and healthy human relationships. While research generally supports the importance of social bonds and life-course theory as a whole, legislators, administrators, parole officers, and practitioners would benefit from more research to evaluate the importance of social bonds and criminal propensities, particularly among highly criminal samples such as offenders released from prison (O'Connell, 2003).

Life-Course Studies

The first attempts at analyzing within-group differences of offenders and assessing the influence of social bonding on criminal behavior occurred in the early 1990s. Sampson and Laub (1993) conducted an influential study regarding the importance of adult social bonds on criminality by analyzing longitudinal data from Sheldon and Eleanor Gluecks' (The Gluecks') *Unraveling Juvenile Delinquency* (1950).

The Gluecks' research sample included delinquent and nondelinquent boys born between 1924 and 1935. The delinquent group consisted of 500 10 to 17-year-old white males committed to a reform school in Massachusetts and the nondelinquent group consisted of 500 10 to 17 year-old white males from Boston public schools. Boys in the two samples were then matched according to age, ethnicity, IQ score, and socioeconomic status.

The Gluecks' research team collected data on these individuals from 1940-1965. They initially interviewed the boys at age 14 and conducted follow-up interviews at ages 25 and 32. The follow-up success rate was an impressive 92 percent. In Wave one (the initial interview), the researchers collected biological, psychological, and sociological information. Interviews for wave two, concerning ages 17-25, began as each subject was almost 25-years-old, and interviews for wave three, concerning ages 25-32, began as each subject was almost 32 years of age. The researchers concentrated on obtaining data on the following social factors in waves two and three: living arrangements, schooling, employment, work habits, marital status, leisure-time activities, companionship, and participation in civic affairs (Sampson & Laub, 1993).

In their secondary data analysis of the Gluecks' data, Sampson and Laub (1993) found a strong association between childhood delinquency and antisocial behavior with later adult behaviors such as arrests, deviance, and excessive drinking. Arrests in both young and later adulthood were three to four times greater among childhood delinquents. The boys in the Gluecks' delinquency group were more likely to have been arrested, have employment problems, and have family problems than boys from the non-delinquency group. These results provide support that criminal propensities in childhood and juvenile delinquency are strong predictors of adult criminality.

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Further investigation by Sampson and Laub (1993), however, indicates that when analyzing within-group differences of delinquents, ties as an adult to social bonds were strong predictors of abstaining from criminal behavior. For example, job stability in young adulthood had a large inverse relationship with each measure of adult crime for both the delinquent and nondelinquent samples, and young adult job stability was negatively correlated with deviant behavior during the 25-32 year old age period. Results were similar for marital attachment. The influence of attachment to a wife at ages 17-25 had an inverse relationship with criminal behavior during the 25-32 year old age period. When analyzing within-group variation, Sampson and Laub (1993) found that job stability and marital attachment in adulthood were significantly related to changes in adult criminality and antisocial behavior. The higher level of stability and attachment, the less likely the individual was to continue their criminal and deviant behavior.

Following Sampson and Laub (1993), several researchers conducted studies on life-course theory, adult social bonds, and desistance from crime. Researchers have studied the association of employment and desistance from crime (Harrison & Schehr, 2004; Uggen, 2000), marriage and criminality (Horney, Osgood, & Marshal, 1995; Laub, Nagin, & Sampson, 1998; Warr, 1998; Wright & Wright, 1992), and the association of the major elements of life-course theory and recidivism with offender samples (Benda, Harm, & Toombs, 2005; Benda, Toombs, & Corwyn, 2005; Benda, Toombs, & Peacock, 2003; O'Connell, 2003).

Horney et al. (1995) conducted the first study of life-course theory that did not involve longitudinal data covering data over a lifespan. Instead, Horney et al. analyzed the short-term importance of life-course theory elements by evaluating the importance of

social bonding variables and individual life circumstances in the three years prior to incarceration for a group of prisoners in Nebraska. The researchers interviewed over 600 newly incarcerated offenders (average age was 28.1 years), and found that changes in offending often follow changes in life circumstances. For example, the odds of being charged with a crime doubled (or halved) following a change in the offenders' local life circumstance, such as getting married and being employed (or getting separated and fired). The strongest predictor of abstaining from committing criminal acts, particularly assault crimes, was whether the offender lived with his wife. The majority of offenders that were married committed their crimes that led to incarceration after moving out of their marital residence. Horney et al. also found employment to be associated with desistance from crime, but it was not as strong a predictor as living with a spouse. The researchers hypothesize that the relatively low influence of employment on desistance from crime may be explained by their crude measurement of employment, which was simply asking the offender if they were employed at a particular time over the past three years.

Sampson and Laub (2003) continued to examine the influence of social bonding variables on desistance from crime by expanding on their 1993 secondary data analysis. Sampson and Laub expanded on their original study by collecting information on a portion of the original sample when they were 70 years old. Thus, they had longitudinal data that spanned over 55 years. Sampson and Laub (2003) collected new data from The Gluecks' original participants by searching the Office of the Commissioner of Probation's central repository in Massachusetts and supplementing the state-level data with criminal histories obtained from the FBI, with the intent of examining within-

individual variables over an entire life course through age 70. Looking back to criminal propensity data originally collected by the Gluecks', Sampson and Laub used multiple forms of regression analyses to determine if criminal propensities in childhood successfully predict future criminal behavior. The results indicate that for this particular sample of childhood offenders, individual differences and childhood characteristics defined by risk did not distinguish among different offending trajectories over the life course. While childhood prognoses tended to predict levels of crime between delinquent and non-delinquent groups, childhood and adolescent risk factors do not appear to predict offenders' future desistance from crime (Sampson & Laub, 2003).

Life-Course and Employment

Though the literature generally shows that work and crime are inversely related, researchers disagree as to whether the relationship between employment and crime is spurious, causal, or simply a correlation (Harrison & Schehr, 2004). Gottfredson and Hirschi (1990) view the relationship as spurious because of the invariant influence of age on criminal behavior. Most criminological research, however, indicates a strong association between employment and offenders' criminal justice success, including a desistance from crime and lower recidivism rates for offenders released from prison.

According to Henderson (2001), the majority of incarcerated offenders experienced employment difficulties before their arrest. McAuley (1999) found the majority of incarcerated offenders to be unemployed at time of their arrest and Watson et al. (2004) found that the majority of prisoners have difficulties with employment before incarceration and upon release. With longer prison sentences, offenders often lose the opportunity to gain work experience, and connections to people that could provide

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employment opportunities are severed. Because most researchers and criminologists consider the relationship between crime and employment to be strong and inverse, some criminologists conducted research assessing the effectiveness of in-prison vocational training programs and work-release programs in terms of reducing recidivism rates.

Harrison and Schehr (2004) analyzed four vocational training programs and found they reduced recidivism between 10 and 50 percent for the first five years after release from prison. For a program to be successful, Harrison and Schehr believe it has to have the following six components: 1) offer services outside the prison environment, 2) provide intensive follow-up services for at least six months, 3) provide temporary funds for immediate reintegration needs, 4) provide employer referral services and job readiness skills, 5) provide vocational training, and 6) teach independent living skills. Selectivity bias, however, is a limitation to the research assessing the effectiveness of vocational programs because inmates with greater motivation may be more likely participate.

In an attempt to clarify the importance of employment on desistance from crime and to provide answers to the self-control theory versus the life-course theory debate, Uggen (2000) conducted an influential study to determine if work results in less crime, and if so, whether the effects depend on the offenders' age. Uggen (2000) conducted a secondary data-analysis with the National Supported Work Demonstration Project, which contains data from a large-scale experimental employment program. To join the program, offenders were required to have been incarcerated within the past six months, and addicts were required to have attended a drug treatment program. The original study, which assessed the influence of the National Supported Work Demonstration Project on

recidivism, is unique because it was an experimental study. Participants randomly

assigned to the experimental group were offered minimum-wage jobs in crews of 8-10

workers led by a counselor and supervisor. The original researchers collected

information on both experimental and control group participants at nine-month intervals

for three years. Uggen (2000) used event history statistical regression to analyze the

influence of employment on recidivism.

Findings indicate that work appears to be a transition in the life course for

offenders over 26 years old. Although the program failed to reduce crime across the

entire sample, it clearly did so for offenders older than 26 years of age. Additionally,

results suggest that maximizing participation rates may increase program effectiveness,

providing evidence that increased levels of bonding with employment has the potential to

be considered a turning point in the life trajectory (Warr, 1998). Uggen's study

demonstrates that stable full-time employment can predict recidivism with a sample of

offenders. The results support Sampson and Laub's life-course theory, considering that

employment differentiated recidivists from non-recidivists with a sample of offenders

over 26 years of age, countering assumptions of Gottfredson and Hirschi's self-control

theory.

Since Uggen's well-cited study assessing the influence of employment on

recidivism, there has been a dearth of research further analyzing this relationship. Three

studies, however, do evaluate the importance of full-time employment and job stability in

predicting recidivism (Benda, Harm, & Toombs, 2005; Benda, Toombs, & Peacock,

2003; O'Connell, 2003). Benda et al. (2003, 2005) analyzed data from a large group of

offenders that graduated from an Arkansas boot camp by using discriminate function

analysis to determine if life-course variables differentiated recidivists from non-recidivists (Benda et al., 2003), and by using Cox's proportional hazard model to examine the time until the first felony arrest or parole violation (Benda et al., 2005). The sample consisted of 601 men and 120 women. The mean age for men was 25.3 with a standard deviation of 5.1 and the mean age for women was 24.2 with a standard deviation of 4.0. Benda et al. (2003) found full-time employment to be the second strongest discriminator between recidivists and non-recidivists, behind marital status. Likewise, Benda et al. (2005) found obtaining full-time employment to be associated with a lower likelihood of recidivism. Additionally, in a methodological review of the literature on the effectiveness of vocational/education programs, Bouffard, Mackenzie, and Hickman (2000) found in-prison vocational training to reduce the likelihood of future offending for offenders released from prison.

The above studies are important in assessing the significance of social bonding in reducing criminality across the life course. Few studies, however, examine the significance of social bonding with recidivism among highly criminal populations, such as offenders that were incarcerated for their crime(s). To address this group, O'Connell (2003) assessed whether factors related to social bonds, developed shortly after release from prison, affect future offending while controlling for individual difference in criminal propensities. By analyzing data from the Ongoing Studies Project for Those at Risk for Drug Use from The University of Delaware (Inciardi et al., 1997), O'Connell (2003) found structural equation models that estimated that the effect of working and the effect of being in an educational program were significantly better fits to the data than the reduced model constraining this effect. The results indicate that working and seeking an

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education are significantly related to recidivism among this sample of released offenders, providing support for Sampson and Laub's life-course theory that social bonds are important characteristics of offenders who avoid further criminality and re-incarceration.

In summary, of the studies reviewed, it appears that full-time employment and job stability have the ability to predict recidivism and desistance from a criminal lifestyle for offenders over 26 years old. Furthermore, full-time employment seems to discriminate between recidivists and non-recidivists in a criminal sample. More research is needed, however, to assess whether social bonding is equally as successful at predicting recidivism and discriminating between recidivists and non-recidivists among other highly criminal samples such as offenders paroled from state prisons.

Life-Course and Marriage

The early literature generally did not find a significant relationship between marriage and criminality (Wright & Wright, 1992). Knight, Osborn, and West (1977) found that early marriage did not produce a significant reduction in criminality, and those married before age 21 were more likely to have a conviction on their record. Rowe and Tittle (1977) agree with Gottfredson and Hirschi's self-control theory and suggested that any relationship between marriage and a reduction in criminality can be explained by the invariant relationship between age and abstaining from crime. West (1982) conducted a longitudinal study and expected to find marriage to be an indisputable crucial event for offenders, but found that self-reported delinquency among unmarried men differed only slightly and insignificantly from married men. Both married men and unmarried men reported a decline in their involvement with delinquent behavior with age but the married men were no less delinquent than the unmarried men. West concluded that marriage

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sometimes has a restraining effect upon delinquents, but less often than he expected because of the tendency of delinquents to marry women who are socially delinquent themselves (Wright & Wright, 1992). Additionally, Farrington (1989) examined the differences between men who had no convictions after age 21 to men who continued to live a life of crime up until the age of 32. Convicted and non-convicted men did not differ in the proportion that lived with a significant other. Twice as many of the convicted men, however, had been separated or divorced from a wife by age 32. Many were also separated from their children. Farrington's conclusion is that marriage does not predict criminality, but similar to Laub et al's (1993) finding, the ability to sustain a marriage predicts abstinence from criminal activity.

Since the development of life-course theory and similar to the relationship between employment and criminal behavior, researchers have generally found that marriage decreases the likelihood of committing further crimes (Benda et al., 2003; Benda et al., 2005; Horney et al., 1995; Laub et al., 1998; Sampson & Laub, 1990; Warr, 1998). Sampson and Laub (1990) found that marital attachment at ages 17-25 decreases the likelihood of committing a crime between ages 25-32. Similarly, researchers have found that men who marry and reside with their spouse have lower offending rates, and these rates become even lower as time passes, possibly indicating the influence of strong marital bonds on offending is large and increases over time (Horney et al., 1995; Laub et al., 1998). In fact, Laub et al. (1998) consider marriage to be the beginning of a gradual movement away from criminal offending, ultimately leading to a very low rate of offending for offenders in a socially cohesive marriage. The effects of a cohesive marriage take time to appear, grow slightly over time, and engender civil obedience. Not

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all threats to internal validity are controlled for, however, as maturation may be a reason why the influence of marital bonds on the desistance of criminal behavior increases over time.

In a study assessing the influence of social bonding elements on recidivism for a sample of graduates from an adult boot camp, Benda et al. (2003) found marriage to be the strongest discriminator between non-recidivists and any type of recidivists. This includes recidivism due to felonies, parole violation for drugs, and parole violation for other reasons. Likewise, using various survival analyses with the same sample of boot camp graduates, Benda et al. (2005) found that graduates who reside with a crime-free spouse are less likely to recidivate than non-married graduates.

Warr (1998) conducted a seminal study investigating the reasons why marriage seems to lead to desistance in criminality. After analyzing data from the National Youth Survey, Warr (1998) found that marriage can indeed be a life-course transition that leads to the offenders desisting from crime. Warr's findings, however, indicate that marriage leads to a reduction in time spent with friends, which ultimately leads to abstaining from criminal behavior. The relationship between marriage and crime became insignificant when controlling for the offenders' association with peers. Thus, the two effects of marriage, according to Warr (1998), are: 1) marriage reduces the time available for friends, indicating a shift for the offender to a family-oriented lifestyle, and 2) marriage ultimately alters the type of friends with whom individuals associate. Regarding questions of causal order, the analysis revealed changes in relations with friends following marriage, rather than the idea that changing peer relations leads to marriage (Warr, 1998).

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The literature assessing the influence of marriage on desistance from crime is not as prevalent as the literature assessing the relationship between employment and crime, but it does indicate that marriage decreases the likelihood of committing crimes and recidivating, particularly for men. This may be because married men generally spend less time with their peers than non-married men, and most crimes are committed in groups of at least two (Warr, 1998; Warr, 2002). Not one of these studies, however, examined the relationship of marriage and recidivism for a sample of released prisoners. Benda et al. (2003) did assess the influence of life-course variables on recidivism for graduates of a boot camp, but this sample is different than a sample of offenders released from state prisons, considering the boot camp sample generally contains first-time offenders with less serious crimes than the prison sample (Benda et al, 2003). It is important to assess the influence of marriage on recidivism for offenders released from prison in order to assess the notion that marriage, as a social bonding variable, decreases the likelihood of recidivism.

Based on the existing literature, life-course theorists and proponents generally assert that offenders' who attach themselves to social bonds such as employment, education, and marriage are more likely to desist from crime. The literature is not as decisive, however, on highly criminal samples such as offenders released from state prisons. The present study will add to the knowledge base by assessing if life-course variables help predict recidivism for offenders recently released from prison. Furthermore, no studies to date have used the life-course variables together as covariates in a Cox Proportional Hazard Model in an attempt to predict time the offenders are crime-free in the community. If this relationship holds up, the knowledge will broaden

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the scope and appeal of life-course theory, and state governments could potentially use
the results to inform the development of post-prison programs focusing on offenders
attaining full-time employment, enrolling in educational programs, and/or receiving
family counseling. Additionally, prison administrators could potentially use this
knowledge to develop in-prison programs that focus on areas such as vocational training,
job skills, and interviewing skills along with educational programs and marital
counseling.

Table 2.1: Influential Life-Course Theory Studies

Author and Date	Sample	Sample Size	Design	Setting	Purpose	Results
Sampson & Laub 1993	Adolescent offenders and non-offenders analyzed for over 25 years	438 juvenile delinquents and 442 non delinquents	Secondary data analysis of longitudinal study covering a 25 year period	Sample collected from boys in reform school in Boston and comparison group from public school	To assess the influence of job stability and marital attachment on desisting from criminal behavior	Attachment to spouse; job stability; and commitment to education, work, and economic goals all significantly modified trajectories of crime and deviance even when controlling for past juvenile delinquency
Sampson & Laub, 2003	Adolescent offenders analyzed for over 55 years	500 adolescent offender	Secondary data analysis and longitudinal study covering a 55 year period	Sample originally collect from boys in reform school in Boston. Researchers then collected new data from the Office of the Commissioner of Probation	1. Determine whether criminal propensities in childhood successfully predict future criminal behavior among a sample of childhood offenders	1. Childhood characteristics do not distinguish among different offending trajectories over the life course

2. attachment to spouse, job |

					2. Assess the influence of job stability, educational pursuits, and marital attachment on desisting from crime or persisting in criminal behavior	stability, and education continue to modify trajectory of crime and deviance
Uggen 2000	Offenders randomly assigned to a work demonstration program in which they were offered minimum wage jobs	Between 1,967-2,210 in control group and between 1,821-2,052 in experimental group	Secondary data analysis study; assessed influence of the National Supported Work Demonstration Project	Participants randomly assigned to minimum-wage jobs in crews of 8-10 workers led by a counselor and supervisor	Determine influence of Work Demonstration Project on recidivism	Participation in minimum significantly lowered recidivism rates for offenders older than 26 years of age
Benda, Toombs, & Peacock 2003 and Benda, Harm, & Toombs 2005	Adult offenders released from an Arkansas Boot Camp	601 men and 120 women	5-year follow up study assessing differences between recidivists and non-recidivists	Sample consists of offenders released form an adult boot camp	To explore what elements of life-course theory successfully predict recidivism and discriminate between recidivists and non-recidivists	Both marital status and job employment successfully discriminate recidivists from non-recidivists and predict desistance from further criminal behavior. Marital status was the strongest predictor

O'Connell 2003	Offenders released from prison	452 men and 124 women	Secondary data analysis of the Ongoing Studies Project for Those At-risk for Drug Use	Sample consists of offenders released from prison	To assess whether factors related to social bonds developed shortly after release from prison affected future offending while controlling for individual differences in criminal propensity	Working had a significant negative effect on drug use, but was non-significant in predicting arrest. Being in school had a significant and negative effect on both arrest and drug use, as did the combined model of all social bonds.
Warr 1998	Adolescent offender followed into adulthood		Secondary data analysis from the National Youth Survey	Longitudinal study of adolescent offenders	To assess if marriage leads to desistance in criminality, and if so, why	Marriage is a life-course transition that leads to offenders desisting from crime. Marriage leads to a reduction in time spent with friends, which ultimate leads to abstaining from criminal behavior.
Horney, Osgood, & Marshall 1995	Newly convicted male offenders	658 men	Interviewed newly convicted male offenders on the last three years of their lives	Interviews took place in a prison in Nebraska	To assess if changes in offending follow changes in life circumstances	Odds of committing a crime doubled (or halved) following a change in local life circumstances such as marriage or employment

Chapter 3

Methodology

This study, which assesses the influence of the primary elements of life-course theory on recidivism, is a secondary data analysis using a randomly selected sample of 250 Texas male parolees released from prison since 2001. The researcher worked with the Executive Service Department of the Texas Department of Criminal Justice (TDCJ) to collect the following variables: race; age at time of incarceration; age at time of release from prison; education level (highest grade completed); total number of offenses; offense that led to incarceration; sentence length; date the offender was released from prison; marital status upon release from prison; whether the offender has been re-incarcerated; and if re-incarcerated, whether it was for a new offense or a technical violation, and crime committed. The researcher then worked with the Parole Services Department of TDCJ to collect the following independent variables: whether the offender was married and lived with his spouse upon release from prison; whether the offender obtained employment after release from prison, and if so, whether he worked part-time or full-time; and whether the offender enrolled in school upon release.

The University of Texas at Austin Institutional Review Board (IRB) and the Texas Department of Criminal Justice Research, Evaluation, and Development (RED) unit approved the present study.

Sample

As Table 3.1 indicates, this random sample of Texas parolees released from prison includes 108 African Americans (43%), 80 Caucasians (32%), and 60 Hispanics

(24%). The offenders' mean age when incarcerated is 31 and the mean age when released from prison is 36, indicating the mean length of incarceration is 5 years. The offenders averaged two previous convictions and ten years of formal education. Including offenders that are legally married and offenders officially considered married by the State of Texas (common law marriage), 46 were married, four were widowed, nine were separated, 48 were divorced, and 140 offenders had never been married. Thirty-nine of the married offenders lived with their spouse upon release from prison. Fifty-nine (24%) of the offenders had been re-incarcerated, 42 for committing a new crime and 17 for committing technical violations. The characteristics of the sample and re-incarceration are discussed thoroughly in chapter four.

Table 3.1: Characteristics of the Sample

Characteristics of the Sample		
	Mean	SD
Age at incarceration (N=249)	31.0	9.59
Age at release (N=250)	36.1	10.90
# of previous offenses (N=250)	2.07	1.37
Education (N=198)	10.0	2.97
	Frequency	Percent
Race		
African American	108	43.2
Caucasian	80	32.0
Hispanic	60	24.0
Marital Status		
Married	42	16.8
Common Law	4	1.6
Widowed	4	1.6
Separated	9	3.6
Divorced	48	19.2
Never Married	140	56.0
Re-Incarcerated	59	23.6
New Crime	42	16.8
Technical Violation	17	6.8
*Race is missing on two offenders in the dataset		

Independent Variables

The first study hypothesis is that offenders released from Texas prisons that develop attachments (social bonds) will have less likelihood of recidivating than offenders released from Texas prisons that lack attachments (social bonds). The second hypothesis is that recidivists who develop attachments (social bonds) will have longer periods crime-free upon release from prison than recidivists that lack attachments. The independent variables for both hypotheses are two of the primary elements of life-course theory, employment and marriage, along with whether the offender is engaged in

educational pursuits. Although most criminologists do not include educational pursuits when researching life-course theory, they are included in the present study because offenders released from prison who pursue an education seem likely to become employed, but may not be at the time because of enrollment in school. Additionally, these offenders may receive the same benefits as offenders who obtain and maintain employment because of the bond they develop with a conventional activity.

Employment

The Texas Department of Criminal Justice considers an offender employed if he has obtained employment upon release from prison and receives compensation for his services. Along with considering employment a dichotomous variable, the researcher attempted to assess employment as an ordinal variable by measuring whether the offender worked full-time, part-time, or was unemployed. The researcher was going to consider offenders who work at least 35-hours-per-week full-time employees and offenders that work less than 35-hours-per-week part-time employees. However, because of the relatively low number of employed offenders that worked part-time and the high percentage of offenders that contain missing data regarding full-time or part-time employment, the researcher omitted this from the analysis.

Educational Pursuits

Whether the offender is participating in educational pursuits is a dichotomous variable. The researcher considers the offender to be actively seeking educational pursuits if he is enrolled in any of the following: college, community college, high school, GED class, and any vocational training.

<u>Marriage</u>

According to Warr (1998), being married helps predict a desistance from criminal behavior only if the offender is married *and* resides with his spouse. Warr found the influence of marriage on desistance from crime to be insignificant for married offenders that do not live with their spouse. Additionally, Horney et al. (1995) found that married male offenders reduce their offending when they are living with their spouse and resume offending when they do not. Therefore, the researcher considers the offender to be married if he is legally married *and* lives with his spouse. The researcher does not consider offenders married if they: 1) are legally married but do not live with their spouse, 2) are widowed, 3) are separated, 4) are divorced, and 5) have never been married.

Control Variables

The study controls for several variables that researchers have found to be associated with higher recidivism rates. The control variables are race, the offenders' age at their most recent conviction that led to incarceration (this variable will be called "age at most recent incarceration"), age when released from prison, education level, length of incarceration, number of prior offenses, and offense that led to incarceration.

<u>Race</u>

The researcher controlled for race because criminologists have consistently found that African Americans have higher recidivism rates than Caucasians, and Caucasians have higher recidivism rates than Hispanics (Petersilia, 2004; Travis, 2005). Researchers have found several reasons that African Americans have higher recidivism rates, including a higher likelihood that police will catch African Americans committing crimes

upon release from prison and the disproportionate number of African Americans living in impoverished neighborhoods with a lack of resources and opportunity (Marbly & Ferguson, 2005; Travis, 2005). Offenders in the sample for the present study were labeled one of the following by TDCJ: African American (43% of the sample), Caucasian (32%), Hispanic (24%), or Other (<1%). There were no Asians or American Indians in the sample.

Age

The Executive Services Department of TDCJ collected the offenders' age when they were initially incarcerated and the offenders' age when they were released from prison. The researcher then categorized age into the following intervals of five year spans: 16-20, 21-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65, and older than 65. Age is a control variable because it is widely recognized in criminological research that younger people commit the majority of crimes, and most offenders commit the majority of their crimes in the late teens and early 20s. Subsequently, it is vital to control for the effects of age on recidivism when analyzing the influence of such variables as employment, educational pursuits, and marriage on recidivism. The mean age for the offenders when they were originally incarcerated was 31 years and the median was 29 years. The range was 16-71 years. The mean age when released from prison was 36 years, the median was 36 years, and the range was 18-83 years. Table 3.2 provides frequencies of age based on the five-year age brackets.

Table 3.2: Age Intervals

Age Interval	Frequency	Percent	Cumulative Percent
16-20	14	5.6	5.6
21-25	35	14.0	19.6
26-30	37	14.8	34.4
31-35	37	14.8	49.2
36-40	44	17.6	66.8
41-45	35	14.0	80.8
46-50	24	9.6	90.4
51-55	16	6.4	96.8
56-60	5	2.0	98.8
>60	3	1.2	100.0

Education

Education level is a continuous variable defined by how many years of formal education the offender has completed. The range for education level is from 0 (no education) to 14 (attended college). The researcher also reconstructed education level into a dichotomous variable, defined by whether offenders finished high school/earned a GED or not. The mean for education level is 10 years of formal education and the median is 11 years of formal education. Seventy-two of the offenders (29%) either graduated from high school or earned a GED.

Number of Prior Offenses

An offender's criminal background is one of the strongest predictors of recidivism (Bonta, Law, & Hanson, 1998). "Career" offenders, those with a more intensive criminal background, defined by the number of previous offenses, are more likely to be re-incarcerated than first-time offenders or offenders with fewer prior offenses (Kapp, Schwartz, & Epstein, 1994; Rosenfeld, Wallman, & Fornango, 2005). To control for the association of previous offenses and recidivism, the Executive Services Department of TDCJ collected information regarding the offenders' previous offenses, specifically, how many previous offenses the offenders have that led to convictions. Arrests that did not

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lead to conviction were not counted as prior offenses. The mean and median number of prior offenses was two convictions, while the range was one to eight convictions.

Offense that Led to Incarceration

The data collected by the Executive Services Department of TDCJ contains the original offense that led to the offenders' conviction and incarceration. In keeping with the categories that the Legislative Budget Board (2005) used in its Texas recidivism study, the researcher categorized the offenses into four broad categories: violent crimes, property crimes, drug crimes, and other. Violent crimes include such crimes as murder, rape, sexual assault, robbery, and assault. Property crimes include such crimes as burglary, larceny, motor vehicle theft, fraud, possession and selling stolen property, destruction of property, trespassing, and vandalism. Drug crimes include such crimes as possession, manufacturing, and trafficking. All other offenses fall into the other category. Regarding the offense that led to the original incarceration for this sample of 250 offenders released from Texas prisons, 58 offenders were incarcerated for violent crimes (23%), 63 offenders were incarcerated for property crimes (25%), 114 offenders were incarcerated for drug crimes (46%), and 15 offenders were incarcerated for other crimes (6%).

Dependent Variable

Recidivism

Recidivism has proven to be a difficult variable for researchers to define and measure for the following four reasons: 1) not all persons committing crimes are caught, 2) not all offenses result in arrest, 3) some arrests are unfounded, and 4) arrests are influenced by police practices and public policies uncorrelated with crime rates

(Petersilia, 2005). In this particular study, whether the offender recidivated or not is the dichotomous dependent variable in the first hypothesis, and how many months between release from prison and re-incarceration is the continuous dependent variable, also known as a time variable, in the second hypothesis. The present study uses two different definitions of recidivism: 1) whether the offender has been re-incarcerated in a Texas Department of Criminal Justice correctional facility (excluding Intermediate Sanction Facilities), and 2) the number of months the offender survives in the community before re-incarceration in a Texas Department of Criminal Justice correctional facility. If an offender lived in the community for 16.4 month before being re-incarcerated, for example, the researcher considers the offender as living 16-months in the community crime free. The study also differentiates between offenders re-incarcerated for committing technical violations of their parole requirements and offenders re-incarcerated for committing new crimes. Offenders re-incarcerated for parole revocation *because* they committed a new crime are considered recidivists for committing a new crime instead of parole revocation. Offenders whose parole was revoked because of committing technical violations are considered re-incarcerated for parole revocation.

Re-incarceration is by no means a perfect operational definition of recidivism but often the most practiced criterion to use (Maltz, 1984; Travis, 2005). Most likely, some offenders committed crimes upon release from prison for which they were not caught, arrested, or convicted (Petersilia, 2005). Additionally, the researcher chose to consider an offender a recidivist if he was re-incarcerated in a Texas state prison or jail in order to remain consistent with both national and state-level studies of criminal recidivism (Langan & Levin, 2002; Maltz, 1994; Watson et al., 2004).

Data Analysis

The researcher conducted several regression analyses to investigate the relationship between social bonding variables and recidivism. The researcher conducted two binary logistic regressions with hierarchical entry of variables to assess the influence of life-course variables on recidivism as a dichotomous variable. Additionally, the researcher conducted three Cox Proportional Hazard Models (survival analyses) to analyze the influence of life-course variables together as covariates on months the offender was crime free in the community.

Logistic Regression

To analyze whether the life-course variables help predict recidivism operationalized as a dichotomous variable (hypothesis one), the researcher conducted logistic regression with hierarchical entry of variables to assess the association of employment, educational pursuits, and marriage with recidivism. Logistic regression combines the independent variables to estimate a probability that a particular event will occur, in this example, combining employment, marriage, and educational pursuits to estimate the probability of the offender being re-incarcerated. Logistic regression computes the probability that a case with a particular set of values is a member of the modeled category (the probability the offender is a recidivist).

Logistic regression with hierarchical entry of variables allows the researcher to analyze the influence of the independent variables while controlling for specified variables known to have a relationship with the dependent variable. The control variables are entered in the first block, before the variables of particular interest, which are inserted in the second block. The researcher then analyzes the chi-square difference between the

two blocks. The overall relationship is considered useful if there is a significant difference between the block with only control variables and the block with the predictor variables. In the present study, the researcher inserted race, age, education level, number of prior offenses, and sentence length in block one and the primary elements of life-course theory in block two for the primary analysis.

The preferred sample size in hierarchical logistic regression is 20 cases for every independent variable. With 250 cases, 3 independent variables, and 5 control variables, the present study clearly satisfies the sample size preference. The measurement requirements are that the independent variables are metric or dichotomous and the dependent variables are dichotomous or nominal. Subsequently, this analysis analyzes employment as a dichotomous variable: whether or not the offender was employed upon release from prison. Marital status and educational pursuits are both dichotomous variables: whether the offender lived with his spouse upon release from prison and whether the offender enrolled in school.

Control variables in this analysis are race (dichotomous), the offenders' age at their most recent incarceration (metric), age when released from prison (metric), education level (metric), and length of incarceration (metric). The dependent variable, recidivism, is a dichotomous variable in the logistic regression analyses. Logistic regression does not make any assumptions of normality and linearity or homogeneity of variance for independent variables (Hair et al., 2005).

The overall influence of employment, educational pursuits, and marriage on recidivism is based on the reduction in the likelihood values for the model that only contains the control variables and the model that includes the predictor variables. The

significance test for the addition of the predictor variables is based on the block chi-square in the omnibus tests of model coefficients. The p-value of the block chi-square was used to assess the null hypothesis that there is no difference between the block with only control variables and the block that includes the predictor variables, and to decide whether to reject or fail to reject the null hypothesis. The relationship between the individual predictor variables and recidivism is based on the significant test of the Wald statistic for the particular variable of interest. Moreover, the researcher tested for multicollinearity by examining the standard errors for b coefficients. A standard error larger than 2.0 may indicate multicollinearity, meaning at least two independent variables are so highly correlated that the relationship of the independent variables with the dependent variable is contaminated.

Survival Analysis

Along with logistic regression, the researcher used three survival analyses to assess the influence of the offenders' attachment to conventional activities such as employment, education, and marriage on recidivism. More specifically, the researcher used Cox proportional hazard modeling, also known as Cox regression modeling. Cox proportional hazard modeling is a method for modeling time-to-event data in the presence of censored cases (Hosmer & Lemeshow, 1999). Time-to-event data in this particular study is the number of months between the offenders' release from prison and re-incarceration. Censored cases are offenders lost from the study or offenders who did not recidivate before the end of data collection (Pugh & Jones, 2004). In the present study, censored cases are offenders that have not been re-incarcerated or have not yet been re-incarcerated. The researcher reconstructed recidivism into a continuous variable, months

between release from prison to re-incarceration, or end of follow-up for non-recidivists, to be used as the dependent time variable.

The goal of survival analysis is to fit a model that will allow the researcher to estimate the effects of variables upon survival time (i.e., elements of social bonding upon months crime-free in the community). Survival time in this study is defined as the months offenders are crime-free in the community since being released from prison. Survival times in criminological research are generally measured in monthly intervals, permitting the computation of monthly survival trajectories (Ekland-Olson & Kelly, 1993; Schmidt & Witte, 1988). The time variable records two different effects: 1) for the offenders who recidivated, it records the time of release from prison to re-incarceration, and 2) for persons who were censored, it records the time of release from prison to the end of follow-up (Hosmer & Lemeshow, 1999). The two survival analyses in the present study will include: 1) the cumulative proportion surviving at the end of a specified time interval, which is one minus what is typically treated as the recidivism rate, and 2) the hazard rate, or the probability that the Texas parolees in the sample not re-incarcerated at the beginning of a specified time interval (month) will be re-incarcerated during that interval (Ekland-Olson & Kelly, 1993).

Cox regression modeling allows the inclusion of predictor variables (also called covariates) in the model and is useful for modeling the time to a specified event, such as re-incarceration, based on the value of the covariate(s). Schmidt and Witte (1988) describe two different senses in which the use of explanatory variables may improve predictions of recidivism: 1) reducing the variance of the prediction for each individual in a group should reduce the variance of the prediction for the group average and 2)

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researchers can correct for differences between the group used to estimate the model and the group for which predictions are to be made.

Moreover, Cox regression modeling provides a hazard function, which is a measure of the potential for the event to occur at a particular time, given that the event has not yet occurred (Hosmer & Lemeshow, 1999). The hazard function is the estimate for the occurrence of an event at a particular point in time, if the case has survived that long (Kleinbaum, 1996). In the present study, survival means the offender has not been re-incarcerated. Larger values of the hazard model indicate greater potential for the offender to recidivate at that point in time. The baseline hazard function measures the probability of the event occurring independently of the predictor variables; the baseline hazard is the hazard for the respective individual when all independent variables values are equal to zero (Wu & Tuma, 1994). The shape of the hazard function is defined by the baseline hazard function, and the covariates help to determine the magnitude of the function. The value of the hazard function is equal to the product of the baseline hazard and the covariate effect (Norusis, 2004).

Although the Cox regression model has very few assumptions, one important assumption is that of proportional hazards (Hosmer & Lemeshow, 1999; Kleinbaum, 1996). The proportional hazards assumption assumes that the ratio of hazards for any two cases at any time period is the ratio of their covariate effect, and the ratio of their predicted hazards remains constant throughout all time points (Kleinbaum, 1996; Norusis, 2004). This means that the hazard function is proportionally related to the baseline hazard and the two curves remain proportional over time (Hosmer & Lemeshow, 1999; Norusis, 2004). The baseline hazard is dependent upon time, but the proportional

hazards assumption assumes the covariate effect is the same for all time points

(Kleinbaum, 1995; Norusis, 2004).

Cox proportional hazards analysis provides survival function graphs and hazard

function graphs with cumulative survival or cumulative hazard as the Y-axis and months

crime free as the X-axis. There are important distinctions between observing data from

logistic regression and data from Cox proportional hazards models. In logistic

regression, the coefficient refers to the odds of an event happening at the end of a study,

while in Cox proportional hazard models the coefficient refers to the entire time period

(Kleinbaum, 1996). Additionally, in logistic regression the odds ratio for a dummy

variable is the ratio of the odds for the group coded 1 to the omitted group, while Cox

regression refers to the ratio of the rates of the two groups.

Survival analysis has become commonplace in criminological research and is

emerging as a statistical tool for social work researchers.   Survival analysis provides a

significant benefit for social work researchers because it means that not all participants of

a study have to be followed for the same time period. It is particularly beneficial for

social work and criminological research because it is common to find situations where

there are many different times of entry into a program and departure from it (Pugh &

Jones, 2004).

Potential Significance of Study

A significant relationship between life-course variables such as employment,

education, and marital status could have important implications for policy makers and

practitioners. For example, if obtaining and retaining full-time employment reduces the

hazard rates of recidivating over time, prison administrators, probation officers, and

practitioners may implement more in-prison vocational training programs, and create job placement programs and case management services upon release from prison. Probation officers could impose not only legal mandates on obtaining employment but mentorship as well, while social workers and counselors could empower their clients by providing psychological support and therapeutic counseling. Social workers could also provide services that are more effective by helping offenders cope with their every day struggles of obtaining and retaining employment. Furthermore, social workers have the ability to advocate for offenders by trying to convince employers to hire their clients by facilitating on going dialogue between the employer and potential employee, which would ideally enable the employer to trust the offender to fulfill his occupational duties.

A significant relationship between education and the hazard rate for recidivating would have similar implications. Ideally, prison administrators would implement more in-prison educational programs and individual counseling to help the offenders understand the relationship between education and recidivism. Upon release from prison, probation officers, case managers, and counselors would need to empower offenders by teaching them the various educational opportunities, how to complete the application process, and provide studying techniques and working skills to the offenders in order to help them attain their educational pursuits.

A significant relationship between marital status and the hazard rate for recidivating would potentially signify the importance of family counseling for offenders still in prison and upon release from prison. For married offenders, this would include couples counseling to empower the offender and his spouse to cope with marital difficulties. Cognitive-behavioral counseling may be appropriate for this endeavor. For

non-married offenders, perhaps family counseling with parents or guardians, siblings, grandparents, and children is appropriate in order to provide the support and structural foundation married offenders may have in their marital relationship. A significant relationship between marriage and recidivism could potentially convince prison administrators to increase conjugal visits for married offenders and family visits for non-married offenders, particularly in the year prior to release from prison, to strengthen the offenders' relationships and ultimately decrease the chances of recidivism.

Chapter 4

Results

Description of Sample

The sample subjects for the present study on criminal recidivism is a random sample of 250 male offenders released from Texas prisons since 2001. The researcher chose a sample of 250 offenders because it satisfies the cases to independent variables ratio for both hierarchical logistic regression and Cox proportional hazard modeling, which is 20 cases for every independent variable. Table 4.1 contains information on demographics of the sample. As Table 4.1 indicates, 43 percent of the sample is African American, 32 percent of the sample is Caucasian, and 24 percent of the sample is Hispanic. The offenders' average age when incarcerated is 31 years and their average age when released from prison is 36 years. The offenders had an average of ten years of education and two prior offenses. Regarding the initial crime committed that led to the offenders' incarceration, 46 percent of the sample committed drug crimes, 25 percent committed property crimes, 23 percent committed violent crimes, and six percent committed other crimes.

There are 108 African Americans in this random sample of 250 Texas offenders released from prison since 2001. The mean age for African American offenders when initially incarcerated was 30, slightly lower than the entire sample, and the mean age upon release from prison was 36 years. African American offenders averaged 10 years of education and two prior offenses. Forty-five percent of African Americans committed drug crimes, which is similar to the entire sample. The primary difference between the African American sample and the entire sample is that violent crimes, instead of property

crimes, are the second most common type of crime that led to African Americans'
incarceration. Thirty-two African Americans in the sample were incarcerated for
committing violent crimes, compared to only 23 percent of the entire sample. Finally, 20
percent of the African Americans were incarcerated for committing property crimes and
just three African Americans were incarcerated for crimes in the other category.
Eighteen African Americans in the sample were married when initially incarcerated.

The means for the Caucasian offenders are similar to both the African American
offenders and the sample as a whole. The mean age at incarceration and age upon release
from prison was slightly older for the Caucasian offenders: the mean age at incarceration
was 32 and the mean age when released from prison is 37 years. Caucasian offenders
averaged ten years of education and two prior offenses. Regarding the crimes that led to
incarceration, 42 Caucasian offenders committed drug crimes (53%), 22 Caucasian
offenders commit property crimes (28%), 12 Caucasian offenders committed violent
crimes (12), and 4 committed crimes in the other category. Sixteen of the Caucasian
offenders were married when initially incarcerated.

The Hispanic offenders in the sample, on average, were younger than the African
American and Caucasian offenders. The mean age when incarcerated for Hispanic
offenders was 30 years and the mean age when released form prison was 34 years.
Hispanic offenders averaged nine years of education and less than two previous offenses.
Regarding the crimes that led to incarceration, the Hispanic averages were more similar
to Caucasians than African Americans. Twenty-two Hispanic offenders were
incarcerated for drug crimes (37%), 18 for property crimes (30%), just 12 offenders were

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incarcerated for violent crimes, and 8 incarcerated for crimes in the other category.

Eleven of the Hispanic offenders were married when initially incarcerated.

Table 4.1: Demographics of Sample by Race

	Entire Sample (N=250)	African American(N=108)	Caucasians (N=80)	Hispanic(N=60)
Age when released	mean = 36	mean = 36	mean = 37	mean = 34
16-20	14(6%)	6(6%)	5(6%)	3(5%)
21-25	35(14%)	12(11%)	12(15%)	11(18%)
26-30	37(15%)	16(15%)	8(10%)	13(22%)
31-35	37(15%)	21(19%)	9(11%)	6(10%)
36-40	44(18%)	17(16%)	13(16%)	14(23%)
41-45	35(14%)	17(16%)	15(19%)	3(5%)
46-50	24(10%)	10(9%)	8(10%)	5(8%)
51-55	16(6%)	5(5%)	7(9%)	4(7%)
56-60	5(2%)	3(3%)	1(1%)	1(2%)
>60	3(1%)	1(1%)	2(3%)	0
# previous offenses mean	2.1	2.2	2.1	1.8
Level of Education mean	10.1	10.4	10.4	9.1
Original Crime				
Drug	114(46%)	49(45%)	42(53%)	22(37%)
Property	63(25%)	22(29%)	22(28%)	18(30%)
Violent	58(23%)	34(32%)	12(15%)	12(20%)
Other	15(6%)	3(3%)	4(5%)	8(13%)

Because the criminological literature on recidivism generally asserts that age is significantly related to re-incarceration, with younger offenders having a higher likelihood of recidivating, the researcher conducted a one-sample t-test to compare this particular sample's mean age to the mean age of the 2001 cohort of offenders released from Texas prisons (Hirschi & Gottfredson, 1993; Kapp, Schwartz, & Epstein, 1994; Langan & Levin, 2005). The purpose of the one-sample t-test was to ensure that this particular sample of 250 Texas parolees is representative of the population of Texas offenders released from prison. The one-sample t-test was conducted to analyze if the sample mean age at release from prison of 36.1 is representative of the population mean

(all Texas offenders released from prison), which is 37, less than a year older than the sample mean. The results of the one-sample t-test, *t*=-1.439 (df=249) and a *p-value* of .151, indicates the sample accurately represents the population of offenders released from Texas prisons regarding their age upon release.

Recidivism

This portion of Chapter 4 discusses recidivism rates for the entire sample; the differential effects that race and original crime have on re-incarceration; and how many months, on average, recidivists were out of prison before re-incarceration. Regarding the entire sample, 59 offenders were re-incarcerated to state prisons or state jails (24%), 42 for committing a new crime (17%) and 17 for committing technical violations of their parole (7%). Twenty-three of the 42 offenders that were re-incarcerated for committing a new crime officially lost their rights to parole *because of* committing a new crime, so the researcher considered them to be re-incarcerated for committing a new crime instead of parole revocation. In fact, a limitation in many criminal recidivism studies is that researchers fail to mention whether offenders re-incarcerated for parole revocation lost their rights to parole because of committing a new crime or committing technical violations to their parole. Furthermore, considering that subjects in this sample were released from prison *since* 2001, the recidivism rates are lower than they will be in future data collection efforts at future time points, since some of the offenders have not yet been out of prison for three years. This will be discussed further in the survival analysis subsection of Chapter 4 since survival analysis is the most appropriate model to use when subjects have entered the study at different times.

The recidivism rate for this sample is over four percentage points lower than the most recent recidivism study for Texas offenders, which is approximately 28 percent for offenders released from Texas prisons in 2001 (Watson et al., 2004). Again, there are two major differences between the two studies. Watson et al. (2004) conducted a three-year recidivism study for all offenders released from Texas prisons in 2001 while this particular study contains offenders released from prison *since* 2001. Therefore, some offenders have been out of prison for more than three years (and many were re-incarcerated after being out of prison for more than three years, which indicates that more than 28 percent of the Watson et al. sample were ultimately re-incarcerated) and some offenders who have been out of prison for less than three years have yet to be re-incarcerated.

Original crime committed

Violent Crimes. The recidivism rate for offenders initially incarcerated for violent crimes- including homicide, assault, rape, and robbery- is very similar to that of the entire sample. The mean age for the violent offenders when released from prison is 34.9 years, slightly lower than the mean age for the entire sample. African Americans constitute the majority of violent offenders released from prison (59%), followed by Caucasians (21%) and Hispanics (21%). Thirteen of the 58 offenders incarcerated for violent crimes were re-incarcerated, eleven for committing a new crime and two for violating conditions of their parole, meaning the recidivism rate for violent offenders is 22.4 percent. Eight of the recidivists were African American, three were Hispanic, and two were Caucasian. Only two of the offenders incarcerated for violent crimes, however, committed another

violent crime upon release from prison. Violent crime recidivists were out of prison for an average of 29 months before re-incarceration.

Property Crimes. The property crimes category includes such crimes as burglary, larceny, motor vehicle theft, fraud, possession and selling stolen property, destruction of property, trespassing, and vandalism. Approximately 25 percent of this sample (63 offenders) was initially incarcerated for committing a property crime. The mean age for property offenders is slightly older than the other crime categories: the mean age at incarceration is 30.4 and the mean age when released from prison was 36.2.   The 22 African Americans (35%) and 22 Caucasians (35%) made up the majority of offenders initially incarcerated for property crimes, followed by the 28 Hispanics (29%) and one offender in the other category. The 29 percent recidivism rate for property offenders was highest of the four categories of crime. Eight of the recidivists were African American, seven were Caucasian, and two were Hispanic. The average time out of prison for recidivists before re-incarnation was 23 months, six months less than the average for violent offenders.

Drug Crimes. The category of drug crimes includes crimes such as possession, manufacturing, and trafficking. Almost 50 percent of the sample (114 offenders) was incarcerated for committing a drug crime. The mean age of drug offenders was slightly older than the rest of the sample: the mean age at incarceration was 33 and the mean age when released from prison was 37 years. African Americans made up 43 percent of the offenders incarcerated for drug crimes, Caucasians made up 37 percent, and 19 percent of the drug offenders were Hispanic. Twenty-four percent of the offenders were re-incarcerated (21%), 14 for committing a new crime and 10 for violating technical

conditions of parole. The vast majority of recidivists initially incarcerated for drug crimes were African American. Sixteen of the recidivists were African American (10 were re-incarcerated for committing a new crime), five were Caucasian (3 for committing a new crime), and three were Hispanic (1 for committing a new crime). Drug crime recidivists were out of prison for an average of 27 months before re-incarceration.

Other Crimes. Fifteen offenders were initially incarcerated for crimes considered in the other category, eight Hispanics, four Caucasians, and three African Americans. The mean age when released from prison for these offenders was 31 years, noticeably less than the mean age for the other three categories. Four out of these fifteen offenders were re-incarcerated, two of which were Hispanic, one African American, and one Caucasian. The mean time between release from prison and re-incarceration for offenders in the other category was 19 months, less than the other three categories of crime committed.

Hierarchical Logistic Regression

Committed a New Crime or Parole Revocation

The first regression model for the present study on criminal recidivism regresses whether the offender has been re-incarcerated for a new crime or parole revocation on employment, marital status, and educational pursuits while controlling for race, age at incarceration, age when released from prison, and length of incarceration. Binary logistic regression requires that the dependent variable is dichotomous and the independent variables are metric or dichotomous. Recidivism, the dependent variable in this regression, is a dichotomous variable. The offender has been re-incarcerated or he has not. The three predictor variables in this regression are all dichotomous variables. Employment, marriage, and educational pursuits are all coded as 0 = no and 1 = yes.

Regarding the control variables, age at incarceration, age when released from prison, number of prior offenses, education level, and length of incarceration are all metric variables. In this particular binary logistic regression model, race is a dichotomous variable: the offenders are either African American or they are not. The researcher decided to dichotomize race as African American or not African American because of the disproportionate number of African Americans in the sample and in Texas prisons compared to the general population, and because African Americans have higher recidivism rates than Hispanics and Caucasians, who have similar recidivism rates to each other.

Offenders' education level was omitted from this and all other hierarchical logistic regression models because 52 cases are missing. Furthermore, level of education does not act as a predictor of recidivism for this sample. In a basic binary logistic regression with recidivism as the dependent variable and education level as the independent variable, the *Wald statistic* is .000 with a *p-value* of .991. Subsequently, the researcher omitted the offenders' education level from this and all other hierarchical logistic regressions.

The minimum ratio of valid cases to independent variables for logistic regression is 10 to 1, with a preferred ratio of 20 to 1. In this analysis, there are 247 valid cases and 8 independent variables (including control variables). The ratio of valid cases to independent variables is 30.89 to 1, which satisfies the minimum requirement as well as the preferred ratio for logistic regression of 20 cases for every independent variable.

The researcher considered a case an outlier in this analysis if it had a studentized residual of larger than 2.0 or smaller than -2.0. Using this criterion, there were six

outliers in this logistic regression, all of which were recidivists. Instead of comparing the classification accuracy of the model that contains all of the cases to a model that excludes outliers and deciding which model to analyze based on that comparison, the researcher decided to keep all of the valid cases in the study. This decision is based on the relatively small number of recidivists (59 overall and 58 valid cases in this particular regression) in the sample.

The researcher assessed multicollinearity in the logistic regression by examining the standard errors for the B-coefficients. A standard error larger than 2.0 indicates numerical problems, such as multicollinearity among the independent variables, cells with a zero count for a dummy-coded independent variable because all of the subjects have the same value for the variable, and complete separation where two groups in the dependent variable can be perfectly separated by scores on one of the independent variables (Hair et al., 2005). Analyses that indicate numerical problems should not be interpreted. As Table 4.3 indicates, multicollinearity is not a concern in this analysis. The standard errors for the independent and control variables are as follows: age at incarceration = .053, age at release = .052, number of prior offenses = .122, maximum sentence prison length = .000, race (as a dichotomous variable) = .342.

The presence of a relationship between the dependent variable and combination of independent variables is based on the statistical significance of the block chi-square at Block 2 after the independent variables have been added to the analysis (the control variables are inserted in the analysis at Block 1). As indicated in Table 4.2, the probability of the Block 2 chi-square (19.452) is $p=<.001$, less than the level of significance of 0.05. The null hypothesis that there is no difference between the model

with only a constant and the control variables versus the model with the addition of the predictor independent variables is rejected. The contribution of the relationship between the independent variables and the dependent variable is supported.

Table 4.2: Block 2 – Omnibus Test of Model Coefficient

	Chi-Square	Degree of Freedom	Significance
Step	13.617	3	.003
Block	13.617	3	.003
Model	31.298	8	.000

To determine if there is a relationship between the individual predictor variables (employment, marriage, and educational pursuits) and the dependent variable (recidivism), the researcher assessed the significance of the Wald Test of the B coefficient and the interpretation of the odds ratio. Table 4.3 contains information on the Wald Test of the B coefficients for the control variables and the predictor independent variables in Block 2. Block 2 contains the control variables and the addition of the predictor independent variables.

As Table 4.3 indicates, one control variable has a Wald Test of the B coefficient score that is significant at the .05 level and two control variables have Wald Test of the B coefficient scores that are very close to significant at the .05 level. The probability for the Wald Statistic for the variable age when released from prison (3.945) is $p=.047$, less than the level of significance of .05. Age when released from prison is a metric variable so that higher numeric values are associated with older age. The value of $Exp(B)$ is .901, which implies a decrease in the odds of recidivating by 9.9 percent. A one-unit increase in age is associated with offenders being 9.9 percent less likely to be re-incarcerated.

Two control variables are not quite significant at the .05 level but have p-values under .10. The probability for the Wald Statistic for the variable race (3.464) is .063, just

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over the level of significance of .05. Race is a dichotomous variable with African

Americans coded as one and offenders who are not African Americans coded as two.

The value of *Exp(B)* is .529, which implies a decrease in the odds of recidivating by 47.1

percent. Offenders who are not African American are 47.1 percent less likely to be re-

incarcerated.

The probability for the *Wald Statistic* for the number of previous offenses (2.923)

is .087, greater than the significance level of .05 but lower than .10. Number of prior

offenses is a metric variable. The value of *Exp(B)* is 1.223, which implies that offenders

with a one-unit increase in previous crimes committed are over 1.2 times more likely to

be re-incarcerated.

The three predictor independent variables in this analysis are marital status,

employment, and educational pursuits. Employment is the only variable with a Wald

Statistic p-value significant at the .05 level. Surprisingly, the p-value is significant at the

other end of the bell curve than originally predicted by the first hypothesis of the study.

The probability for the Wald Statistic for employment (9.411) is *p*=.002, less than the

level of significance of .05. Employment is a dichotomous variable, coded 0 if the

offender did not have a job upon release from prison and 1 if the offender did have a job

upon release from prison. The value of *Exp(B)* is 2.821, implying that offenders who

obtained employment upon release from prison were 2.8 times more likely to be re-

incarcerated.

In this hierarchical logistic regression, the direction of the relationship between

marital status and recidivism is also different than the researcher anticipated. The

probability for the Wald Statistic for marital status (3.275) is *p*=.07, not significant at the

.05 level, but close enough to warrant more analysis. Marital status is a dichotomous

variable, coded 0 if the offender is not married and 1 if the offender is married and lived

with his wife upon release from prison. The value of *Exp(B)* is 2.155, implying that

married offenders who live with their wives upon release from prison are 2.1 times more

likely to be re-incarcerated than non-married offenders are. Chapter 5 provides an

analysis of the relationships between marriage and employment on recidivism along with

a discussion on the limitations of the dataset regarding the usage of a hierarchical logistic

regression.

Finally, there was not a strong relationship between educational pursuits and

recidivism . The probability for the Wald Statistic for educational pursuits (.010) is

p=.919, well above the .05 level of significance.

Table 4.3: Block 2 – Variables in the Equation for Analysis 1

Variables	B	SE.	Wald	df	Sig.	Exp(B)
Age_incarceration	.053	.053	.969	1	.325	1.054
Age_release	-.104	.052	3.945	1	.047	.901
# of prior offenses	.209	.122	2.923	1	.087	1.233
Sentence Length	.000	.000	.757	1	.384	1.000
Race	-.636	.342	3.464	1	.063	.529
Marital status	.768	.424	3.275	1	.070	2.155
Employment	1.037	.338	9.411	1	.002	2.821
Enrolled in school	.004	.040	.010	1	.919	1.004
Constant	.553	.859	.414	1	.520	1.738

The researcher performed a 75%-25% cross-validation test to confirm the results

of the hierarchical logistic regression with re-incarceration for committing a crime or

parole revocation as the dependent variable. For a hierarchical logistic regression, the cross-validation must verify the contribution of the independent variables entered after the control variables have been included. This is based on the statistical significance of the block chi-square for the second block of variables. In the cross-validation analysis, the relationship between the independent variables and the dependent variable taking into account the effect of the control variables is statistically significant. The probability for the block chi-square (12.322) testing the block of independent variables is $p=.006$. The significance of the overall relationship between the independent variables (employment, marital status, and educational pursuits) and the dependent variable supports the interpretation of the full data set.

The second step in the cross-validation analysis is to assure the individual independent variables have the same relationship with the dependent variable as they do when analyzing the entire dataset. The relationship between employment and recidivism is statistically significant for the model using the full data set ($p=.002$). Similarly, the relationship in the cross-validation analysis is statistically significant. In the cross-validation analysis, the probability for the test of relationship between employment and recidivism is $p=.005$, which is also less than the .05 level of significance and statistically significant.

Finally, the classification accuracy for the selected cases in the 75%-25% cross-validation analysis was 78.1%, compared to 80.0 percent for the unselected cases, which also acts as the validation sample. Considering the difference is less than two percent, the cross-validation analysis indicates that this logistic regression model would be

effective in predicting scores for cases other than those included in the calculation of the regression analysis (Hair et al., 2005).

Committed a New Crime Only

The second binary logistic regression with a hierarchical entry of variables assesses the influence of the same independent variables (employment, marriage, and educational pursuits) on re-incarceration for committing a new crime. Offenders who were re-incarcerated for committing technical violations of their parole were not considered recidivists in this analysis. Of the 247 valid cases in this analysis, 41 offenders were re-incarcerated for committing a new crime since being released from prison. The control variables (age when incarcerated, age when released from prison, number of previous offenses, sentence length, and race) remained the same in this logistic regression model as they were in the first regression analysis.

As Table 4.5 indicates, multicollinearity is not a problem in this analysis excluding offenders who were re-incarcerated for parole revocation. The standard errors for the independent and control variables are as follows: age at incarceration = .064, age at release = .063, number of prior offenses = .140, maximum sentence prison length = .000, race (as a dichotomous variable) = .391. Furthermore, as indicated in Table 4.4, the probability of the Block 2 chi-square (11.326) is $p=01$, less than the level of significance of 0.05. The null hypothesis that there is no difference between the model with only a constant and the control variables versus the model with the addition of the predictor independent variables is rejected. The contribution of the relationship between the independent variables and the dependent variable is supported.

Table 4.4: Block 2 for Analysis 2

	Chi-Square	Degree of Freedom	Significance
Step	11.326	3	.010
Block	11.326	3	.010
Model	27.470	8	.001

Regarding the control variables, the offenders' age when released from prison is the only statistically significant variable. The probability of the Wald Statistic (4.239) is $p=.040$, less than the .05 level of significance. The value of *Exp(B)* is .878, implying that a one-unit increase in age with this sample is associated with a 12.2 percent reduction in the likelihood of being re-incarcerated for committing a new crime. Moreover, although not significant at the .05 significance level, the probability of the Wald Statistic for race (3.152) is $p=.076$. This p-value is low enough to warrant analysis. The value of *Exp(B)* is .500, implying that offenders in this sample who are not African American are 50 percent less likely to be re-incarcerated for committing another crime.

The three predictor independent variables are employment, marital status, and educational pursuits. Similar to the binary logistic regression using all recidivists as the dependent variable, employment is the only significant independent variable. The probability for the Wald Statistic for employment (8.136) is $p=.004$, less than the level of significance of .05. The value of *Exp(B)* is 3.032, implying that offenders who obtained employment upon release from prison in this sample were 3 times more likely to be incarcerated for committing a new crime than offenders in this sample who did not obtain employment upon release from prison.

The influence of marriage on recidivism is not as strong for offenders re-incarcerated for committing a new crime compared to all recidivists. The probability for

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the Wald Statistic for marriage (1.963) is *p*=.161, larger than the .05 level of significance.

The value of the *Exp(B)* is 1.940, implying that married offenders in this sample are 1.9

times more likely to be re-incarcerated for committing a new crime than offenders who

are not married. There is a 16 percent probability, however, that these results were

obtained by chance.

Table 4.5: Block 2 – Variables in the Equation for Analysis 2

Variables	B	SE.	Wald	df	Sig.	Exp(B)
Age_incarceration	.073	.064	1.281	1	.258	1.075
Age_release	-.130	.063	4.239	1	.040	.878
# of prior offenses	.209	.140	2.237	1	.135	1.232
Sentence Length	.000	.000	.748	1	.387	1.000
Race	-.694	.391	3.152	1	.076	.500
Marital status	.663	.473	1.963	1	.161	1.940
Employment	1.109	.389	8.136	1	.004	3.032
Enrolled in school	.021	.045	.230	1	.632	1.022
Constant	.337	.977	.977	1	.730	1.40

Survival Analysis

The researcher conducted three different Cox proportional hazard models (Cox

regression models): 1) one model including censored cases, which includes the offenders

who have not recidivated, 2) one model excluding censored cases, and 3) one model

excluding censored cases and recidivists older that 37 years of age. Cox proportional

hazard modeling was the method of survival analysis chosen for the present study

because it includes predictor variables (covariates) and control variables in the model.

Cox regression analyses *usually* contain censored cases. Moreover, Cox regressions

provide estimated coefficients for each of the covariates, which enables the researcher to assess the impact of multiple predictor variables in the same model. In the first two Cox regression analyses, the researcher entered the control variables in a forward stepwise approach, which only maintains the influential variables in the analysis (Kleinbaum, 1996; Norusis, 2004).

The first Cox regression model examines the influence of employment, marriage, and educational pursuits on time until re-incarceration. Because there were no differences in the binary logistic regression between all offenders and only offenders re-incarcerated for committing a new crime, the researcher decided to include all recidivists in the Cox regression analyses. Censored cases are included in this particular model.

There are 249 valid cases in this Cox regression analysis. One case was omitted from the analysis for having missing values. Almost 24 percent of the sample (59 cases) experienced the event of interest (re-incarceration) and 190 cases were censored for not having experienced re-incarceration.

Cox regression is a robust model that contains only one important assumption, which is the proportional hazard assumption. The proportional hazard assumption states that the ratio for any two cases at any time period must be the ratio of their covariate effect. Put another way, the hazard function is proportionally related to the baseline hazard and the two curves remain proportional over time (Hosmer & Lemeshow, 1999). In the Supreme Test for the proportional hazard assumption (Willet & Singer, 1995), the p-value for the maximum absolute value for employment (1.25) is $p=.446$ and the p-value for the maximum absolute value for marriage (.750) is $p=.816$. In both cases, the researcher failed to reject the null hypothesis that there is no difference between the

baseline hazard and the hazard influenced by the covariates. Subsequently, the proportional hazard assumption is satisfied in this Cox regression model.

The researcher entered the following control variables in the first block of the model: age at incarceration, age when released from prison, number of previous offenses, and race as a dichotomous variable (African American or not African American). The forward stepwise approach only keeps the influential variables in the analysis. Control variables that had their variation explained away by other control variables were omitted from the analysis. Specifically, according to Norusis (2004), if the step is to add a variable, the inclusion makes sense if the significance of the change is less than .05 and if the step is to remove a variable, the exclusion makes sense if the significance of the change is greater than .10. Considering that criterion, the following two control variables were kept for the final model: the offenders' age when released from prison and the offenders' number of previous offenses.

Table 4.6 contains information on Block 1 in this Cox regression. Exp(B) is the predicted change in the hazard for a one-unit increase in the covariate. In Block 1, the p-value for the Wald Statistic for age when released from prison (9.209) is $p=.002$, less than the .05 level of significance. The value of Exp(B) for age when released from prison (.956) means that the recidivism hazard is reduced by 4.4 percent for every one-unit increase in age when released from prison.

The other control variable in Block 1 is the offenders' number of previous offenses. The p-value for the Wald Statistic for the number of previous offenses (4.281) is $p=.039$, less than the .05 level of significance. The value of Exp(B) for the offenders' number of previous offenses (1.222) means that the recidivism hazard is approximately

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1.2 times greater for an offender with one more previous conviction than an offender with one less previous conviction.

Table 4.6: Block 1-Control Variables for Cox Regression 1

Variables	B	SE	Wald	df	Sig.	Exp(B)
Age when released	-.045	.015	9.209	1	.002	.956
Number of offenses	.201	.097	4.281	1	.039	1.222

The chi-square change from previous step and the chi-square change from previous block both report the effect of adding the elements of life-course theory (employment, marriage, and educational pursuits) to the model selected in Block 1. As Table 4.7 indicates, the chi-square change from Block 1 to Block 2 is not significant at the .05 level.

Table 4.7: Chi-Square Change for Cox Regression 1

	Chi-Square	df	Sig
From Previous Step	3.205	4	.524
From Previous Block	3.205	4	.524

Figure 4.1 is the survival curve for the "average" offender and Figure 4.2 is the hazard curve for the "average" offender. The basic survival curve is a visual display of the model-predicted time to recidivism. The horizontal axis displays the months to re-incarceration and the vertical axis show the probability of survival. In practice, when using actual data, survival and hazard curves are step functions instead of smooth curves (Kleinbaum, 1996). The mean survival rate for all subjects is .805 and the mean hazard rate is .240.

Despite the insignificant chi-square change from Block 1 to Block 2, the researcher examined the covariates entered in Block 2, which are employment, marriage, and educational pursuits. Table 4.8 provides information for the covariate variables in

Block 2 of the Cox regression model. The regression coefficient for employment

suggests that the recidivism hazard for employed offenders is reduced by 17.2 percent

compared to the recidivism hazard for unemployed offenders. The p-value of the Wald

Statistic (.433) is *p*=.510, however, which is greater than the level of significance of .05,

meaning that any observed difference between employed offenders and unemployed

offenders could be due to chance. Figure 4.3 provides the survival curves for employed

and unemployed offenders while Figure 4.4 provides the hazard curves.

The *Exp(B)* for marriage is 1.634, which suggests that the hazard for married

offenders is 1.6 times that of non-married offenders. The p-value of the Wald Statistic

(2.304) is *p*=.129, which is greater than the level of significance of .05, meaning that for

marriage, as well as employment, any observed difference between married offenders and

non-married offenders could be due to chance. This is more likely for the employment

variable than for the marriage variable, but both provide insignificant results. Figure 4.5

provides the survival curves for married and single offenders and Figure 4.6 provides the

hazard curves.

The Exp(B) for the offender being enrolled in school is 1.361, which suggests the

hazard for offenders that enrolled in school is almost 1.4 times that of offenders who did

not enroll in school. The p-value of the Wald Statistic (.407) is *p*=.523, well above the

.05 level of significance, meaning that any observed differences between offenders who

enrolled in school upon release from prison and offenders who did not enroll in school

could be due to chance. Figure 4.7 provides the survival curves for educational pursuits

while Figure 4.8 provides the hazard curves. The plot labeled 9 is the survival/hazard

curve for offenders who have an unknown employment status.

4.8: Block 2 – Covariates for Cox Regression 1

Variables	B	SE.	Wald	df	Sig.	Exp(B)
Age_release	- .046	.015	9.428	1	.002	.955
# of prior offenses	.211	.100	4.479	1	.034	1.234
Employment	-.188	.286	.433	1	.510	.828
Marital Status	.491	.323	2.304	1	.129	1.634
Enrolled in school	.308	.483	.407	1	.523	1.361

Figure 4.1: Survival Curve for "Average" Offender

Months from release to re-incarceration

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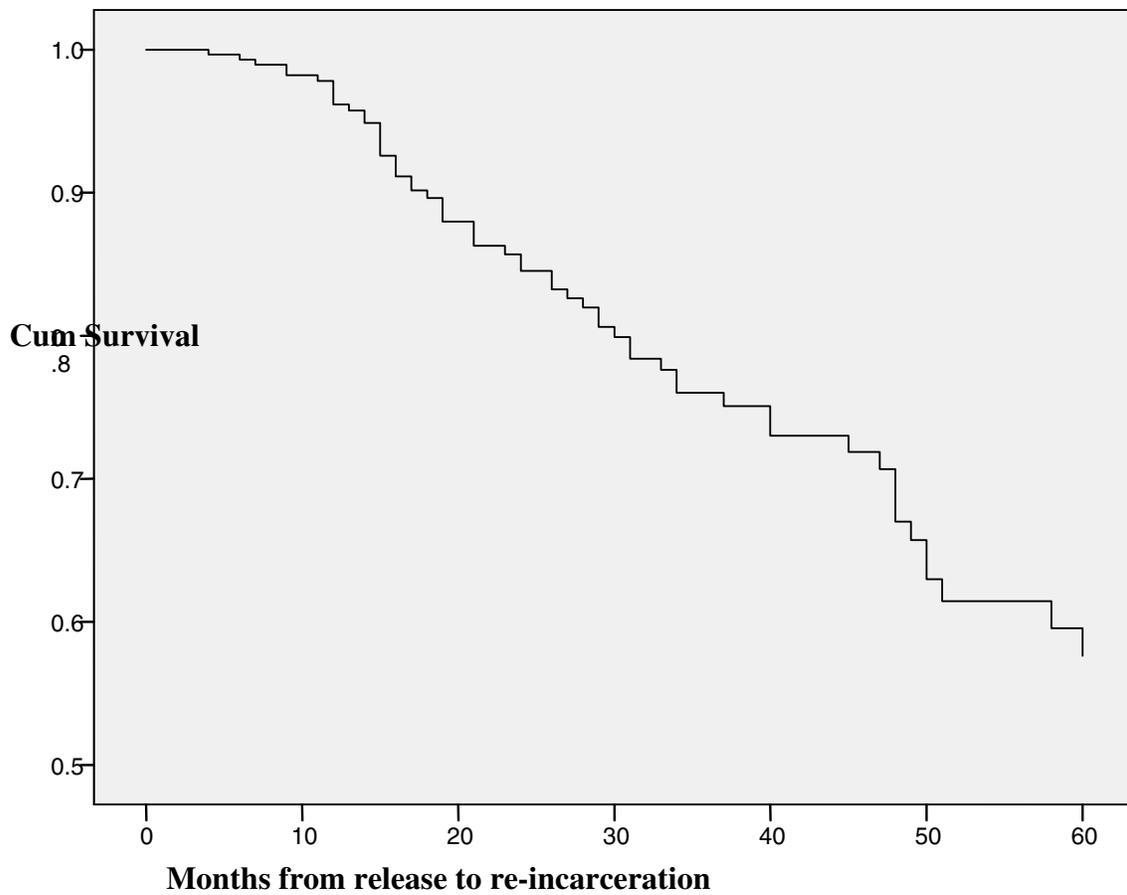
Figure 4.2: Hazard Curve for "Average" Offender
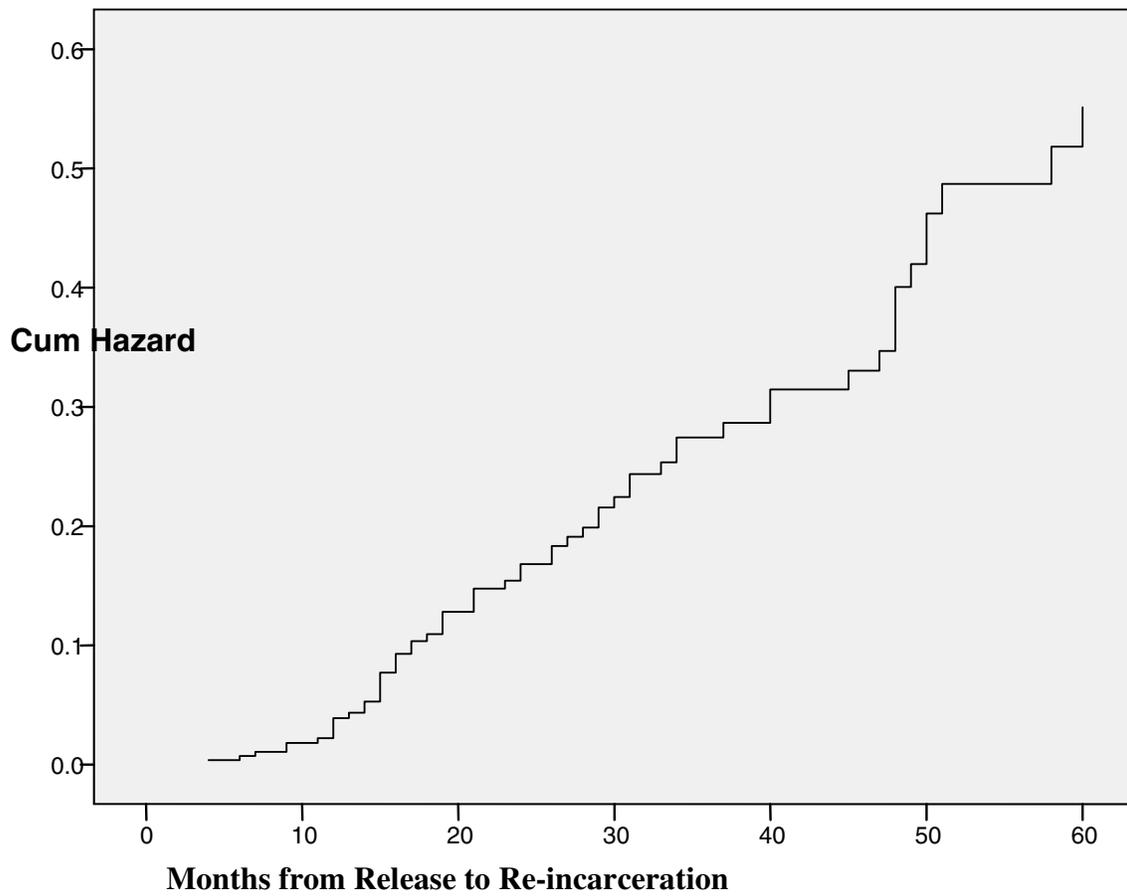
Figure 4.3: Survival Curves for Employed Offenders and Unemployed Offenders
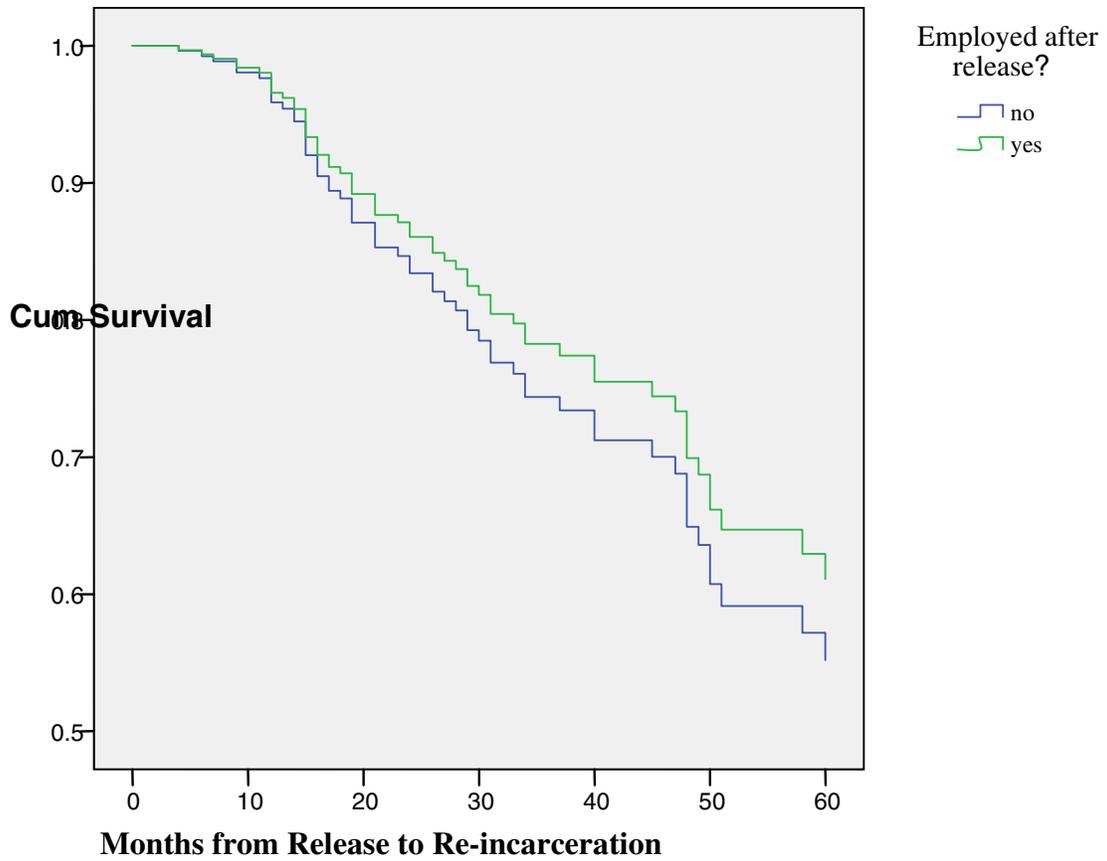
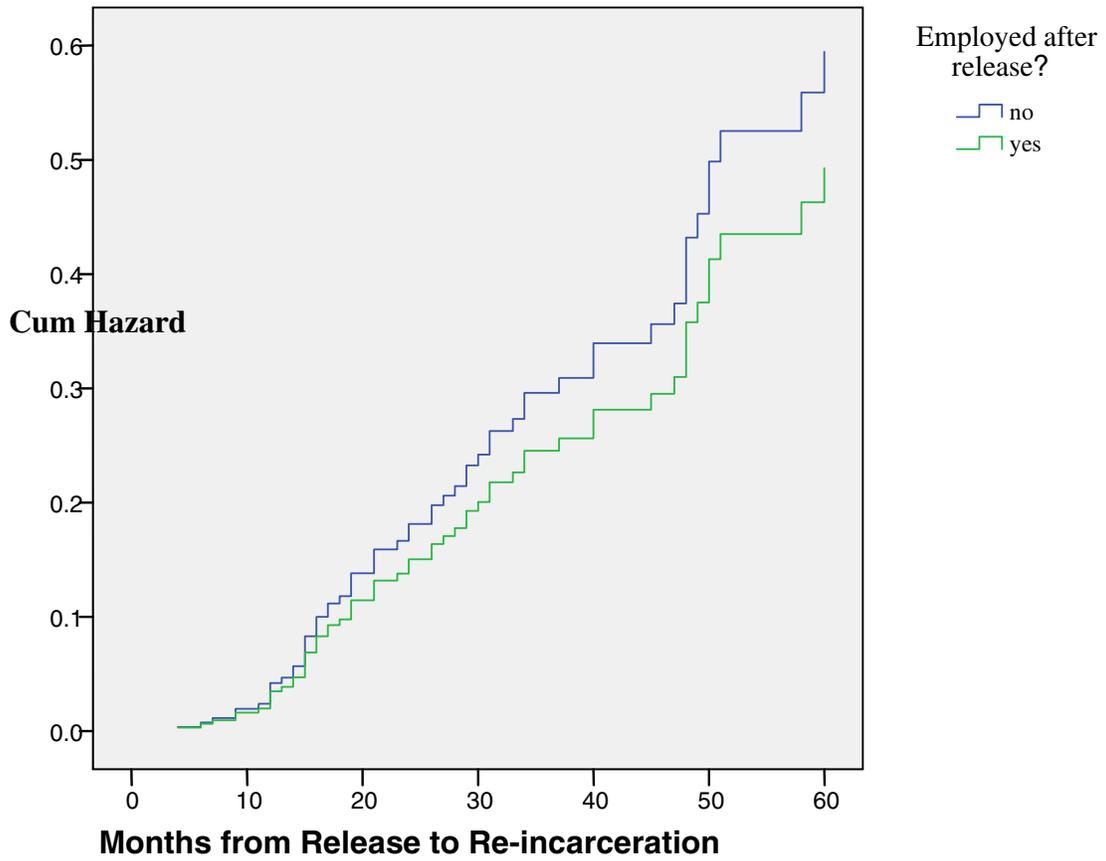**Figure 4.4: Hazard Curves for Employed and Unemployed Offenders**

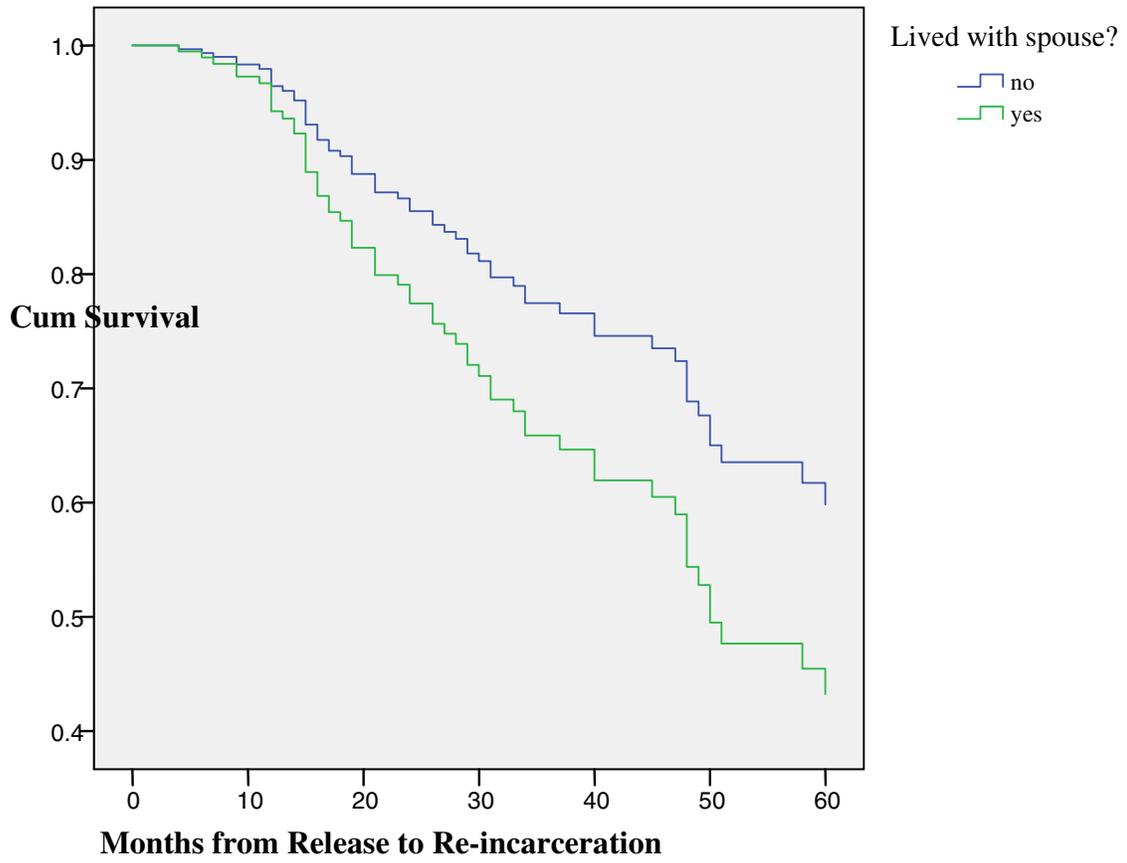**Figure 4.5: Survival Curves for Married and Single Offenders**

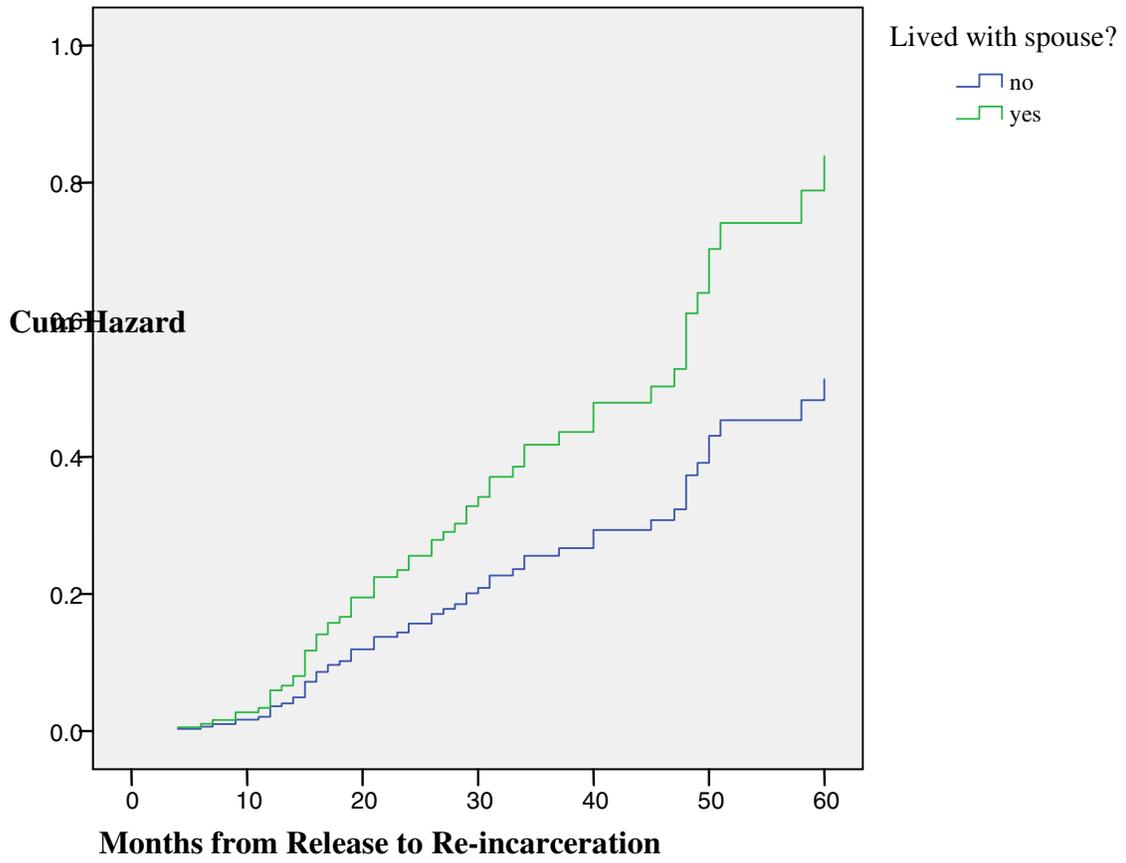**Figure 4.6: Hazard Curves for Married and Single Offenders**

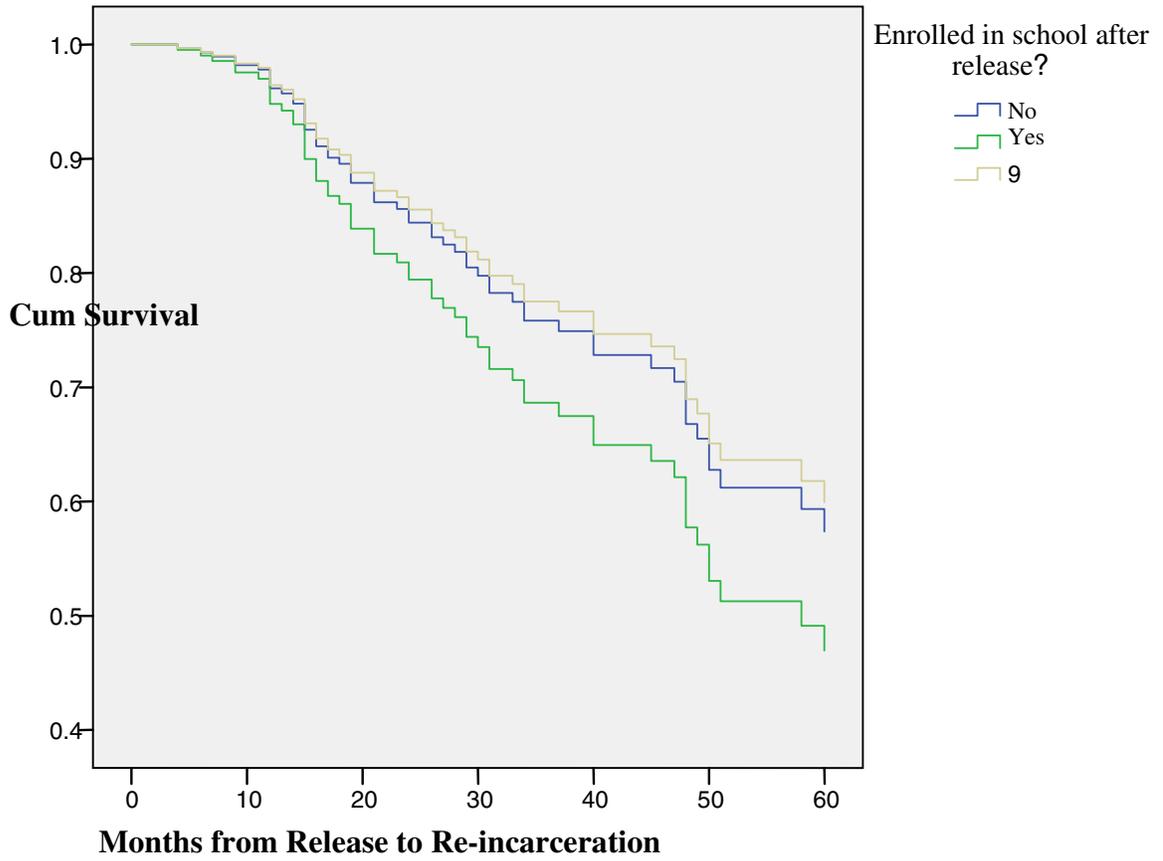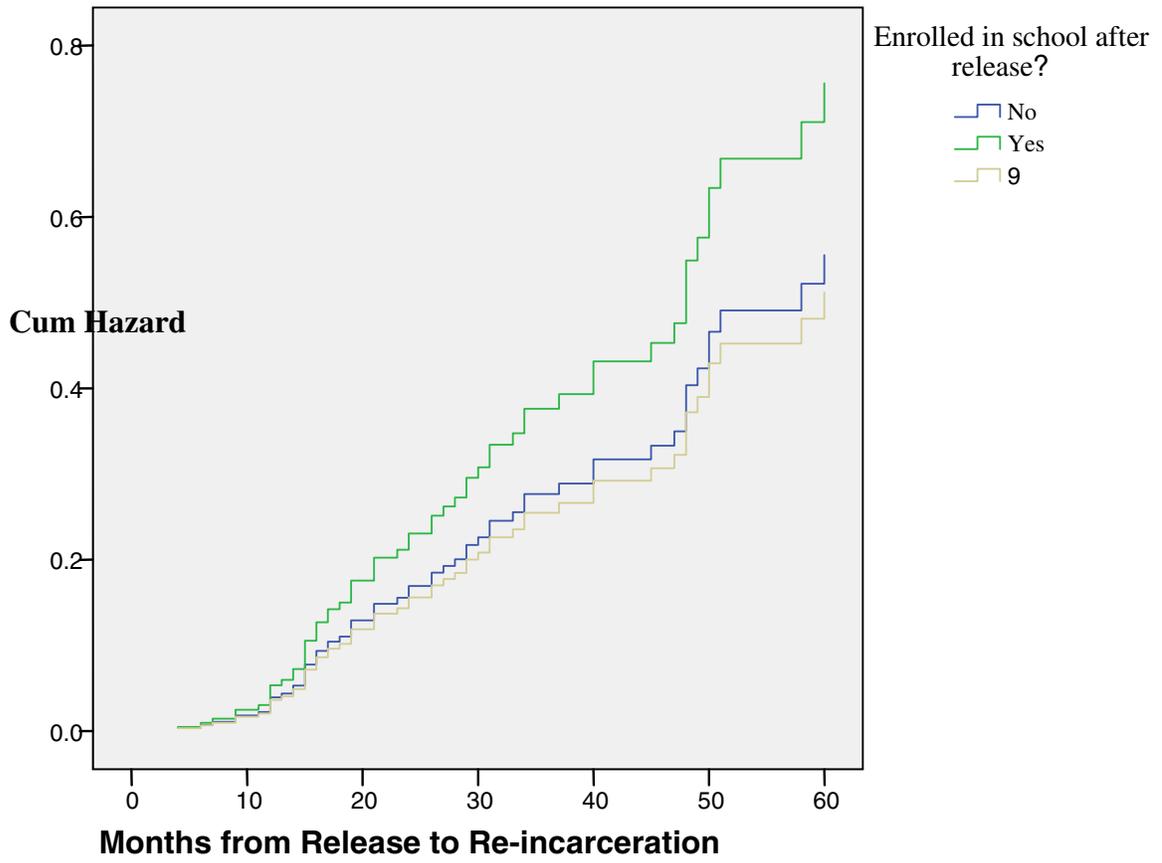**Figure 4.7: Survival Curves for Educational Pursuits**

Figure 4.8: Hazard Curves for Educational Pursuits

The second hypothesis states that recidivists who develop attachments (social bonds) will have longer periods crime-free upon release from prison than recidivists that lack attachments (social bonds). Subsequently, the researcher conducted a Cox regression model exclusively with recidivists. Censored cases were omitted from the analysis, providing a clear model that enables the researcher to assess the influence of the offenders' attachment to social bonds on time to re-incarceration. Furthermore, censored cases were omitted for this analysis because the short censored periods may be problematic for the reason that the participants may not have had sufficient time to commit a new crime. There are 59 cases in this particular Cox regression model, which are all of the offenders in the sample re-incarcerated for committing a new crime or parole revocation.

The proportional hazard assumption is satisfied in this model as well as the first Cox regression model. In the Supreme Test for the proportional hazards assumption (Willet & Singer, 1995), the p-value for the maximum absolute value for employment (.553) is $p=.937$ and the p-value for the maximum absolute value for marriage (.456) is $p=.971$, well over the .05 level of significance. In both cases, the null hypothesis that there is no difference between the baseline hazard and the hazard influenced by the covariates is accepted and the proportional hazard assumption is satisfied. The two curves remain proportional over time.

The control variables in this model, also entered in the first block of the model, remained the same in the second Cox regression model as they were in the first model. Considering the criteria to include and exclude control variables in forward stepwise analyses, that inclusion makes sense if the significance of the change is less than .05 and

exclusion makes sense if the significance of the change is greater than .10, race is the only control variable included in the model. Race is a dichotomous variable with African Americans as the reference group. The p-value of the Wald Statistic for race (6.995) is $p=.008$, well below the .05 level of significance. The *Exp(B)* value for Race is 2.108, implying that the hazard for African Americans is 2.1 times that of offenders in the sample that are not African American.

As Table 4.9 indicates, the chi-square change from the block with only the control variable (race) and the block including the elements of life-course theory (15.512) is statistically significant ($p=.004$), which rejects the null hypothesis that there was no difference between the two blocks. The contribution of the elements of life-course theory on time until re-incarceration is supported. Figure 4.9 is the survival curve for the "average" recidivist.

Table 4.9: Chi-Square Change for Cox Regression 2

	Chi-Square	df	Sig
From Previous Step	15.512	4	.004
From Previous Block	15.512	4	.004

The researcher assessed the p-value of the Wald Statistic and the regression coefficients to analyze the influence of the covariates (employment, education, and marriage) on time to re-incarceration while controlling for whether the offender is an African American. As Table 4.10 indicates, only one of the three predictor variables had a statistically significant relationship with time to re-incarceration. The p-value of the Wald Statistic for employment (13.487) is $p<.001$, smaller than the .05 level of significance. The null hypothesis that there is no difference between the baseline hazard

and the hazard for employed offenders is rejected. The value of Exp(B) for employment (.315) means that the recidivism hazard is reduced by 68.5 percent for employed offenders. Since this model is solely with recidivists, this result indicates that employed offenders took longer to be re-incarcerated than unemployed offenders at a statistically significant level. Figure 4.10 is the survival curve for employed and unemployed recidivists. As Figure 4.10 visually displays, the survival rate for employed recidivists is much higher throughout time, indicating it takes employed offenders longer to recidivate.

Although the relationship between marital status and time to re-incarceration is not statistically significant in this Cox regression model, the influence of marriage appears quite strong, indicating there may be a chance of a Type II error, especially considering the small sample size of married recidivists (N=13). The p-value of the Wald Statistic for marriage (1.458) is $p=.227$, higher than the .05 level of significance. The *Exp(B)* of .659 indicates that the recidivism hazard is reduced by 34.1 percent for married recidivists over time. Because the p-value is greater than .05, however, it is plausible that the results were obtained by chance. Figure 4.11 is the survival curve for married and single recidivists.

Finally, the p-value of the Wald Statistic for the offender being enrolled in school is quite high, which led to the researcher deciding not to analyze that relationship further. The Wald Statistic for educational pursuits in this model is .018, $p=.895$. Educational pursuits do not influence how long it takes a recidivist to be re-incarcerated.

Table 4.10: Block 2 – Covariates for Cox Regression 2

Variables	B	SE	Wald	df	Sig.	Exp(B)
Race	.789	.308	6.547	1	.011	2.201
Employment	-1.156	.315	13.487	1	.000	.315
Marital status	- .418	.346	1.458	1	.227	.659
Enrolled in school	-.066	.496	.018	1	.895	.937

Figure 4.9: Survival Curve for "Average" Recidivist

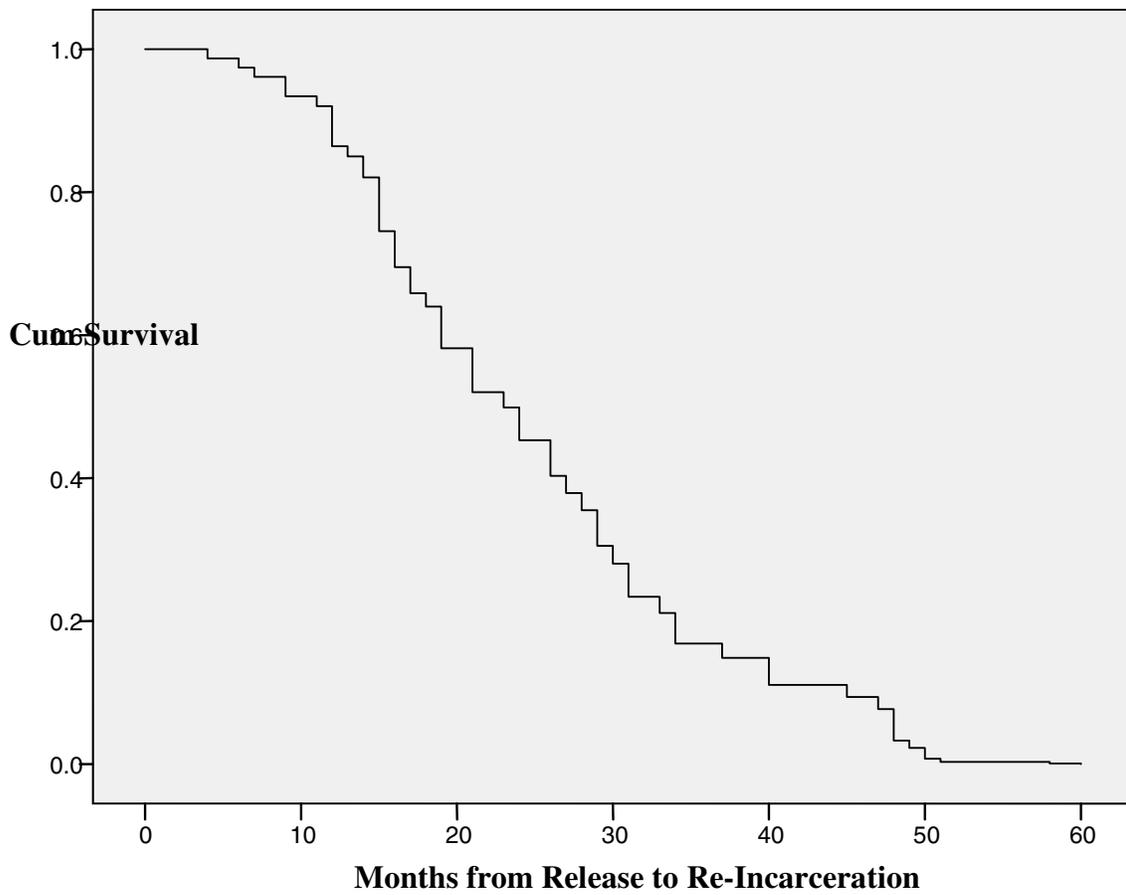Months from Release to Re-Incarceration

Figure 4.10: Survival Curves for Employed and Unemployed Recidivists
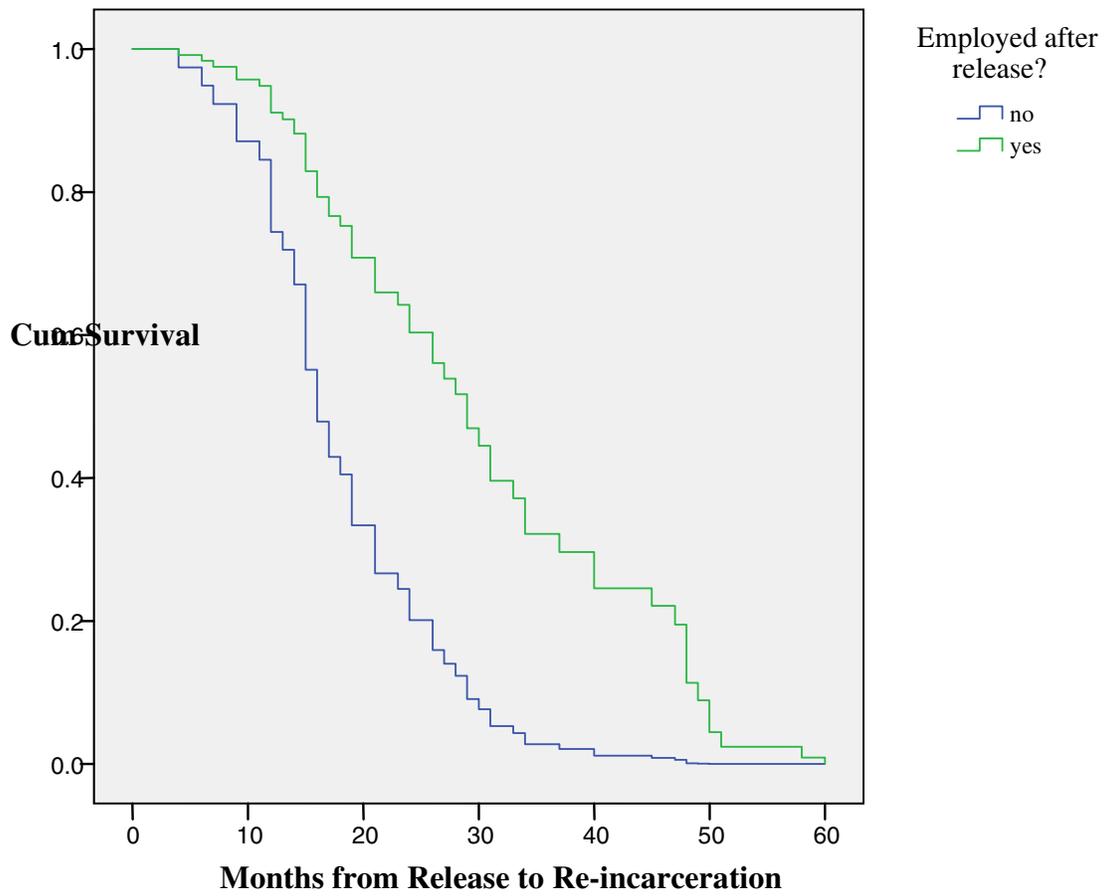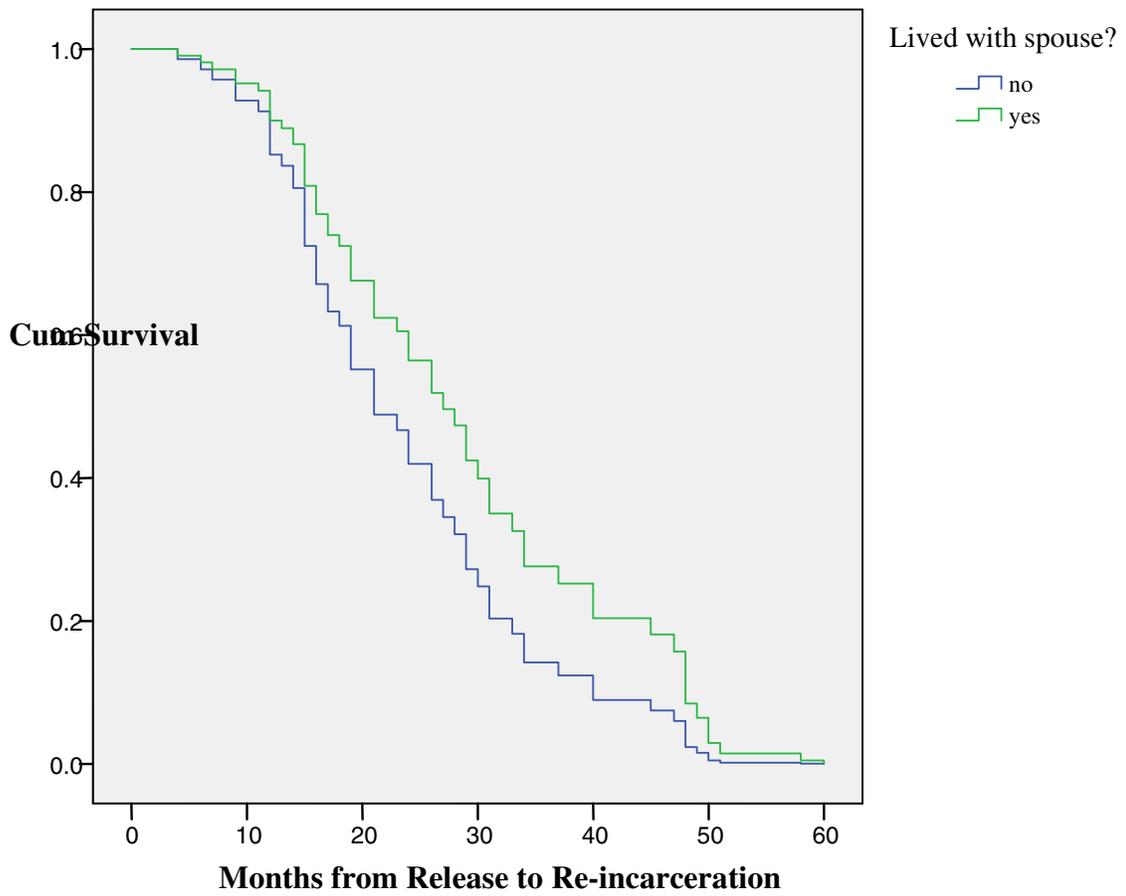
Figure 4.11: Survival Curves for Married and Single Recidivists

Of the four models conducted thus far (two hierarchical regression analyses and two Cox regression models), the Cox regression model excluding censored cases is the only model that produced significant results in the predicted direction for a primary element of life-course theory (employment) and recidivism, defined in this case as time until re-incarceration. Although the offenders' age when released from prison was controlled for in the previous model, the researcher conducted a second Cox regression model excluding the censored cases solely for offenders younger than 37, the mean age at release for the entire sample. If the Cox regression model for the younger half of offenders produces the same significant results as it did with all of the recidivists, the researcher's confidence will increase that age is not acting as an influential extraneous variable.

There are 139 offenders in the sample younger than the offenders' mean age when released from prison (37-years-old), including 41 recidivists who were included in this Cox regression model. Theoretically, age when released from prison should not be an influential control variable because the analysis is only for the younger half of offenders. However, the researcher decided not to use a stepwise approach in this particular model to assure that the offenders' age at incarceration, age when released from prison, number of previous offenses, and race will all be included in the first step.

The proportional hazard assumption is also satisfied in the model that only includes recidivists 37 years-of-age or younger. In the Supreme Test for the proportional hazards assumption (Willet & Singer, 1995), the p-value for the maximum absolute value for employment (.498) is $p=.907$ and the p-value for the maximum absolute value for marriage (.510) is $p=.08$, well over the .05 level of significance. In both cases, the

researcher failed to reject the null hypothesis that there is no difference between the baseline hazard and the hazard influenced by the covariates.

As Table 4.12 indicates, race (African American or not African American) is the only influential control variable with a statistically significant p-value for the Wald Statistic. The p-value of the Wald Statistic for race (8.319) is $p=.004$, well below the .05 level of significance. The Exp(B) value for race is 3.555, implying that the hazard for African Americans younger than 37-years-old is more than 3.5 times that of offenders in the sample younger than 37-years-old that are not African American. Interestingly, the p-value for the Wald Statistic for age when released from prison (.318) is $p=.573$. As expected, there is no influence of age when released from prison when analyzing offenders' younger than the mean age of the sample when released from prison.

As Table 4.11 indicates, the chi-square change from the block with only the control variable (race) and the block including the elements of life-course theory (13.653) is statistically significant ($p=.008$), which rejects the null hypothesis that there is no difference between the two blocks. The contribution of the elements of life-course theory on time until re-incarceration is supported. Figure 4.15 is the survival curve and Figure 4.16 is the hazard curve for the "average" recidivist under 37 years of age.

Table 4.11: Chi-Square Change for Cox Regression 3

	Chi-Square	df	Sig
From Previous Step	13.653	4	.008
From Previous Block	13.653	4	.008

As Table 4.12 indicates, one of the three predictor variables has a statistically significant relationship with time to re-incarceration with a significance level of .05. The

p-value of the Wald Statistic for employment (11.109) is p=.001. The null hypothesis

that there is no difference between the baseline hazard and the hazard for employment is

rejected. The value of Exp(B) for employment (.253) implies that the recidivism hazard

is reduced by 74.7 percent for employed offenders younger than 37-years-old compared

to unemployed offenders younger than 37-years-old. This result indicates that employed

offenders younger than the mean age of the sample are taking longer to be re-incarcerated

than unemployed offenders younger than the mean age of the sample at a statistically

significant level. Figure 4.13 is the survival curve for employed and unemployed

recidivists. As Figure 4.13 visually displays, the survival rate for younger employed

recidivists is higher throughout time than the survival rate for younger unemployed

recidivists, indicating it takes younger employed offenders longer to recidivate.

Although not significant at the .05 level, the relationship between marriage and

length to re-incarceration is very strong. The p-value for the Wald Statistic for marriage

(2.797) is p=.094. The value of Exp(B) for marriage (.460) implies that the recidivism

hazard is reduced by 54 percent for married offenders younger than 37-years-old

compared to single offenders younger than 37-years-old. There is a nine percent

probability, however, of the results occurring by chance. Figure 4.14 is the survival

curve for married and single recidivists younger than the mean age for the sample.

Similar to the other models in the study, this model portrayed no relationship

between educational pursuits and length to re-incarceration. The p-value for the Wald

Statistic for educational pursuits (.304) is p=.581. The researcher decided not to analyze

the variable further because of the high p-value.

Table 4.12: Block 2 – Covariates for Cox Regression 3

Variables	B	SE	Wald	df	Sig.	Exp(B)
Age at incarceration	.050	.087	.323	1	.570	1.051
Age when released	-.049	.088	.318	1	.573	.952
# of previous offenses	-.217	.201	1.167	1	.280	.805
Race	1.268	.440	8.319	1	.004	3.555
Employment	-1.376	.413	11.109	1	.001	.253
Marital status	- .777	.464	2.797	1	.094	.460
Enrolled in school	.344	.623	.304	1	.581	1.411

Figure 4.12: Survival Curves for "Average" Recidivist Under 37 Years of Age
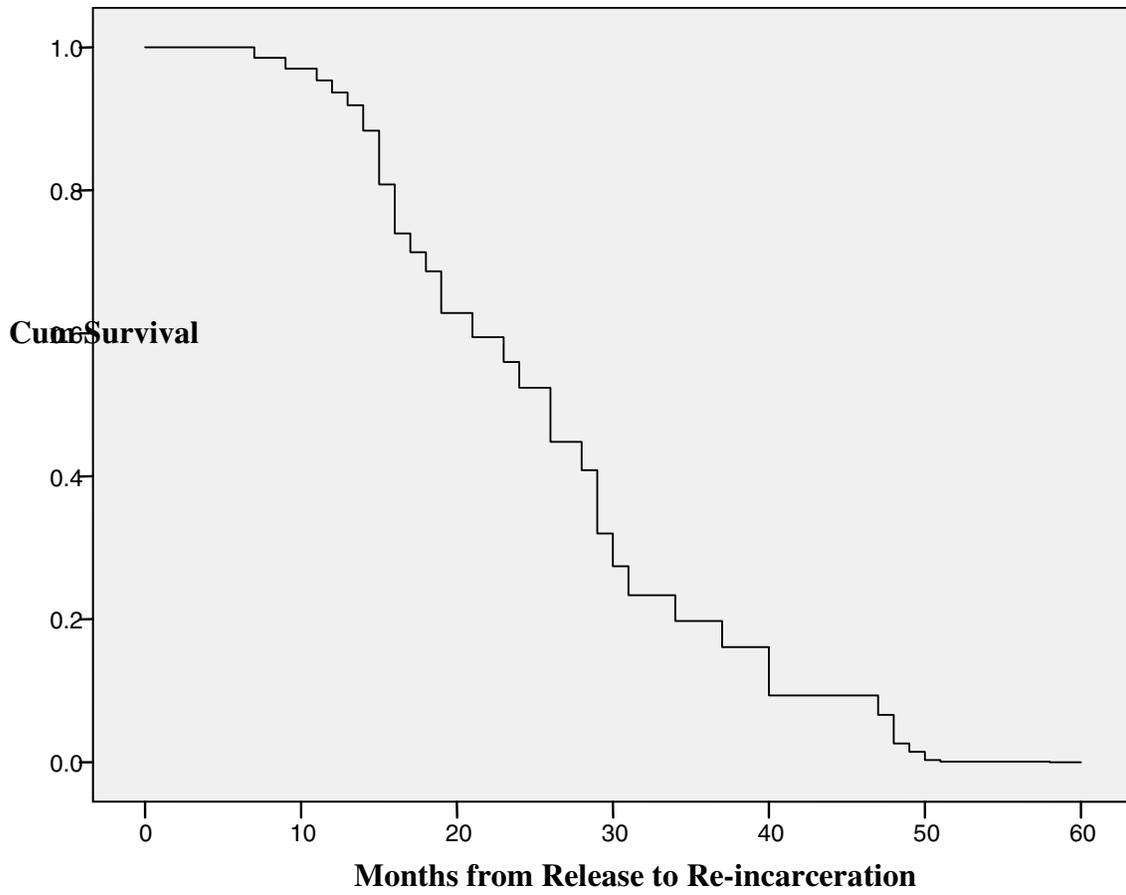
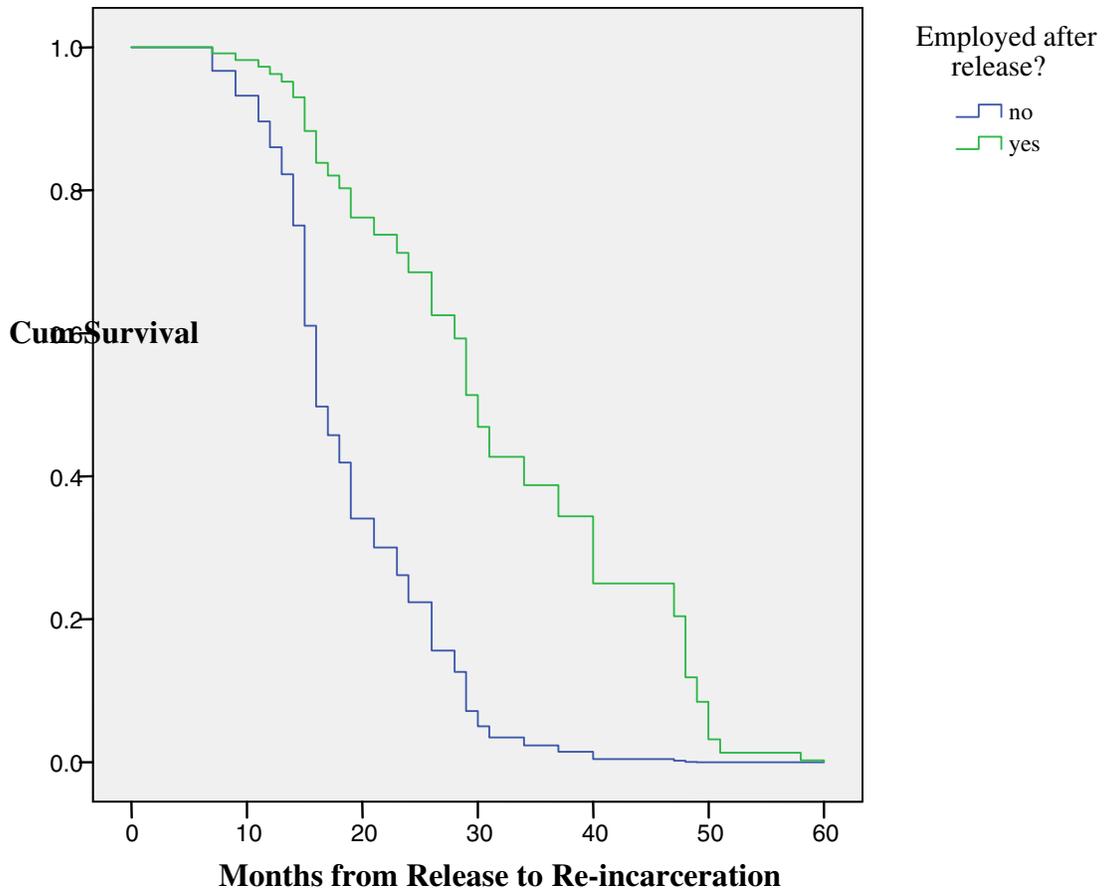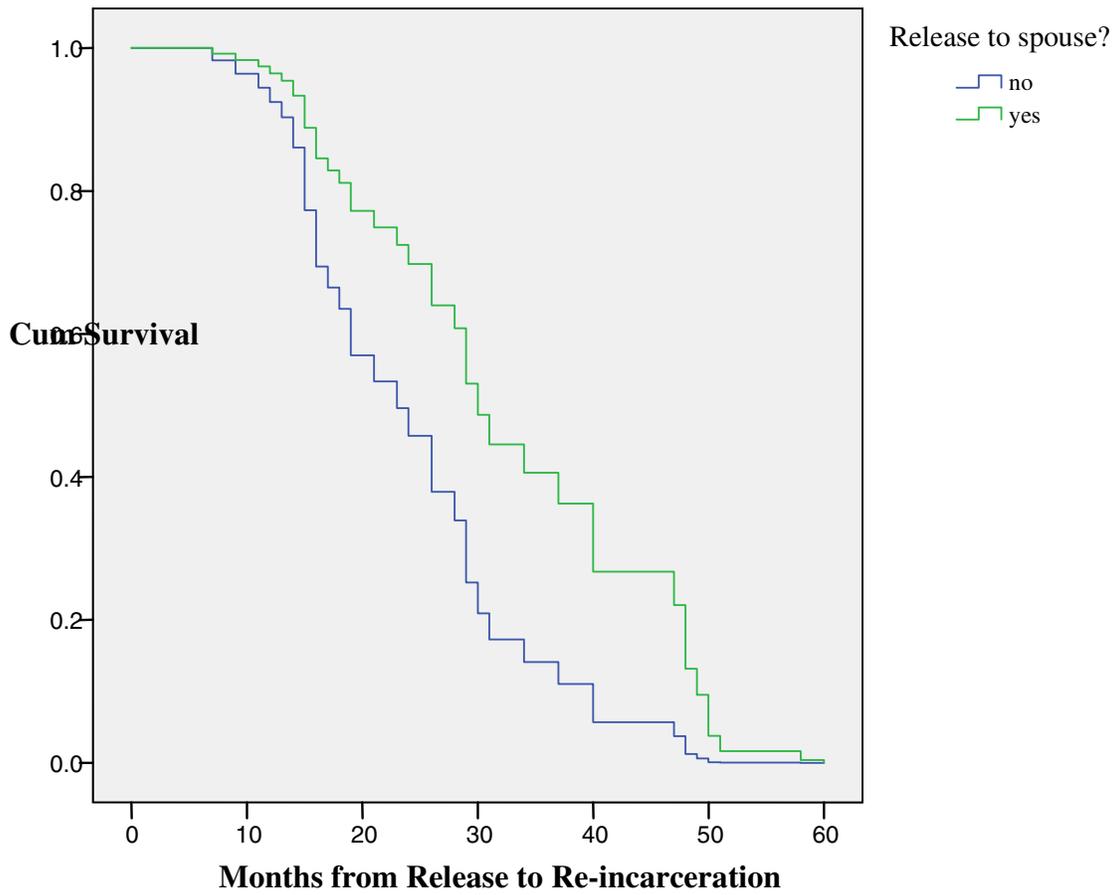**Figure 4.13: Survival Curves for Employed and Unemployed Offenders Younger Than 37 Years of Age**

Figure 4.14: Survival Curves for Married and Single Offenders Younger than 37 Years of Age

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Chapter 5

Summary and Discussion

Chapter 5 provides a discussion and summary of the present study assessing the influence of social bonds on criminal recidivism. First, the researcher summarizes the findings from Chapter 4 and discusses whether they support or reject the hypotheses originally mentioned in Chapter 1. The researcher then discusses the importance and contributions of the findings before summarizing the study's strengths and limitations. Finally, the researcher examines the implications and makes recommendations for policy and practice before proposing future research recommendations.

Discussion of Results

The goal of the present study was to investigate the influence of post-release variables on re-incarceration for a random selection of male offenders released from prison since 2001. By achieving this goal, the researcher went beyond previous Texas re-incarceration studies, which primarily examined the relationship between demographic variables and recidivism, such as the influence of race and age on re-incarceration. The researcher was able to investigate the influence of the offenders' attachment to employment, marriage, and educational pursuits on re-incarceration for a random selection of 250 Texas male offenders released from prison since 2001. Conducting binary logistic regressions with a hierarchical entry of variables and Cox proportional hazard regression models enabled the researcher to meet the specific aim of the study, which was to assess the influence of social bonding variables on recidivism and recidivists' time crime-free in the community, based on the attachments to social bonds

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offenders develop upon release from prison. The statistical models controlled for the influence of the following variables on recidivism: the offenders' age when incarcerated and age when released from prison, number of prior offenses committed by the offenders, sentence length, and the offenders' race.

Binary Logistic Regression Models

The first hypothesis for the present study states that offenders released from Texas prisons that develop attachments (social bonds) will be less likely to recidivate than offenders released from Texas prisons that lack attachments (social bonds). More specifically, the researcher hypothesized that: A) Offenders released from Texas prisons that obtain employment will be less likely to recidivate that offenders released from Texas prisons that do not obtain employment, B) Offenders released from Texas prisons that are married (and live with their spouse) will be less likely to recidivate than offenders released from Texas prisons that are not married, and C) Offenders released from Texas prisons that are participating in educational pursuits will be less likely to recidivate than offenders released from Texas prisons that are not participating in educational pursuits.

Based on the two hierarchical logistic regression models, the researcher's above hypotheses were not only rejected, but the employed offenders were actually more likely to be re-incarcerated than the non-employed offenders at a statistically significant level. It is important to recognize, however, that the offenders in this sample were released from prison at different times since 2001. Some of the offenders have been out of prison for over five years while some have been out for less than one year, meaning some of the offenders who have been out of prison for shorter times have not *yet* been re-incarcerated.

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Furthermore, not one offender in the sample who has been out of prison for less than two years obtained employment upon release from prison. This indicates that employed offenders in the sample have been out of prison longer on average than unemployed offenders, have had more opportunities to commit crimes, get caught committing crimes, and ultimately be re-incarcerated.

It is unknown why the offenders in the sample released within the past two years have not obtained employment. Perhaps parole officers did not emphasize employment to offenders that were released since 2005 like they may have earlier in the decade. No matter the reason, it is important to note that employed offenders were out of prison longer before re-incarceration. In fact, the mean time from release to re-incarceration *or* data collection for employed offenders is 44 months while the mean time for unemployed offenders is 22 months. This difference possibly skews the results from the binary logistic regression because employed offenders have generally been out of prison longer, increasing the likelihood of committing crimes and being re-incarcerated. Finally, while logistic regression allows the researcher to predict group membership (recidivist or not) based on levels of the covariates, it simply dichotomizes the dependent variable into a yes or no category, and does not account for time until re-incarceration in this particular analysis.

Although the offenders were released from prison at different times, and logistic regression does not consider the time between release from prison and re-incarceration or data collection, the data still show that employed offenders are more likely to be re-incarcerated than unemployed offenders. This result certainly does not support the researcher's a priori assertion that life-course theory could be applied to offenders

released from prison. According to the two binary logistic models, Hypothesis 1A is rejected, and the results indicate that employed offenders in this sample are more likely to be re-incarcerated than unemployed offenders.

The two hierarchical binary logistic regression models provided null results regarding the relationship with between marriage and recidivism. The researcher considered offenders to be married in this study if they had a wife *and* lived with their spouse upon release from prison. Although the results were null at the .05 level of significance, married offenders in this sample were approximately two times more likely to be re-incarcerated than non-married offenders. This result is similar to the research from the late 1970s and 1980s, which generally stated that marriage did not lead to a reduction in criminality for male offenders.   Similar to Hypothesis 1A, Hypothesis 1B, which states that married offenders released from prison are less likely to be re-incarcerated than single offenders released from prison, was rejected. According to the binary logistic regression, married offenders in this sample are no less likely to be re-incarcerated than single offenders, and the idea that life-course theory can be applied to offenders released from prison is not supported.

The third component of the first hypothesis states that offenders released from prison who are enrolled in school are less likely to be re-incarcerated than offenders that are not enrolled in school. The researcher failed to reject the null hypothesis that there was no difference in recidivism rates between offenders who were seeking educational pursuits and offenders who were not. While education is a variable that life-course proponents believe is important in the desistance process for later adolescence and earlier adulthood, researchers have not studied the influence of adult school enrollment in

desisting from criminal behavior. The researcher hypothesized that offenders released from prison who are seeking educational pursuits are less likely to continue criminal activity because they are attached to a conventional activity. This was not the case, however, and the researcher failed to reject the null hypothesis that there is no difference between enrolled offenders and offenders not enrolled in an educational program.

Cox Proportional Hazard Models

Survival Analysis may be the more appropriate statistical analysis to use when assessing the relationship between social bonds and recidivism with this particular sample because offenders were released from prison at different times. As mentioned in Chapter 3, survival analysis provides a significant benefit for social work research because not all participants of a study have to be "followed" for the same time period. There are important distinctions between observing data from logistic regression and data from Cox proportional hazards analysis. In logistic regression, the coefficient refers to the odds of an event happening at the end of a study, while in Cox proportional hazard models the coefficient refers to the entire time period. Additionally, in logistic regression, the odds ratio for a dummy variable is the ratio of the odds for the group coded one to the omitted group, while Cox regression refers to the ratio of the rates of the two groups (Kleinbaum, 1996).

Along with the binary logistic regression models, the researcher also conducted Cox proportional hazard models for the following two reasons: 1) to include the amount of time from release to re-incarceration when assessing whether attached offenders are less likely to be re-incarcerated, and 2) to determine if recidivists that become attached to conventional activities have longer periods in the community crime-free before re-

incarceration than recidivists that are not attached to conventional activities. There are three Cox proportional hazard models in the present study. The first model includes all recidivists and censored cases, which are the offenders in the sample who have not recidivated. This model includes the influence of time to re-incarceration when assessing if offenders that are attached to conventional activities are more or less likely to recidivate. The second model, which excludes the censored cases, pertains to the second hypothesis, which states that recidivists that develop attachment (social bonds) will have longer periods crime-free upon release from prison than recidivists that lack attachments (social bonds). Finally, because younger offenders generally recidivate more often than older offenders, the third Cox regression model only includes recidivists that are the same as or younger than the mean age of the sample, which is 37 years of age.

The first Cox regression model included the control variables with a forward stepwise approach in the first block and the life-course variables in the second block. The model retained age when released from prison and number of previous offenses as the influential control variables. The researcher included employment, marriage, and educational pursuits in the second block. After considering the influence of age when released from prison and the number of previous convictions on recidivism while including time to re-incarceration, the life-course variables did not contribute to the model as a whole. This indicates a null relationship between the life-course variables and recidivism, which is different from the binary logistic regression model that did not include time to re-incarceration that found employment to be a predictor of recidivism. The relationships between the elements of life-course theory and recidivism from the first

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Cox regression model will not be discussed further because the addition of life-course variables did not contribute to the model.

The two Cox regression models that directly address recidivists' time crime-free before re-incarceration are the Cox regression models excluding the censored cases. The first of the two models examines the survival curves and differences in hazard ratios for all recidivists, and the second model analyzes survival curves and differences in hazard ratios for recidivists younger than 37-years-old. The researcher conducted the second model in order to examine Gottfredson and Hirschi's (1990) notion that the relationship between age and criminality explain away any potential relationships between other independent variables and criminality.

Employment extended recidivists' time crime-free in the community at a statistically significant level while controlling for age, number of previous offenses, and whether the offender was an African American or not. The monthly hazard ratio (the chances of the offender recidivating at a specific time period if they had not recidivated up to that point) decreased by over 60 percent for employed offenders compared to unemployed offenders up until the time all of the recidivists were re-incarcerated. Moreover, although not significant at the .05 significance level, there were hazard ratio differences between married and single offenders, with married offenders taking longer to be re-incarcerated. Similar to the binary logistic analysis, there was virtually no relationship between educational pursuits and time to re-incarceration.

Regarding the second hypothesis, based on this sample of 250 released Texas offenders, it appears that recidivists who obtain employment upon release have longer periods of time crime-free than offenders who do not obtain employment. The same

cannot be said for marriage since it was not significant at the .05 level of significance. These results remained the same when conducting the Cox regression model with only the younger half of the sample.

Importance and Contribution

The binary logistic regressions indicate that marriage and educational pursuits do not have statistically significant results with recidivism, and being employed is related to recidivism, although there are limitations using hierarchical logistic regression with this sample. Considering that employed offenders in this sample take longer to recidivate, however, it appears that the influence of attachment to employment may lead to a temporary desistance from criminal behavior for this highly criminal sample. Offenders who obtained employment upon release from prison had lower recidivism rates the first three years after release from prison, but were often re-incarcerated in the fourth or fifth year. This could be because of offenders being fired, laid-off, or quitting their jobs; or it could indicate that the motivation for abstaining from criminal behavior *because* of being employed wears off over time. Interestingly, the majority of criminal recidivism studies provide one, two, and three-year follow-ups on the offenders. The average length from release to re-incarceration in the present study, however, is 26 months; only 10 months before the traditional three-year recidivism study would have ended.

The data provide evidence to support the notion that recidivism studies should include more follow-up points than one, two, and three years. The results do not support the first hypothesis that life-course variables lead to a decline in recidivism rates, which conflicts with Uggen's (2000) results on the influence of job-placement programs and Benda et al's (2003) results on the influence of life-course variables on criminal

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recidivism and substance abuse for adult boot-camp graduates. The present study does not dispute Sampson and Laub's (1993) findings that juvenile delinquents who become attached to conventional activities are less likely to engage in criminal behavior as an adult. However, it does provide preliminary data indicating that attachment to conventional activities does not decrease the likelihood of re-incarceration for offenders released from state prison. This is contrary to studies supporting life-course theory as a basis for reducing recidivism (Benda et al., 2003; Benda et al, 2005; Uggen, 2000). Although the present study does not contain data on the offenders' self-control levels, when discussing the likelihood of re-incarceration, it does support Gottfredson and Hirschi's (1990) claim that it is unnecessary to study the influence of external social forces on offenders' behavior.

There are no known studies to date that use the primary elements of life-course theory together as covariates in a Cox regression model to asses their influence on criminal recidivism and time crime-free in the community before re-incarceration. While the Cox regression model with the censored cases provided null results, indicating the elements of life-course theory do not decrease the likelihood of recidivism, the two Cox regression models excluding censored cases supported the researcher's hypothesis that recidivists who develop attachments will have longer periods crime-free before re-incarceration. This is potentially important for two reasons: 1) to reduce the problem of overcrowded prisons; and 2) to increase the probability that offenders will remain crime-free during periods that several studies indicate have the highest recidivism rates.

Although not the case with this sample, in which the average length to re-incarceration was 26 months, most adult criminal recidivism studies find that offenders

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are most at risk for re-incarceration the first year out of prison. This could be for several reasons; including drug addiction; lack of financial means to afford housing, food, and bills; lack of resources developed from family involvement and a positive peer network; and re-connecting with a prior criminal peer network. If employment decreases the chances of the offender being re-incarcerated the first 12-24 months out of prison, as it does in the present study, the offender is more likely to surpass the time when most recidivists are re-incarcerated; ultimately increasing the chances the offender will mature out of the desire to continue a criminal lifestyle. Again, in the present study, the recidivism rates increased the second year out of prison, but this is not the case for most adult criminal recidivism studies. Enabling the offender to remain crime-free the first year out of prison could ultimately increase their chances of post-prison success.

The final Cox proportional hazard model in the study provides results indicating that employment extends the recidivists' time crime-free before re-incarceration even when older subjects are excluded from the sample. Proponents of self-control theory generally assert that it is irrelevant to study the influence of external social forces on criminality and criminal behavior because the influence of age on crime is so strong and invariant across time and place (Gottfredson & Hirschi, 1990). While life-course theory proponents do not dispute the strong relationship between age and crime, they do believe external social forces can reduce criminality for offenders at any age (Sampson & Laub, 1993; Uggen, 2000). Although employment did not reduce the likelihood of recidivism (the outcome measure generally used in criminological studies involving offenders released from prison), it did provide support for the notion that a primary element of life-course theory is related to criminal behavior (extended time to re-incarceration),

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regardless of the subjects' age. Employment, an external social variable, extended time crime-free in the community, even for younger offenders, who are generally more prone to engage in criminal behavior.

Strengths and Limitations

Strengths

A major strength of the present study is that the researcher was able to gather information on a random sample of offenders released from Texas prisons over the past six years. The sample size satisfied the necessary cases-to-independent variables criteria for both binary logistic regression and Cox proportional hazard models, the statistical analyses used in the study. Moreover, an independent sample t-test comparing the average age of the sample to the average age of all Texas prisoners released from prison indicated the sample was representative of the population.

As previously discussed, previous researchers that studied adult criminal recidivism in Texas focused primarily on the relationship between demographic variables, such as race and age, on recidivism. No known studies have assessed the influence of post-prison variables, such as employment and marriage, on recidivism in the state of Texas. With the help of the Texas Department of Criminal Justice, the researcher was able to create a dataset that included these post-prison variables along with the offenders' demographic characteristics. The researcher was then able to analyze how influential these variables were in terms of recidivating and extending the time between release from prison and re-incarceration.

The majority of studies on criminal recidivism do not distinguish whether the offender was re-incarcerated for committing another crime or for a parole revocation (a

technical violation of their parole). If they do include this information, they generally do not consider the fact that some offenders lost the rights to their parole because of committing another crime, not simply committing technical violations of their parole. Subsequently, the numbers are often skewed in the direction of being re-incarcerated for parole revocation because several offenders that commit new crimes are officially re-incarcerated for parole revocation. Any offender in the present study who was officially re-incarcerated for parole revocation, but committed a new crime that led to losing their rights to parole, were considered re-incarcerated for committing a new crime. This provides more information than other criminal recidivism studies and more clearly explains the reasons offenders were re-incarcerated.

Another strength of the study includes the statistical analyses conducted by the researcher. The researcher used binary logistic regression with a hierarchical entry of variables to assess the influence of life-course variables on recidivating, while controlling for variables already known to be influential, and Cox regression survival analyses to asses the life-course variables influence on survival and hazard ratios while controlling for the same variables. Although there are limitations to using binary logistic regression when the subjects have been out of prison for different lengths of time, it enabled the researcher to determine the likelihood of recidivism while controlling for several variables known to be associated with recidivism rates for adult offenders. Using binary logistic regression to assess the influence of post-release variables provided a more sophisticated analysis than simply comparing recidivism percentages, such as several prior studies on criminal recidivism. Moreover, this is the first known study that used the primary elements of life-course theory together in a Cox proportional hazard model to

assess their influence on re-incarceration while considering length to re-incarceration and recidivists' time crime-free in the community before re-incarceration. The Cox regression models allowed the researcher to compare survival ratios, survival curves, hazard ratios and hazard curves, which provide both statistical and visual differences between offenders attached to conventional activities and offenders who did not become attached.

Limitations

The primary limitation of the present study is the lack of information regarding the offenders' substance use and mental illness. Several studies have found substance abuse to be a significant predictor of criminality, arrests, convictions, imprisonment, and recidivism (Dowden & Brown, 2002). Moreover, chemically dependent prisoners that do not participate in substance abuse treatment, whether in prison or upon release, are more likely to be re-incarcerated, usually within the first year of release (McCollister et al., 2003). This is also the case for offenders with a mental illness or co-occurring disorders (White, Goldcamp, & Campbell, 2006). The researcher was not able to include substance abuse or psychological disorders as control variables in the present study due to Texas Department of Criminal Justice's guidelines regarding data accessible to researchers.

Despite satisfying the minimum cases-to-independent variables ratio requirement for binary logistic regression and Cox regression survival analyses, the sample size of 250 is quite small compared to the population of Texas offenders released from prison since 2001. Approximately 55,000 Texas prisoners were released from prison in 2001 alone. Because of limited resources for the present study, coupled with the cost of obtaining data from the Texas Department of Criminal Justice, the researcher was limited

to a sample size of 250 offenders. It would have been desirable to have a larger sample size to increase the power and decrease the chances of committing Type II errors.

Another study limitation involves problems with data collection. Instead of measuring employment, marriage, and educational pursuits in time intervals, such as once every six months, there is only one measurement point for each independent variable. Employment was defined as whether the offender obtained a job upon release from prison, and marriage was defined as whether the offender was married and lived with his spouse upon release from prison. The researcher did not know whether employed offenders retained their jobs and whether married offenders remained married, or, whether unemployed and single offenders' eventually found a job or married. This limits the present study's ability to assess whether social bonding variables immediately upon release from prison predict desistance from criminal behavior and does not allow the offender to develop these attachments over time.

Finally, as previously mentioned, offenders had release dates that span five-year period, which may be problematic for some of the statistical models used in the analysis. The binary logistic regression simply dichotomizes the recidivism into a yes or no category. Despite this being the traditional method of analyzing recidivism, it does not account for time between release from prison and re-incarceration, which is important in the present study considering several offenders have been out of prison for shorter times than have other offenders. It is possible that several offenders who have not been out of prison for a long time have yet to recidivate, but in the binary logistic regression they are considered desisters of crime. The Cox regression survival models may be more

appropriate considering this limitation, but with only 59 recidivists, chances of

committing a Type II error are heightened.

Implications

Cox regression results of the present study suggest that obtaining employment

upon release from prison predicts a temporary desistance from criminal behavior, but the

effects do not last over time. This has potentially important implications for policy and

social work practice. Parole officers often demand that offenders on their caseload obtain

and maintain employment or lose their right to parole and return to prison. The results of

this study indicate that without additional services, employment requirements may not be

as effective as originally thought because the influence of employment on criminal

behavior appears to diminish over time. Subsequently, more money needs to be used on

combining the demand for employment with substance abuse counseling, psychological

counseling with a social worker, family counseling, and/or case management services

(Springer, McNeece, & Arnold, 2003). Decreasing the amount of money spent on

incarcerating non-violent offenders would create more money to spend on providing

services for offenders released from prison.

While the results indicating that employment extends offenders' time crime-free

in the community before re-incarceration appears important, considering previous studies

assertions that offenders are most at-risk for re-incarceration the first year out of prison,

support to offenders' released from prison must continue beyond the first year after

release from prison. Because most criminologists' consider offenders to be most at-risk

for re-incarceration their first year out of prison, existing post-prison services generally

target offenders within their first year of release but are virtually non-existent for

offenders who have been out of prison for more than one year (Travis, 2005). If future studies that assess the relationship between life-course variables and recidivism find that employment extends offenders' time crime-free in the community before recidivism, but also find the effects diminish over time, this would indicate that equal resources must be provided to offenders who have been out of prison for more than one year.

Social workers providing services to offenders released from prison should be aware that the influence of employment on desistance from crime might diminish over time. While it is understandable and admirable that social workers act as advocates, mentors, and case managers to help their clients recently released from prison obtain employment, especially when it is a condition of their parole, social workers should continuously measure their clients' motivation levels regarding the desire to avoid re-incarceration. When the offenders' desire to be employed and motivation to remain out of prison weakens, the researcher recommends using social work techniques such as motivational interviewing or solution-focused therapy (Kim, 2006), known to increase the clients' motivation by focusing on the client's positive attributes. Moreover, it is vital that social workers provide adequate mentorship, case management, and counseling to offenders over time.

Recommendations for Future Research

To thoroughly and systematically study the influence of life-course theory on recidivism for offenders released from prison, it would be ideal to conduct a longitudinal study spanning the entire life-course, from adolescence through adulthood. Although this would be very difficult to conduct and would most likely require federal funding and considerable resources, it would allow the researcher to analyze if employment, marriage,

and education in one phase of the life-course predict a desistance from criminal behavior in the next phase. For example, after the offender is released from prison, the researcher should not just assess whether the offender is employed directly after release, but continue to assess if the offender is employed over time. Additionally, the researcher would be able to measure if offenders who do not obtain employment directly after release from prison do so over time. Similar to the Gluecks' original longitudinal study discussed in Chapter 2, the researcher would be able to assess if employment at one phase, such as the first two years out of prison, predicted the offender remaining crime-free during the third and fourth years out of prison. Similarly, the researcher would have the ability to observe if obtaining employment in the second phase out of prison predicted desistance in subsequent years out of prison. Subsequently, the researcher would not be limited to analyzing the influence of employment directly after release from prison on recidivism. It is important for the researcher to statistically control for substance abuse and mental illness in this recommended study because of their strong influence on criminal behavior and recidivism.

Moreover, a longitudinal study beginning in adolescence will enable the researcher to collect information regarding the subjects' levels of self-control and allow him or her to study its influence on criminal activity. While it is generally understood in criminological literature that adolescents with high levels of self-control are less likely to engage in future criminal activities than adolescents with low-levels of self-control, life-course theorists and general theory of crime proponents debate the magnitude of this relationship. Future researchers who measure the subjects' level of self-control will be able to analyze the influence of life-course variables on criminal recidivism while

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statistically controlling for self-control. This will help determine if life-course variables

are influential despite the influence of the offenders' self-control levels. Additionally,

future researchers will be able to conduct analyses with social bond variables as the

dependent variables in need of prediction and modeling. Perhaps future researchers will

determine that offenders unable to develop social bonds have the lowest levels of self-

control, which would support self-control theory. The researcher also recommends

disaggregating the data by race, age, and crime committed to evaluate the differential

effects of these variables.

Along with the longitudinal study, researchers should conduct cross-sectional

studies by comparing offenders that obtained employment to offenders who did not. In

any cross-sectional studies that future researchers perform, it will be vital to control for

the offenders' motivation level. Regardless of the design used, the results of the present

study indicate that researchers should extend the traditional three-year limit and collect

follow-up information for at least five years.

Conclusion

This present study on criminal recidivism examines the influence of employment,

marriage, and educational pursuits on re-incarceration and builds on previous recidivism

studies with Texas offenders by analyzing the importance of post-release from prison

variables. Furthermore, the present study contributes to the life-course theory literature

by beginning to determine if the theory and its variables are pertinent to offenders

released from state prisons. The results of the present study indicate that of the life-

course theory variables, employment may lead to a temporary desistance in crime but the

effects diminish over time. Social workers providing services to offenders released from

prison should be cognizant that the motivation to remain crime free engendered by employment is not permanent; therefore indicating the social worker should continuously assess and work on increasing their clients' motivation levels.

In conclusion, although the present study pertains to individual offenders' attachment to conventional activity, macro level issues such as poverty, racism, discrimination, and utilitarian policies directed towards offenders released from prison must not be ignored. The prisoner reentry process has proven very difficult for offenders for many reasons besides individual characteristics, such as lack of resources, opportunities, and treatment. Upon release from prison, offenders may need more than employment to remain crime-free upon release. Employment appears to delay re-incarceration, but many offenders released from prison need more resources and support to desist from criminal behavior. It is vital for the offenders themselves, their families, and low-income communities in general that resources are made available to prevent further crime and create opportunities that help offenders released from prison become law-abiding, tax paying, community members who can be role models for the next generation.

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