

**A Longitudinal Analysis of the Mediating Role of Substance Use
in the Relationship between Work Commitment and Antisocial Behavior
among Formerly Incarcerated Young Adults**

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Abstract

This study ($N = 1,289$) aims to provide a better understanding of the association among work commitment, substance use, antisocial behavior, and race by 1) examining the effect of work commitment on antisocial behavior; 2) investigating the role of substance use as a mediator between work commitment and antisocial behavior; and 3) identifying racial differences in the substance use mediated relationship between the two factors. The study's data was drawn from the Pathways to Desistance Study, a longitudinal project following juvenile offenders. The association between work commitment and antisocial behavior was analyzed using a random effects model; the substance use mediated relationship between the two factors was analyzed using structural equation modeling; and the racial difference in the mediated relationship was analyzed using subgroup analyses. The random effects model revealed results that clearly supported the notion and the study's hypothesis about the role of work on reducing antisocial behavior, after controlling for substance use and demographic covariates. This indicated work might guide individuals to lead prosocial lives and help them keep conventional norms, which, in turn, results in less antisocial behavior. Second, in the cross-sectional mediational analyses included in the longitudinal mediation model, work commitment was associated with higher levels of substance use; which, in turn, was related to a higher level of antisocial behavior. That

is, work commitment was associated with higher levels of antisocial behavior through the presence of substance use, which contrasted the hypothesis. This may imply that the deterrence effect of work on substance use is weaker among juveniles transitioning into young adults, like the sample in this study, than adults described in other studies. Lastly, the current study did not find evidence to support racial differences in the substance use mediated relationship between work commitment and antisocial behavior in terms of the direction and magnitude of the coefficients, which was also in contrast to the study's hypothesis. Future criminal desistance research should further investigate the effect of work on criminal behavior while considering the motivations of substance use among formerly incarcerated youth since substance use seemed to dominate all other factors in the analyses.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	XII
1.0 CHAPTER ONE	1
1.1 STATEMENT OF THE PROBLEM.....	1
1.1.1 Macro Conditions Affecting Recidivism and Racial Disparities in the Justice System.....	3
1.1.2 What Factors Lead Individuals to Desist from Crime?	9
1.2 IMPORTANCE OF STUDY	14
1.3 RELEVANCE TO SOCIAL WORK.....	16
2.0 CHAPTER TWO	19
2.1 THEORETICAL FRAMEWORK.....	19
2.1.1 Subjective Theory on Desistance: Identity Theory	19
2.1.2 Structural Theory on Desistance: Theory of Social Bond	23
2.1.3 Focus on Employment as a Significant Form of Social Bond.....	27
3.0 CHAPTER THREE	29
3.1 LITERATURE REVIEW	29
3.1.1 Explaining the Relationship between Employment and Criminal Desistance.....	29
3.1.2 Explaining the Relationship between Employment and Substance Use... 32	

3.1.3	Explaining the Relationship between Substance Use and Criminal Desistance.....	35
3.1.4	Racial Differences in the Association among Employment, Substance Use, and Crime	37
3.1.5	Conceptualizing Employment Quality in the Current Study	42
4.0	CHAPTER FOUR.....	44
4.1	METHODOLOGY	44
4.1.1	Data and Sample.....	44
4.1.2	Procedures	45
4.1.3	Time Periods of Theoretical Interest	46
4.1.4	Measures	46
4.1.5	Hypotheses.....	50
4.1.6	Analytic Strategies	51
5.0	CHAPTER FIVE.....	60
5.1	RESULTS	60
5.1.1	Univariate and Bivariate Analyses.....	60
5.1.2	Multivariate Analysis	71
5.1.3	SEM Analysis	73
5.1.4	Mediation Model.....	76
5.1.5	Subgroup Analyses	82
6.0	CHAPTER SIX	90
6.1	DISCUSSION.....	90
6.1.1	Work Commitment and Antisocial Behavior	92

6.1.2	Work Commitment on Antisocial Behavior Through Substance Use	95
6.1.3	Complex Relationship between Work Commitment and Substance Use.	98
6.1.4	Racial Differences in the Mediated Relationship Between Work Commitment and Substance Use	100
6.1.5	Possible Reasons for Failing to Detect Significant Effects over Time	102
6.1.6	Limitations	104
6.2	IMPLICATIONS	107
6.2.1	Social Policy on Criminal Desistance.....	107
6.2.2	Social Work with Criminal/Juvenile Justice Involved Populations.....	111
6.2.3	Future Research.....	112
6.3	CONCLUSION	115
APPENDIX A		117
APPENDIX B		119
BIBLIOGRAPHY		123

LIST OF TABLES

Table 1. <i>Descriptive Statistics for Major Study Variables</i>	61
Table 2. <i>Descriptive Statistics for Control Variables</i>	63
Table 3. <i>Descriptive and Bivariate Statistics for Racial Comparison of Antisocial Behavior and Work Commitment</i>	65
Table 4. <i>Descriptive and Bivariate Statistics for Racial Comparison of Substance Use</i>	66
Table 5. <i>Descriptive and Bivariate Statistics for Racial Comparison of Gang Involvement and Parental SES</i>	68
Table 6. <i>Correlations among All Study Variables (Estimated by Spearman's Rho)</i>	70
Table 7. <i>A Longitudinal Panel Analysis of the Effect of Work Commitment on Antisocial Behavior: A Random Effects Regression Model (N = 1,289)</i>	73
Table 8. <i>Model Fit Information for Each Estimated Model</i>	75
Table 9. <i>Statistics of Each Path (Adjusting for CVs)</i>	80
Table 10. <i>Results of Total, Direct, and Indirect Effects (N = 1,289)</i>	81
Table 11. <i>Subgroup Analyses: Model Fit Information for Each Estimated Model</i>	83
Table 12. <i>Subgroup Analyses: Results of Total, Direct, and Indirect Effects (N = 1,289)</i>	85

LIST OF FIGURES

Figure 1. <i>The Number of Arrested Juveniles in the U.S. in 2014 (N = 1,024,100).</i>	2
Figure 2. <i>Racial Profiles of Detained Juveniles in the U.S. in 2013</i>	4
Figure 3. <i>Three-Wave Autoregressive Mediation Model</i>	59
Figure 4. <i>Path Analyses (Final Model Adjusting for Control Variables)</i>	79
Figure 5. <i>Subgroup Analysis of Whites</i>	87
Figure 6. <i>Subgroup Analysis of Blacks</i>	88
Figure 7. <i>Subgroup Analysis of Hispanics</i>	89

DEDICATION

To Christina, Aiden, and Ethan

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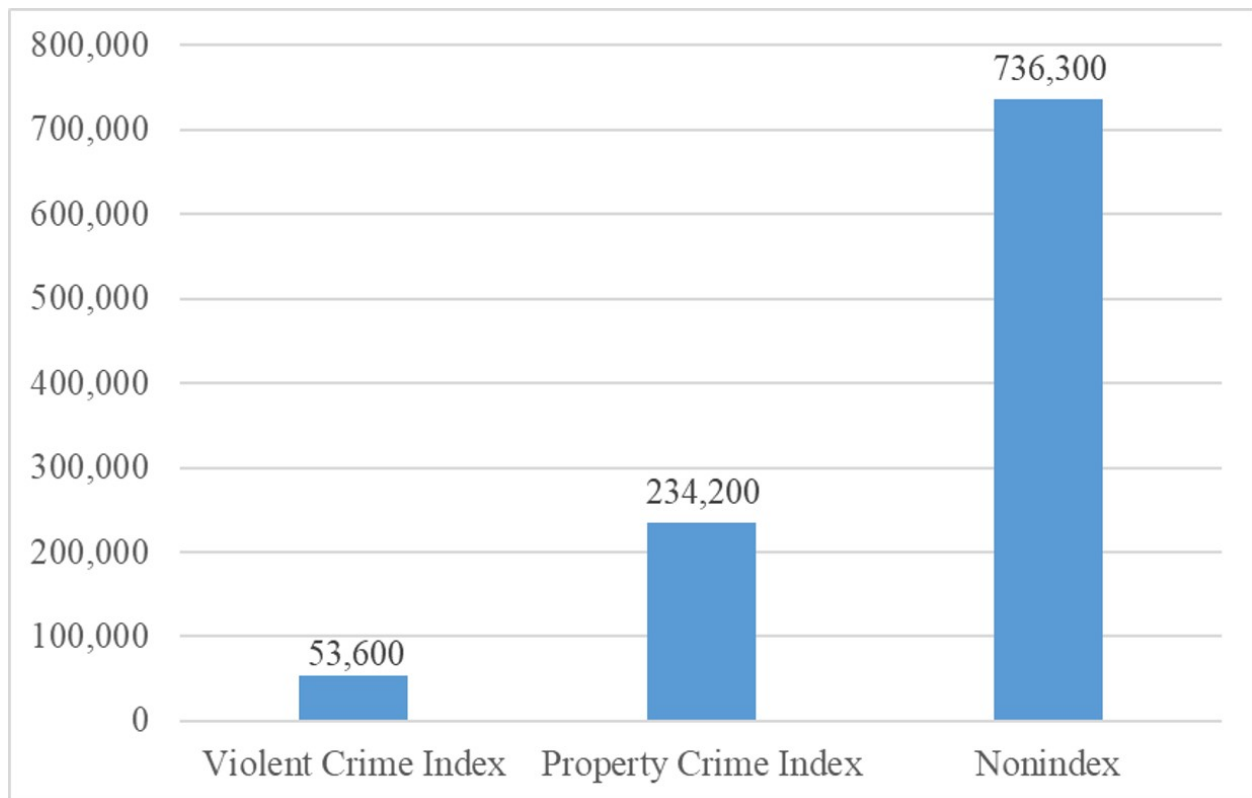
1.0 CHAPTER ONE

1.1 STATEMENT OF THE PROBLEM

As of 2014, the number of arrested juveniles was estimated to be around one million and considered a major concern by policy makers, scholars, service providers, and the general public (Office of Juvenile Justice and Delinquency Prevention [OJJDP], 2014b). Juvenile courts handled more than one million cases in 2013 (OJJDP, 2013); of these juveniles, about 61,000 youth were housed in correctional facilities as of 2011 (Hockenberry, 2014); youth and young adults comprised a third of all reentries from various types of facilities every year (Martinez & Abrams, 2013; Mears & Travis, 2004). However, researchers consistently uncover that most young people who enter such facilities often fail to avoid delinquency and reintegrate into the community, resulting in high recidivism rates (Abrams & Snyder, 2010). For example, over 50 percent of formerly incarcerated young men will have contact with the juvenile or criminal justice system at 12 months post-release (Abrams & Snyder, 2010; Mathur & Clark, 2014; Snyder & Sickmund, 2006). This is quite consistent with the case of adults, in that more than 60 percent of American adults who have been released from prisons are rearrested within three years (James, 2015; National Crime Prevention Council, 2005). Such high rates of recidivism

among formerly incarcerated juveniles create formidable policy and practice challenges within the justice system.

Figure 1. *The Number of Arrested Juveniles in the U.S. in 2014 (N = 1,024,100)*



Note. Non-index includes other offenses such as other assaults, drug offense, disorderly conduct, vandalism, etc.

Data source: OJJDP (2014a).

It is well documented that continuity of juvenile criminal activity is a significant predictor of adult offending (Barrett & Katsiyannis, 2016; Laubacher, Rossegger, Endrass, Angst, Urbaniok, & Vetter, 2014). More than 50 percent of juvenile delinquents continue to

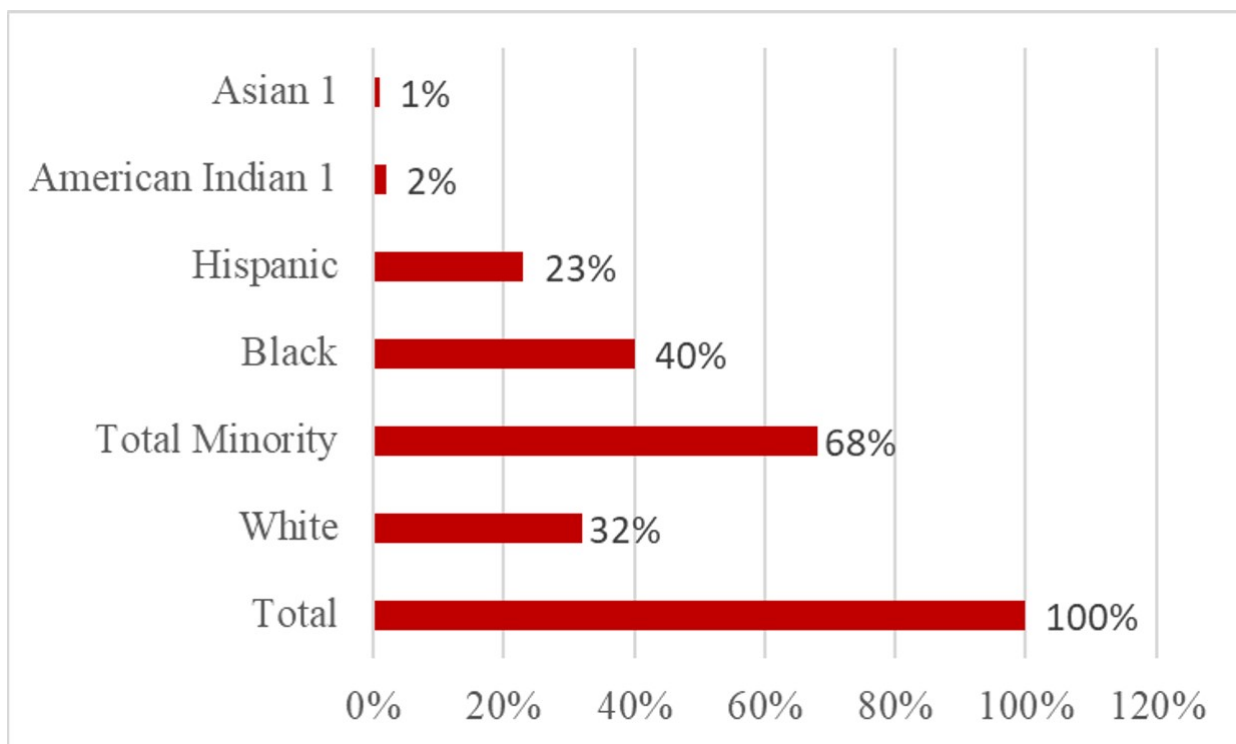
offend into early adulthood, defined as being between the ages of 20 and 25 (Loeber, Farrington, Stouthamer-Loeber, & White, 2008). A situation in which formerly incarcerated young individuals come back to their communities only to succumb to high recidivism rates associated with adult criminal behaviors, leading to a growth in the number of adult prisoners prompts society to rethink the current U.S. juvenile/criminal justice system, also known as revolving door justice, which is one of the most critical challenges we face (Freeman, 2003). Thus, the current study first critically situates the justice system in the U.S. within a possible macro context to center the discussion around recidivism among young men.

1.1.1 Macro Conditions Affecting Recidivism and Racial Disparities in the Justice System

Strikingly, a disproportionately high percentage of incarcerated juveniles are young people of color, especially Blacks, given that they make up only 14 percent of the population, but more than 40 percent of those incarcerated (Institute of Medicine & National Research Council, 2001; The Sentencing Project, 2014; OJJDP, 2015b). This is not unlike the incarcerated adult population, which is composed of 45 percent of people of color (Chin, 2002; Goffman, 2014; Vaughn, Wallace, Davis, Fernandes, & Howard, 2008). Causes of this phenomenon have been mainly discussed in dichotomous ways. The first camp emphasizes that this problem is not a racial issue, but is attributed to solely individual behavioral problems (Brown et al., 2003; Institute of Medicine & National Research Council, 2001; Rocque, 2011; Sampson & Lauritsen, 1997). That is, this camp tries to explain the overrepresentation of youth of color in the justice system through behavior-based explanations or differential involvement hypothesis (Piquero &

Brame, 2008), stating that crime is caused by personal behavioral problems (Institute of Medicine & National Research Council, 2001; Rocque, 2011; Sampson & Lauritsen, 1997). According to this camp, such behavioral problems are often due to the exposure to risk factors among youth of color, including poor health care conditions, economically disadvantaged conditions, and lack of upward mobility (Institute of Medicine & National Research Council, 2001).

Figure 2. *Racial Profiles of Detained Juveniles in the U.S. in 2013*



Note. Data source: OJJDP (2015a).

While it is true that crime or delinquency literally stem from individual behaviors, another camp criticizes that the differential involvement hypothesis often misrepresents the underlying causes of such behavioral problems. For example, Brown and his colleagues (2003) sharply contest that the idea from behavior-based explanations on racial disparities in the justice system overlooks the macro context, such as structural disadvantages. This position is often referred to as the differential selection hypothesis (Piquero & Brame, 2008), the explanation of bias in the criminal/juvenile justice system (Institute of Medicine & National Research Council, 2001), or the differential treatment thesis (Rocque, 2011). This camp claims the individual behavioral problem approach goes far beyond reality and distorts what young people of color actually face in the racially-biased justice system (Brown et al., 2003). That is, the justice system treats youth of color differently, compared to White youth (Rocque, 2011).

According to this camp, such bias is present in systematic processes such as racial disparity in police contact and courtroom decisions (Institute of Medicine & National Research Council, 2001; Rocque, 2011). Police contact and courtroom decisions for drug offenses provide a good example for this. Drug offense convictions are a major cause of incarceration in the U.S., particularly for minority youths and adults (Alexander, 2010). In several states, 90 percent of those incarcerated for drug-related crimes were people of color (Alexander, 2010) who had experienced early exposure to the juvenile justice system and believed prison would be their future (Stopford & Smith, 2014). Even though proportionately, youth of color are not more likely to commit drug crimes, they tend to be arrested at twice the rate of Whites (Chin, 2002); they also tend to be sentenced more harshly than their counterparts (Rocque, 2011); and their

incarceration represents almost 60 percent of all the youth detained for drug violations in the juvenile justice system (OJJDP, 2015b).

Among police and court officers, race is often considered a readily observable characteristic that influences their decision-making choices, “which leaves ample room for (racial) bias” (Institute of Medicine & National Research Council, 2001, p.243). Thus, scholars consistently argue that drug violations, among all the categories of crimes, is the most troubling in the context of racial disparities in the juvenile/criminal justice system (Alexander, 2010; Chin, 2002). This is the reason why the camp argues that this clearly indicates that race has played a role in the U.S. justice system (Alexander, 2010; Chin, 2002; Free, 2001; Johnson, 2007; Rocque, 2011; Soss, Fording, & Schram, 2011; Wacquant, 2012). The racially biased juvenile/criminal justice system thus encourages racial disparities in the justice system and directly affects the lives of young people of color (Alexander, 2010; Institute of Medicine & National Research Council, 2001; Sharkey, 2013).

The establishment of the modern racially-biased justice system can be traced back to the beginning of the mid-1970s when the federal government declared a War on Drugs by enacting a series of laws involving penalties for possessing, buying, and selling drugs (Goffman, 2014). Such nationwide rhetoric regarding the War on Drugs and toughness on crime (Sharkey, 2013) contributed to the establishment of sentencing commissions, mandatory minimum sentences, and the elimination of parole (Alexander, 2010; Petersilia, 2003; Sharkey, 2013) and as well as the criminalization of people of color. The proliferation of the toughness on crime profoundly changed the U.S. government’s management of poor Black communities (Goffman, 2014) where

the majority of young Blacks who had been housed in facilities lived (Stopford & Smith, 2014).

In the era before the War on Drugs, according to Goffman (2014), segregated Black communities were not of interest to law enforcement. When drug use became a national concern in the 1960s-70s, the crackdown on the drug economy was initiated by targeting poor Black neighborhoods where members of the community had experienced hardship from the dramatic cuts in employment and welfare benefits (Goffman, 2014). During the 1980s when crime and welfare were major themes of the Reagan administration, anti-drug and welfare rhetoric were utilized to portray a negative image of poor Black communities (Alexander, 2010). Since the Anti-Drug Abuse Act of 1988 was introduced, harsh penalties fell more disproportionately on Blacks and their neighborhoods by portraying them as casual drug users, even though the expression of Blacks youths and adults as casual drug users is statistically inaccurate, given that Whites represent the vast majority of drug offenders (Chen, 2002).

Another macro aspect related to structural disadvantages is that poverty and racism are inextricably linked to the juvenile/criminal justice system. This does not mean poverty causes crime per se; but we need to critically reflect on the structural conditions contributing to poverty that affect many incarcerated juveniles, their families, and neighborhoods. The 1970s was characterized by globalization and deindustrialization that isolated poor people of color and left them jobless (Alexander, 2010). The seismic change of the U.S. economic structure greatly impacted poor Black neighborhoods (Sharkey, 2013; Wilson, 1996; Wilson, 2012). As late as 1970, more than 70 percent of Black men living in urban cities had industrial jobs, but this had dropped to 28 percent by 1987 when the drug war was at its height (Alexander, 2010). Under a situation where new manufacturing jobs opened in suburban areas, the growing spatial

mismatching effect on securing jobs profoundly impacted Black youths and adults stuck in economically and socially disadvantaged inner cities (Alexander, 2010; Sharkey, 2013; Wilson, 2012). The declining opportunity in the labor market for poor urban Blacks directly impacted the criminal justice system (Simon, 1993). Regarding this, Alexander (2010) asserts that the decline in legitimate employment opportunities among young people of color in urban areas led to the increased incentivization of involvement in the illegal drug market. Additionally, law enforcement faces less logistical challenges when focusing on poor Blacks and their neighborhoods compared to Whites and their neighborhoods, where investigations might be more complicated or involve more pushback (Chin, 2002). Such a status of inequality is a critical feature of young people of color characterized as a contemporary underclass (Simon, 1993; Wacquant, 2012; Wilson, 2012).

In sum, racism and poverty are intertwined with each other in the U.S. juvenile/criminal justice system. Racial bias especially has played a key role in shaping such systematic practices that many young people of color currently confront (Soss et al., 2011). In other words, racial bias has become embedded in the juvenile/criminal justice system, which has led to racial disparities in the justice system and the disproportionate punishment of people of color and their communities. Additionally, racial disparities in the justice system and punishment came to play a central role in sustaining their poverty, which is described as “the double regulation of the poor (minorities)” (Soss, et al., 2011, p.6). These macro contexts embedded in the U.S. justice system affect the lives of youth of color, who are essentially pushed to become criminal persisters (Glynn, 2014; Hughes, 1998). Racial disparities in offending behaviors, thus, can be explained within these contexts.

1.1.2 What Factors Lead Individuals to Desist from Crime?

Such contexts surrounding the current U.S. justice system are coupled with multilayered factors such as subsistence and intrapersonal conditions related to successful reentry (Shinkfield & Graffam, 2009), making the reentry issue ever more complicated. It is significant to note that the problem of formerly incarcerated young people's reentry cannot be linearly explained since dynamic factors are associated with recidivism (Shinkfield & Graffam, 2009; United Nations Office on Drugs and Crime, 2012). In other words, many of them have suffered from multiple problems (e.g. unemployed individuals with criminal and substance abuse histories are often exposed to risky behavior), rather than a single issue. Thus, the macro context intertwined with dynamic conditions prompts the present study to look at criminal desistance, which is broadly defined as the process by which a person arrives at a decline or cessation of offending or other antisocial behavior (Laub & Sampson, 2001; Mulvey et al., 2004): Under the current U.S. justice system, which factors are related to enhancing formerly incarcerated young people's ability to desist from crime? Criminal desistance during the reentry process is directly tied to preventing recidivism which refers to "a person's relapse into criminal behavior, often after the person receives sanctions or undergoes intervention for a previous crime" (National Institute of Justice, 2014b).

Researchers have sought to identify the factors that cause criminal offending and those that lead individuals who have had criminal justice involvement to desist by developing theories (Berg & Huebner, 2011). A couple of competing theories have been developed to provide a better understanding of criminal desistance (e.g., subjective theory rooted in social psychology

and behavioral economics or structural theory influenced by sociological perspectives). One prominent structural theory on criminal desistance is Sampson and Laub's theory of informal social control that assumes the stronger the ties to society, the more likely an individual is to desist from criminal behaviors (Laub & Sampson, 2003; Sampson & Laub; 1993). The theory demonstrates individuals can desist from crimes when he or she experiences a meaningful structural turning point such as employment. In other words, persons who lack such social bonds are most likely to fail in their desistance from criminal behaviors (Laub & Sampson, 2003; Sampson & Laub; 1993).

There is no doubt that employment is a core subsistence condition that helps individuals desist from crimes (Harley, 2014; Laub & Sampson, 2003; Uggen & Shannon, 2014). Since Sampson and Laub (1993) tested their theory and provided empirical evidence of the effect of employment as a social bond on reducing criminal behaviors, many studies have discussed reasons why employment is an important factor to address criminal desistance (Duran, Plotkin, Potter, & Rosen, 2013; Graffam, Shinkfield, Lavelle, & McPherson, 2004; Shinkfield & Graffam, 2009; Uggen & Shannon, 2014). A recent empirical study provides consistent evidence that persons who were unemployed after release from prison were highly likely to experience recidivism, emphasizing that employment secured right after release was the primary predictor of recidivism regardless of offense types (Nally, Lockwood, Ho, & Knutson, 2014). Yet the effects of employment on offending outcomes are mixed. Tripodi, Kim, and Bender (2010) found *simply* securing employment after release from prison is not associated with a lower likelihood of recidivism (Tripodi et al., 2010). These empirical findings can be theoretically explained by Sampson and Laub's informal social control theory, which emphasizes the quality of social

bonds (i.e., job quality such as work commitment; Sampson & Laub, 1993). Regarding this, Visher, Debus, and Yahner (2008) provide empirical evidence that offending is significantly reduced if formerly incarcerated people hold *stable* jobs with sufficient incomes. Findings from previous studies imply employment would be effective on criminal desistance; but further study is needed to determine the robust effect of employment on offending by specifying job characteristics through separating *the quality of the job* from simple employment measurement (Uggen, 1999).

Substance use (e.g. alcohol, illicit drug use) is a significant intrapersonal factor triggering mental health conditions that affect criminal desistance (Shinkfield & Graffam, 2009). Hussong, Curran, Moffitt, Caspi, and Carrig (2004) noted substance use was highly related to antisocial behaviors among young adults in the general population. The intersection between substance use and the lives of people interacting with the criminal justice system is even more compelling. For example, the prevalence of substance use among individuals who come in contact with the justice system is four times higher than the general population (Wooditch, Tang, & Taxman, 2013). Under this phenomenon, substance use has a negative pervasive effect on criminal desistance. A body of literature reveals that offenders with higher substance use dependence have a higher likelihood of recidivism (Makkai & Payne, 2005; Schroeder, Giordano, & Cernkovich, 2007). Previous studies point out that employment is regarded as a preventive factor for reducing substance use among adult populations (Arkinson, Montoya, Whitsett, Bell, & Nagy, 2003; Brown & Montoya, 2009; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014).

However, the relationship between employment and drug use is also reciprocal. In Brown and Montoya (2009), for example, employment was a significant predictor of drug use reduction. This is due to the fact that improved emotional functioning resulting from job stability helped decrease substance use, including illegal drug use (Arkinson et al., 2003). On the other hand, a Kentucky study found employment is associated with a higher likelihood of substance use (Center on Drug and Alcohol Research [CDAR], 2007). The study interpreted their results as employment perhaps allowing people to have more income and access to transportation to obtain drugs and alcohol (CDAR, 2007). Thus, it remains unclear how employment and substance use affect each other. The negative effect of substance use on criminal desistance is clear. As such, previous studies suggest employment can be an effective way to prevent substance use dependence, hence reducing criminal offending as well. Nonetheless, the relationship between employment and substance use is complex due to its reciprocal association (Brown & Montoya, 2009; CDAR, 2007), which implies more research is necessary to shed light on their relationship. In desistance research, little is known about the impact of substance use, whether it has a mediating power to alter the effect of employment, hence influencing criminal offending.

Racial differences in criminal offending behavior must be critically assessed under the context of the U.S. criminal justice system depicted earlier, but it has not been studied as much in desistance research (Haynie, Weiss, & Piquero, 2008; Piquero, MacDonald, & Parker, 2002). Since each race may show different degree of subsistence and intrapersonal conditions, Laub and Sampson (2001) once denoted that criminal desistance results may differ across race. Previously, this study argued that structural disadvantages such as racial bias have been embedded in the current criminal justice system, especially with regards to racial disparities in the justice system.

This issue will be revisited in Chapter Three, but a possible assumption that can be drawn from these circumstances is that patterns of employment, substance use, and antisocial behaviors may differ across race. An empirical study from Johnson (2004), for instance, reported direction of work effect on substance use varied according to race. The findings imply that there would be racial differences in criminal offending behavior depending on the relationship between employment and substance use. Expressly, race differences in criminal offending behavior can be based on the relationship between macro (i.e., employment) and micro (i.e., individual substance use) factors, indicating that there is a need for separate analyses based on race. Without understanding the racial issue (e.g., racial differences in offending outcomes), therefore, desistance studies will likely fail to account for the oppressed groups in the system, that is, why it is harder for some groups to desist from crime. Similarly, Glynn (2014) also argues that a clear understanding of desistance cannot be achieved without accounting for race since it is complexly intertwined with structural barriers, particularly in employment, and intrapersonal conditions such as substance use that may hinder the ability of people of color to desist from crime.

Despite the importance of accounting for race, a major limitation of desistance studies utilizing Sampson and Laub's theory of informal social control is that there have rarely been explicit explanations of racial/ethnic differences in criminal desistance within *contemporary* samples. Sampson and Laub (1993)'s theory was originally built upon Gluecks' classic study of juvenile delinquency (1950, 1968), which focused on White males born in Boston between 1922 and 1929. Sampson and Laub (1993) tested their data and discovered job stability as employment quality plays a vital role in developing social bonds that corresponds to desistance from criminal behaviors among adults. Still, it is not certain whether the theory can account for similar effects

with contemporary samples under the current criminal justice system, which is different (racially biased justice system, discriminated job market, and so forth) than the contexts under which the original samples used in the theory lived. This is a major reason why the current study cannot ignore race in determining the association among employment, substance use, and criminal offending.

1.2 IMPORTANCE OF STUDY

To date, desistance studies utilizing Sampson and Laub (1993)'s theory have contributed to uncovering various relationships and mechanisms affecting desistance, but several gaps still exist. Previous desistance studies focusing on the role of employment have focused on examining the direct effect of employment on criminal desistance. Notably, many of them continued to examine the effect of employment on criminal desistance by utilizing simple employment measurements. Researchers call for more advanced ways to investigate such associations between employment and criminal desistance, including the effect of work commitment on criminal desistance and the interplay among subsistence factors (e.g., employment), intrapersonal factors (e.g. substance use), and race.

Consequently, the current study attempts to partly fill these gaps in the literature by investigating a mechanism that helps explain the relationship among the factors. That is, by adding substance use as an alternate explanation in the relationship between employment and desistance from antisocial behavior, the current study seeks to examine to what extent the two

factors, work commitment and substance use, affect offending behavior in young adult populations. In addition, the current study investigates racial differences in such an association to address claims that more desistance research reflecting race is necessary to identify its impact on offending outcomes. Put differently, separately analyzing by different races in this relationship is significant to show racial differences in the structural condition (i.e., employment) that affects the intrapersonal condition (i.e., substance use), which in turn affects the targeted social problem (i.e., criminal offending). This also challenges the thesis of differential behavior, arguing that high recidivism rates among youth of color and racial disparities in the justice system are attributed to their cultural or behavioral deficiencies, not to structural conditions (Brown et al., 2003).

In order to accomplish this purpose, first, the current study examines the effect of work commitment on criminal desistance in a longitudinal sample made up of young adults who had been former serious juvenile offenders enrolled in the Research on Pathways to Desistance Project.

Research Question #1: *To what extent is work commitment related to antisocial behavior?*

Second, the current study investigates the underlying mechanism in the relationship among work commitment, substance use, and antisocial behavior by examining whether substance use mediates the association between work commitment and criminal desistance.

Research Question #2: *To what extent does substance use mediate the relationship between work commitment and antisocial behavior?*

Third, the current study is particularly interested in understanding the variations in the mediating role of substance use in the relationship between work commitment and criminal desistance among different races (i.e., subgroup analyses).

Research Question #3: *Does the substance use mediated relationship between work commitment and antisocial behavior vary across race and ethnicity?*

1.3 RELEVANCE TO SOCIAL WORK

Broadly, criminal desistance study should be discussed alongside reentry issues. Thus far, desistance study has been dominantly conducted in literature from various social science approaches, such as criminology, sociology, social psychology, or behavioral economics. However, there are several important reasons why desistance study is also relevant to social work. First is a goodness of fit. Social work can focus on the goodness of fit between the individual and his environment (Higgins & Severson, 2009), which is well suited to the person-in-environment (PIE) perspective. Within this perspective, social work practitioners and researchers pay attention to the mutual exchanges that function between the individual and his environment (Germain & Gitterman, 1996). For example, the social work profession highlights the importance of understanding an individual (e.g. formerly incarcerated people) and his behavior (e.g. criminal desistance) in light of the environmental contexts (e.g. micro and macro settings or conditions through which interventions via practice and policy are delivered). That is, social workers emphasize how the reciprocal exchanges between formerly incarcerated people

and their circumstances lead such individuals to desist from antisocial behaviors. Therefore, the PIE perspective is beyond a theoretical framework, rather it is a superordinate principle that directs us to the social problem and relevant theories we should look at within the principle.

Second, the social work profession has historically advocated for incarcerated individuals since the inception of the profession in 1904 (Roberts & Springer, 2007). A common image projected of formerly incarcerated people are as perpetrators, since their criminal behaviors target vulnerable people who are referred to as victims (Harley, Cabe, Woolums, & Turner-Whittaker, 2014). However, this group is considered one of the most marginalized and vulnerable populations (Geiger, 2006). Vulnerability is defined as susceptibility to harm “resulting from an interaction between the resources available to individuals and communities and the life challenges they face” (Mechanic & Tanner, 2007, p.1220). Marginality is used to describe spaces of socio-culture, politics, and economy, where vulnerable people “struggle to gain access to resources and full participation in society” (Harley et al., 2014, p.5). The problems associated with formerly incarcerated people, such as reentry or reincarceration, clearly represent their vulnerability and marginality. Breaking the intersectionality of their vulnerability and marginality is addressed in the National Association of Social Workers (NASW) Code of Ethics, stating that “The primary mission of the social work profession is to enhance human well-being and help meet the basic human needs of all people, with particular attention to the needs and empowerment of people who are vulnerable, oppressed, and living in poverty.” (NASW, 2008).

The third reason is related to our professional efforts to create balance in becoming involved in traditionally marginalized populations. The social work profession has developed a vital role in the issues surrounding formerly incarcerated people who are often described as

involuntary clients (Higgins & Severson, 2009). Social workers agree that a major purpose of criminal justice is to maintain public safety (Wilson, 2010). Yet, the social work profession has noted a gradual weighing of the application of the punishment approach, which is interpreted as an imbalance between punishment (for incarceration) and rehabilitation (for reentry). Such imbalance is attributed to Martinson's 1974 report regarding the unsuccessful outcomes of reentry programs targeting formerly incarcerated people resulting in higher recidivism rates followed by criminal justice get tough on crime policies since the 1980s (Killian & Maschi, 2009; Patterson, 2012). As previously stated, current mass incarceration in the United States and higher recidivism rates are byproducts of such an imbalance. Therefore, the social work profession is being called upon to reestablish the equilibrium of the situation by rethinking formerly incarcerated people's reentry by exploring the critical factors that enhance individuals' ability to desist from crimes.

Lastly, linked to the third reason given that the current imbalance between punishment and rehabilitation approaches is primarily grounded in the paucity of scientific knowledge regarding the effectiveness of reentry at the individual level of change to desist from antisocial behaviors, it is essential for the social work profession to produce evidence-based findings about it. Social work, where its value is well fitted to reentry problems, should be a leading discipline in this research trend on reentry. Our role should be to improve the connection between research theory and practice in order to help shape better social policy and practice.

2.0 CHAPTER TWO

2.1 THEORETICAL FRAMEWORK

In this chapter, two major competing criminal desistance theories are discussed: Subjective theory and structural theory of criminal desistance. The former focuses on individual's subjective processes, whereas the latter describes structural conditions. In bodies of literature on conceptual frameworks of criminal desistance, the two sub-theories discuss the ideas of identity and social bonds, respectively, to inform a better understanding of the process of desistance among justice-involved people by positioning their unique points. After comparing these two theories, this study justifies why the structural theory is necessary to examine the aforementioned relationship by highlighting employment as an important type of social bond.

2.1.1 Subjective Theory on Desistance: Identity Theory

Identity defined as “a sense of who one is” (Paternoster & Bushway, 2009, p.1111) has long been looked at in the social and behavioral sciences because it directly links to one's motivation and behavioral guidelines (Paternoster & Bushway, 2009). Within this association, identity theory assumes that in order to sustain desistance from crime, fundamental and intentional

changes in a person's sense of self is necessary (Paternoster & Bushway, 2009). Such changes in the sense of self highlight the raised awareness of the consequences of criminal actions when it comes to justice-involved individuals, which can be a crucial determinant of communities' willingness to accept their return (Bazemore & Stinchcomb, 2004).

The identity theory of desistance has been developed by integrating various bodies of literature in social psychology emphasizing personal motivation by social interaction (Giordano, Schroeder, & Cernkovich, 2007) or behavioral economics highlighting individual rational choice to achieve identity transformation (Paternoster & Bushway, 2009). By building on these works, theorists of identity theory not only share the core assumption that "desistance requires a fundamental change in how a person views herself and her world and that it is intentional" (Paternoster & Bushway, 2009, p.1107), but also position different points of view on identity change toward desistance from crime. For example, Maruna and Mann (2006) view that offenders who are already leaning toward prosocial behaviors try to transform their identities by willfully distorting their past behaviors to rationalize them. Maruna (2001) describes the process of deliberate cognitive distortion as a means to justify the reason or purpose of their past behaviors.

Paternoster and Bushway (2009) build another branch of identity theory of desistance. Paternoster and Bushway (2009) take a different stance from what Maruna (2001) argues. For Paternoster and Bushway (2009), justice-involved people as a human agency have the ability to change their identities from their hearts. In addition, no matter what structural factors influence them, desistance is a natural outcome of former offenders' intentional efforts to change their identity. It is importantly noted that a possible self can be directed in two different critical ways

known as self-enhancement and self-regulation (Paternoster & Bushway, 2009). Once an offender achieves a positive possible self and avoids a negative possible self, the former fuels one's optimism and allows offenders to envision their future selves with possible identities, called self-enhancement. The idea of self-enhancement implies that identity change is possible through the experience of enhanced esteem, which leads justice-involved people to think about the self as mutable (Paternoster & Bushway, 2009). Another idea of a possible self is called self-regulation, which provides motivations for one's behavioral change. Here, such individuals naturally envision their positive and negative futures within the possible self. Since many of them may fear negative futures, such fear makes them set a specific and feasible roadmap, which is referred to as self-regulation, to transform into a positive future self (Paternoster & Bushway, 2009). Motivation can only be found in the process of self-regulation where they avoid the feared-self, and end up pursuing the desired-self. However, the identity change does not occur in a moment, but requires time because the change is slow and gradual (Paternoster & Bushway, 2009).

Investigating how criminal-justice populations change their identity has remained a challenge among scholars due to its complexity stemming from dynamic personal factors in the desistance process (LeBel, Burnett, Maruna, & Bushway, 2008). A common method to explain how the individual identity can be changed is the narrative approach (Maruna, 2001). Narratives are an important method to explain and internalize what they did, why they did it, and why they are now different (Maruna, 2001). By developing their own stories, individuals have a chance to intentionally think back on their victims' suffering from their offenses so that they can move beyond their previous identities (Maruna, 2001).

In sum, identity change from offender to non-offender must be a prior condition to promote criminal desistance during the reentry process. The theory posits that only justice-involved individuals who intentionally transform their identities are able to utilize structural supports help them pursue change. That is, to truly desist from crime, individuals need to restructure their understanding of the self (Maruna, 1999). Identity theory developed by Paternoster and Bushway (2009) assert that self is not immutable, so true change from an offender's heart is possible through their abilities, which is based on an emphasis on human agency. Thus, individuals are like agents of their own change. Agency is defined as "having sense of command over one's destiny" (Matza, 1964/2009, p. 28-29), therefore, it plays an important role in this theory, which stresses that identity change has internal causes rather than external ones (Healy, 2013).

However, there are a couple of critiques of the theory. Although identity change explained by Paternoster and Bushway (2009) clearly states that one's fear from a negative possible self helps him or her become motivated to create a roadmap to achieving a positive identity such as a worker, good father/mother, or spouse, the theory does not explicitly explain how conventional opportunities (e.g. employment, marriage, or sound social networks) are available for such populations who are in the process of transforming their identities. Another critique is related to the structural environment surrounding justice-involved people. Such cognitive (i.e., identity) shifts may likely be enough for change to occur under conditions of relatively less severe disadvantage. In other words, cognitive change among such populations cannot occur if they live in extreme socially and economically disadvantaged communities (Giordano, Cernkovich, & Rudolph, 2002). In accordance with this, Glynn (2014) also criticizes

that even if individuals can change their identity by the process of knifing off their past, as Maruna (2001) explains, it is doubtful as to whether people of color, especially Black men, whose mobility is seldom enabled within a racially biased system, are able to go through such identity transformations.

2.1.2 Structural Theory on Desistance: Theory of Social Bond

To respond to one limitation found in the subjective theory of criminal desistance, questioning how disadvantaged individuals can reach conventional opportunities, it is helpful to turn to the social bonds discussed by Sampson and Laub in their age-graded informal social control theory, which provides an appropriate theoretical foundation to understand how social bonds such as employment have an effect on criminal desistance (Laub & Sampson, 2003; Sampson & Laub, 1993). They theorize the arrival of key events in the process of desistance is exogenous. This indicates an unintentional consequence of exogenous circumstances, called turning points, is criminal desistance. Individuals can produce social bonds by participating in conventional institutions (Laub & Sampson, 2003; Sampson & Laub, 1993). Social bonds, as one of the major themes in their theory, are characterized as the source of restraint of one's criminal behaviors (Sampson, & Laub 1993). The idea of social bonds as an informal social control is built upon Hirschi's social control theory (1969), demonstrating that social bonds can be characterized as emotional ties to others, investment in relationships, and access to legitimate activities. His concept of social bonds originally derived from Durkheim (1897/1951), which states that individuals' deviations are caused by poor integration into social groups.

A key explanation that the theory premises is that having ties to conventional institutions is crucial, especially during adulthood since structural factors can work to modify childhood pathways, “regardless of prior individual differences in criminal propensity” (Sampson & Laub, 1993, p.243). In other words, they believe that an individual who was in a trajectory of criminality during childhood does not necessarily have to remain in the same trajectory as criminal doers. Their trajectory can be modified in a positive way by experiencing turning points, which can occur through the quality or strength of personal bonding to society. For Sampson and Laub (1993), turning points are equated to the establishment of social bonds and are crucial to understanding the process of desistance among persons who have had justice contact. Sampson and Laub (1993) describe turning points as events that can redirect one’s life trajectory from offending to non-offending. Bonding to conventional institutions in adulthood can be described as turning points. Therefore, turning points resulting in adult social bonds allow individuals to better desist from crimes.

Strong ties to work is a critical external constraint related to desistance (Laub & Sampson, 2003). Employment as a social bond is regarded as an informal social control for individuals who have had involvement in the criminal justice system since it provides structure to one’s life (Sampson, & Laub 1993). Adult life is mainly structured by an individual’s occupation (Laub & Sampson, 2003). Individuals’ routine activities are limited when he or she has a strong commitment to work. This allows for self-regulation to be possible by keeping himself or herself busy while working to maintain employment. Put simply, those who keep themselves busy by working are less likely to be involved in delinquency (Laub & Sampson, 2003). As a result, individuals may become more aware of their identities and find meaning in

their lives through employment, which increases competence, social utility, and self-esteem that are central to sound mental health (Laub & Sampson, 2003). How employment is conceptualized as a social bond will be further described later.

Even though the informal control theory premises the effect of work on criminal desistance, the theory emphasizes a critical condition, “the quality of social bonds” (Sampson & Laub, 1993, p.140), that leads to criminal desistance. Put differently, simply being employed does not bring the function of social control to individuals who are in the desistance process (Sampson & Laub, 1993). The quality of the employment, including work stability, personal commitment, and good relationships between the employer and employees should be a part of the employment. Individuals who have a weak attachment to work are more likely to become involved in delinquent behavior than those who have strong ties to the labor force.

When discussing the effect of exogenous events (e.g., employment) on criminal behavior, it is important to recognize a competing explanation that may influence the complexities in identifying the causal impact among factors. Regarding this, Laub and Sampson (2003) emphasize the adverse impact of substance abuse on social bonds. Substance abuse often follows negative consequences in maintaining work regardless of one’s criminality since it becomes more difficult to continue fulfilling one’s responsibilities. Thus, substance abuse in the workplace signals a low quality of employment: Instability at work, poor commitment, detrimental relationships between the employers and employees. This may be a rival explanation of how substance use can alter the causal relationship between employment and criminal desistance.

In sum, Sampson and Laub (1993) have articulated a social bonding theory that seeks to identify sources of desistance over the course of life. Building on Hirschi (1969)'s classical social control theory, they stress strong work attachment is associated with desistance from crime. A key point they posit is the independence of adult trajectory from that of childhood. That is, adult criminal paths cannot be predicted from childhood paths due to the role of adult social bonds that are different from those of children. This highlights that social bonds like employment are concrete mechanisms of external restraint of individual behaviors.

The current study is also aware of a major critique of Sampson and Laub (1993), in that they may overemphasize the structural factors such as turning points, ignore subjective components (Barry, 2013; Maruna, 1999). However, Sampson and Laub (1993) articulate the degree of individual commitments by using the phrase "the quality or strength of social bonds" (p.140). This implies that although they mainly embrace structural factors to understand the process of desistance, they do not fully reject the subjective factors. In response to this, Laub and Sampson (2003) recently refined their theoretical framework on social bonds by more clearly articulating subjective components such as commitment, personal investment, and motivation, which are related to the aspect of quality. In this context, the current study agrees that identity change from offender to non-offender is possible through participation in more conventional roles such as employees, emphasizing the role of structural factors as a priority of identity transformation. This provides a major justification of why Laub and Sampson's theory of social bonds is primarily applied to this study's conceptual model.

2.1.3 Focus on Employment as a Significant Form of Social Bond

Drawing from the theoretical framework, social bonds are conceptualized as binding to social institutions. According to Hirschi (1969), who provided a conceptual cornerstone for Sampson and Laub (1993/2003), four elements are composed of social bonds, including attachment, involvement, belief, and commitment. Attachment represents ties to prosocial entities through the internalization of societal norms; involvement refers to how much structured time individuals spend engaging in conventional behaviors; belief describes the validity of shared societal values, norms, and authority; lastly, commitment refers to the amount of investment in societal institutions. Securing jobs is a well-known key social factor in increasing criminal desistance among persons who have had contact with the criminal justice system (Sampson & Laub, 1993; Uggen & Shannon, 2014). Although various types of social bonds, including family/marriage, school, or military service, etc. exist, there are a couple of reasons why the current study focuses on employment as an important social bond in addressing criminal desistance.

First, employment can act as a gateway to becoming a law-abiding citizen who is aware of conventional norms (i.e., attachment and belief), hence contributing to reducing illegal activities among adults (Duran et al., 2013; Uggen & Shannon, 2014; Wilson, 1996) by regulating their lives (i.e., commitment). Employment reinforces structured prosocial activities (i.e., involvement), so it leads people to engage less in antisocial or criminal behaviors (Duran et al., 2013). This perspective explains all four elements of social bonds.

Second, family disruption is often explained by financial difficulties, which derives from structural forces such as chronic joblessness, particularly for families living in disadvantaged

communities (Brown et al., 2003). Thus, employment plays a critical role in providing financial resources to the employees themselves as well as to their family members. This contributes to yielding personal support and positive relationships among family members (Graffam et al., 2004; Shinkfield & Graffam, 2009). When formerly incarcerated persons are given opportunities to productively participate in their communities through working and supporting their families, safer community and financially secured family systems can be established (Center for the Study of Social Policy, 2012). This perspective helps to explain why employment is regarded as a more important form of social bond than family relationships (Laub & Sampson, 2003).

Lastly, the expected results mentioned above enhance self-esteem and improve mental health conditions (Bierens & Carvalho, 2011; Graffam et al., 2004; Laub & Sampson, 2003; Lee & Lee, 2017). Employment is known as a primary element to enhancing mental health and is its social and economic determinant (World Health Organization, 2005). By being employed, not only can an individual's self-esteem be promoted, which may possibly bring about relief from mental disorders (Hannah & Hall, 2006; Lee & Lee, 2017), but it can also act as a gateway to social integration (Bush, Drake, Xie, McHugo, & Haslett, 2009; Hannah & Hall, 2006; Lee & Lee, 2017; Wong & Solomon, 2002).

3.0 CHAPTER THREE

3.1 LITERATURE REVIEW

The previous chapter discussed why employment is important in preventing the committing of crimes through Laub and Sampson's theory of social bonds (1993, 2003). The discussion expanded the argument that different characteristics of employment should be examined for criminal desistance, beyond simply being employed, which may not guarantee social control to persons who are in the desistance process. Grounded by the theoretical framework and research questions, this chapter provide a review of the literature that identifies empirical evidence on each path (i.e., employment to substance use; substance use to criminal offending (or antisocial behavior); and employment to criminal offending) as well as the role of race in the association.

3.1.1 Explaining the Relationship between Employment and Criminal Desistance

The effect of employment on criminal behavior is well documented; however, one of the conceptual and methodological issues pointed out in the literature is that it is necessary to look beyond the dichotomy of employment vs. unemployment (Weiss & Reid, 2005), in order to

identify the robust effect of employment on crime. As demonstrated in Sampson and Laub's theory (1993) as well as previous studies on mixed outcomes of employment effects on offending outcomes (Skardhamar & Savolainen, 2014), if the aspect of work quality is not distinguished from the simple presence of employment, the effect of employment on criminal behavior would be spurious because the mere availability of being employed hardly provides a way to identify personal aspects (e.g., individual commitment to work) embedded in one's employment. Thus, various characteristics of employment remain critical (Bushway, 1998; Bushway, 2011; Sampson & Laub, 1993; Uggen, 1999; Wadsworth, 2006) in investigating the relationship between employment and criminal desistance.

Responding to the weak effect of employment itself on crime, a body of literature has gradually hypothesized the association among different types of work characteristics and criminal behavior (Allan & Steffensmeier, 1989; Sampson & Laub, 1993; Uggen, 1999; Wadsworth, 2006, Weiss & Reid, 2005). For example, Wadsworth (2006) utilized data from two waves (1979 and 1980) of the National Longitudinal Study of Youth (NLSY) with 3,136 young adults. Under a hypothesis that "lower quality employment may influence an individual's participation in crime" (p.355), criminal behaviors as dependent variables were separately measured by property and violent crime; employment quality (rewarding attributes and employment benefits) was created by using principal component factor analysis (Wadsworth, 2006). By using the two-stage Heckman probit model to adjust for potential sample selection bias in the full regression model, Wadsworth (2006) saw persons experiencing a higher quality of employment, such as more subjectively rewarding jobs and more benefits, displayed less property-related and violent crimes after controlling for age, gender, race, marriage, family

income, living situation, etc. Other studies also supported the effect of job quality on crimes (Allan & Steffensmeier, 1989; Laub & Sampson, 2001; Uggen, 1999; Wadsworth, 2006; Weiss & Reid, 2005).

Beyond simple employment status, however, measuring the quality of employment varies across studies from income (Acemoglu, 2001), adequate hours and pay (Allan & Steffensmeier, 1989), job stability or work commitment (Laub & Sampson, 2001; Sampson & Laub, 1993; Wadsworth, 2006), job satisfaction (Uggen, 1999), employment benefits (Wadsworth, 2006) to occupational prestige (Weiss & Reid, 2005). Various ways to define the quality of employment imply its complex nature and a potential risk of inaccuracy with regard to measurement (Weiss & Reid, 2005). Regarding this, Wadsworth (2006) emphasizes that a researcher should conceptualize employment quality on the basis of the theoretical assumption underlying the relationship between employment and crimes. For example, if a researcher follows an economic framework, premising that one's financial ability can be improved through employment, which deters the individual from crimes, then the level of income or pay would be a useful measure for employment quality (Wadsworth, 2006). Overall, previous studies highlighted that attachments to conventional norms (or criminal desistance) depend on the quality of employment, meaning job quality works to reduce criminal behavior since it acts as a mechanism of strong social control.

3.1.2 Explaining the Relationship between Employment and Substance Use

The issue of substance use and dependence is considered a serious risk factor threatening healthy lives of all Americans (SAMHSA, 2005). The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders ([DSM-V] American Psychiatric Association, 2013) defines substance abuse as a pattern of recurrent use leading to clinically damaging consequences. Individuals influenced by substance use problem may experience failure to perform major personal responsibilities (e.g., as an employee); put themselves in physically dangerous situations (e.g., DWI), and/or often come in contact with the criminal justice system due to substance use (e.g., repeated arrests for substance-related offenses). The substance use problem is prevalent in the U.S. For instance, SAMHSA's National Survey on Drug Use and Health (NSDUH) reported 21.5 million persons aged 12 or older need treatment for substance use disorders, including 17.0 million persons with alcohol use disorders, 7.1 million with illegal drug use disorders, and 2.6 million who suffer from both (Center for Behavioral Health Statistics and Quality, 2015).

The effect of employment on substance use provides bifurcated results, depending on age. For example, a body of literature regarding such relationships among juveniles has consistently reported that adolescents employed in paid work tend to use substances more than those who are not employed (McMorris & Uggen, 2000; Johnson, 2004; Paternoster, Bushway, Brame, & Apel, 2003). Some possible explanations of the results include easier access to substances facilitated by their earnings, working with adult co-workers who encourage them to use substances, and greater independence from their parents (Johnson, 2004). Johnson (2004)

reports, however, the outcomes can vary according to race and ethnicity. On the other hand, employment has been identified as a potential preventive mechanism that reduces substance use dependence among adults (Webster, Staton-Tindall, Dickson, Wilson, & Leukefeld, 2014). This is due to the fact that by being employed, individuals can enhance emotional/cognitive functioning, which results in a decreased relapse back to substance use (Arkinson et al., 2003).

The effect of employment to lower substance use is evidenced in the 2013 NSDUH reporting a correlation between employment and the use of illicit drugs. According to the report, about 9.1 percent of adults who were employed full-time were illicit drug users, which was lower than those who were employed part-time and unemployed (13.7 % and 18.2 %, respectively; SAMHSA, 2014). Some studies point out a possible reciprocal relationship between employment and substance use due to employment acting as a possible facilitator to gain easier access to illicit substances from earned income (CDAR, 2007; Uggen & Shannon, 2014). Yet, ample studies (Arkinson et al., 2003; Brown & Montoya, 2009; Compton, Gfroerer, Conway, Finger, 2014; Lee et al., 2015; Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004; Webster, Staton-Tindall, Duvall, Garrity, & Leukefeld, 2007) have revealed outcomes consistent with the NSDUH report of an inverse relationship between employment and substance use, regardless of the study designs (Longitudinal or cross-sectional). Some studies hypothesized the aspect of job quality on substance use (Brown & Montoya, 2009; Webster et al., 2007). For example, Brown and Montoya (2009) examined the role of employment on drug use by utilizing a longitudinal panel design among 543 low-income women of color receiving welfare in Houston, Texas. The study utilized the Attitudes, Behaviors, and Skills Assessment (ABSA) instrument, which is a comprehensive questionnaire asking respondents about socio-demographics, information related

to drug history, employment, household income, psychological functioning, and welfare receipt (Brown & Montoya, 2009). Hours worked were measured as the quality of employment in this study. Their regression analysis revealed employment quality (higher employment hours) was a significant predictor of drug use reduction (Brown & Montoya, 2009).

Regarding the effects of employment quality on substance use, Webster and his colleagues (2007) provide deep outcomes of its effect by operationalizing employment quality in a variety of ways, with 500 criminal justice samples in Kentucky. To go beyond a dichotomized way of measuring employment, the study used factor analysis to produce four different types of employment quality, including job status, earnings, duration, and stability (Webster et al., 2007). Their findings showed a similar pattern where the four types of employment quality had significant relationships, but inconsistent correlation patterns with substance use (Webster et al., 2007). For example, full time status was related to a lower use of cocaine, sedatives, methamphetamines, heroin, methadone, and multiple drugs; high employment earnings were associated with decreased use of marijuana, cocaine, and multiple drugs; employment duration had an impact on reducing marijuana and multiple drug use; and job stability was related to less relapse in the use of methamphetamines (Webster et al., 2007). Based on the findings, when employment quality is measured by employment status (full-time, part-time, unemployment), it may serve as a better predictor of a reducing drug use (Webster et al., 2007).

Studies like Webster and colleagues (2007) suggested various ways of measuring employment are needed to predict more accurate patterns of a reduction in substance use. The suggestion is reasonable in light of the inconsistent results from some studies. For instance, the findings from the 2007 Kentucky Needs Assessment Project with the 3,312 general Kentucky

households reported adults living in Kentucky aged 18 to 44 years old who were employed full-time were more likely to engage in substance use (CDAR, 2007), which was similar to the findings from adolescents' cases (Johnson, 2004), compared to respondents in other employment statuses. Regarding the effect of employment earnings on substance use, Uggen and Shannon (2014) also found results inconsistent with those of Webster and colleagues (2007), reporting that more income leads to more drugs.

3.1.3 Explaining the Relationship between Substance Use and Criminal Desistance

Substance use has been considered a major contributing factor to an individual's criminal behavior (Bahr, 2015; Gossop, Trakada, Stewart, & Witton, 2005; Petersilia, 2003; Roussel & Omori, 2016; Schroeder et al., 2007). The relationship is also reciprocal in that chronic offenders are highly likely to be substance users, compared to non-chronic offenders (OJJDP, 2010). Theoretically, it is interesting with regards to the substance use issue since it is common for contemporary drug users to be exposed to hard drugs such as heroin, crack cocaine, amphetamine, ecstasy, etc., which were not widely available during the period of Gluecks' sample, based on a cohort of young White males who comprised the basis for Sampson and Laub's theory (Laub & Sampson, 2003; Sampson & Laub, 1993). Intertwined with the criminal justice context and the prevalence of drug use, drug offenders have become a primary concern in the U.S. justice system since convictions for drug offenses contribute to mass incarceration (Bahr, 2015; Petersilia, 2003). At the federal prison level, the number of people convicted of drug violations comprised half of the total federal prison population in 2014; at the state level,

the current number of drug offenders has increased 10 times over the three decades (The Sentencing Project, 2015). It is also estimated that about one-half of individuals incarcerated in state and federal prisons abuse or are addicted to substances (National Institute on Drug Abuse, 2012). Regarding the causal connection between substance use and crime, Goldstein (1985) provides three different ways to explain it in his classic framework. The first way is the psychopharmacological model premising that short or long term effects of drugs may have an impact on violent behaviors. The second way is the economic pressure model suggesting violent crimes such as robbery are triggered by some drug users' motivation to secure money to support drug use. The third way is systematic violence proposing that violence intrinsically occurs when illicit drug users interact with the drug sale and distribution system (Goldstein, 1985).

Substance use-crime connections have been widely accepted and well documented (Bennett, Holloway, & Farrington, 2008; Delaney, Laux, Piazza, Ritchie, & Jenkins, 2014; Gottfredson, Kearley, & Bushway, 2008; Hammersley, 2011; Hussong et al., 2004; Makkai & Payne, 2005; Schroeder et al., 2007). For example, Schroeder and colleagues (2007) examined the role of drug use on criminal desistance processes with three-wave panel data from the Ohio life-course study with 254 young people who were institutionalized in state level facilities. They were aware of the effects of both alcohol and drug use on criminal behaviors, but assumed alcohol and drug use may have a different strength on the relationship, leading them to separately analyze alcohol and drug use on crime outcomes. Schroeder and colleagues (2007) highlighted both alcohol and drug use had a positive effect on crime, but the effect of drug use was stronger than alcohol on criminal behavior. Nevertheless, there was no way to identify variations by the type of drugs on the types of offenses in this study.

Bennett and his colleagues (2008) conducted the first meta-analysis of the relationship between the types of drugs and types of crimes. Based on a review of 30 studies meeting the study's certain criteria (e.g., type of study, methods, measures, and sample), the study confirmed the evidence of the effect of substance use on offending by reporting drug users were 2.8 and 3.8 times more likely to offend than non-drug users. Among the drug users, crack users showed the highest odds of offending (6 times greater), followed by heroin users (3 times greater) and cocaine users (2.5 times higher). Marijuana or amphetamine users categorized as recreational drug users were also more likely to offend (1.5 times and 1.9 times greater, respectively), compared to non-users; but the strength of the relationship was weaker than hard drug use such as crack, heroin, and cocaine (Bennett et al., 2008). The study also found drug use was significantly associated with all types of offenses, including property and violent crimes (Bennett et al., 2008).

3.1.4 Racial Differences in the Association among Employment, Substance Use, and Crime

The previous chapter of the current study explains that the effect of race on criminal desistance has not been examined to a large extent. It is not clear why the substantial body of literature on desistance has not looked at race as a primary factor in desistance outcomes. For this, two possible reasons can be assumed. First, desistance scholars may feel that the question of race and crime is hard to answer due to the methodological and conceptual challenges in defining and

measuring the association between them (Bowling & Phillips, 2002), since traditionally race has been ideologically driven (Glynn, 2014).

Second, the reason for overlooking race in desistance study might be in the history of research on discrimination in the criminal justice system, which is divided into three phases (Brown et al., 2003). Research on wave one, which was before the civil rights era, dominantly focused on systematic racial discrimination in the South, where discrimination was rampant at all institutional levels (Brown et al., 2003).

Research on wave two, conducted from the 1970s to the early 1980s, focused on the “racial character of American Justice” (p. 136) with the adoption of more rigorous scientific methods. But the dominant conclusion from wave two was that race did not significantly influence individuals’ paths in the justice system, except for drug offenses (Brown, et al., 2003). This may have incorrectly signaled to other researchers that high incarceration rates among Blacks were attributed to their commitment of more serious offenses, not to race (Brown et al., 2003). Brown and his colleagues (2003) point out that this logic from wave two influenced many other researchers and policy makers who firmly believe that young people of color commit more crimes than White people (i.e., differential behavior explanations), which allows for the assumption that the same logic might have influenced desistance study as well.

Research on wave three, which emerged in the early 1990s, has focused on how discrimination truly operates in the system – even under the pretense of being “bureaucratically neutral or color-blind” (Brown et al., 2003, p. 138). Researchers in wave three uncovered fundamental methodological issues in wave two, including defining discrimination too simply as overt racial prejudice and over-aggregation of the data on Black-White disparities in the justice

system. According to the followers of wave three logic, contemporary discrimination is not based on veracious racial bias, but on accumulated processes that are subtle and insidious, which produce visible discriminatory outcomes (Brown et al., 2003). Massive unemployment rates among urban Blacks (which leads them to commit crimes) and distorted public images of people of color regarding routinized illegal drug use (Alexander, 2010) may be the best examples of this argument. They also argue that when we only look at the national average on Black-White disparities by aggregating data, we will miss the disadvantaged reality that people of color face (Brown et al., 2003), which is in the system's blind spots.

In the aforementioned contemporary U.S. criminal justice system, race has insidiously played a role in determining which individual might or might not be able to desist from crime. Given the current racially biased justice system, there may be implications on the ability of people of color, particularly young adults who are socially and economically disadvantaged (Brown et al., 2003), to desist from crime. Following the logic of wave three, researchers note several aspects of racially disadvantaged experiences that are relevant to different criminal offending outcomes, which are the reasons why race is included as an important part of the current study.

First, for people of color, particularly Blacks, there have been a pattern of overrepresentation in offending histories. A key finding in criminal desistance studies is that race is regarded as a significant predictor for categorizing criminal persisters or desisters (Haynie et al., 2008). Previous studies have consistently found the rate of criminal offending among African-Americans to be higher than that of Whites (Elliott, 1994; Haynie et al., 2008; Lockwood, Nally, & Ho, 2016; Wells et al., 1992); and that Black youths were more susceptible

to engaging in criminal behaviors (Markowitz & Salvatore, 2012). However, Haynie and colleagues' (2008) longitudinal study using Add Health data of 12,000 respondents reveals racial differences in offending can be lessened by controlling for employment. Specifically, being employed in a skilled job reduces the odds of engaging in violence among African-Americans. This indicates employment mediates the relationship between race and criminal offending; employment contributes to diminishing racial differences in violence (Haynie et al., 2008).

As previously discussed, Sampson and Laub's theory (1993, 2001) identifies the lack of employment and/or unstable labor conditions to be major indicators of offending, which people of color often face (Wilson, 1996; Heller, 2014), particularly as these young adults commonly suffer from unstabilizing social bonds (Brown et al., 2003). This points to the second aspect of the disadvantaged experience profoundly influenced by race, which is that the securing of employment varies across race. For example, literature has consistently revealed discrimination against people of color in the job search process (Bertrand & Mullainathan, 2004; Fryer, Pager, & Spenkuch, 2013; Pager, 2003). Even if they are hired, the jobs are often unstable, temporary or unreliable (Sharkey, 2013; Pager, Western, & Bonikowski, 2009; Wilson, 1996). The Bureau of Labor Statistics (2014) reports unemployment, unstable jobs, and low wages to be common among African-Americans. Under the circumstances, people of color with criminal histories are particularly disadvantaged in securing jobs. Young people of color who go to prison are permanently detached from the labor market and remain vulnerable (Western, 2006). Even when employed, they face various gaps in job stability, hourly wages, and annual income, compared to their White counterparts (Western, 2006), which hinder them from being able to engage in prosocial lives and establish social bonds.

The third perspective of the disadvantaged experience associated with race is inaccurately portraying people of color as casual substance users (Lee, Goodkind, & Shook, 2017). As a matter of fact, the relationship between race and substance use is another complex issue. Even though SAMHSA (2016) reports the rate of illegal drug use among African-Americans ages 12 and up in 2014 was higher than the national average (12.4% vs. 10.2%), statistically this does not make up the bulk of drug users when compared to Whites (Chin, 2002; Kakade et al., 2012; Jackson & Lecroy, 2009; Welty et al., 2016). The argument regarding a misguided perception against African-Americans on substance use has been supported by many studies (Kakade et al., 2012; Lee et al., 2017; Welty et al., 2016). For instance, Kakade and colleagues (2012) utilized the National Longitudinal Survey of Youth 1997 to investigate the relationship between substance use and illegal behaviors with arrests among 6,625 youths aged 12 to 17 years. They concluded Black adolescents were less likely to be engaged in drug use or delivery, but more likely to have been arrested than their White counterparts (Kakade et al., 2012).

These findings are supported by the most recent longitudinal study from Welty and colleagues (2016). The study reported robust findings by investigating racial/ethnic differences in the prevalence of substance use in their 12-year longitudinal research. The study utilized longitudinal data from the Northwestern Juvenile Project with a random sample of 1,829 young people in detention in Chicago who were interviewed nine times from 1995 to 2011. The results were contrary to common stereotypes of people of color. White youths showed the highest prevalence of drug use (e.g., cocaine, hallucinogens or PCP, opiates, amphetamines, and sedatives), compared to Hispanics and African-Americans; When compared with Blacks and

Whites, Whites had 32.1 times greater odds of cocaine-use disorders than their minority counterparts (Welty et al., 2016).

As such, empirical evidence suggests racial impact exists across themes from overrepresentation in criminal offending to a discriminatory job market, and a distorted public image of substance use. This indicates race has the power to explain the ways people of color go through the disadvantaged experience, which may differ from their White counterparts. Thus, it may be the case for people of color that their offending outcomes may also differ from Whites. The current study recognizes that race is conceptually complex when examining criminal desistance; but its significance should not be overlooked given the contemporary criminal justice context surrounding people of color. Viewing race may be a way to stay aligned with the wave three research. On the other hand, it may be a methodologically oversimplified way to understand racial variations in the relationship among employment, substance use, and antisocial behavior. Nevertheless, this can be a preliminary initial endeavor to construct a potential answer to the key question of whether the theory is able to clearly explain criminal desistance of those populations who are disproportionately affected by a racially biased system.

3.1.5 Conceptualizing Employment Quality in the Current Study

As discussed earlier, measuring employment quality depends on how it is conceptualized based on the theoretical assumptions connected to the relationship between employment and crime (Wadsworth, 2006). Thus, conceptualizing employment quality should be consistent with the chosen theory's assumptions of “why people work and why people commit crimes” (Wadsworth,

2006, p.343). In Sampson and Laub's theory of informal social control, employment quality and crime are viewed as control mechanisms. Put differently, the more people work, the more they become committed, which establishes strong social bonds leading to deterrence from criminal behaviors. In this sense, the relationship between employment and crime premised by Sampson and Laub (1993, 2003) goes beyond monetary factors (Wadsworth, 2006) since crimes may occur when people are not regulated by a commitment to daily routines or investments. Given the theoretical assumptions, therefore, an appropriate strategy is to use work commitment as an indicator of work quality in the current study.

4.0 CHAPTER FOUR

4.1 METHODOLOGY

4.1.1 Data and Sample

The current study utilizes the Pathways to Desistance study, which is a longitudinal project following 1,354 juvenile offenders from adolescence to young adulthood in Phoenix, Arizona ($n = 654$) and Philadelphia, Pennsylvania ($n = 700$) between 2000 and 2010. The study's data was collected to determine initial patterns of how serious adolescent offenders stop engaging in antisocial behaviors; to demonstrate the impact of social context and developmental changes that may lead to positive changes in their behaviors; and to compare the effects of restrictions and interventional measures in influencing such changes. Participating youths (1,170 males and 185 females) were between 14 and 17 years old at the time of the baseline interviews conducted in court systems from 2000 to 2003, when they were convicted of felonies or other serious offenses such as serious weapon, property, or sexual assault offenses (Monahan, Steinburg, & Cauffman, 2013). Nearly 70 percent of those interviewed at baseline had at least two previous instances of criminal charges (Na, 2016). The majority of participants were males who comprised 86.4 percent; females comprised 13.6 percent. Non-Hispanic Blacks (41%) were the primary race in

the sample, followed by Hispanics (34%), non-Hispanic Whites (20%), and other racial groups (5%). Due to the relatively small sample size, the other racial groups ($n = 65$) were excluded from the current study, in which there were a total of 1,289 young people. All of the data utilized in the current study are publicly available from the Interuniversity Consortium for Political and Social Research (ICPSR). Since this study used publicly available data, it was eligible for exemption from the University of Pittsburgh IRB review.

4.1.2 Procedures

Adolescent enrollees were given baseline interviews within 75 days of their adjudication in juvenile court and within 90 days of their decertification hearings (Philadelphia County, PA) or arraignments (Maricopa County, AZ) if they were processed in adult courts (Schubert et al., 2004). After the baseline interviews, follow-up interviews were scheduled every six months for three years with the respondents (i.e., 6, 12, 18, 24, 30, and 36 months) and then every year until 2010 (i.e., 48, 60, 72 and 84 months). Follow-up interviews were held in participants' homes, public places, including libraries, or facilities with computer-assisted interviews that programmed all measures and associated skip patterns. Participants entered their responses directly on a keypad while trained interviewers read the battery of measures and encouraged honest reporting by protecting their privacy. Confidentiality protection corresponding to statutes provided by the Department of Justice were implemented during the interviews. To minimize attrition, participants were paid on a graduated payment scale beginning at \$50 per interview and capped at \$150 (Mulvey, Schubert, & Piquero, 2014).

4.1.3 Time Periods of Theoretical Interest

Data for desistance factors in the current study were drawn from 60, 72, and 84 month follow-ups since most participants would have become young adults and expected to be employed by the 60 month follow-up interview.

4.1.4 Measures

Dependent Variable

Antisocial behavior. Antisocial behavior was measured by the Self-Reported Offending (SRO). The SRO used in the Pathways to Desistance Study was an adaptation of similar earlier scales (Huizinga, Esbensen, & Weiher, 1991) used to measure youths' involvement in antisocial and illegal behaviors, consisting of 22 items which elicit different types of serious criminal activity. The 22 items included: 1. purposely destroyed or damaged property that did not belong to you in the recall period; 2. purposely set fire to a house, building, car or vacant lot; 3. entered or broke into a building (home or business) to steal something; 4. stole something from a store (shoplifted); 5. bought, received, or sold something that you knew was stolen; 6. used checks or credit cards illegally; 7. stole a car or motorcycle to keep or sell; 8. sold marijuana; 9. sold other illegal drugs (cocaine, crack, heroin); 10. carjacked someone; 11. driven while you were drunk or high; 12. been paid by someone for having sexual relations with them; 13. forced someone to have sex with you; 14. killed someone; 15. shot someone (where bullet hit the victim); 16. shot at someone (where you pulled the trigger); 17. took something from another person by force, using

a weapon; 18. took something from another person by force, without a weapon; 19. beat or physically attacked somebody so badly that they probably needed a doctor; 20. been in a fight; 21. beat up, threatened, or physically attacked someone as part of a gang; and 22. carried a gun.

At baseline, participants were asked to answer whether they had ever engaged in any crimes (yes/no). The same follow-up questions were utilized to collect more information on whether the adolescent has engaged in the activity during the follow-up period. A total offending variety proportion scales were computed from the Self-Reported Offending (SRO). Variety proportions were calculated after participants responded “yes” to engaging in any of the 22 crimes. The proportions comprised of the number of different types of crimes committed by a participant, regardless of when it was committed, divided by the number of answered questions out of a maximum of 22 items. As this score gets closer to "1", it signifies that the youth has committed a greater variety of offenses (Hampton, Drabick, & Steinberg, 2014). Variety proportions, which have been used frequently to index criminal activity (Hindelang, Hirschi, & Weis, 1981), have been determined to result in good predictive and construct validity in assessing delinquent behavior (Thornberry & Krohn, 2000). The variety proportions were converted into variety scores by multiplying them by 22 for total offending to make for easier interpretation (Kaiser, 2016; Larson, 2013). Internal consistency reliabilities for total offending variety were desirable, with .88 across time points (The Pathways to Desistance Study, n.d.).

Independent Variable

Work Commitment. Work commitment was measured by total weeks worked across all community and under-the-table jobs. Due to the fact that the variable was positively skewed, it

was transformed by recoding the variable into a 7-level Likert-type scale (e.g., unemployment, 1-13 weeks, 14-26 weeks, 27-39 weeks, 40-47 weeks, 48-49 weeks, and more than 50 weeks). The recoding method is based on the range of weeks worked introduced in Acs, Wheaton, Enchautegui, and Nicholas (2014).

Mediating Variable

Substance Use. Substance use was measured by the average number of times of substance use (range: 0 to 8), including alcohol and illegal drugs, which was adapted from the Alcohol and Health Study at the University of Missouri (Chassin, Rogosch, & Barrera, 1991). Participants were asked in the recall period, 1. How many times you have been drunk?; 2. How many times have you used marijuana or hashish?; 3. How many times have you used sedatives or tranquilizers in the recall period?; 4. How many times have you used stimulants or amphetamines?; 5. How many times have you used cocaine (including powder, crack, free base, cocoa leaves, or paste)?; 6. How many times have you used opiates?; 7. How many times have you used ecstasy?; 8. How many times have you used hallucinogens to get high?; 9. How many times have you used inhalants to get high?; and 10. How many times have you used amyl nitrate, odorizers, or rush to get high? The study participants responded to a 9-level Likert-type scale anchored by not at all, 1 to 5 times, 6 to 11 times, 1 time per month, 2 to 3 times per month, 1 time per week, 2 to 3 times per week, 4 to 5 times per week, and every day. In terms of internal consistency reliability, the 10-item scale for all substance use showed moderate internal consistency at each time point (Cronbach's $\alpha = .58$, mean inter item $r = .29$ for 60 months; Cronbach's $\alpha = .50$, mean inter item $r = .19$ for 72 months; and Cronbach's $\alpha = .61$,

mean inter item $r = .29$ for 84 months). The average inter-item correlations at each time point were in the range of .19 to .29, which is considered as an indicator for an acceptable level of consistency (Clark & Watson, 1995). To make a meaningful interpretation, the scores were rounded to the nearest whole number. To minimize the impact of outliers, the most extreme scores were converted to the same values of the next most extreme scores, as suggested by Kline (2011).

Control Variables

The current study includes several control variables collected at baseline, 60, 72, and 84 month follow ups, which are potentially correlated with the constructs in the model, based on empirical studies (e.g., Cernkovich & Giordano, 1992; Johnson, 2004; Pyrooz, Decker, & Webb, 2010). It is important to control for family characteristics, including socioeconomic status (SES) and the number of family members arrested or jailed. As an indicator of SES, a parental Index of Social Position (ISP) was chosen since the index was computed based on both education and occupation of the biological mother and father (Hollingshead, 1957). Both self and collateral-reported parental occupation and education were coded using a 7-point scale ranging from 1 (higher executives, proprietors, major professionals; professional degree) to 7 (unskilled employees; less than seven years of school). The ISP was computed based on the formula $(\text{Occupation score} \times 7) + (\text{Education score} \times 4)$ (Hollingshead, 1971). The individual parent ISP score was not computed when neither the occupation nor the education for the parent were given. In addition to this, juveniles' characteristics such as age, gender (0 = male, 1 = female), race (1 =

non-Hispanic Whites, 2 = Non-Hispanic Blacks, and 3 = Hispanics), and gang involvement (0 = no, 1 = yes) were included as controls.

Among control variables, age, and gang involvement were time variant variables collected from 60, 72, and 84 month follows-ups like the major study variables (antisocial behavior, work commitment, and substance use related variables), whereas parental SES, race, and gender, were treated as time invariant variables since they were collected only from the baseline.

4.1.5 Hypotheses

Based on an extensive review of the theory and literature, the following research hypotheses highlight the major areas of examination.

Hypothesis #1: Within the theoretical framework of Sampson and Laub (1993, 2003), it is noted that the quality of social bonds leads to criminal desistance. Therefore, *it is expected that higher work commitment will predict decreases in antisocial behavior over time, after controlling for relevant variables.*

Hypothesis #2: According to previous literature, it is predicted that higher work commitment reduces the level of substance use (Brown & Montoya, 2009; Webster et al., 2014) and less (or non) drug users are less likely to commit crimes than (heavier) drug users (Bennett et al., 2008). Thus, *substance use will mediate the relationship between work commitment and antisocial behavior, with those who have higher work commitment having lower substance use, which will decrease antisocial behavior over time.*

Hypothesis #3: Based on previous literature, it is noted that engaging in offending behavior among people of color will be reduced once they secure stable employment (Haynie et al., 2008); people of color are less likely to become involved in drug use than Whites (Kakade et al., 2012; Welty et al., 2016); and employment facilitates even less substance use among minorities than Whites (Johnson, 2004). The findings from these studies allow for the premise that people of color with high work commitment tend to abstain more from substance use, which may result in lower offending behavior. Therefore, *the magnitude of the substance use mediated relationship between work commitment and antisocial behavior will be stronger among people of color than Whites, such that people of color who have higher work commitment and lower substance use would show less antisocial behaviors than their counterparts.*

4.1.6 Analytic Strategies

Univariate, Bivariate, and Multivariate Analyses

In this stage, univariate and bivariate analyses for all variables were conducted. In bivariate analyses, for the time-variant variables, a Friedman test and Cochran's Q test were utilized to examine whether study variables exhibit significant change over time. Group differences (Whites vs. Blacks vs. Hispanics) for work commitment and variety scores for antisocial behavior were examined through a Kruskal-Wallis test. A chi-square test was conducted to compare the racial differences of gang involvement. Additionally, correlations among study variable across time points were analyzed.

Multivariate regression analyses were then primarily conducted to examine to what extent work commitment is related to antisocial behavior. Since longitudinal panel data, in which individuals were observed at multiple points, was utilized to do this, a random effects model was conducted to investigate the effect of work commitment on antisocial behavior, after controlling for covariates. Random effects model is known as one of the basic models for the analysis of panel data (Schmidheiny, 2016). The analysis of the model was conducted using Stata version 15.

Structural Equation Modeling (SEM): Advantages of a Structural Equation Model

Approach

The mediation model, which is a causal model, is used to test the hypotheses in the current study. To test the mediation model, two methods are commonly used: Standard multiple regression and structural equation modelling (SEM). Traditionally, multiple regression has been used to estimate mediation effects (Kenny, 2016; Preacher & Hayes, 2004). However, the current study will utilize an autoregressive model based on a SEM approach, since there are more advantages of using SEM over multiple regression. There are four major advantages of SEM, including 1) the simultaneous nature of the indirect and direct effects, 2) more precision with smaller standard errors than regression, 3) a way to control for measurement error, and 4) the advanced treatment for missing data (Buhi, Goodson, & Neilands, 2007; Gunzler, Chen, Wu, & Zhang, 2013; Iacobucci, Saldanha, & Deng, 2007; McCoach, Black, & O'Connell, 2007).

First, SEM is designed to test complicated mediation models in a single analysis that provides a convenient way of interpretation and estimation by simplifying the testing of

mediation hypothesis (Gunzler et al., 2013). In other words, it allows for all variables in the model to be investigated in one step (Buhi et al., 2007; Gunzler et al., 2013; McCoach et al., 2007), whereas multiple regression requires multiple steps to test for mediation.

Related to this simultaneous estimation of all parameters, the second advantage of SEM over regression is that it allows researchers to reduce standard errors (Iacobucci et al., 2007). Iacobucci and colleagues (2007), who investigated and compared SEM and regression found smaller standard errors for SEM than in regression. This is due to the SEM approach fitting all parameters in a single analysis, which is always statistically superior (Iacobucci et al., 2007). Hence using SEM is preferred since the method consistently detects more powerful precision of mediation effects (Iacobucci et al., 2007).

The third advantage of using SEM is related to handling incomplete data (Buhi et al., 2007; Morizot & Blanc, 2007). All statistical methods are subject to issues with missing data because of poor handling, which can cause bias in estimates, standard errors, and statistics (Allison, 2003). SEM provides sophisticated missing data techniques such as full-information maximum likelihood (FIML) that allows researchers to efficiently handle the issue over conventional methods such as list-wise or pair-wise deletion leading to the underestimation of standard errors (Allison, 2003; Buhi et al., 2007).

Autoregressive Mediation Model

Within the SEM context, in this study, a full autoregressive mediation model with three time points will be utilized to assess the level of work commitment and substance use as predictors of antisocial behavior. Autoregressive mediation models are a type of path analysis to

test longitudinal relations among variables (e.g., X, M, and Y) that requires at least three or more time points (Lockhart, MacKinnon, & Ohlrich, 2011). Autoregressive mediation models assume that the values of certain variables measured at earlier time points would influence the values of variables at a future time point (Bentley, 2011). The basic three-time point autoregressive mediation models involve one variable measured at three-time points for a set of individuals (Bentley, 2011). At the same time, the stability of the measures is assessed over time (Lockhart et al., 2011). Such stability is also referred to as an autoregressive effect (Geiser, 2013).

Stability is a core concept of the autoregressive model, which refers to “some degree of rank-order correlation over time” (Maxwell & Cole, 2007, p.24) or “the extent to which the mean of a measure is the same across time” (MacKinnon, 2008, p.195). Thus, the autoregressive model also focuses on examining such stability of individual differences from T to T+1 (Selig & Little, 2012). Small coefficients or those close to zero indicate there are substantial changes in individual differences, whereas large coefficients mean there is relatively little change in individual differences over time (Selig & Little, 2012). In other words, variable X measured at time point one may be likely to correlate with the same variable measured at time point two; if the correlation is large, then the variable X is stable, regardless of the substantial change of average score (i.e., mean) of such variable (Maxwell & Cole, 2007). With regards to this, individual differences in growth (or intra-individual change) are not modeled in the autoregressive mediation models, indicating that the models focus on interindividual change (Bentley, 2011; Lockhart et al., 2011). Therefore, autoregressive mediation models are appropriate when the variables related to research questions are relatively stable over time (i.e., no significant amount of change over time; Bentley, 2011; Lockhart et al., 2011).

This study followed the combined three-wave models outlined by MacKinnon (2008) to investigate the autoregressive mediation model within the SEM context. First, the effects two waves apart were considered since the model used three waves. Second, the stability (i.e., individual change) denoted by s_1 , s_2 , and s_3 in Figure 3 was measured with the relations between the same variable over time (i.e., X_1 to X_2 to X_3 ; M_1 to M_2 to M_3 ; Y_1 to Y_2 to Y_3). Third, only longitudinal relations were included in the model (i.e., X_1 to M_2 to Y_3). Fourth, covariances among the variables at T_1 were included. Fifth, contemporaneous (cross-sectional) mediation relations among X , M , Y at T_2 and T_3 were nested in the longitudinal mediation model described in the first four steps. Lastly, a longitudinal relationship between X_1 and Y_3 was specified. Then, four cross-lagged relations among variables were included (i.e., M_1 to X_2 , Y_1 to M_2) as literature on the relations highlighted such possible relationships; that is, reverse directions between work commitment and substance use and between substance use and criminal offending may be possible. As MacKinnon (2008, pp. 204-205) explained, “the direction of relations among X , M , Y were all free to vary.”

In terms of the mediational effects, estimating the product of a_1 and b_2 reflecting the temporal order was a primary concern of the current study. Along with the longitudinal mediational effects, this study was also interested in the cross-sectional mediational effects at each time point (i.e., the product of a_3 and b_3 at T_2 and the product of a_4 and b_4 at T_3). For the direct effects, a longitudinal direct effect presented as c'_3 and two contemporary direct effects including c'_4 and c'_5 specified in Figure 3 were major interesting points for the current study.

Subgroup Analyses

Subgroup comparisons was conducted to determine whether the substance use-mediated relationships between work commitment and antisocial behavior will vary according to race. The primary model of this was estimated by separating the model for Whites, Blacks, and Hispanics. That is, separate path coefficients in the final model was estimated for Whites, Blacks, and Hispanics, respectively.

SEM analyses were conducted using the *Mplus* version 8 (Muthén & Muthén, Los Angeles, CA). The fit of the models to the data will be evaluated using various indices such as the chi-square goodness of fit statistic, the standardized root mean square residual (SRMR), the root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI). Good model fit will be indicated by non-significant (or a small) chi-square value, an SRMR below .05, an RMSEA less than .06, both CFI and TLI above .90 (Bentley, 2011; Geiser, 2013; Hu & Bentler, 1999). Since major study variables violated the normality assumption, model fit was estimated by maximum likelihood estimation with robust standard errors (MLR) in *Mplus*.

Normality Issue

The shape of the dependent variable at each time point in this study violated the assumption of normal distribution, which displayed serious skewness. The Shapiro-Wilk test was used to assess normality ($p < .001$). The cause of the non-normal sampling distribution of the dependent variable at each time point is that the variable strongly had floor effects (i.e., left censored or censored from below at zero). Alternative to this situation when the normal theory

approach is not possible is bootstrap resampling procedures, which is robust to non-normality (Mallinckrodt, Abraham, Wei, & Russell, 2006; Muthén, Muthén, & Asparouhov, 2016). Since the products of a and b are often violated the normality assumption, bootstrapping method is recommended in order to obtain a non-symmetric confidence interval for testing statistical significance of mediational effects (Geiser, 2013; Mallinckrodt et al., 2006; Muthén et al., 2016). If the confidence interval at either 95 percent or 99 percent does not cover zero, it indicates the mediational effect is significant. Therefore, cross-checking the traditional significant test (i.e., *p*-value) with the bootstrapping confidence interval is necessary.

Multicollinearity and Singularity

A variance inflation factor (VIF) that is greater than 2.5 and low tolerance indicate a possible problem with the multicollinearity/singularity with those variables. At each time point, it was identified that there was no concern for VIF since it was less than 2.5. In addition, there were no condition indices greater than 30 and at least two of the variance proportions were greater than .50. Therefore, the tolerance, VIF, and collinearity diagnostic values met the assumptions.

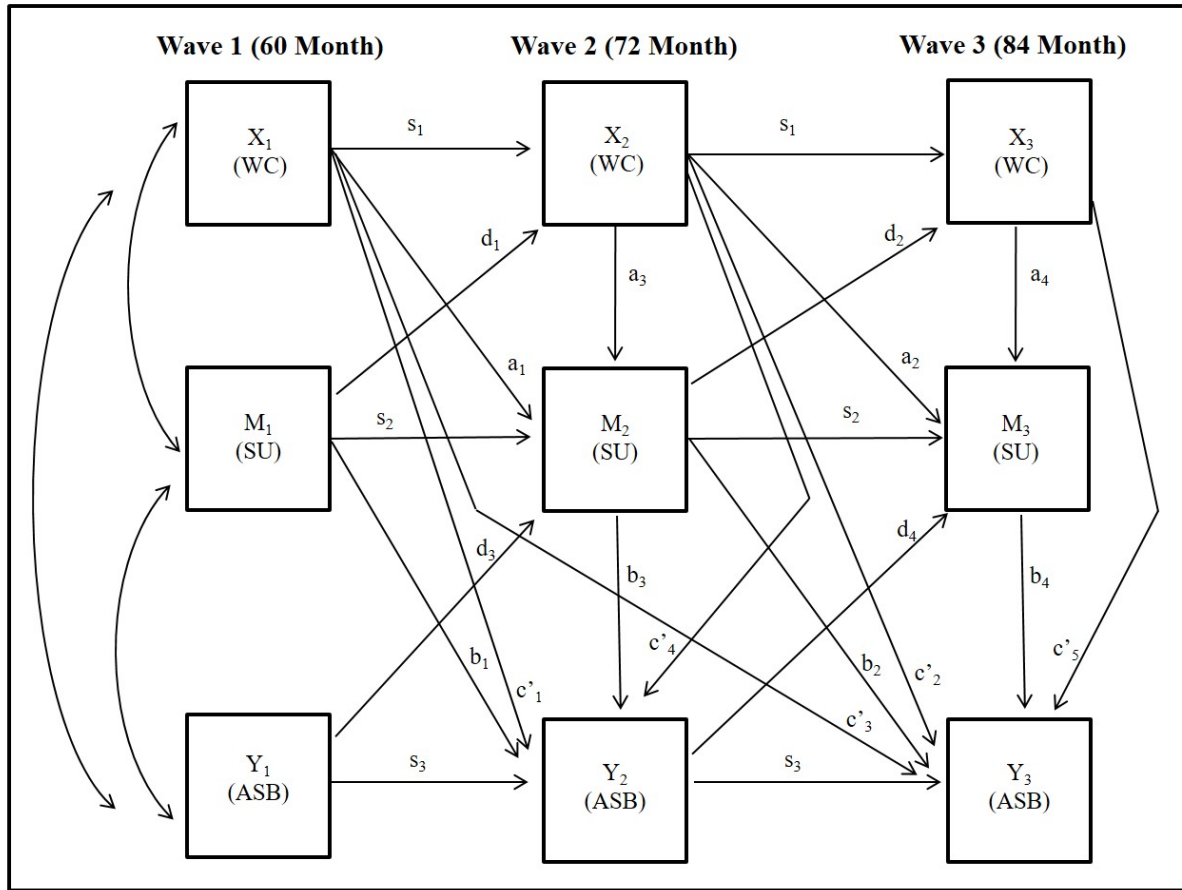
Missing Data

Data from the Pathways to Desistance Study provides relatively lower missing rates than other longitudinal panel data sets. For example, in the major study variables, the missing rates of the total offending variety scores were 11.7 percent at 60 months, 13.7 percent at 72 months, and 16.8 percent at 84 months. The missing rates of the number of total weeks worked across

community and under-the-table jobs displayed similar total offending variety scores, as in 11.6 percent at 60 months, 13 percent at 72 months, and 16.4 percent at 84 months. For the missing rate of substance use, the number of times of substance use presented 11.8, 13.7, and 17 percent at each time point. Missing rates in major study variables are quite low when it comes to the nature of a longitudinal panel study; however, it is necessary to address the substantial rate of missing data among the variables to produce unbiased estimates.

In the current study, full-information maximum likelihood (FIML) estimations handle missing data to obtain less biased estimates, compared to traditional methods for handling missing data, such as listwise deletion and multiple imputation (Allison, 2012). Although the dependent variable violated the normality assumption, using FIML is rational since the bootstrapping method to construct asymmetric CIs is computed by only FIML (or ML in *Mplus*). In addressing missing data, FIML is efficient since the estimation has minimum sampling variance (Allison, 2012). It also assumes that the missing pattern of data should be missing completely at random (MCAR) or at least missing at random (MAR). Even if the missing patterns of data are not assumed as MCAR or MAR, estimating FIML to handle missing data often produces less biased estimates when the missing rates display relatively low (Pardini, Loeber, & Stouthamer-Loeber, 2005; Schafer & Graham 2002).

Figure 3. Three-Wave Autoregressive Mediation Model



Note. (X) WC: Work commitment; (M) SU: Substance use; (Y) ASB: Antisocial behavior.

5.0 CHAPTER FIVE

5.1 RESULTS

5.1.1 Univariate and Bivariate Analyses

Table 1 displays the descriptive statistics for major study variables, including antisocial behavior, work commitment, and substance use. The means and standard deviations (*SD*) for antisocial behavior ranging from 0 to 19 were 1.30 (*SD* = 2.37) at 60 months (*T*₁), 1.11 (*SD* = 2.00) at 72 months (*T*₂), and 1.01 (*SD* = 1.90) at 84 months (*T*₃). The means for work commitment ranging from 0 to 60 weeks were 17.83 (*SD* = 20.14) at 60 months, 20.70 (*SD* = 20.78) at 72 months, and 20.47 (*SD* = 21.59) at 84 months. For the current study, a nonparametric Friedman test of repeated measures were conducted to evaluate whether major study variables exhibit significant differences over time. The Friedman test, known as a nonparametric alternative to the one-way ANOVA with repeated measures, is appropriate when data distributions violate the assumption of normality. As presented in Table 1, the Friedman test indicated there was no evidence of significant change over time in the dependent variable (antisocial behavior, $\chi^2(2) = 4.11, p > .05$) and mediator (number of times of substance use, $\chi^2(2) = 1.02, p > .05$, $\chi^2(2) = 1.76, p > .05$, $\chi^2(2)$

= .17, $p > .05$, respectively). The Friedman test presented a significant amount of change over time in independent variables (work commitment), $\chi^2(2) = 8.79$, $p < .01$.

Table 1. *Descriptive Statistics for Major Study Variables*

					Nonparametric Test for Repeated Measures
	<i>N</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	Friedman Test
Antisocial Behavior (Range: 0-22)					
T ₁	1,138	0-19	1.30	2.37	$\chi^2(2, N = 819) = 4.11$
T ₂	1,113	0-13	1.11	2.00	
T ₃	1,072	0-14	1.01	1.90	
Work Commitment (Range: 0-60)					
T ₁	1,140	0-60	17.83	20.14	$\chi^2(2, N = 831) = 8.79^{**}$
T ₂	1,121	0-60	20.70	20.78	
T ₃	1,078	0-60	20.47	21.59	
Substance Use					
Number of Times of Substance Use (Range: 0-8)					
T ₁	1,137	0-8	.49	.63	$\chi^2(2, N = 818) = 1.02$
T ₂	1,113	0-4	.50	.57	
T ₃	1,070	0-7	.50	.65	

Note. $^{**}p < .01$.

T₁: 60 months; T₂: 72 months; T₃: 84 months.

Table 2 shows the descriptive statistics for control variables, such as gang involvement, age, and parental SES. At 60 months, 5.9 percent of respondents reported they had been involved in gang activity. The percentage of gang involvement reduced as time went by, as in 5.1 percent at 72 months and 4.9 percent at 84 months. The proportions of the gang involvement among participants at each time point were .07, .06, and .06, respectively. The results from the nonparametric Cochran's Q test, which is used for binary variables that are repeatedly measured to evaluate the differences of the proportions, suggested there was not a statistically significant change in the proportion of gang involvement across time points, $\chi^2(2) = .54, p > .05$. Additionally, the mean ages were 21, 22, and 23 at each time point, respectively. The mean and standard deviation of parental SES ($M = 51.39, SD = 12.26$) from the baseline were also reported in Table 2.

Table 2. *Descriptive Statistics for Control Variables*

								<i>Nonparametric Test for Repeated Measures</i>
	<i>N</i>	No (%)	Yes (%)	Proportion	Range	<i>M</i>	<i>SD</i>	<i>Cochran's Q Test</i>
Gang Involvement								
T ₁	1,148	1,072 (83.2)	76 (5.9)	.07				$\chi^2 (2, N = 845) = .54$
T ₂	1,121	1,055 (81.8)	66 (5.1)	.06				
T ₃	1,076	1,013 (78.6)	63 (4.9)	.06				
Age								
T ₁	1,151				18-24	21.01	1.15	
T ₂	1,123				20-25	22.02	1.15	
T ₃	1,079				20-26	23.03	1.15	
Parental SES								
BL	1,281				11-77	51.39	12.26	

Note. BL: Data collected from the baseline.

Table 3 shows descriptive information about racial differences with regards to antisocial behavior and work commitment. The mean antisocial behavior among Whites was slightly higher than Blacks and Hispanics, except at 72 months. Since the assumption of normality was violated, a Kruskal-Wallis test was conducted to determine whether these differences were statistically significant. Results of the test indicated there were no statistically significant differences among means by race at each time point, $H(2) = 1.34, p > .05$ at 60 months, $H(2) =$

.71, $p > .05$ at 72 months, and $H(2) = .06$, $p > .05$ at 84 months. For work commitment, the mean number of total weeks worked among Whites was higher than their counterparts, except at 60 months. However, results from the Kruskal-Wallis test identified that there were no statistically significant differences among means by race at each time point, $H(2) = 1.62$, $p > .05$ at 60 months, $H(2) = 4.11$, $p > .05$ at 72 months, and $H(2) = 1.00$, $p > .05$ at 84 months.

Table 3. *Descriptive and Bivariate Statistics for Racial Comparison of Antisocial Behavior and Work Commitment*

	Race	<i>N</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	Kruskal-Wallis Test
Antisocial Behavior (Range: 0-22)						
T ₁	White	256	0-14	1.41	2.23	$\chi^2 (2, N = 1,138) = 1.34$
	Black	452	0-19	1.33	2.65	
	Hispanic	430	0-14	1.22	2.13	
T ₂	White	242	0-12	1.04	1.80	$\chi^2 (2, N = 1,113) = .71$
	Black	481	0-13	1.17	2.09	
	Hispanic	390	0-12	1.07	2.02	
T ₃	White	226	0-12	1.04	1.92	$\chi^2 (2, N = 1,072) = .06$
	Black	469	0-14	.98	1.86	
	Hispanic	377	0-11	1.03	1.94	
Work Commitment (Range: 0-60)						
T ₁	White	256	0-60	16.55	20.25	$\chi^2 (2, N = 1,140) = 1.62$
	Black	454	0-56	18.49	19.99	
	Hispanic	430	0-60	17.89	20.23	
T ₂	White	244	0-60	22.97	21.04	$\chi^2 (2, N = 1,121) = 4.11$
	Black	486	0-60	19.78	20.67	
	Hispanic	391	0-60	20.42	20.72	
T ₃	White	228	0-60	21.99	21.60	$\chi^2 (2, N = 1,078) = 1.00$
	Black	469	0-60	20.15	22.03	
	Hispanic	381	0-60	19.95	21.03	

Descriptive and bivariate statistics on racial differences for substance use are displayed in Table 4. The mean of the number of times of substance use among Blacks was slightly higher than Whites and Hispanics at 60 and 72 months. At 84 months, the mean among Hispanics was

slightly higher than other races, but there were no statistically significant differences among means by race at each time point, $H(2) = 4.97, p > .05$ at 60 months, $H(2) = 1.98, p > .05$ at 72 months, and $H(2) = 2.40, p > .05$ at 84 months.

Table 4. *Descriptive and Bivariate Statistics for Racial Comparison of Substance Use*

	Race	<i>N</i>	Range	<i>M</i>	<i>SD</i>	Kruskal-Wallis Test
Number of Times of Substance Use (Range: 0-8)						
T ₁	White	255	0-4	.51	.61	$\chi^2 (2, N = 1,137) = 4.97^\dagger$
	Black	452	0-8	.53	.70	
	Hispanic	430	0-4	.43	.55	
T ₂	White	242	0-4	.50	.58	$\chi^2 (2, N = 1,113) = 1.98$
	Black	481	0-3	.51	.57	
	Hispanic	390	0-4	.47	.56	
T ₃	White	225	0-4	.47	.61	$\chi^2 (2, N = 1,070) = 2.40$
	Black	468	0-7	.48	.63	
	Hispanic	377	0-6	.55	.69	

Note. $^\dagger p < .10$.

To compare the racial differences of gang involvement, chi-square test was conducted as presented in Table 5. There was not enough evidence to suggest an association between race and gang involvement at each time point, $\chi^2(2) = 2.30, p > .05$ at 60 months, $\chi^2(2) = 1.73, p > .05$ at 72 months, and $\chi^2(2) = 1.03, p > .05$ at 84 months. Regarding the parental SES, there were no statistically significant differences among means by race, $H(2) = .04, p > .05$, according to the Kruskal-Wallis test.

Table 5. *Descriptive and Bivariate Statistics for Racial Comparison of Gang Involvement and Parental SES*

	Race	<i>N</i>	No (%)	Yes (%)	Range	<i>M</i>	<i>SD</i>	
Gang Involvement								Chi-square Test
T ₁	White	239	218 (91.2)	21 (8.8)				$\chi^2(2) = 2.30$
	Black	500	470 (94)	30 (6)				
	Hispanic	409	384 (93.9)	25 (6.1)				
T ₂	White	242	229 (94.6)	13 (5.4)				$\chi^2(2) = 1.73$
	Black	487	462 (94.9)	25 (5.1)				
	Hispanic	392	364 (92.9)	28 (7.1)				
T ₃	White	227	214 (94.3)	13 (5.7)				$\chi^2(2) = 1.03$
	Black	468	437 (93.4)	31 (6.6)				
	Hispanic	381	362 (95)	19 (5)				
Parental SES								Kruskal-Wallis Test
	White	271			22-77	51.27	12.79	$\chi^2(2, N = 1,281) = .04$
BL	Black	558			18-77	51.49	11.94	
	Hispanic	452			11-77	51.34	12.34	

Note. BL: Baseline.

Table 6 shows the correlations among all the study variables at 60, 72, and 84 months. Since the study variables were not normally distributed, Spearman's rho, which is robust to outliers (Mukaka, 2012), was used to measure the strength of association of the variables at each time point (Hauke & Kossowski, 2011). Work commitment and antisocial behavior were significantly and negatively correlated at each time point, $\rho = -.06, p < .05$ at 60 months, $\rho = -.08, p < .05$ at 72 months, and $\rho = -.09, p < .01$ at 84 months. Work commitment and substance use were significantly and positively correlated at each time point, $\rho = .14, p < .001$ at 60 months, $\rho = .15, p < .001$ at 72 months, and $\rho = .21, p < .001$ at 84 months. Substance use and antisocial behavior were significantly and positively correlated at each time point, $\rho = .45, p < .001$ at 60 months, $\rho = .47, p < .001$ at 72 months, and $\rho = .43, p < .001$ at 84 months.

In addition, gang involvement at 60 months was significantly and positively correlated with gang involvement at 72 months, $\rho = .10, p < .01$. Gang involvement and work commitment were significantly and negatively correlated at 72 and 84 months, $\rho = -.16, p < .001$ and $\rho = -.13, p < .01$, respectively. Gang involvement and antisocial behavior was also significantly and positively correlated at 72 and 84 months, $\rho = .20, p < .001$ and $\rho = .20, p < .001$, respectively. Gang involvement was significantly and positively correlated with substance use only at 72 months, $\rho = .10, p < .01$.

Table 6. *Correlations among All Study Variables (Estimated by Spearman's Rho)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 T ₁ WC	1																		
2 T ₁ SU	.14***	1																	
3 T ₁ ASB	-.06*	.45***	1																
4 T ₁ Age	.02	.03	-.01	1															
5 T ₁ Gang	-.001	-.02	-.01	.00	1														
6 T ₂ WC	-.03	-.10**	-.04	-.002	.003	1													
7 T ₂ SU	-.04	-.05	-.02	.01	-.01	.15***	1												
8 T ₂ ASB	-.001	-.01	.02	.01	.03	-.08*	.47***	1											
9 T ₂ Age	.03	-.03	.02	-.04	.02	-.01	.003	-.04	1										
10 T ₂ Gang	.01	.02	.01	-.02	.10**	-.16***	.10**	.20***	.03	1									
11 T ₃ WC	-.01	-.01	.01	.05	.02	.02	-.01	-.01	.03	-.06[†]	1								
12 T ₃ SU	-.02	.02	.02	-.01	.002	.04	-.01	-.03	.01	-.02	.21***	1							
13 T ₃ ASB	-.03	.01	.01	-.06[†]	-.02	.004	-.04	-.05	.02	.01	-.09**	.43***	1						
14 T ₃ Age	-.09**	-.03	.01	-.02	-.003	.05	-.01	-.02	.01	.02	.03	-.003	-.05	1					
15 T ₃ Gang	-.02	.01	.04	-.03	-.05	.02	-.01	-.03	-.06[†]	-.001	-.13**	.04	.20***	.03	1				
16 SES	.01	-.05	-.04	-.03	-.01	.04	.04	.02	.02	-.01	-.02	.01	-.04	.04	-.03	1			
18 Sex	.02	-.04	-.02	-.02	.03	-.04	.02	.02	.02	.03	.03	.03	.02	-.03	-.004	-.06*	1		
18 Black	.02	.04	-.03	.06[†]	-.02	-.04	.04	.02	-.01	-.03	-.01	-.03	.00	-.04	.03	.003	.03	1	
19 Hispanic	.02	-.06[†]	.01	-.02	-.02	-.002	-.04	.02	-.01	.04	-.01	.05	-.01	.05[†]	-.03	.002	.01	-.65***	1

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. WC: Work Commitment; SU: Number of Times of Substance Use; ASB: Antisocial

Behavior.

5.1.2 Multivariate Analysis

Research Question #1: *To what extent is work commitment related to antisocial behavior?*

Hypothesis #1: *It is expected that higher work commitment will predict decreases in antisocial behavior, after controlling for relevant variables.*

A longitudinal panel analysis with a random effects model, using robust standard errors to deal with the violation of the normal distribution of the dependent variable, was first conducted to examine the association between work commitment and antisocial behavior, after controlling for substance use and other control variables. Prior to estimating the random effects model for this study, a Hausman test was conducted to determine whether fixed or random effects was appropriate. According to the results of the Hausman test, the random effects model was more appropriate than the fixed effects model, $\chi^2(9) = 13.45, p = .14$. In Stata, the robust standard errors can be used with full-information maximum likelihood (Williams, Moral-Benito, & Allison, 2016), which is efficient due to minimum sampling variance, to handle missing values (Allison, 2012). Consistent with Sampson and Laub's theory of social bonds, which is the main theme of their age-graded informal social control theory (1993, 2003), work commitment had a significant effect in reducing antisocial behavior after controlling for covariates, including substance use across time points. As displayed in Table 7, the variety scores of antisocial behavior decreased by .12 point for each 1-unit increase in work commitment, $b = -.12, SE = .02, p < .001$. Regarding substance use, the variety scores of antisocial behavior increased by 1.45

points for each 1-time increase in the number of times of substance use, $b = 1.45$, $SE = .08$, $p < .001$.

The results of some control variables used in these analyses were consistent with expectations. For example, literature points out age is important in predicting negative antisocial behavior (Lageson & Uggen, 2013; Sampson & Laub, 1993; Uggen, 2000). The random effects model as shown in Table 7 depicted that as age increased, antisocial behavior decreased. That is, those who were older earned a variety of scores of antisocial behavior that were .06 points lower than those who were younger, $b = -.06$, $SE = .03$, $p < .05$. Individuals who reported gang involvement were more likely to commit antisocial behavior ($b = 1.03$, $SE = .19$, $p < .001$). Other control variables such as race, gender, and parental SES were not significant on antisocial behavior. Turning to lagged regressions, the estimated effects on antisocial behavior became negative, but were not significant in two year, $b = -.13$, $SE = .09$, $p > .05$ and three year lagged work commitment, $b = -.15$, $SE = .10$, $p > .05$.

Although the random effects estimates confirmed findings from the previous studies on the relationship between work commitment and criminal behavior, these results should be cautiously interpreted given the relatively small effect size (i.e., $ICC = .0836$). That is, work commitment and other control variables explained only approximately 8.36% of the variance in antisocial behavior.

Table 7. *A Longitudinal Panel Analysis of the Effect of Work Commitment on Antisocial Behavior: A Random Effects Regression Model (N = 1,289)*

Predictors	Coefficients	Robust SE
<i>Time Variant</i>		
Work Commitment	-.12***	.02
# of Times of Substance Use (SU)	1.45***	.08
Age	-.06*	.03
Gang Involvement (1 = Yes)	1.03***	.19
<i>Time Invariant (Predictors from the baseline)</i>		
Parental SES	-.002	.003
Sex (1 = Female)	-.03	.09
Black	.003	.08
Hispanic	-.02	.09
<i>Time-Lagged Variables</i>		
Two Year Lag	-.13	.09
Three Year Lag	-.15	.10

Note. * $p < .05$, *** $p < .001$

5.1.3 SEM Analysis

An autoregressive mediation model within the SEM context was conducted to examine the substance use-mediated relationship between work commitment and antisocial behavior while

adjusting for demographic control variables. As indicated in Table 8, there was a significant difference between the observed and model covariance matrices in the base conceptual model, Satorra-Bentler Scaled (*S-B*) χ^2 (24) = 303.66, $p < .001$. The base model provided a poor model fit to the data, standardized root mean residual (SRMR) = .07, root mean square error of approximation (RMSEA) = .10 (90% CI: .09, .11), comparative fit index (CFI) = .49, and Tucker-Lewis index (TLI) = .29. Again, small and insignificant chi-square values at .05 level, the SRMR below .05, the RMSEA less than .06, CFI and TLI above .90 are generally considered a good fit (Bentley, 2011; Geiser, 2013; Hu & Bentler, 1999). However, there was an improvement of the model by adding omitted paths, and the revised final model provided a good model fit to the data: There was no significant difference between the observed and model covariance matrices in the final model, *S-B* χ^2 (10) = 4.43, $p = .93$, SRMR = .01, RMSEA = .00 (90% CI: .00, .01), and both CFI and TLI = 1.00. In a chi-square difference test for the Satorra-Bentler scaled chi-square, $\Delta\chi^2$ in the final model was significant, indicating that the larger model with more freely estimated parameters, therefore with fewer degrees of freedom, fit the data better than the smaller model (Schermelele-Engel & Müller, 2003). This result confirmed the revised final model was appropriate.

Table 8. *Model Fit Information for Each Estimated Model*

Model	Absolute			SRMR	Parsimonious	Incremental		<i>S-B</i> $\Delta\chi^2$	Δdf	<i>p</i>
	<i>S-B</i> χ^2	<i>df</i>	<i>p</i>		RMSEA (90% CI)	CFI	TLI			
M1 (Baseline autoregressive model)	303.66	24	< .001	.07	.10 (.09 - .11)	.49	.29	-	-	-
M2 (Longitudinal paths from work commitment to substance use to antisocial behavior and substance use to antisocial behavior added)	304.16	18	< .001	.07	.11 (.10 - .12)	.47	.05	1.91	6	= .93
M3 (Cross-sectional mediational paths at T ₂ and T ₃ added)	71.61	17	< .001	.03	.05 (.04 - .06)	.90	.81	192.28	1	< .001
M4 (Final model: Cross-lagged paths from substance use to work commitment and antisocial behavior to substance use added)	4.43	10	= .93	.01	.00 (.00 - .01)	1.00	1.00	68.75	7	< .001

Note. Model fit was estimated by MLR.

Before conducting a mediation model, the analysis was extended to include the same hypothesized direct effect within the context of the longitudinal SEM model, based on the findings from the random effects model with panel data. As shown in Figure 4 and Table 9, the longitudinal SEM model found work commitment at T₁ was negatively associated with antisocial behavior at T₃, but this was not significant, $\beta = -.02, p > .05$. However, in contemporary relations between work commitment and antisocial behavior, which were nested in the longitudinal autoregressive mediation model, individuals with more work commitment had lower antisocial behavior compared to those who had less work commitment (i.e., a direct effect: $\beta = -.15, p < .001$ at T₂, $\beta = -.12, p < .001$ at T₃) at each time point, which was consistent with the results from the random effects model controlling for substance use. The magnitude of the direct effects at each time point decreased compared to the magnitude of the total effects (i.e., a total effect: $\beta = -.10, p < .01$ at T₂, $\beta = -.07, p < .01$ at T₃), which met the criteria of causal steps described by Baron and Kenny (1986).

5.1.4 Mediation Model

Research Question #2: *To what extent does substance use mediate the relationship between work commitment and antisocial behavior?*

Hypothesis #2: *Substance use will mediate the relationship between work commitment and antisocial behavior, with those who have higher work commitment having lower substance use, which will decrease antisocial behavior.*

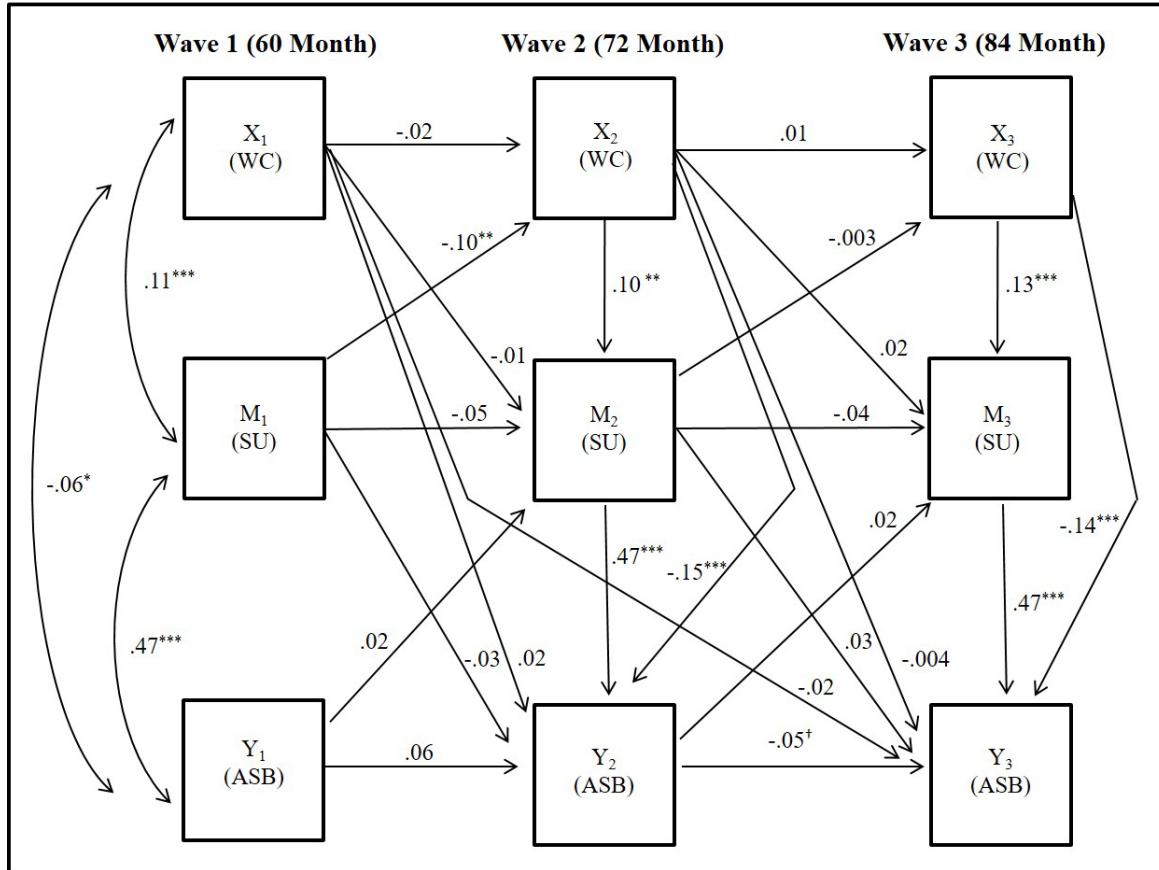
Mediational tests calculated by the Sobel test, which was the default in *Mplus*, was conducted for all samples. Unexpectedly, there was no evidence of a longitudinal mediated effect between work commitment at T₁ and antisocial behavior at T₃ through the presence of substance use at T₂, $\beta = .00, p > .05$. However, in contemporary mediation relations, which were nested in the longitudinal autoregressive mediation model, work commitment was associated with higher levels of antisocial behavior through the presence of substance use (i.e., an indirect effect: $\beta = .05, p < .01$ at T₂, $\beta = .05, p < .001$ at T₃). In other words, people with higher work commitment were more likely to engage in substance use ($\beta = .03, p < .01$ at T₂, $\beta = .04, p < .001$ T₃) and engaging in substance use tended to increase antisocial behavior ($\beta = 1.44, p < .001$ at T₂, $\beta = 1.30, p < .001$ at T₃). As presented in Table 9, about two percent of the variability of substance use was explained by work commitment at T₂ and T₃. Approximately 24 percent of the variability of antisocial behavior at T₂ was explained by work commitment and substance use at the same time point. Additionally, about 23 percent of the variability of antisocial behavior at T₃ was explained by work commitment and substance use at the same time point. This observation of indirect effect indicated that the effect was partially mediated by substance use. The results of the 95 percent bootstrap confidence interval and the *p*-value agreed with each other as shown in Table 10.

Besides these, the model allowed for some possible cross-lagged relations (e.g., M to X, Y to M) based on the literature (Badel & Greaney, 2013; CDAR, 2007; Uggen & Shannon, 2014) to capture the longitudinal changes within the factors. By allowing the cross-lagged relations, the direction of relations among X, M, and Y are all free to vary (MacKinnon, 2008).

Even though the model with the cross-lagged relations violates the temporal precedence of X to M to Y, it is useful to estimate the possible cross-lagged relations among study variables (MacKinnon, 2008). About two percent of the variability of work commitment at T₂ was explained by substance use at T₁. There was a significant longitudinal effect of substance use on work commitment, such that substance use at T₁ statistically significantly predicted work commitment at T₂, $\beta = -.32, p < .01$. That is, people with more substance use at T₁ was associated with less work commitment at T₂. Substance use at T₂ was also negatively associated with work commitment at T₃, but this result was not significant, $\beta = -.01, p > .05$.

Figure 4. Path Analyses (Final Model Adjusting for Control Variables)

Full model



Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. In the path diagram, standardized coefficients are presented.

Table 9. *Statistics of Each Path (Adjusting for CVs)*

Path	<i>B</i>	<i>z</i>	β	<i>z</i>	<i>R</i> ²
T ₂ Work \leftarrow T ₁ Work	-.02	-.51	-.02	-.51	.02
T ₂ Work \leftarrow T ₁ SU	-.10**	-3.36	-.32**	-3.33	
T ₃ Work \leftarrow T ₂ Work	.01	.43	.02	.43	.01
T ₃ Work \leftarrow T ₂ SU	-.003	-.08	-.01	-.08	
T ₂ SU \leftarrow T ₁ Work	-.01	-.28	-.003	-.28	.02
T ₂ SU \leftarrow T ₂ Work	.10**	3.34	.03**	3.38	
T ₂ SU \leftarrow T ₁ SU	-.05	-1.29	-.05	-1.27	
T ₂ SU \leftarrow T ₁ ASB	.02	.55	.01	.55	
T ₃ SU \leftarrow T ₂ Work	.02	.70	.01	.70	.02
T ₃ SU \leftarrow T ₃ Work	.13***	4.29	.04***	4.47	
T ₃ SU \leftarrow T ₂ SU	-.04	-1.23	-.05	-1.22	
T ₃ SU \leftarrow T ₂ ASB	.02	.62	.01	.62	
T ₂ ASB \leftarrow T ₁ Work	.02	.67	.02	.68	.24
T ₂ ASB \leftarrow T ₂ Work	-.15***	-6.05	-.15***	-5.73	
T ₂ ASB \leftarrow T ₁ SU	-.03	-.67	-.08	-.66	
T ₂ ASB \leftarrow T ₂ SU	.47***	18.32	1.44***	13.89	
T ₂ ASB \leftarrow T ₁ ASB	.06	1.36	.05	1.32	.23
T ₃ ASB \leftarrow T ₁ Work	-.02	-.65	-.02	-.64	
T ₃ ASB \leftarrow T ₂ Work	-.004	-.13	-.003	-.13	
T ₃ ASB \leftarrow T ₃ Work	-.14***	-5.52	-.12***	-5.34	
T ₃ ASB \leftarrow T ₂ SU	.03	1.10	.10	1.09	
T ₃ ASB \leftarrow T ₃ SU	.47***	15.84	1.30***	10.95	
T ₃ ASB \leftarrow T ₂ ASB	-.05 [†]	-1.86	-.05 [†]	-1.87	

Note. [†] $p < .10$, ** $p < .01$, *** $p < .001$.

Table 10. *Results of Total, Direct, and Indirect Effects (N = 1,289)*

Longitudinal analysis	β (95% Bootstrap CI)
Indirect effect via substance use at T ₂	.00 (-.004, .003)
Direct effect	-.02 (-.07, .04)
Total effect	-.02 (-.07, .03)
Contemporary analyses	
Indirect effect via substance use (T ₂)	.05** (.02, .07)
Direct effect	-.15*** (-.20, -.10)
Total effect	-.10** (-.16, -.05)
Indirect effect via substance use (T ₃)	.05*** (.03, .08)
Direct effect	-.12*** (-.17, -.08)
Total effect	-.07** (-.12, -.02)

Note. ** $p < .01$, *** $p < .001$. If the CI of total, indirect, and direct effects covers zero, the coefficient is insignificant; if zero is not within the interval, then the effect is significant.

5.1.5 Subgroup Analyses

Research Question #3: *Does the substance use mediated relationship between employment quality and antisocial behavior vary across race?*

Hypothesis #3: *The magnitude of the substance use mediated relationship between work commitment and antisocial behavior will be stronger among people of color (Black or Hispanic) than Whites, such that people of color who have higher work commitment and lower substance use would show less antisocial behaviors than their White counterparts.*

Racial subgroup analyses were conducted to investigate whether there were differences in the results of mediational analysis depending on race. In order to do this, a mediational model with the total sample was separately run for each race (White, Black, and Hispanic). As displayed in Table 11, there was no significant difference between the observed and model covariance matrices in the revised final model for all races, $S-B \chi^2_{White} (10) = 5.76, p = .84$, $S-B \chi^2_{Black} (10) = 5.24, p = .88$, and $S-B \chi^2_{Hispanic} (10) = 5.60, p = .85$. The final model provided a good model fit to the data, $SRMR_{White} = .02$, $SRMR_{Black} = .01$, and $SRMR_{Hispanic} = .01$; $RMSEA_{White} = .00$ (90% CI: .00, .04), $RMSEA_{Black} = .00$ (90% CI: .00, .02), and $RMSEA_{Hispanic} = .00$ (90% CI: .00, .03); and both CFI and TLI = 1.0 for all races.

Table 11. *Subgroup Analyses: Model Fit Information for Each Estimated Model*

Model	Absolute			SRMR	Parsimonious	Incremental	
	<i>S-B</i> χ^2	<i>df</i>	<i>p</i>		RMSEA (90% CI)	CFI	TLI
White	5.76	10	= .84	.02	.00 (.00 - .04)	1.00	1.00
Black	5.24	10	= .88	.01	.00 (.00 - .02)	1.00	1.00
Hispanic	5.60	10	= .85	.01	.00 (.00 - .03)	1.00	1.00

Note. Model fit was estimated by MLR.

As found in the mediational test for the total sample, there were no significant longitudinal mediational and direct effects among different races, as shown in Table 12 and Figures 5, 6, and 7. In contemporary analyses, individuals with more work commitment had significantly lower antisocial behavior compared to those who had less work commitment among different races; except for Hispanics at 72 months (i.e. a direct effect: $\beta_{White} = -.23, p < .001, \beta_{Black} = -.13, p < .05, \beta_{Hispanic} = -.05, p > .05$ at 72 months; $\beta_{White} = -.15, p < .01, \beta_{Black} = -.09, p < .05, \beta_{Hispanic} = -.20, p < .001$ at 84 months). However, work commitment was significantly associated with higher levels of antisocial behavior through the presence of substance use only for Blacks at .05 (i.e., an indirect effect: $\beta_{White} = .06, p = .08, \beta_{Black} = .07, p < .05, \beta_{Hispanic} = .04, p = .07$ at 72 months; $\beta_{White} = .05, p = .06, \beta_{Black} = .05, p < .05, \beta_{Hispanic} = .04, p = .11$ at 84 months). Specifically, African-Americans with higher work commitment were

more likely to engage in substance use ($\beta_{Black} = .03, p < .05, \beta_{Black} = .04, p < .05$, respectively) and engaging in substance use tended to increase antisocial behavior ($\beta_{Black} = 2.12, p < .001, \beta_{Black} = 1.41, p < .001$, respectively) at each time point. As detected in the analysis of the total sample, this effect was also partially mediated by substance use among African-Americans. The results of the 95 percent bootstrap confidence interval agreed with the p -value as presented in Table 12.

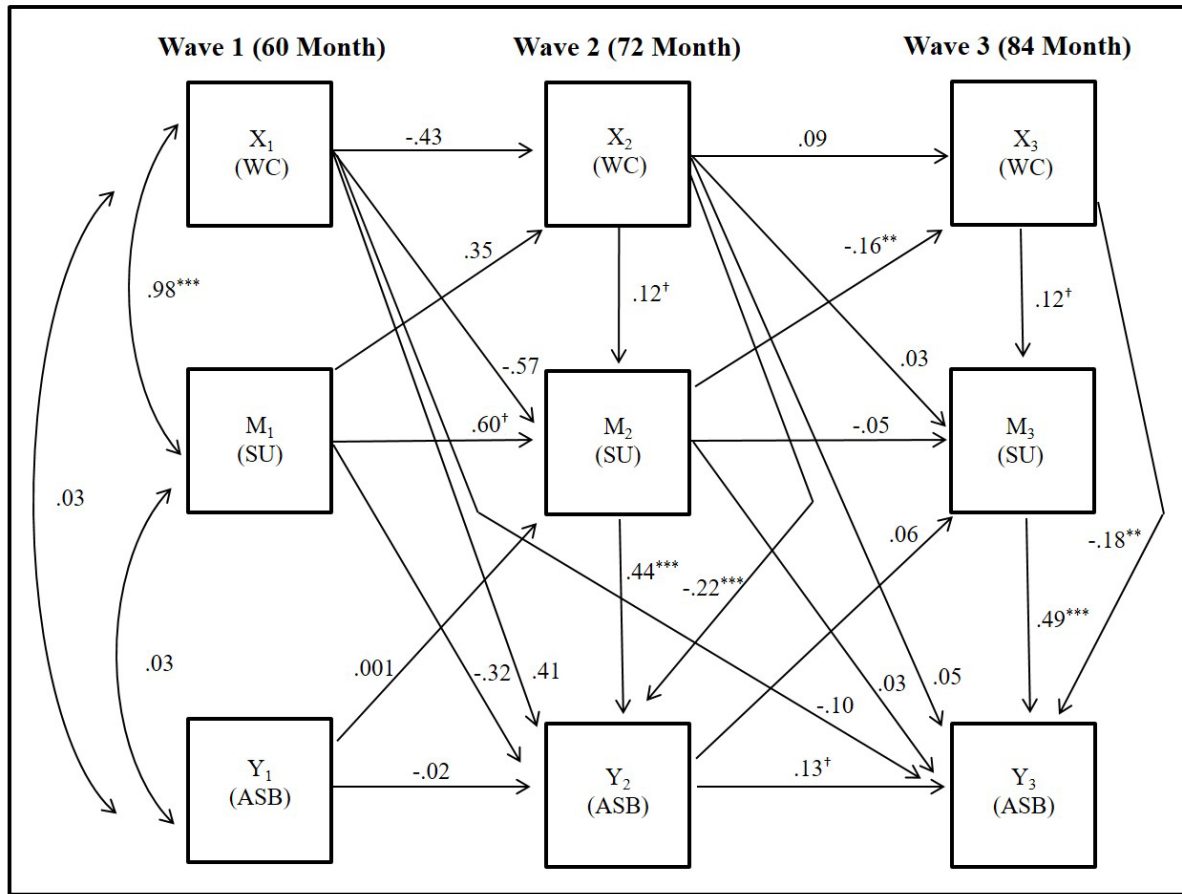
Table 12. *Subgroup Analyses: Results of Total, Direct, and Indirect Effects (N = 1,289)*

Longitudinal analysis	β		
	White (n = 274)	Black (n = 561)	Hispanic (n = 454)
	(95% Bootstrap CI)	(95% Bootstrap CI)	(95% Bootstrap CI)
Indirect effect via substance use at T ₂	-.002 (-.01, .01)	-.001 (-.01, .004)	.00 (-.004, .01)
Direct effect	-.01 (-.02, .01)	.004 (-.01, .01)	.003 (-.01, .01)
Total effect	-.01 (-.03, .01)	.01 (-.01, .02)	.003 (-.01, .01)
Contemporary analyses			
Indirect effect via substance use (T ₂)	.06 [†] (-.01, .13)	.07* (.01, .15)	.04 [†] (-.002, .09)
Direct effect	-.23*** (-.35, -.12)	-.13* (-.24, -.03)	-.05 (-.14, .04)
Total effect	-.18** (-.30, -.06)	-.06 (-.17, .06)	-.01 (-.11, .09)
Indirect effect via substance use (T ₃)	.05 [†] (-.001, .01)	.05* (.01, .10)	.04 (-.01, .08)
Direct effect	-.15** (-.24, -.06)	-.09* (-.17, -.003)	-.20*** (-.29, -.11)
Total effect	-.10* (-.20, -.003)	-.04 (-.13, .06)	-.16** (-.25, -.07)

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. If the CI of total, indirect, and direct effects covers zero, the coefficient is insignificant; if zero is not within the interval, then the effect is significant.

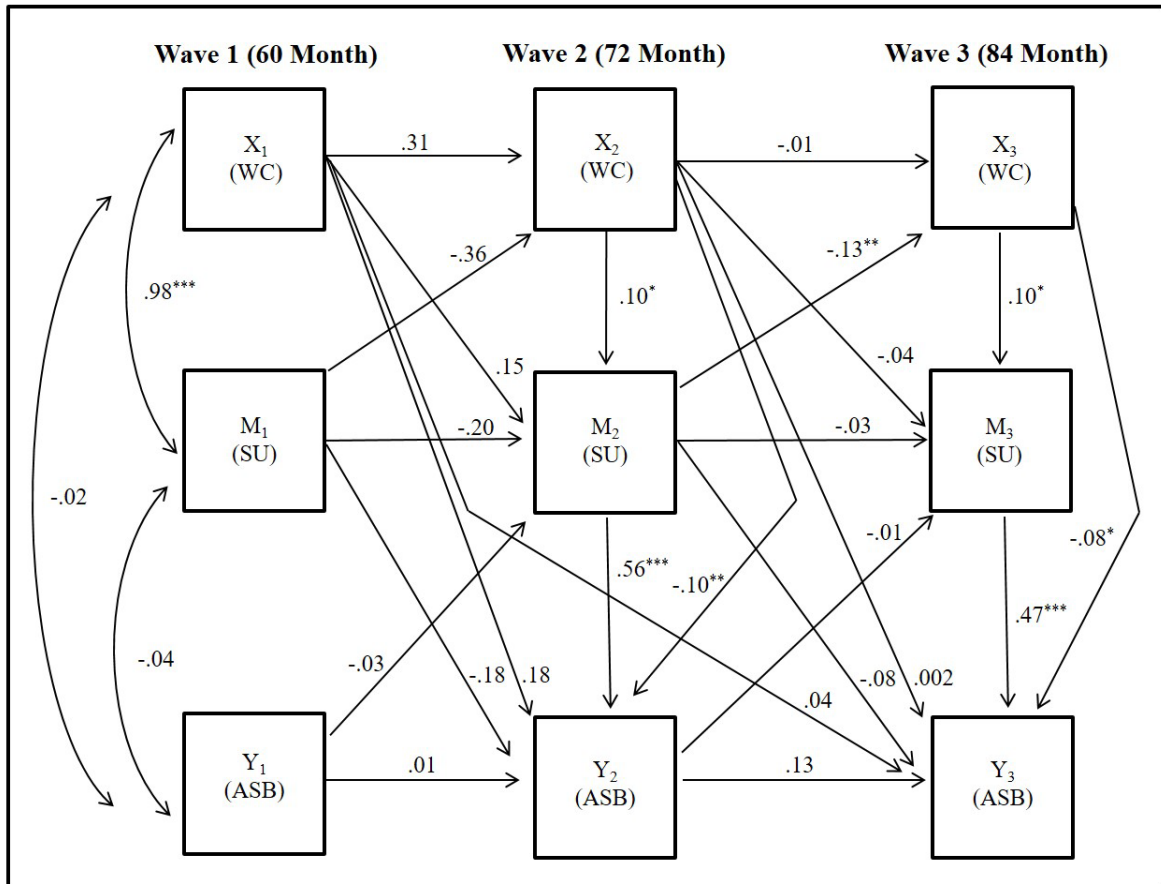
In sum, there were no differences in contemporary mediational effects among race in terms of direction, which was in contrast to the current study's hypothesis on racial differences in mediational effects. Such mediational effects were significant at .05 for only Blacks; the mediational effects for Whites and Hispanics were marginally significant at .10. For the direct effects, the results for all races were significantly consistent with the analysis for the total sample, except for Hispanics at T₂ ($\beta_{Hispanic} = -.05, p > .05$), which supported the impact of work commitment on reducing antisocial behavior as the theory premised. These results should be cautiously interpreted since the subgroup analyses were only conducted by separately analyzing the same model according to race; the analyses did not cover any evidence of statistical differences of the coefficients among races.

Figure 5. Subgroup Analysis of Whites



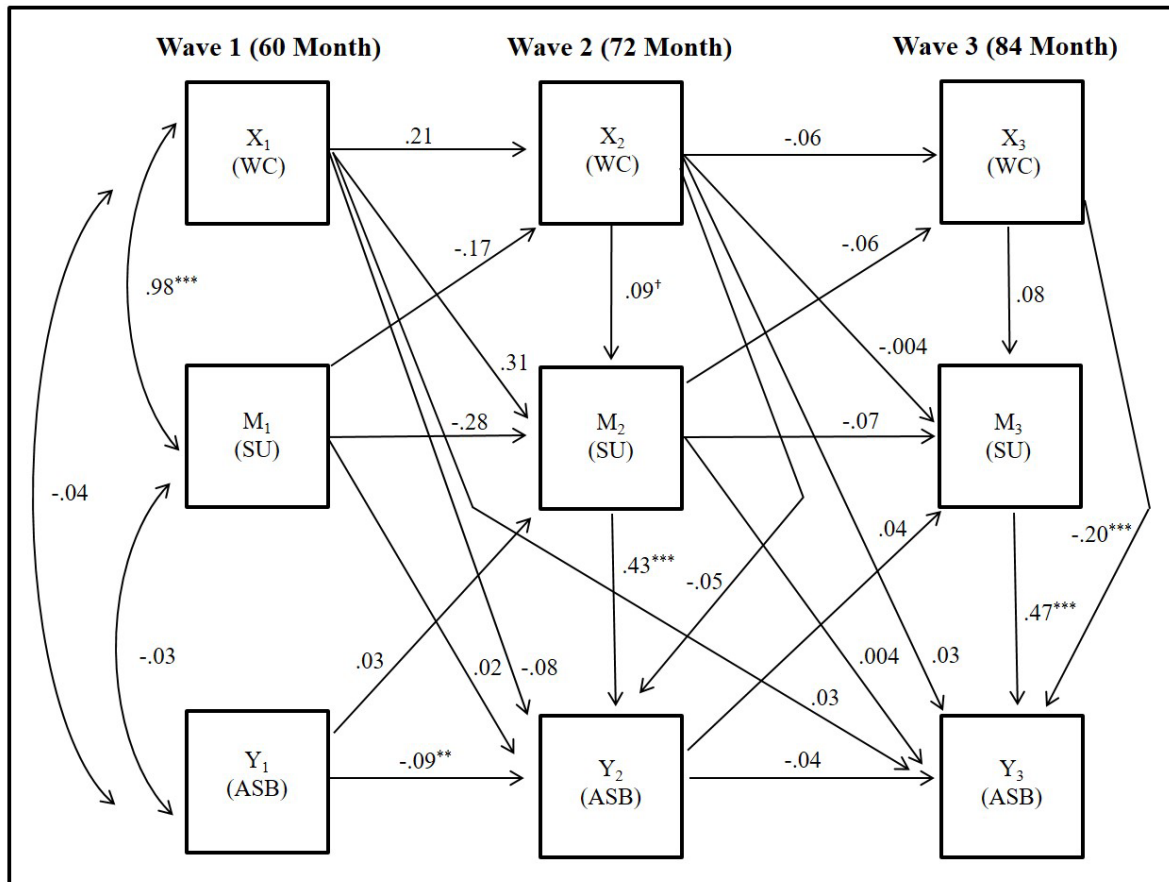
Note. [†] $p < .10$, ^{**} $p < .01$, ^{***} $p < .001$. In the path diagram, standardized coefficients are presented.

Figure 6. *Subgroup Analysis of Blacks*



Note. * $p < .05$, ** $p < .01$, *** $p < .001$. In the path diagram, standardized coefficients are presented.

Figure 7. Subgroup Analysis of Hispanics



Note. [†] $p < .10$, $**p < .01$, $***p < .001$. In the path diagram, standardized coefficients are presented.

6.0 CHAPTER SIX

6.1 DISCUSSION

This study is designed to examine the association between work commitment and antisocial behavior and the substance use mediated relationship between the two factors as well as racial differences in the mediated relationship, using an autoregressive mediation model based on the idea that “previous behavior is the best predictor of present behavior” (Geiser, 2013, p.126). This study unpacked the social bond theory, developed by Sampson and Laub (1993/2001) in order to develop a series of hypotheses. As Laub and Sampson (2003) highlighted, the basic premise of the examination is that employment is an important adult social bond to help people desist from criminal offending behavior. But, when it comes to the modern-day prevalence of illicit drug use, which had not been widely available in samples of Gluecks’ data (1950, 1968) upon which Laub and Sampson (2003)’s theory was built, substance use should be importantly considered to examine to what extent it interplays with the relationship between work and offending/antisocial behavior. This study was also prompted to formulate a question on racial differences in the mediated analysis given racial disparities in the labor market, substance use, and criminal offending behavior. To examine the direct effect of work commitment on antisocial behavior, the current study first utilized a random effects model with panel data and extended the same

hypothesis to both longitudinal and contemporary SEM models. The study used data from the three most recent waves of the Pathways to Desistance study looking at 1,289 juveniles convicted of felonies who had become young adults by the time follow-up data was collected at 60 (T₁), 72 (T₂), and 84 (T₃) months.

An important contribution of the current study is to extend the understanding of the role of work commitment as a social bond in lessening antisocial behavior among young adults who had been serious juvenile offenders and the role of substance use in the association. In contrast to the hypothesis, however, this study revealed that the presence of substance use can result in the inverse of the direction of antisocial behavior predicted by work commitment. That is, work commitment significantly increases the level of antisocial behavior based on the level of substance use. This may imply that the positive effect of work commitment on antisocial behavior could be eclipsed by substance use. These relationships revealed in the contemporary analysis are also found in the subgroup analyses, which are in contrast to the study's hypothesis on racial differences of the substance use mediated relationship between the two factors. Such mediated relationships are a bit stronger among African-American young adults at 72 months; the magnitudes were almost the same among Whites and African-Americans at 84 months. However, the coefficients are significant only for African-Americans at the .05 level at both time points. Given these results, no racial differences were found in terms of the direction and magnitude of the mediated relationship. The magnitude and direction of the mediated relationship by race present a similar pattern as found in the model for all samples. Yet, all significant findings were limited to contemporary mediations that merely showed the mediated

effect at one point in time, and did not significantly extend to a longitudinal mediation using time lags.

6.1.1 Work Commitment and Antisocial Behavior

Policymakers, practitioners, and the general public who are concerned about the successful reentry of formerly incarcerated people profoundly believe that employment is an essential component to counter crimes (Lageson & Uggen, 2013). As anticipated, the results clearly supported the notion and the study's hypothesis about the role of work on reducing antisocial behavior, after controlling for substance use and demographic covariates, which were evidenced in both the random effects model and contemporary SEM mediation model (i.e., direct effects). Particularly, the random effects model provided evidence that age was effective in reducing antisocial behavior as suggested previous studies (Sampson & Laub, 1993; Lageson & Uggen, 2013; Uggen, 2000). The difference to the previous studies addressing the role of age was that such studies reported work would be effective in decreasing offending behavior for young adults over the age of 25 than adults transitioning from adolescents to young adulthood ranging from 18 to 25 (Sampson & Laub, 1993; Lageson & Uggen, 2013; Uggen, 2000). In the current study, the average age of the samples ranged from 21 to 23 across time points, meaning the random effects model confirmed work commitment had an effect on reducing antisocial behavior for emerging adults ages 18 to 25. Yet, the findings should be cautiously interpreted, as the effect size of work commitment on antisocial behavior was small; they were not consistently significant in the longitudinal model, as presented in the path from work commitment at T₁ to antisocial behavior

at T₃. This will be discussed later in the context of uncorrelation among the major study variable across time points.

Although the magnitude was small, when it comes to the findings from the cross-sectional models, work might guide individuals to lead prosocial lives and help them keep conventional norms, which in turn results in less antisocial behavior, consistent with the theory and previous studies on social bonds (see, for example, Nally et al., 2014; National Research Council, 2007; Savolainen, 2009; Van Der Geest, Bijleveld, & Blokland, 2011). Therefore, work might be a good predictor of desistance from crimes, particularly for young people who have been in contact with the criminal justice system. Although the random effects model and the contemporary SEM analysis provided evidence that once individuals committed to work, it might help them promote their ability to desist from antisocial behavior, this study did not identify major challenges to being employed. As revealed by some studies like Pager (2003), Bushway (2004), Bushway and Sweeten (2007), or Graffam, Shinkfield, and Hardcastle (2008), finding jobs and securing commitment to the jobs are difficult among people with criminal histories. That is, entering the labor market with a criminal record is still considered the biggest challenge. Therefore, future study needs to further investigate how and to what extent individuals with criminal histories gain employment and make meaningful connections to work. When examining this extended topic, pre-existing conditions such as education levels and mental health status, which were not adjusted for in this study, should be controlled to more accurately explain the effect of work commitment on antisocial behavior.

Additionally, the employment data of this study did not fully reflect the true meaning of work commitment. First my justification of this to conceptualize work commitment is in line

with the chosen theory's assumptions of “why people work and why people commit crimes” (Wadsworth, 2006, p.343). As the theory premises, the more people work, the more they become committed, allowing them to develop strong social bonds. Second, follow-up data from the baseline of the Pathways to Desistance study provides continuous employment variables measured only by weeks worked in community and under-the-table jobs. As stated earlier, this continuous measure was recoded into a 7-level Likert-type from zero to more than 50 weeks to account for skewness. Yet, operationalizing work commitment with weeks worked across community and under-the-table jobs may oversimplify the concept since the way to measure work commitment merely reflects the length of work. Put differently, it may not be sufficient in capturing the true variations of work commitment. This highlights that it is necessary for future studies to fully reflect the multidimensional elements of work commitment, such as work enjoyment, adherence to personal work ethics, work contributions to establish individual life goals, fulfillment stemming from work, and so forth (Hayday, 2002).

Community jobs and under-the-table jobs were combined for the following reasons. First, previous studies consistently point out informal work contributed to establishing a negative relationship between work and criminal offending behaviors (Apel, Bushway, Brame, Haviland, Nagin, & Paternoster, 2007; Bushway, 2011). Second, the exclusion of under-the-table jobs would likely result in the current study missing individuals who had only worked in these types of jobs. Even though this strategy was based on literature and employed to minimize the loss of sample size of those who reported weeks worked, our employment data did not provide any information about the types of under-the-table jobs. This study assumes that including under-the-

table jobs rather than only community jobs may better depict the challenge faced by formerly incarcerated young adults of securing legitimate jobs.

6.1.2 Work Commitment on Antisocial Behavior Through Substance Use

In general, the results were in contrast to the hypothesis about the influence of work commitment on antisocial behavior factoring in substance use. This study hypothesized if young people have higher work commitment, then they will have lower substance use, which will decrease antisocial behavior. However, work commitment was associated with higher levels of antisocial behavior through the presence of substance use. As mentioned earlier, literature is divided on the effect of employment on substance use. On one side, some studies argue that employment is effective in lowering substance use (Arkinson et al., 2003; Brown & Montoya, 2009; SAMHSA, 2014). The opposite camp states earned income from employment facilitates access to substances (CDAR, 2007; Uggen & Shannon, 2014). It is evident that the results of the path from work commitment to substance use in this study supports the latter interpretation of the relationship between work and substance use. Regarding this path, many related studies, particularly focusing on juveniles, have provided consistent findings (Johnson, 2004; Kaestner, Lo Sasso, Callison, & Yarnoff, 2013; Paschall, Flewelling, & Russell, 2004; Osilla, Hunter, Ewing, Ramchand, Miles, & D'Amico, 2013; Wu, Schlenger, & Galvin, 2003). For example, in a recent cross-sectional study, Osilla and her colleagues (2013) examined the association between work intensity and substance use using data from at-risk youths who were referred to a diversion program between 2008 and 2011. They found the more the youth worked, the more they used illicit substances

after controlling for demographic characteristics. Another recent study done by Kaestner and his colleagues (2013) using the 1997 cohort of the National Longitudinal Survey of Youth and Monitoring the Future survey also supported these findings by reporting that hours of work were positively associated with alcohol and tobacco use.

The focus on juveniles in the above studies might imply that the deterrence effect of work on substance use would be stronger among adults than juveniles transitioning to young adults. Earlier explanations of the role of work experience among juveniles suggested they would benefit from work since young people could learn a sense of responsibility in terms of earning income and being supervised by adult employees (Uggen & Wakefield, 2008). However, Uggen and Wakefield (2008) demonstrate the work effect is mostly limited to adults because if adolescents are exposed to too much work, it may likely negatively affect school performance and impact their sense of aspiration, which appears to increase behavioral problems (Bachman & Schulenberg, 1993; Uggen & Wakefield, 2008). This may be a rational justification for the contrasting yields to the hypothesis of work commitment decreasing substance use for those who just entering young adulthood or transitioning from juveniles to young adults. As Uggen and Wakefield (2008) delineated, for many working at-risk youth, employment could function as a gateway to using illicit substances (Wu et al., 2003). This can potentially be explained by several factors, including relationships with adult employees who had an early initiation of substance use (learning from them); substance use as a byproduct of psychosocial difficulties derived from heavy work commitment in terms of time investment or stress; earning income allowing easier access to substances (Wu et al., 2004). Given that these factors are widely known as possible

explanations of the path of work to substance use, the sample in this study might have followed similar experiences in transitioning into young adulthood.

Overall, the partial mediational results (i.e., young people with high work commitment were more likely to use substances and having substance use tended to increase antisocial behavior) of this study indicate that when we are framed by certain aspects of the theory (i.e., structural factors such as social bonds) to investigate potential factors related to criminal desistance, researchers might lose insight into projecting an accurate picture of the issue. Although Sampson and Laub's theory highlights that social bonds like employment are concrete mechanisms of external restraints of individual behaviors, they may overemphasize the structural factors on reducing criminal behavior (Barry, 2013). As a matter of fact, Sampson and Laub (2003) once pointed out their theoretical limitations. They explained that in developing their framework, they had utilized the Gluecks' data, which was comprised of sample populations born in Boston between 1922 and 1929, who had spent their young adulthoods during a time when alcohol abuse was pervasive, but hard drugs such as cocaine and heroin were not common as in the present day. Thus, this study's analysis suggests that the factors affecting intrapersonal conditions (i.e., substance use problems) should not be ignored when investigating personal criminal desistance using Sampson and Laub's theory of social bonds. This would be aligned with Maruna (1999)'s critique on the structural theory explaining the criminal desistance process, that without considering such subjective matters (i.e., personal motivations to use illicit substances, internal conflicts between self-regulation through work commitment and substance use, etc.), an argument that being employed leads individuals with criminal histories to desist from crime may be weak. The findings from this study may support this aspect. Therefore, in

order to address the limitations revealed in this study using the structural theory on criminal desistance, future study needs to further examine the effect of work on substance use using a nationally represented sample. In addition, it may be helpful to add other conceptual models to more fully understand criminal desistance (Bottoms, Shapland, Costello, Holmes, & Muir, 2004; Crank, 2014; Giordano et al., 2002; LeBel et al., 2008) to ask and answer the question how personal commitment and motivation can be combined with structural resources to promote desistance from crime (Barry, 2013).

To sum up, while the findings were not consistent in both the longitudinal and cross-sectional results, the evidence illustrates, based on the results from the contemporary analyses, while employment as social bonds has been considered the dominant pathway to criminal desistance, the effect of employment as a deterrent of antisocial behavior may be diminished depending on the level of substance use. This implies there needs to be a more nuanced study by tapping into both structural and subjective theories assume regarding the process of criminal desistance (e.g., examining personal commitment and motivations combined with structural conditions) to better understand criminal desistance. To validate this explanation, future research should highlight personal and structural determinant factors affecting substance use as well as interactions within the two theories.

6.1.3 Complex Relationship between Work Commitment and Substance Use

Besides the findings of the main research questions, an interesting aspect identified by this study was the relationship between work commitment and substance use. Such an association was

tested by adding cross-lagged paths from substance use to work commitment. Including the cross-lagged paths was not only based on previous studies related to the work-substance use association, but also represented an additional goal of the autoregressive model that tries to explain individual differences not explained by the autoregressive effects (i.e., stability coefficients) through exogenous variables (Geiser, 2013). As a result, a path from substance use (T) to changes in work commitment one year later (T + 1) was significant for all samples. That is, individuals who engaged in more substance use at T₁ significantly predicted lower work commitment at T₂. Similar results were found in subgroup analyses but were different at various time intervals, such that people with more substance use at T₂ were associated with lower work commitment at T₃; but these results were significant for Whites and Blacks.

The results support previous studies like that of Badel and Greaney (2013), which showed drug abuse as a primary factor for individuals' unstable work conditions. They also found a causal effect of unstable job conditions on drug abuse, in that persons exposed to unemployment due to drug abuse increased their use of illegal drugs (Badel & Greaney, 2013). However, this explanation was not supported in this study; this study found that people with more work commitment were associated with higher levels of substance use (i.e., paths a₃ and a₄). Thus, the impact of substance use on lower work commitment and impact of work commitment on higher substance use at both T₂ and T₃ signify the complex nature of the relationship between work and substance use. These results make it challenging to simply explain the work-substance use relationship. There is no easy answer as to what the results mean. Even though the cause-effect linkage here is not clear, substance use itself appears to be potentially an overwhelming factor since it seems that heavy substance users may seek out

alcohol or drugs regardless of their work commitment. Even though substance use leads people to have lower work commitment, people might have greater motivation to work to be able to afford illicit substances.

6.1.4 Racial Differences in the Mediated Relationship Between Work Commitment and Substance Use

Unexpectedly, the results from the current study did not find evidence to support racial differences in the substance use mediated relationship between work commitment and antisocial behavior. To examine this, the current study utilized the subgroup analyses by separately analyzing the model by race. Although statistical difference tests among race on the coefficients of the mediated relationship were not conducted (i.e., interaction effect) in these analyses, the current study identified the directions of paths a (work commitment to substance use) and b (substance use to antisocial behavior), and mediational effects were the same at each time point across race. Generally, race did not seem to be a key predictor of the mediated outcomes in this sample. As found in the model for the total sample, work commitment was associated with higher levels of antisocial behavior through the presence of substance use in all races; but this mediated relationship was statistically significant only for Blacks, which was in contrast to the hypothesis. It is unclear why there were contrasting results, but the current study is able to empirically address the potential reason for no differential mediated relationship among race only through the pattern of descriptive information. That is, it may be in the same vein as the results of the bivariate analyses, indicating there were no statistically significant differences on

means, SDs, and other frequencies of work commitment, substance use, antisocial behavior, and control variables, such as gang involvement and parental SES among races. This may indicate that this sample comprised of those convicted of felonies all had similar backgrounds, which may have been a factor in these outcomes due to the minimal variations among races. Otherwise, this study was not able to empirically account for the reason of why the findings contrasted the hypothesis.

Nevertheless, investigating racial differences in these relationships should be further studied. To accurately present the phenomena, we need to focus on racial differences and substance use, particularly related to the path from employment and substance use, for the following reasons. First, basically, many empirical studies like Welty and colleagues (2016) who delivered strong findings about racial/ethnic differences in the prevalence of substance use provide evidence that youth of color were less likely to use illicit substances compared to Whites. Second, when looking at Johnson (2004) for evidence of racial differences in the effect of long work hours on substance use, it is noted that the effect of work in increasing substance use is limited to Whites (Johnson, 2004). Given these studies, my hypothetical path is rational, stating that people of color who have higher work commitment and lower substance use would show less antisocial behaviors than their counterparts. Results contrasting with the hypothesis may be attributed to subtle different characteristics in samples drawn from different data (e.g., formerly incarcerated young adults from Phoenix and Philadelphia in this study, youth from a nationally represented sample such as the National Longitudinal Study of Adolescent Health in Johnson, 2004, and detained youth from Chicago in Welty et al., 2016). Therefore, further study

to shed light on the racial differences in work on substance use should be pursued to better understand criminal desistance among different races.

6.1.5 Possible Reasons for Failing to Detect Significant Effects over Time

The results from this study did not support longitudinal direct and mediational effects even with optimal time intervals between the measures (i.e., a one-year time interval elapsed for each variable from 60 months to 84 months; Cole & Maxwell, 2003). This may be attributed to a few possible reasons. First, to detect significant longitudinal mediation and direct effects, the stability representing “some degree of rank-order correlation over time” (Maxwell & Cole, 2007, p.24) had to be stable. The coefficient of the stability corresponds to a large correlation of variables across time points (Maxwell & Cole, 2007). Given the insignificant low correlation of each variable across time points for the current study, it could be said that work commitment, substance use, and antisocial behaviors were unstable. Therefore, a stability issue might have caused the failure to detect the expected longitudinal effects in the current study.

Additionally, if the stability coefficients were close to zero, then it would indicate there were substantial changes in the individual’s standings on the measure over time (Selig & Little, 2012). This is not directly related to the means and standardized deviations (SDs) of each measure (Maxwell & Cole, 2007). For example, in the current study, the means of work commitment at each time point were 17.83 weeks at T_1 ; 20.70 weeks at T_2 ; and 20.47 weeks at T_3 . A nonparametric Friedman test of repeated measures was conducted to evaluate whether the variable exhibited significant difference over time. Although there was a statistically significant

change over time in work commitment, there was little difference in work commitment, given the relative small means and standard deviations at each time point. Substance use (M) and antisocial behavior (Y) showed similar magnitudes of means and SDs with non-significant results from the Friedman test. Therefore, such a considerable change in the individuals' standings in each of the measures in the current study's sample over time (Selig & Little, 2012) might be considered a major statistical reason for failing to detect longitudinal effects as hypothesized.

Lastly, Kazdin (2003) points out censored data that have ceiling or floor effects can potentially pose problems in detecting the change in the dependent variable. Again, censored data refers to the fact that the scores of the dependent variable may reach an upper (ceiling) or lower (floor) limit (floor; Kazdin, 2003; Wooldridge, 2009). That is, this type of dependent variable may not allow additional changes to occur at the next time point due to this limit (Kazdin, 2003). Given this, the distribution of the dependent variable of the current study, which showed floor effects, may be another reason for the absence of longitudinal mediational effects in the current study.

As stated above, possible statistical reasons for the lack of longitudinal effects would be straightforward. However, it is more important to shed light on factors other than statistical accounts for future research. For example, no correlation among work commitment, substance use, and antisocial behavior across time points except substance use at T₁ and work commitment at T₂ were consistent with small or close to zero coefficients of stability, which yielded overall non-longitudinal direct and mediational effects within the SEM context. Scrutinizing and discerning why this happened would be more critical for the future study to project an accurate

picture of the phenomena. The question why this occurred might be clearly answered by non-statistical factors, including quality of measurement, time intervals to measure across waves, individual social-psychological status, and so forth. Particularly, one-year time intervals to measure each individual's standings may be too long for this sample (i.e., young people who were convicted), in spite of its optimality based on Cole and Maxwell (2003)'s suggestion. It is assumed that such criteria may be more appropriate for the general populations. Ultimately, this effort may relate to the other question of how and why a substantial reshuffling of the individuals' standings on the construct over time can be explained.

6.1.6 Limitations

There are several limitations to the current study. The most notable one in this study is related to data limitations. Even though this study utilizes longitudinal data allowing for the examination of temporal precedence to establish causation, longitudinal effects were mostly undetected (except for the path from substance use at T_1 to work commitment at T_2). Although the possible statistical reasons for this were discussed above (e.g., evidence of a substantial change of major study variables over time and no correlation among variables across time points), non-statistical factors have not been empirically accounted for. It would be especially more important to explore why individuals in the sample showed such substantial changes in each study variable, as evident from very small, close to zero stability coefficients, which disallowed for the use of the basic mechanism of the autoregressive mediation model (i.e., predicting future behavior from earlier ones, Geiser, 2013). Again, this highlights that when evidence of substantial change of

“the individuals’ standings on the construct over time” (Selig & Little, 2012, p. 266) are able to be identified, using the autoregressive mediation should be discouraged. Theoretically, under this condition, there would be a few ways to detect longitudinal mediational effects with the sample analyzed in the current study. For these reasons, unintendedly, most interpretations and implications for this study were discussed grounded by the findings from cross-sectional analyses, which were nested in the longitudinal model. Therefore, all findings should be cautiously interpreted since they did not allow to infer causality.

The second limitation is associated with the types of sub-models in SEM (i.e., latent variable vs. manifest model). One factor benefited from SEM would be the fact that the model is more useful than multiple regression to account for the measurement error (Blackwell, Honaker, & King, 2015; Preacher & Hayes, 2004). An important assumption of the mediation model is that there is no measurement error in the mediator (Baron & Kenny, 1986). The role of the measurement error in the mediation model that affects bias estimates of direct and indirect effects has been widely discussed (Blackwell et al., 2015; McCoach et al., 2007; Raykov & Penev, 1999; VanderWeele, Valeri, & Ogburn, 2012). This could be controlled by using a latent variable model by unequivocally adjusting for random measurement errors through the use of multiple indicators of latent variables at each time point (Bentley, 2011; Geiser, 2013). However, the current study only used the manifest model due to data issues, making it difficult to alleviate the measurement error, which might have led to biased estimation (Gunzler et al., 2013; McCoach et al., 2007).

The third limitation was the way of measuring work commitment. As previously discussed, work commitment was only measured by weeks worked across community and under-

the-table jobs due to data limitations. Future study should adopt a more solid way to operationalize work commitment that rigorously reflects the various dimensions of work, including personal life goals related to work, individuals' job satisfaction and so forth (Hayday, 2002). Particularly, employment needs to be separately measured as to whether it is paycheck-oriented or career-oriented jobs since an individual's work commitment would differ depending on the nature of the job.

The fourth was the limited use of control variables, which might be related to a possible confounding issue, particularly regarding preexisting conditions surrounding formerly incarcerated young adults. The current study mainly focused on changes in antisocial behavior predicted by the work commitment and substance use mediated relationship between the two factors, adjusting for basic demographic variables. Thus, other control variables related to potential preexisting conditions among such populations, including school orientation, education level, mental health and substance use related clinical scores need to be extensively controlled in order to come to a more solid conclusion. This may indicate that the findings of the current study need to be replicated. Other than statistical methods, matured and practical experimental designs are more appropriate to minimize the confounding effects (Pourhoseingholi, Baghestani, & Vahedi, 2012).

Fifth, substance use was analyzed as a mediator in the relationship between work commitment and antisocial behavior in the current study. Again, using substance use as a mediator in such an association was purely motivated by the question of whether the effect of work on reducing antisocial behavior still can hold true when substance use mediates the relationship between the two factors. However, it also needs to be considered as a moderator in

the association since different levels of substance use affect the direction and/or strength of the association (Baron & Kenny, 1986) between work commitment and antisocial behavior.

Including substance use as a moderator can be guided by the complexity of human behavior where “Individuals are not the same” (MacKinnon, 2011, p. 679).

Finally, several questionnaires used in the study were measured through self-reporting. Knight, Little, Losoya, and Mulvey (2004) empirically proved that Self-Reported Offending (SRO) produce good indicators of criminal or antisocial behaviors based on the confirmatory factor analyses and the construct validity test coefficients. Yet, other self-report responses to topics such as work commitment and substance use may have yielded biased estimates affected by social desirability. This may imply potential validity problems associated with it.

6.2 IMPLICATIONS

Despite these limitations, the findings of this study point to some notable implications for social policy, social work, and future research.

6.2.1 Social Policy on Criminal Desistance

Based on previous studies consistently pointing out that informal social control through employment contributes to reducing recidivism rates (Nally et al., 2014; National Research Council, 2007; Sampson & Laub, 1993; Savolainen, 2009; Van Der Geest et al., 2011),

employment has been highlighted as one of the critical factors that enhance one's ability to criminally desist at the policy level (Devers, 2011). However, as seen from the findings from this study, the relationship between employment and offending behavior is complex since the statistical direction of the association depends on other factors such as substance use. In other words, establishing strong social bonds to desist from criminal behavior would depend on what extent individuals also desist from alcohol and illicit drugs or other factors. This confirms that a single approach to address the issue is inappropriate. Social policy to support justice-involved populations' ability to desist from crime needs to expand to comprehensive methods.

Policy interventions based on the integrative approach do not have a long history given that federally supported interventions for formerly incarcerated people started to focus on an integrative approach in the early 2000s to address the multiple issues they face (Fox, 2010). Reentry programs such as Minnesota's High-Risk Revocation Reduction (HRRR) program might be a good example of a policy option designed by such an approach. This program was funded by the Second Chance Act, which was enacted to promote public safety by breaking the cycle of recidivism (Bureau of Justice Assistance, 2015). The HRRR program in Minnesota is known as a highly integrative intervention program providing enhanced employment training and substance use dependency treatment as well as other support such as case planning, housing assistance, mentoring, and transportation assistance (Clark, 2015). According to Clark (2015)'s evaluation with a randomized experimental design, HRRR participants ($n = 162$) have lower recidivism rates compared to the control group ($n = 77$) after 1-2 years of post-release. As shown as evidence from Clark (2015), policies incorporating multiple interventions such as Minnesota's HRRR programs are strongly recommended to address such issues. When policymakers seek to

continuously address the current reentry policy, they must also accountably address how to sustain efforts to build on what the evidenced-based policy intervention find. This implies policy must address important characteristics of formerly incarcerated populations. It is noted for policy makers that many of their clients often suffer from multiple problems, rather than a single issue.

Thus, policy should help formerly incarcerated young people prepare to cultivate desistance ability before their incarceration. This is also aligned with the fact that young people who are currently incarcerated should be able to continue their vocational training while in prison and participate in employment programs to improve job stability after release (Dever, 2011). A critical point from criminal desistance research is that individuals must decide independently to transform their identity from offender to non-offender (National Institute of Justice, 2014a), which fits under the assumption of identity theory, a subjective theory of criminal desistance (Paternoster & Bushway, 2009). In this context, cognitive programs that promote their willingness and motivation should be greatly encouraged for those who prepare for criminal desistance. Policy interventions should connect offenders after release by providing effective monitoring.

Another policy intervention that should be considered is a mentoring program for at-risk juveniles since their levels of aggression and substance use could decrease when they meet strong mentors (Tolan, Henry, Schoeny, Lovegrove, & Nichols, 2014). Mentoring is a key intervention method for preventing delinquent behaviors of youth who are involved in the justice system as well as supporting them (DuBois, Holloway, Valentine, & Cooper, 2002; DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Tolan et al., 2014). The first policy effort for implementing a mentoring program is the Juvenile Mentoring Program (JUMP), which has been

funded by the Department of Justice since 1994 (Raposa, Dietz, & Rhodes, 2017). JUMP, which is a part of the Juvenile Justice and Delinquency Prevention (JJDP) Act of 1974, aims to provide mentoring for at-risk juveniles between ages 5-20 (Raposa et al., 2017). Since its inception, policy efforts have expanded through other federal agencies' grants and initiatives, including the Department of Health and Human Services' Mentoring Children of Prisoners (MCP) program, the Department of Education's Student Mentoring, and the Safe and Drug Free Schools (SDFS) program (Fernandes-Alcantara, 2015; Raposa et al., 2017).

Even though broad meta-analyses support significant evidence that mentoring is effective for youth's delinquency prevention (DuBois et al., 2011), an important criterion is required to assure the impact of mentoring (Tolan et al., 2014). Such a feature is required to develop a solid relationship between mentor and mentee (DuBois et al., 2002; Tolan et al., 2014). When mentors and mentees' personal interests and background match, a large effect size can be expected; that is, mentoring as a delinquency prevention approach has much promise (DuBois, 2011). Such a strong relationship between mentors and recipients is not based on professional duties, but on personal commitment and responsibility (Tolan et al., 2014). Research explains that if mentorship is motivated by professional advancement, including paid service (e.g., mental health service), the impact on youth violence would differ since there would be a potential limitation that such service providers may have a lower sense of duty (Tolan et al., 2014). Besides this, if mentors are not well trained to handle both expected and unexpected challenges, a strong relationship cannot be established, which diminishes the program's effectiveness (Tolan et al., 2014). The findings from previous research imply, therefore, existing mentoring programs must

adopt strategic ways of recruiting and retaining quality mentors who seek to establish sound relationships with at-risk youth. Policy interventions should also consider proportionate ratios of gender, race, age, socioeconomic status, and other risk factors to pursue a goodness of fit with such youth (National Center for Mental Health Promotion and Youth Violence Prevention, 2009).

6.2.2 Social Work with Criminal/Juvenile Justice Involved Populations

Social work operates in a variety of environments where various social networks, relationships, resources, level of trust, and human beings are intertwined with each other. Therefore, social work professionals must be cognizant of the mechanism and how these components function and influence the clients (i.e., criminal justice populations) of social work. In this sense, desistance-based intervention approaches fit well within the social work perspective since the approaches compel social workers to think of formerly incarcerated young people themselves, their families, and the communities (Cusson, 2010). Such an approach also encourages us to comprehensively think of such people's strengths, resources, and rights, not just keeping us in the realm of criminogenic needs and risk factors (Cusson, 2010).

In terms of the problem of the formerly incarcerated people's desistance from crime, the social work profession must seek strategies of how they can stop offending behavior by maximizing a strength-based paradigm, which contrasts with risk-based approaches. These kinds of approaches require more of a positive focus on what factors are needed for them to garner good results based on their potential (McNeill & Maruna, 2007). The social work profession in

the criminal/juvenile justice system needs to continuously advocate desistance or strength-focused approaches. The most effective way to advocate may be to provide rigorous scientific evidence by projecting interventions. By being equipped with these approaches, social work interventions will be able to deliver better outcomes in understanding the predictors of desistance, which will allow for the better shaping of policy. This is ultimately and directly associated with the grand challenge for social work, *promoting smart decarceration* (Epperson & Pettus-Davis, 2016), by rethinking justice involved people's reentry and exploring the critical factors enhancing their abilities to desist from crimes.

6.2.3 Future Research

Although the results regarding the substance use mediated relationship between work commitment and antisocial behavior and its racial differences were in contrast to the hypotheses, these findings are still useful in serving as an initial study into a number of possible avenues for future criminal desistance research within the field of social work. First, the relationship between substance use and work needs to be further studied to gain a clearer understanding of it.

Although the negative impact of substance use on work is widespread and has been a growing concern in the U.S., research on such a relationship, particularly focusing on at-risk youth and young adults, has not been fully investigated (Badel & Greaney, 2013). As found in the longitudinal cross-lagged and cross-sectional paths in the current study, the association between the above two factors revealed its complexity. Further research may help establish a robustness of causal claims on the relationships. Particularly, it should compare at-risk youth transitioning

into young adults and adults with similar backgrounds to the juveniles to shed light on similarities and differences in outcomes; if differences exist, the research should explore which factors contribute to those differences to garner firmly established findings.

Related to this, second, the findings suggest that motivations of substance use among formerly incarcerated young people should be investigated since substance use seemed to dominate all other factors in the analyses. The extant literature has informed that substance use alone is a powerful predictor of negative consequences, including offending behavior, lower participation in treatment sessions, and worsened psychiatric symptoms among justice-involved populations (Easton, 2012; Easton, Swan, & Sinha, 2000; Lobmaier, Berman, Gossop, & Ravndal, 2013; Prendergast, Greenwell, Farabee, & Hser, 2009; Uggen & Wakefield, 2008). Motivation to seek addiction treatment and to change substance use behavior have been examined extensively (Korcha, Polcin, Bond, Lapp, & Galloway, 2011), yet motivation of substance use alone is lacking or outdated. Scrutinizing what specific factors influence substance use should be further studied to better understand this issue.

Third, aligned with the necessity of an integrative approach for policy implications, future research using the criminal desistance framework can be involved in maximizing the same approach to examining the complexities of these factors based on the premise that both micro and macro components can influence criminal desistance outcomes. Regarding this, a possible question may include to what extent micro (e.g., individual perceptions, demographic elements, etc.) and macro factors (social bonds, institutional resources, policy intervention on marginalized populations, etc.) interact with each other, which is beyond the dependence of a single theoretical perspective. A point to be noted when conducting a study based on an integrative approach is to

determine the mechanisms of causal inference on criminal desistance. For example, empirical findings from LeBel et al. (2008) suggest that subjective factors precede structural factors in their interaction, whereas Simons and Barr (2014) observe a gradual change of subjective factors in one's social life. However, these differing results may be consistent with what Bottoms et al. (2004) previously argued, that there may be various potential mechanisms related to the interaction between subjective and structural factors on desistance. Since there is a lack of detailed understanding of how subjective and structural factors interact (Bottoms et al., 2004; LeBel et al., 2008), more empirical evidence should be provided in order to determine causal inference from the model.

Fourth, although no racial differences in the substance use mediated relationship between work commitment and antisocial behavior were detected in the subgroup analyses, race still remains a significant factor in criminal desistance research. A key question of Sampson and Laub's desistance theory is whether it is able to explain desistance of those who are disproportionately incarcerated (e.g. Black Americans) in the same manner as discussed in the existing body of literature on desistance. Beyond the simple comparison among different races as done in this study, future studies should inquire how well desistance studies reflect race. Regarding this question, Glynn (2014) argues that to critically contextualize race as a significant variable in desistance studies, combining the concept of the intersection of race and class into existing desistance theories may be an innovative way to reflect Blacks' voices on desistance. Similarly, Elliot (1994) suggests that contextual differences surrounding race need to be further investigated in order to better understand racial disparities. The contextual differences may result from all inequalities stemming from a racially biased system. Perceptions of people of color as a

human agency may be differently and unconsciously shaped by systematic injustice. As reaffirmed by Glynn (2014), it is important to take a close look at what barriers there are to impeding desistance among people of color and how the barriers can be overcome. This is why Glynn (2014) argues that desistance theories and studies are able to be complete and devoid of flaws, when they critically consider race matters.

6.3 CONCLUSION

This study is motivated by the question of what factors affect the reentry of justice-involved people and the potential directions for research and intervention to be considered. In the U.S., employment is one of the most important types of social bonds that affects crime reduction and such a notion is widespread among policy makers and the general public (Lageson & Uggen, 2013). Given the firm faith on the effects of work, the main purpose of this study is to examine the effect of work commitment on antisocial behavior and the role of substance use as a mediator between work commitment and antisocial behavior among formerly incarcerated young adults utilizing Laub and Sampson (2003)'s theory of social bonds. This study suggests that it is evident employment works to reduce antisocial or offending behavior. Yet, the current study provides evidence the effect of work is eclipsed by the presence of substance use. Such findings are important steps toward filling the gaps by investigating the substance use mediated relationship between the two factors. The findings imply that Sampson and Laub's theory still provides benefits to understanding the impact of social bonds in reducing criminal behavior; but the

contrasting findings to the hypothesis also highlight that we need to strategically incorporate the notions of the intersection of subjective and structural factors to better understand offending behavior outcomes. Therefore, it would be inadequate to make assumptions driven by a single theoretical framework to comprehend such a complex relationship. Also, to draw a better understanding of racial differences in criminal desistance, ongoing research on exploring the voices of isolated people is essential. Relevant stakeholders such as policy makers, researchers, and social work practitioners should commit to synthesizing their efforts to deliver more integrative policies and sophisticated ways to address key issues with respect to criminal desistance among formerly incarcerated young people.

APPENDIX A

MPLUS SYNTAX

Variable:

names =

jobs60 jobs72 jobs84 jobs60r jobs72r jobs84r	!X
sur60 sur72 sur84	!M
cnsq60 cnsq72 cnsq84	
dpnd60 dpnd72 dpnd84	
total60 total72 total84 total60b total72b total84b	!Y
agg60 agg72 agg84 agg60b agg72b agg84b	
inc60 inc72 inc84 inc60b inc72b inc84b	
age60 age72 age84 gang60 gang72 gang84	!CVs
neigh60 neigh72 neigh84 famcrim0 ses0 gender0	!CVs
prwork0 school0 Black0 Hispanic0 race0;	!CVs

Usevariables =

jobs60r jobs72r jobs84r	!X
sur60 sur72 sur84	!M
total60 total72 total84	!Y
age60 gang60 ses0 gender0	!CVs
Black0 Hispanic0;	!CVs

Missing = all(-99);

Analysis:

Type = general;

Estimator = ML;

BOOTSTRAP = 10000;

Model:

jobs72r on jobs60r sur60 age60 gang60 ses0 gender0

Black0 Hispanic0;
jobs84r on jobs72r sur72 age60 gang60 ses0 gender0
Black0 Hispanic0;
sur72 on jobs60r jobs72r sur60 total60 age60 gang60 ses0 gender0
Black0 Hispanic0;
sur84 on jobs72r jobs84r sur72 total72 age60 gang60 ses0 gender0
Black0 Hispanic0;
total72 on jobs60r jobs72r sur60 sur72 total60 age60 gang60 ses0
gender0 Black0 Hispanic0;
total84 on jobs60r jobs72r jobs84r sur72 sur84 total72 age60 gang60
ses0 gender0 Black0 Hispanic0;

sur60 with jobs60r total60;
jobs60r with total60;
age60 gang60 ses0 gender0 Black0 Hispanic0
with sur60 jobs60r total60;

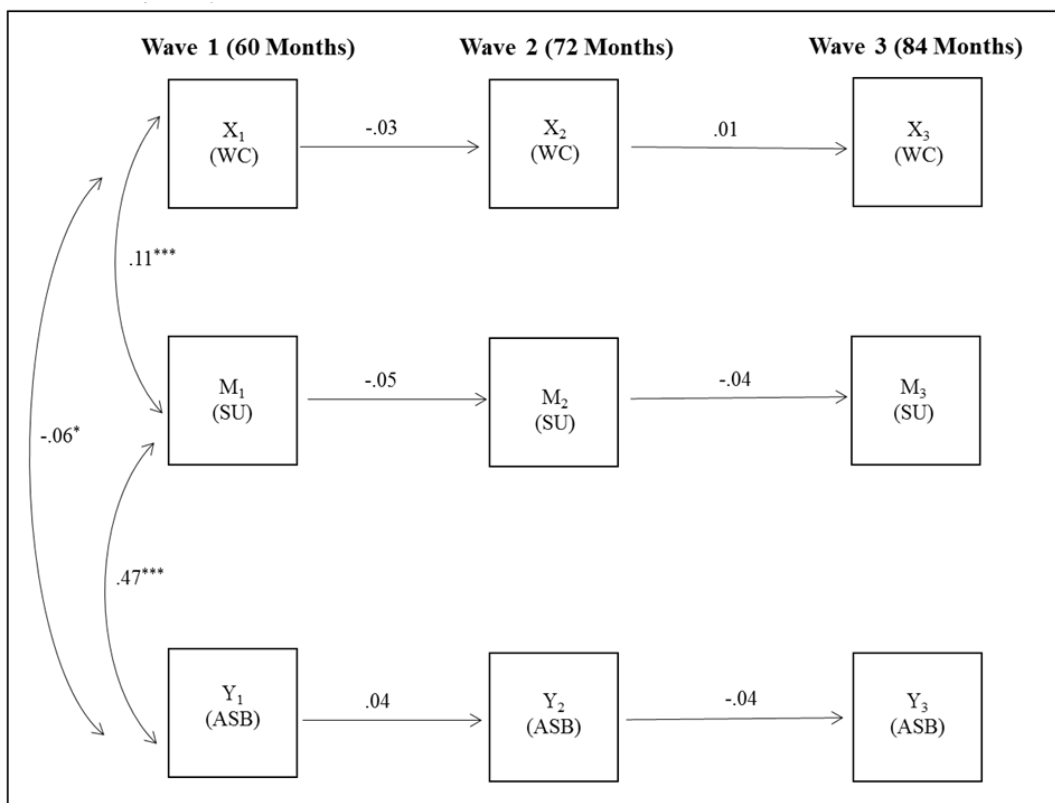
Model indirect:
total84 IND jobs60r;
total72 IND jobs72r;
total84 IND jobs84r;

Output:
STDYX;
cinterval(bootstrap);

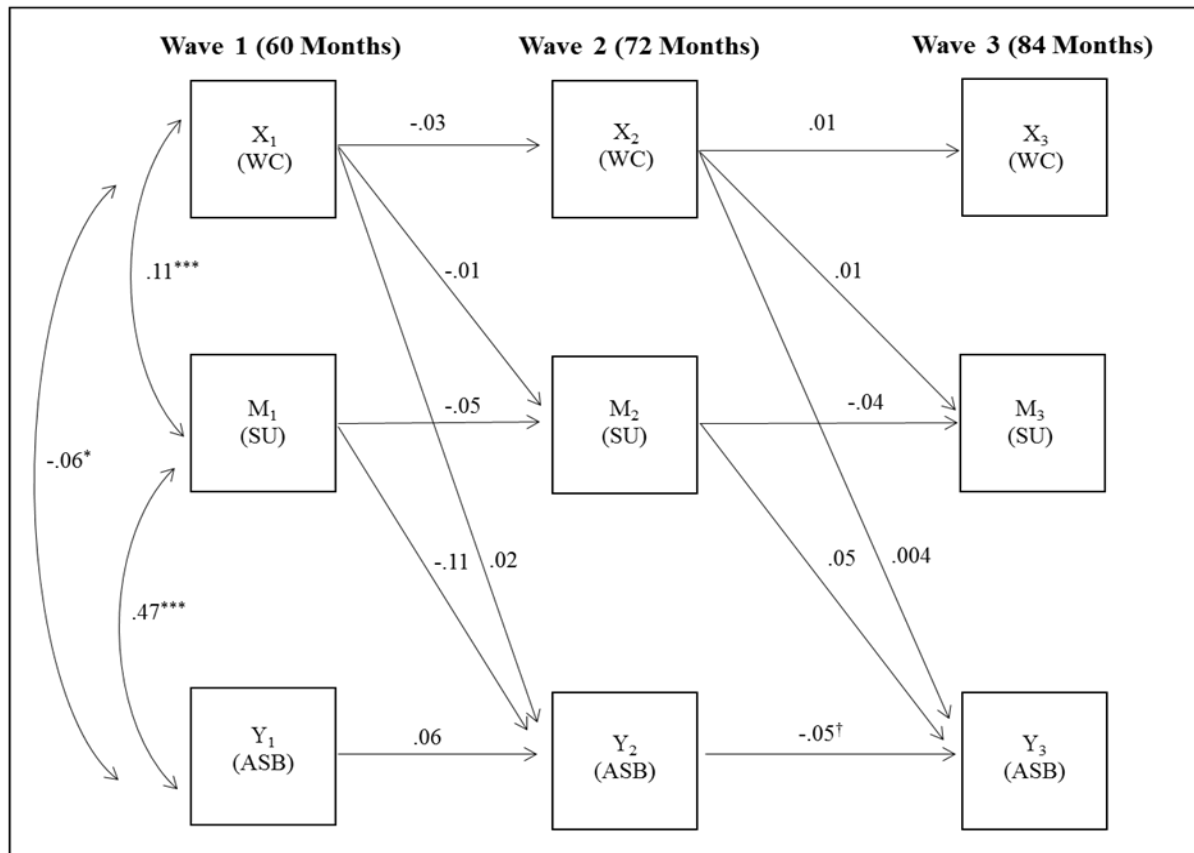
APPENDIX B

MODEL-BUILDING

B.1 MODEL 1 (BASE)

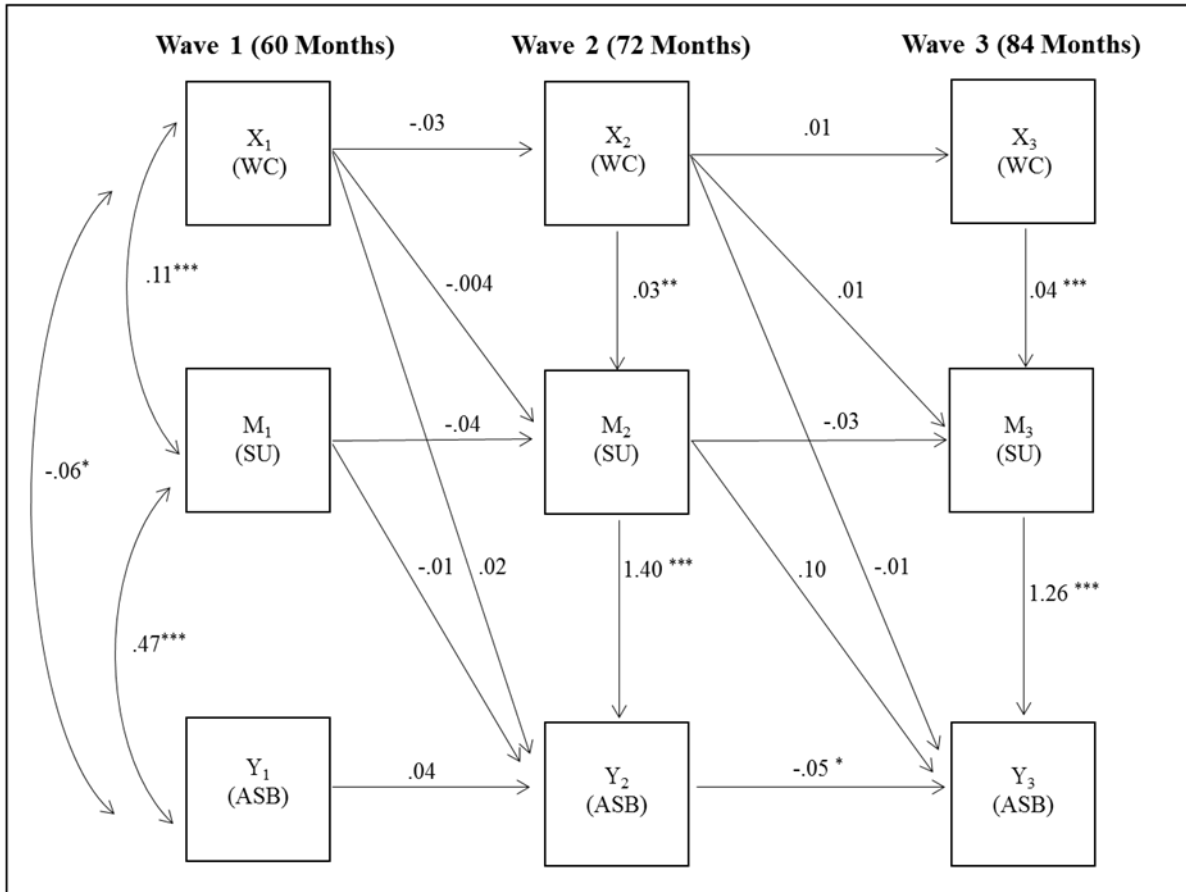


B.2 MODEL 2



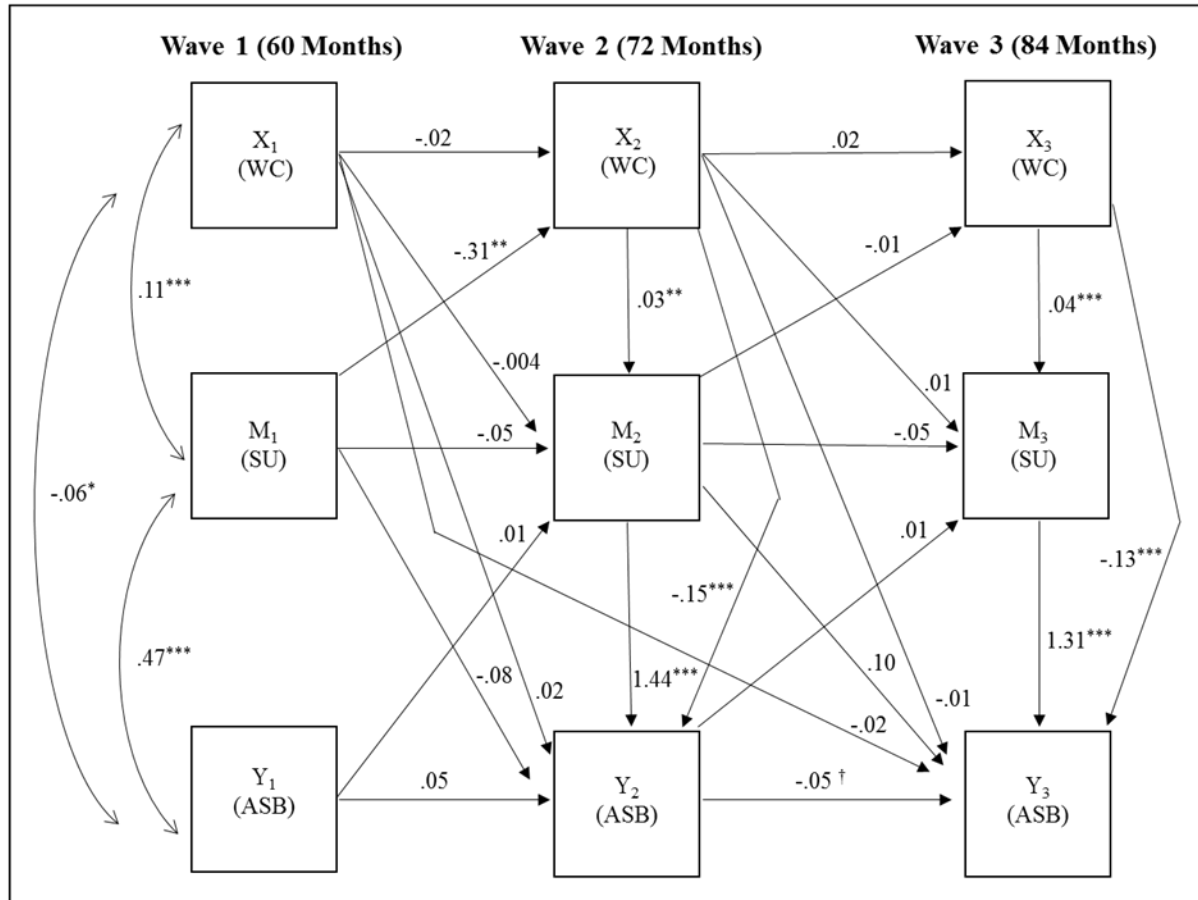
[†] $p < .10$, * $p < .05$, *** $p < .001$.

B.3 MODEL 3



* $p < .05$, ** $p < .01$, *** $p < .001$.

B.4 MODEL 4 (FINAL)



[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

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