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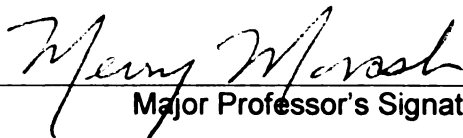
EXPLAINING DRUG USE AND DELINQUENCY BY
RACE AND ETHNICITY: A TEST OF DIFFERENTIAL
ASSOCIATION, SOCIAL BONDS AND SELF-CONTROL

presented by

Yan Zhang

has been accepted towards fulfillment
of the requirements for the

Ph.D. degree in Criminal Justice



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EXPLAINING DRUG USE AND DELINQUENCY BY RACE AND ETHNICITY:
A TEST OF DIFFERENTIAL ASSOCIATION, SOCIAL BONDS
AND SELF-CONTROL

By

Yan Zhang

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ABSTRACT

EXPLAINING DRUG USE AND DELINQUENCY BY RACE AND ETHNICITY: A TEST OF DIFFERENTIAL ASSOCIATION, SOCIAL BOND, AND SELF-CONTROL THEORY

By

Yan Zhang

The research presents an explanatory model that integrates three particularly dominant criminological theoretical perspectives, differential association, social bond and self-control theories, to examine relationships between drug use and delinquency and race and ethnicity (which include non-Hispanic whites, blacks Americans, Asian Americans, and Hispanic Americans) in the United States. The key hypotheses are that the causal processes leading to drug use and delinquent/criminal behavior, which are specified in the integrated model, are invariant across racial and ethnic groups

By using the 2001 National Household Survey of Drug Abuse dataset, the study examines the integrated model and tests the causal processes across race and ethnicity, addressing the questions: do the theoretical constructs vary across racial and ethnic groups? Are the causal processes invariant across racial and ethnic groups? What

are the variations in parameters across racial and ethnic groups? And what is the relative importance of differential association, social bonds, and self-control in explaining drug use and delinquency for different racial and ethnic groups.

The results support the integrated theoretical model and indicate that this integrated model could be applied for each racial and ethnic group. However, the overall causal mechanisms between background variables, social bonds, differential associations and self-control vary by race and ethnicity as well as age. The model explains the most variance in drug use for Whites, and the least for Asians. On the other hand, it explains the most variances of delinquent behavior for Asians among youths, but the least variances in criminal behavior for Asians among adults. The parameters of the causal linkages specified in the model vary between the racial and ethnic groups. The determinative process of differential associations, and self-control also vary significantly across race and ethnicity.

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CHAPTER I: INTRODUCTION

Throughout the last century, minorities such as black Americans, Hispanics and Native Americans have been more likely than whites to be involved in the criminal justice system. They have been more likely to commit crime and delinquency, more likely to be in jail or prison, on probation or parole. While scholars agree that disproportionate representation of minorities (especially blacks) in the justice system is partially caused by racial bias and discrimination, many believe there do also exist race-related differences in patterns of criminality. Scholars have differed on the extent of how much more involved in crime and delinquency some racial groups are than others, and also have differed on the theoretical causal explanations. Biological perspectives claim that genetic attributes as intelligence, temperament, and other individual characteristics contribute to racial differences in the prevalence of crime (Wilson and Herrnstein 1985; Sampson and Lauritsen 1997). Subcultural theorists believe that a black subculture of violence could explain the racial variation in crime (Wolfgang and Ferracuti 1967). Social disorganization approaches, on the other hand, emphasize community structures and cultures that produce

differential rates of crime (Sampson and Lauritsen 1997). Strain theorists argue that a lack of economic opportunities and success of race and ethnic minorities is the main causes of racial differences in offending (Merton 1938; Blau and Blau 1982), and differential association theories indicate the race and ethnic ratios in crime result from differential associations with criminal and anti-criminal patterns (Sutherland and Cressey 1966). Control theorists believe differential child-rearing practices and family supervision are the fundamental reasons in accounting for racial or ethnic variations (Gottfredson and Hirschi 1990). Empirical research examining different theoretical interpretations of racial and ethnic disparities in crime and delinquency has produced disputable results either against or in support of competing theoretical perspectives. There is no agreement that any single theory has adequately addressed the reason for racial and ethnic differences in crime and delinquency (Hawkins 1993; Gottfredson and Hirschi 1990; Sampson and Lauritsen, 1997).

A consideration of the literature on the debate over causes of racial disparities in criminality reveals that few tests of the theories mentioned above have been designed "ad hoc" for the purpose of explaining the racial

and ethnic disparities. Rather, most theories have been applied "post hoc" to explain racial and ethnic difference (Sampson and Lauritsen 1997). Theorists assume that factors causing crime and delinquency are common across race and ethnic groups (Hirschi 1969). Using this logic, Wilson and Herrnstein claimed:

Though racial factors may affect the crime rate, the fundamental explanation for individual differences in criminality ought to be based--indeed, must be based, if it is to be a general explanation--on factors that are common to all societies. If racial or ethnic identity affects the likelihood of committing a crime, it must be because that identity co-varies with other characteristics and experiences that affect criminality. After examining constitutional, familial, educational, economic, neighborhood, and historical factors, there may or may not be anything left to say on the subject of race (1985:29).

Hirschi made similar argument in his study of "Cause of Delinquency":

...the causes of delinquency are the same among Negroes as among whites. It follows from this assumption that we need not study Negro boys to determine the causes of their delinquency. If we can further interpret the relation between academic achievement and delinquency among white boys, we will have further interpreted the original relation between race and delinquency (1969: 80-81).

The racial and ethnic disparities in crime are therefore a function of the magnitude of differences of intervening variables between racial/ethnic groups derived from each theory.

Consistent with the assumption that there are similar causes of crime across racial groups, most empirical research testing theories has been restricted to the white population. For example, in testing control theory and differential association theory, researchers used only the non-black male data from the Richmond Youth project (e.g., Costello and Vowell 1999; Hirshci 1969; Matsueda 1982), although the original dataset include information on both non-black and black subjects. Drug use and delinquency researchers have also developed empirically tested models on the basis of a database generally restricted to white,

middle-class youth from small cities and/or suburban areas (e.g., Brook et al. 1990; Elliott et al. 1985; Jessor and Jessor 1977; Kandel 1974; Kaplan 1975). The results are then automatically applied to minorities groups. There is not enough systematic evidence to evaluate the extent to which existing mainstream theories are applicable to racial and ethnic minorities (exception, e.g. Matsueda and Heimer 1987), the population believed to be most (or least for Asians) at risk of engaging in crime and delinquency. The magnitudes of the variations of intervening variables between racial and ethnic groups are not clear; and the capacities of theoretical models to explain crime and delinquency across different racial and ethnic groups are uncertain.

The few studies analyzing racial and ethnic differences in criminality focus on white and black individuals. Researchers and theorists have been silent about other minority groups, such as Asian Americans and Hispanic Americans, the two most rapidly growing minority groups. They are either combined with other minority groups as a whole, or just excluded from study. However, literature shows that different racial and ethnic groups present various patterns of involvement in criminal and delinquent behavior. While Asian Americans generally have

the lowest crime rate, Hispanics, like African Americans, are more likely than whites to be involved in law violations. In order to understand the connection of race and ethnicity to criminal behavior, it is critical to study Asian and Hispanic Americans as well as blacks and whites, that is, to study the full continuum for involvement of criminal behavior.

With the aim of addressing existing issues and contributing to the literature on empirical analysis of relationship between race and ethnicity and criminal behavior, this study will develop an integrated theoretical model that incorporate three major theoretical perspectives—differential association, social bond, and self-control theories. This study will use the National Household Survey of Drug Abuse 2001 dataset to test the empirical relationships and determine the efficacy of theoretical constructs in explaining criminal patterns (drug use and delinquency) of non-Hispanic whites and blacks as well as Asian Americans and Hispanic Americans in the United States.

Race and Ethnicity in the United States

In the history of United States, race has been thought of as a genetically distinct subpopulation of a given species (Cornell and Hartmann 1998). For example, the racial categories are generally assumed to represent "natural, physical, divisions among humans that are hereditary, reflected in morphology, and roughly but correctly captured by terms like black, white, and Asian" (Haney Lopez 1994:6). This three-category classification scheme and other category schemes, has been criticized by social scientists (Haney Lopez 1994; Adrian Piper 1992; Martha E. Gimenez 1989; Ferrante and Brown 2001). They point out that many people do not fit clearly into a racial category, because no sharp dividing line distinguishes characteristics such as black skin from white skin or curly hair from wavy. There are also no fixed and definite boundaries between races because people may have mixed ancestry. Social scientists contend that the classification rules are arbitrary, vague, contradictory and subject to change (Cornell and Hartmann 1998; Ferrante and Brown 2001). There exists heterogeneity among people designated as belonging to a particular race. For example, people classified as Asian include Chinese, Japanese,

Malayans, Mongolians, and Siberians. Therefore, social scientists argue that race is not a biological fact but a social creation. As Cornell and Hartmann (1998:23) remark, "races are not established by some set of natural forces but are products of human perception and classification. They are social constructs."

Social scientists define race as "a group of people loosely bound together by historically contingent, socially significant elements of their morphology and/or ancestry" (Haney Lopez 1994:7). Adrian Piper (1992) states, "what joins me to other blacks, then, and other blacks to another, is not a set of shared physical characteristics, for there is none that all blacks share. Rather, it is the shared experience of being visually or cognitively identified as black by a white racist society, and the punitive and damaging effects of that identification" (pp. 30-31). For all social purpose, what is important is not that people are genetically different but that they approach one another with dissimilar perspectives. It is in the social setting that race is important. Although race is a social concept, and the classification of racial groups suffer from many limitations, for the purpose of collecting and reporting information, Federal Statistical Directive No. 15 identified five minimum racial categories

in the United States: American Indian or Alaska Native; Asian or Pacific Islander; Black; and Whites (Ferrante and Brown 2001).

The concept of ethnicity in social science has a very broad meaning. It can refer to people who share (or believe they share) a national origin; a common ancestry; a place of birth; distinctive and visible social traits such as religious practice, style of dress, body ornaments, or language; and /or socially important physical characteristics such as skin color, hair texture, and/or physical build (Ferrante and Brown 2001). Richard A. Schermerhorn (1978: 12) defines ethnic group as "a collectivity within a larger society having real or putative common ancestry, memories of a shared historical past, and a cultural focus on one or more symbolic elements defined as the epitome of their peoplehood."

The Federal Statistical Directive No. 15 names only two official ethnic categories into which all people in the United States must be placed: Hispanic origin and non-Hispanic origin. There is great diversity in how Hispanics define themselves racially, and there are great cultural differences between, say, Puerto Ricans and Cubans, as there are between racial groups (Sampson and Lauritsen 1997). Not sharing a common culture, the multitude of

groups classified as Hispanic has been criticized as a political definition that has little meaning (e.g., Mann 1993, pp. 8-12), with many preferring the label "Latino" instead. Similar arguments have been made about the meaning of race categories, namely, that there is more within-group variation (in terms of traditional cultural experiences) than there are differences between race groups (Sampson and Lauritsen 1997).

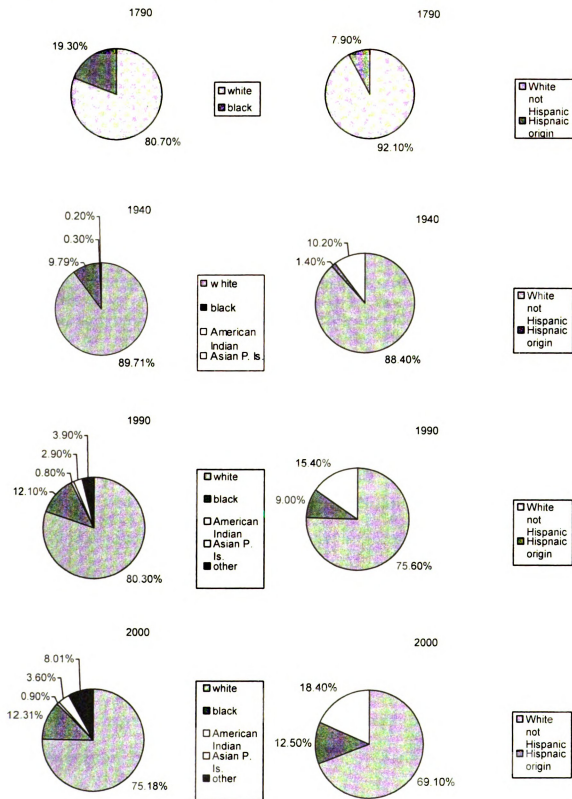
The minimum categories set forth in Directive No. 15 are criticized for not reflecting the diversity of the U.S. population. In October 1997, the U.S. Office of Management and Budget (OMB) released a notice, "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity", that summarizes the results of both the research and the public comment. It also provides the new standard for race and ethnicity, which includes five racial categories: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white; and two ethnic categories: Hispanic or Latino and Not Hispanic or Latino. According to the OMB notice¹, American Indian or Alaska Native means "a person having origins in any of the original peoples of North and

¹ <http://oas.samhsa.gov/NHSDA/methods/RaceEthnicity.pdf>.

South America (including Central America), and who maintains tribal affiliation or community attachment.” Asian means “a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.” “A person having origins in any of the black racial groups of Africa” is classified as Black or African American. Native Hawaiian or Other Pacific Islander is a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands. White is a person having origins in any of the original peoples of Europe, the Middle East or North Africa. The ethnic category “Hispanic or Latino” is defined as a person of Cuban, Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.

The U.S. Census Bureau data indicate that the resident population of the United States has been changed considerably over the past 200 years. Figure 1 presents the population changes from 1790 to 2000 by race and Hispanic origin.

Figure 1. United States--Race and Hispanic Origin: 1790 to 2000



Whites made up 75.1 percent of the approximately 211 million residents of the U.S. population in 2000. This represents a decline from 80.3 percent in 1990. Blacks represent 12.3 percent of the 2000 population, up modestly from 1990. American Indians comprise only 0.9 percent of the population. However, Hispanics and Asians have been growing fast during the past half-century. According to U.S. Census Bureau, in 1940, the estimated Hispanic population was only about 1.86 million, accounting for 1.4 percent of the American population. However, the Hispanic population has increased 18 times over the last sixty years. In 2000, the Hispanic population was more than 35 million, accounting for 12.5 percent of the American population, and is now larger than the population of blacks. Hispanics have become the largest minority group in the United States. The Asian American population has also increased rapidly. After the enactment of the Immigration Act of 1965 that abolished discriminations based on national origins and opened the door to immigration from all countries, the number of Asian immigrants to the United States increased 750 percent over the last three decades, from 1.4 million (or 2.7 percent of the American population) in 1970 to 11.9 million (or 4.2 percent of the American population) in 2000 (US Census

Bureau 1993, 2002). Estimates are that the Asian American population will reach 20 million in 2020 (US Census Bureau, 2000).

The change of the population composition and the increasing diversity in the United States call for more attention to the minority groups. To understand American society one should understand the heterogeneity of different minority groups. In the current study, analysis will concentrate on the criminal patterns of four racial and ethnic groups: non-Hispanic white, non-Hispanic black, non-Hispanic Asian, and Hispanic American. Three other minority groups: non-Hispanic American Indian/Alaska Native, non-Hispanic Hawaiian/Pacific Islander, and non-Hispanic more than one race will not be included in the current study because of the inadequate sample size. This racial and ethnic classification scheme uses the combined format and is consistent with the 1997 OMB notice of "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity." It also identifies groups that experience differential treatment and reactions within U.S. society, and that therefore are meaningful in a framework that considers race and ethnicity to be social constructions.

Racial Disparities in Crime and Delinquency

Researchers and criminologists have long recognized the racial and ethnic disparities in rates of adult crime and juvenile delinquency in the United States (Hawkins et al., 2000; LaFree, 1994; LaFree and Russel, 1993). Even so, because there exist different source of data on crime—official arrest data, self-reported crime, and national victimization survey data etc., findings on the correlates of criminal offending and race are not consistent. For more than seventy years, scholars have differed on how much more involved in crime blacks are than whites (Tonry, 1995).

Arrest Data

Studies that have used official data on arrests have indicated that criminal offending, especially serious and violent offending is more common among blacks and Native Americans than among whites, and that offending among Asian Americans is least common (Hawkins et al., 2000; Snyder, 1999). For example, the FBI 2001 Uniform Crime Report (UCR) data (Table 1) indicates that whites account for 69.5 percent of all arrests, blacks, American Indians and Asians account for 28.1 percent, 1.3 percent, and 1.1 percent of

all arrests respectively. Although whites are arrested for the majority of all crimes, blacks and American Indians are still disproportionately represented in arrests reported in the UCR. In 2001, blacks comprised 28.1 percent of total arrests yet constituted 12.3 percent of the total population². The black arrests rate is 2.5 times that of the arrest rate for whites. American Indian and Alaska Natives comprised 1.3 percent of total arrests but just .9 percent of the population. The American Indian and Alaska Native arrests rate is about 1.6 times that of whites. Asians, however, appear to be underrepresented in arrest statistics. Asians account for 1.1 percent of all arrests, yet make up 3.7 percent of the population. The Asian American arrest rate is only about a third of the white arrests rate. The general pattern of overrepresentation of blacks and American Indians among persons arrested has been consistent throughout the (for the last fifty years) recorded history of the last century, though black and white differences in rates of offending have decreased somewhat in recent years (Figure 2).

The relationship between race and arrest is not the same for all crime types; there are certain offenses for

² Crime arrests data are obtained from Sourcebook of Criminal Justice Statistics 2002, pages 356-358. The population data are obtained from U.S. Census Bureau Population estimates website, <http://census.gov/popest/data/national/tables/NC-EST2003-asrh.php>. Then the rates are calculated by author.

which each group is over represented (Sampson and Lauritsen 1997). For instance, whites are most likely to be arrested for driving while intoxicated, and Asians are over-represented in arrests for illegal gambling. Native Americans are more likely to be arrested for liquor laws and drunkenness, and blacks are disproportionately arrested for violent crime (Hindelang 1978; Elliott and Ageton 1980; Sampson and Lauritsen 1997). In 2001, blacks accounted for 48.7, 34.8, 53.8 and 33.7 percent of murder, rape, robbery, and aggravated assault arrests respectively³. In general, blacks are approximately six times more likely to be arrested for violent crimes than are whites.

The relationship between race and arrest also differs by ages. In 2001, black juveniles' arrest rates were 1.85 times that of white juveniles (36.3 per 1000 for black juveniles, 19.6 per 1000 for white juveniles), but the black adults' arrest rates were 2.88 times that of white adults (88.5 per 1000 for black adults, 30.7 per 1000 for white adults). The percentage of violent crime arrest for black juvenile is even higher than that of black adults. For every 100 arrested black juveniles, 7 of them are arrested for violent crimes; and the rate for black adults is 6.

³ Sourcebook of Criminal Justice Statistics 2002, pages 356-358.

There have been major disagreements about the validity of the patterns shown by official statistics. Researchers argue that the disparities in the arrest data partially result from racial bias in police arrest and crime-recording practices (e.g., Sutherland and Cressey, 1966; Tonry, 1995; Sampson and Lauritsen, 1997; Wilson and Herrnstein, 1985; Hawkins et al., 2000; Hagan and Peterson, 1995). Young black men suffer more from stereotypes of blacks as "disreputable" and "dangerous" (Sampson and Lauritsen 1997), which leads to police arresting young black men more frequently than would be expected from levels of involvement in actual criminal behavior. Thus, almost any index of crime rates is likely to exaggerate the rate for blacks as compared with the rate among whites (Sutherland and Cressey 1966).

Scholars pointed out the disproportionate representation of minorities in crime arrest could also be the results of government policies. One example is for drug-related arrests. Research shows that from 1965 through the early 1980s, nonwhites arrest rate were approximately twice as that of whites for drug-related offenses (Blumstein 1993; Tonry 1995). Following the federal government's launch of the "war on drugs," nonwhite arrest rates rose steadily and skyrocketed, while white

arrest rates were basically stable and increased only slightly. By the end of the 1980s, nonwhite arrest rates of drug-related offenses were five times higher than that of whites (Tonry 1995). An examination of the juvenile arrest rates for drug-related offenses revealed a more salient pattern (Blumstein 1993). From the late 1960s to the early 1980s, white arrest rates for juvenile drug offenses were slightly higher than those for black juveniles. White arrest rates continued to drop after 1980s, but black rates soared until the late 1980s when they were four to five times higher than white rates (Blumstein 1993). The national drug use survey data, however, indicated that drug use was declining among both white and nonwhite populations since 1980s (Tonry 1995). Therefore it is highly unlikely that these race differences in arrests represent general substance use patterns. Rather, these differences reflect the government's targeting and enforcement of specific types of drug use and trafficking (Blumstein 1993; Tonry 1995). To check on the extent of bias in police arrest records, victim surveys, and self-reported data are used (Wilson and Herrnstein, 1985; Sampson and Lauritsen, 1997; Hawkins et al., 2000).

Table 1. Crime arrests by offense charged and race, United States, 2001
(percentage)

	White	Black	Native	Asian and Pacific Island
Total	69.5	28.1	1.3	1.1
Murder and non-negligent Manslaughter	48.4	48.7	1.3	1.6
Forcible rape	62.7	34.8	1.1	1.4
Robbery	44.5	53.8	0.6	1.1
Aggravated assault	64.0	33.7	1.1	1.2
Burglary	69.4	28.5	1.0	1.1
Larceny-theft	66.1	31.2	1.2	1.5
Motor vehicle theft	57.5	39.8	0.9	1.8
Arson	76.9	20.7	1.5	0.9
Violent crime	60.2	37.6	1.0	1.2
Property crime	66.0	31.4	1.2	1.5
Total Crime Index	64.4	33.1	1.1	1.4
Other assaults	65.4	32.2	1.3	1.1
Forgery and counterfeiting	67.8	30.1	0.6	1.5
Fraud	67.7	31.0	0.6	0.7
Embezzlement	65.8	32.0	0.5	1.6
Stolen property; buying, Receiving, possessing	59.4	38.7	0.7	1.1
Vandalism	74.7	23.0	1.3	1.0
Weapons; carrying, Possessing, etc.	61.0	37.2	0.7	1.0
Prostitution and commercialized vice	57.1	40.3	0.6	2.1
Sex offenses (except forcible Rape and prostitution)	73.3	24.2	1.1	1.4
Drug abuse violations	64.2	34.5	0.6	0.7
Gambling	27.7	68.1	0.1	4.1
Offenses against family and children	67.7	29.5	1.2	1.7
Driving under the influence	87.4	10.2	1.4	1.0
Liquor laws	86.4	10.0	2.7	0.9
Drunkenness	83.9	13.3	2.3	0.5
Disorderly conduct	64.4	33.4	1.4	0.8
Vagrancy	61.2	35.7	2.5	0.6
All other offenses (except traffic)	66.0	31.4	1.4	1.2
Suspicion	61.8	36.9	0.4	0.9
Curfew and loitering law violations	70.5	27.1	0.9	1.5
Runaways	75.4	19.1	1.2	4.2

Source: Sourcebook of Criminal Justice Statistics 2002, pages 356-358.

Victimization-based Estimation

Estimates of violent crimes for different racial groups, as reported in the 2001 National Crime Victim Survey (NCVS) and 2001 UCR arrest data, show much the same pattern as indicated previously. Blacks comprised 24.6 percent of the violent offenders, and whites comprised about 64.3 percent of the violent offenders⁴. The black violent crime rate is about 2.3 times of that of the white crime rates. However, the 2001 NCVS shows that blacks account for only 22.5 percent of rape offenders, which is significantly lower than the percentage obtained from the arrested data (34.8). The percentages of blacks robbery and aggravated assault are 47.4 and 26.8 respectively.

A limitation of victim surveys is that the race of the offender is only known when there has been interaction between victim and offender, thus, offender race is rarely known for burglaries and larcenies. Another problem is that the NCVS data produce incidence rates instead of prevalence rates, and each racial subgroup may contain different proportions of repeat offenders (Sampson and Lauritsen, 1997). The NCVS data is also limited because

⁴ <http://www.ojp.usdoj.gov/bjs/pub/pdf/cvus0102.pdf>. The population data are obtained from U.S. Census Bureau, Census 2000 Redistricting Data (P.L. 94-171) Summary File for states.

the race estimates are based solely on victim reports of lone-offender crime (Sampson and Lauritsen 1997).

Self-reported Offending

Self-reported offending data typically measure less serious forms of common delinquency by juveniles (Hindelang et al. 1979, 1981; Wilson and Herrnstein, 1985). Studies based on self-reported data usually found little or no differences among juveniles of different racial and ethnic groups (see Hindelang et al. 1979, 1981). For example, the 1997 National Longitudinal Survey of Youth indicates the "ran away from home" rates are 11 percent and 10 percent for white youths (12 to 16 years old) and non-white youths respectively. About 10 percent of whites have ever carried a handgun, and about 9 percent non-whites have ever carried a handgun. The percentage reporting "ever stole a vehicle for use or sale" is the same (1 percent) for both whites and non-whites. The Monitoring the Future Study shows that during 1997 and 1998, alcohol and drug use are more common among white and Hispanic high school seniors than black high school seniors. About 30 percent of black seniors

reported use of Marijuana, but 39.9 percent of whites, and 37.2 percent of Hispanics reported use of Marijuana⁵.

One reaction to these findings was to attribute racial bias to official statistics. Others posited methodological explanations. In particular, Hindelang et al. argued that self-report studies typically measure less serious forms of common delinquency, whereas official arrest statistics showing race differentials refer primarily to serious index crimes. The validity of self-reported data may also differ by racial group, because blacks underreport certain offenses at higher rates than do whites (Hindelang et al. 1981; Sampson and Lauritsen 1997; Hawkins et al. 2000). But a more recent study found no racial differences in predictive validity based on these self-reports (Farrington et al., 1996). One major study that used self-reported data, the National Youth Survey, showed that serious and violent juvenile offenders were disproportionately black males (Elliot and Ageton, 1980; Elliott et al., 1986).

In summary, although no one denies that there is bias in the criminal justice system and limitations of available data sources, it is unlikely that the system bias against racial minorities is the major reason that causes the disproportions. There do exist race-related differences in

⁵ <http://www.ncjrs.org/html/ojjdp/nationalreport99/chapter3.pdf>

patterns of criminality. These differences have provoked competing theoretical interpretations and public policy debates (Hawkins, 1995; Hawkins et al. 2000; LaFree and Russel, 1993).

Theories Explaining Racial Differences

Conventional theoretical models explaining the connection between race and ethnicity and crime reflect at least four different approaches. These are: biological (or constitutional) approaches, the cultural deviance perspectives, control theories, and structural theories (Bruce, 2000; Hawkins et al., 1995; Sampson and Wilson, 1995; Wilson and Herrnstein, 1985).

Biological Approaches

Early biological perspectives distinguished criminals from non-criminals by certain physical anomalies with hereditary origins (Lombroso, 1876; Sheldon, 1936, 1940, 1942). They sought to explain high rates of crime among African-Americans in terms of genetic inferiority or other inherent physical deficiencies (LaFree and Russel, 1993). For example, Brearley (1932) asserted that the disproportionate rate of homicide among blacks is due to

"their peculiar genetically-determined temperament" as well as "excessive emotionality" (111-16). Contemporary biocriminal perspectives acknowledge both the importance of biological factors and social environment. In the biocriminal perspective, the tendency to commit crime has both constitutional and social origins (Herrnstein and Murray, 1994; Wilson and Herrnstein, 1985). However, a closer inspection of these ideas reveals that the core of the traditional argument remains intact (Bruce, 2000). For instance, Wilson and Herrnstein (1985) suggested that differences in black and white crime rates in the United States could be attributed to constitutional differences of youthfulness, intelligence and temperament for the two groups. They claim, "to the extent these differences exist and increase the probability of offending, some of the racial disparity may be explained" (1985:1). Biological or constitutional criminal perspectives generate much controversy and have been challenged by people working within alternative perspectives.

One controversy is that the biocriminological perspective has a tendency to medicalize political issues. The most disturbing example is that this theory has been used by totalitarian regimes such as Nazi Germany (Bruce, 2000; Einstadter and Henry, 1995). As a result, many

scholars resist the biological perspective on political and policy ground (Sampson and Lauritsen, 1997). In addition to their political implications, biological criminal theories have been criticized for a lack of empirical support (see Jencks, 1992; Shoemaker, 1984; Sutherland & Cressey, 1974). Many of the key hypotheses have yet to be tested, making it nearly impossible to assess the empirical validity of the arguments made (Jencks, 1992). Indeed, even supporters of biological criminology approaches find no evidence that biological factors play a causal role in violent crimes in general (Mednick et al., 1988).

Cultural deviance perspectives

Cultural deviance theories generally assume crime is always relative to the norms of the group defining it as crime--therefore, it is a product of social definitions (Gottfredson and Hirschi 1990). Differential association, subculture, labeling, and conflict theories all have their foundation in the cultural deviance perspectives (Gottfredson and Hirschi 1990). The following discussion focuses on subcultural and differential association explanations of racial variation in crime.

Subculture Theories

Subculture of violence perspectives argue that there are certain groups in the United States that have developed values that are conducive to crime or that approve of or justify crime in certain circumstances (Anderson 1994; Cloward and Ohlin 1960; Cohen 1955; Miller 1958; Wolfgang and Ferracuti 1967). Once the values develop, they are passed on from generation to generation, even in the absence of the deprivation that stimulated their development in the first place (Wolfgang and Ferracuti 1967; Curtis 1974). The most influential of these perspectives is the subculture of violence theory developed by Wolfgang and Ferracuti (1967). Wolfgang and Ferracuti argued that certain segments of society have adopted distinctively violent subcultural values. This value system provides its members with normative support for their violent behavior, thereby increasing the likelihood that hostile impulses will lead to violent action. In attempting to explain the high rate of homicide among young African-American males in the inner city, Wolfgang and Ferracuti (1967) speculate that there is a subculture of violence among blacks:

A male is expected to defend the name and honor of his mother, the virtue of womanhood...and to accept no

derogation about his race, his age, or his masculinity (1967:153).

In "The Code of the Streets," Anderson provides a contemporary account of the subculture of violence thesis. He argues that there exists a "code of the street" in poor, inner-city African-American communities. The code pressures African American youth in the inner city to respond to shows of disrespect with violence (Anderson, 1994).

However, little empirical evidence was found to support the conclusion that blacks and white Americans differ significantly in their attitudes and values toward crime (Kornhauser, 1978; DiIulio, 1995; Cao et al., 1997; Gottfredson and Hirschi, 1990). For instance, Ball-Rokeach (1973) and Poland (1978) tested the hypothesis that violent behavior results from a commitment to subcultural values condoning violence. Both found little evidence in support of the subculture of violence thesis. Erlanger (1974) tested Wolfgang and Ferracuti's contention that there is a subculture of violence among blacks and found that there is "an absence of major difference by race" in approval of interpersonal violence (p. 283). An empirical study by Cao and associates (1997) also rejected the hypothesis that a

unique subculture of violence exists among the general population of African Americans in the United States.

Gottfredson and Hirschi (1990: 151) pointed out the reason that the subcultural view of criminality lacks empirical support is that all groups, whatever their racial or ethnic composition, condemn the use of force or fraud and endorse values contrary to crime. Even those who commit crime do not endorse criminal acts.

Another limitation of the subculture theories to explain racial differences is that they are tautology. In subculture models, violent behaviors are used to infer the existence of a subcultural system, which in turn is used to explain behavior (Sampson and Lauritsen, 1997).

Structurally oriented researchers criticized that subcultural thought assumes that members of a particular societal subgroup create and maintain a unique subculture. They argued that the observed cultural tendencies are in fact manifestations of local structural conditions and general levels of opportunity (Anderson, 1990; Wilson, 1987). As Sampson and Wilson (1995) pointed out, ignoring the structural features of a given community has the effect of directing attention to alleged problems within African American and other disadvantaged communities. The role of

subculture in creating racial disparities of criminal behavior remains to be demonstrated.

Differential association theory

The premise of differential association theory is that criminal behavior is learned by interacting with others, especially intimate others (Sutherland and Cressey, 1966). "A person becomes delinquent because of an excess of definitions favorable to violation of law over definitions unfavorable to violation of law" (Sutherland and Cressey, 1966:81). According to Sutherland, factors such as race, social class, and broken homes influence crime because they affect the likelihood that individuals will associate with others who present definitions favorable to crime:

...The race ratios in crime result from differential associations with criminal and anti-criminal patterns. In the United States, race may be related to associations in either or both of two ways. First, the inheritance of certain characteristics may determine the social and economic level at which members of a race must live and thus possibly throw them into situations where certain criminal patterns impinge upon them with great frequency and

intensity...Second, confinement of a race to a given locale may mean that the members of the race can hardly escape the traditions which are characteristic of the locale. The traditions may be in conflict with the laws under which people of a certain race are expected to live, or they may be essentially anti-criminal. Thus, the experience of people in a racial group may be such that there is much or little conflict between its traditional ways of behaving and the laws under which is the group expected to live (Sutherland and Cressey, 1966:151-152).

Empirical analyses provide evidence supporting differential association theories to explain crime and delinquency (e.g., Matsueda 1982). However, little research has tested whether differential association theory can be equally applied to different racial and ethnic groups (an exception is Matsueda and Heimer 1987); the capacity to explain racial variation of crime and delinquency also is unknown. Because differential association theory is promising, a more detailed review of differential association theory and its empirical status will be presented in chapter two.

Control theories

Control theories are distinguished from other criminological theories by their assumption that "individuals are capable of committing delinquent and criminal acts without benefit of example, training, or rewards over and above those inherent in the acts themselves" (Hirschi and Gottfredson 2003: 151). Control theories claim, "all crimes are mundane, simple, trivial, easy acts aimed at satisfying desires of the moment, as are many other acts of little concern to the criminal law" (Gottfredson and Hirschi 1990: xv). Crimes are available to everyone, and require no special motivation or training for their commission (Hirschi and Gottfredson 2003). Control theories assume the causes of crime are the same everywhere and at all times, and are not products of unique culture, peoples, setting, historical periods, or even variable legal definitions of crime (Britt and Gottfredson 2003). Two representative control theories are Hirschi's social bond theory and Gottfredson and Hirschi's self-control theory.

Social bond theory

Social bond theory maintains that persons conform to legal codes because they are bonded to society. Criminal and

delinquent acts result when an individual's bond to society is weak or broken. Hirschi (1969) classified four elements of the bond to conventional society: attachment, belief, commitment, and involvement. Since control theory presumes a general causation of criminal behavior for all groups, Hirschi claims that the causes of crime are same among blacks and whites. The difference of crime rates is thus the results of differences of elements of social bond that people in each racial group have.

Self-control theory

The basic premise of Gottfredson and Hirschi's self-control theory is that juvenile delinquency, adult crime, and "analogous" behaviors are caused by low self-control, which is formed at a very early age through inconsistent and ineffective parenting. According to Gottfredson and Hirschi (1990:153), differences among racial and ethnic groups in levels of direct supervision by family, and more importantly differences in self-control are the major factors that account for racial or ethnic variations of crime and deviant behavior. They claimed that the large crime differences between racial groups in the United States result from variation in approaches to child rearing. The elements of child-rearing identified by

Gottfredson and Hirschi (1990) include attachment of the parent to the child, parental supervision, recognition of deviant behavior, punishment of deviant acts, parental criminality, family size, family structure, and mother's employment status etc. However, to date no analysis has been provided on how different racial groups vary in each of the conditions of child rearing, and how these differences are related to variation in crime rates.

Structural perspective

Instead of focusing on characteristics internal to a racial or ethnic minority group or a person, social structural perspectives center on a group's status and material reality in a class- and race-stratified society (Bruce, 2000). These perspectives suggest that characteristics of communities, cities, or societies such as harsh economic conditions facing a population, coupled with high levels of residential segregation, and social disorganization and weak social control account for the disparate crime rates. The structural theories that are discussed here include strain theory, and macro- and community-level perspectives.

Strain theory

Strain theories have sometime been classified as social structural theories (Einstadter and Henry, 1995). However, rather than focusing on various areas or community environments, they locate the causal force to adapt in the organization of the whole society (Einstadter and Henry, 1995).

Merton's (1938) strain theory argued that the motivation for crime frequently derives from society. He claimed that societies that place a high relative emphasis on cultural goals like monetary success and a low relative emphasis on the norms or rules for goal achievement have higher crime rates. Merton pointed out that some individuals and groups within a society are subject to special pressure for crime. While everyone is urged to strive for monetary success, lower-class individuals are frequently prevented from achieving such success through legitimate means. Individuals experiencing such goal blockage are under considerable strain or pressure, and are most strongly motivated to use illegitimate means (e.g. crime) for success:

First, such antisocial behavior is in a sense "called forth" by certain conventional values of the culture

and by the class structure involving differential access to the approved opportunities for legitimate, prestige-bearing pursuit of the culture goals. The lack of high integration between the means-and-end elements of the cultural pattern and the particular class structure combine to favor a heightened frequency of antisocial conduct in such groups. ... Recourse to the first of the alternative responses, legitimate effort, is limited by the fact that actual advance toward desired success-symbols through conventional channels is ... relatively rare and difficult for those handicapped by little formal education and few economic resources. The dominant pressure of group standards of success is, therefore, on the gradual attenuation of legitimate, but by and large ineffective, strivings and the increasing use of illegitimate, abut more or less effective, expedients of vice and crime (1938).

Although Merton's theory did not examine the relationship of race and crime specifically, it would be consistent with Merton's strain theory to explain the high crime rate among blacks as the result of the conflict between the culture

goals and the lack of legitimate channel of blacks to achieve the goals.

Strain theories are criticized because they assume that race or ethnicity is equivalent to lower class or deprived status (Gottfredson and Hirschi, 1990; Sampson and Lauritsen, 1997). Such a view omits middle-class crime or for that matter crimes of the powerful, regardless of their class. Moreover, some racial and ethnic groups such as Chinese, Japanese and Hispanic, who have also experienced economic exclusion and deprivation as African Americans, exhibit a much lower crime rate than do African Americans. It is unknown to what extent structural or cultural differences account for lower offending rates among those ethnic groups, but clearly socioeconomic status and deprivation alone are inadequate explanations (Wilson and Herrnstein 1985).

Macro-level or community-level theories

One of the main studies focusing on macro-level structure condition is Blau and Blau's (1982) work on metropolitan structure and crime. Blau and Blau (1982) emphasized the effects of relative deprivation on black crime. They suggested that social inequality between

blacks and whites, as well as economic inequality, generally increased rates of criminal violence.

The Chicago School research of Clifford Shaw and Henry McKay indicated that three structural factors—low economic status, ethnic heterogeneity, and residential mobility—led to the disruption of local community social organization, which in turn accounted for variations in crime and delinquency rates (Kornhauser, 1978; Sampson and Wilson, 1995). Through the study of Chicago delinquency, Shaw and McKay (1942) observed that high rates of delinquency persisted in certain areas over many years, in spite of population turnover:

The important fact about rates of delinquency for Negro boys is that they, too, vary by types of area. They are higher than the rates for white boys, but it cannot be said that they are higher than rates for white boys in comparable areas, since it is impossible to reproduce in white communities the circumstances under which Negro children live. Even if it were possible to parallel the low economic status and the inadequacy of institutions in the white community, it would not be possible to reproduce the effects of

segregation and the barriers to upward mobility (1949: 641).

Shaw and McKay therefore rejected individualistic explanations of delinquency and focused instead on the processes by which delinquent and criminal patterns of behavior were transmitted across generations in areas of social disorganization and weak social controls (1942: 320). Building on Shaw and McKay's work, Sampson and Wilson (1995) developed a contextual theory that incorporated structural and cultural factors to explain the race and crime relationship. They viewed "the race and crime linkage from contextual lenses that highlight the very different ecological contexts that blacks and whites reside in—regardless of individual characteristics" (1995:1). The basic thesis was that macro social patterns of residential inequality give rise to the social isolation and ecological concentration of the truly disadvantaged, which in turn leads to structural barriers and cultural adaptations that undermine social organization and hence the control of crime.

Ecological studies generally are seen to have several inherent problems and limitations that affect their usefulness. Davidson (1981:87-89), for example, says there

is a fundamental methodological problem of false or spurious results. What may be observed on the aggregate level may not be the case for individuals. Drawing conclusions for individuals from aggregate data is known as the ecological fallacy.

One crucial theoretical criticism is that the explanation is tautology. The central explanatory concept, social disorganization, is presented as both a description of a condition and the cause of that condition. Another criticism is that racial composition is used to denote material and structural disadvantage; however, this measure does not specify why African Americans are disadvantaged at the outset (Bruce, 2000).

Limited Empirical Research on Connections Between Race and Ethnicity and Crime

A multitude of studies have tested and compared theories to explain how individuals become involved in criminal and delinquent behaviors. However, empirical research examining competing explanations of the connection of race and ethnicity to crime and delinquency remains incomplete (Hawkins et al., 2000; McNulty, 2001; McNulty and Bellair, 2003; Sampson and Lauritsen, 1997). Although

race and ethnicity are critical variables in many theories of crime, previous studies of racial and ethnic differences in the criminal justice systems centered on the processing of offenders. A check of publications in some of the major criminal justice and criminology journals provides evidence of the limited research on why race is correlated with crime. For example, *Criminology*, during 1989 to 2003, published 36 articles related to race, and less than a third of them examined theoretical models that explained how race was related to the etiology of crime. *Justice Quarterly*, during 1984 to 2003, published 25 articles related to race, and no more than 5 of them examined the relationship between race and criminality. The *Journal of Criminal Justice*, from 1973 to 2003, published about 90 articles related to race, and only about 6 of them analyzed the race and crime relationship. Several reasons contribute to the limited number of studies on the relationship of race, ethnicity, and crime.

The first reason, as Hawkins points out, is that "public discourse about both crime and race in the United States has always been an ideological and political mine field" (1995). Given the history of racial discrimination in the United States, any examination of black-white differences in criminal behavior is likely to be

politically sensitive and controversial (Wilson and Herrnstein, 1985). Despite the abundance of empirical data, many criminologists long avoided speaking openly on the subject of "race and crime" for fear of being misunderstood or labeled a racist (Tonry, 1994; Sampson and Lauritsen, 1997). Some even argue that using empirical data to study the race and crime question is itself evidence of racism (MacLean and Milovanovic, 1990; from Sampson and Lauritsen, 1997). The extreme sensitivity of the subject has tended to discourage rather than stimulate the development of theoretical studies of race, ethnicity, and crime (Hawkins, 1995; Walker et al., 1996).

Second, theories about racial and ethnic differences in violence have primarily been developed in reference to comparisons between whites and blacks. Despite the changing racial and ethnic diversity of U.S. society, data on crime information for Hispanic and non-Hispanics, and for groups such as Asian Americans and Native Americans are lacking. However, the tremendous growth in the Hispanic and Asian population, and different patterns of involvement of criminal and delinquent behavior of different racial or ethnic groups (i.e. the low crime rates of Asians, and the relatively high crime rates for Native Americans and Hispanics) justify consideration of these groups.

Since the UCR and NCVS data provide no information about the offenders' ethnicity, little is known about the Hispanic criminality patterns. The victimization information obtaining from the NCVS data shows that at 2002, Hispanics were victims of overall violence at about the same rate than non-Hispanics. However, the data obtained from national correction system indicate that Hispanic males were about 2.6 times likely as white males to be incarcerated. At yearend 2002 there were 1,176 sentenced Hispanic male prisoners per 100,000 Hispanic males in the United States, compared to 450 white male inmates per 100,000 white males⁶. This information might give us a good reason to assume that Hispanics just like African Americans and Native Americans are more likely than whites being involved in law violations. In order to understand the connection of race and ethnicity to criminal behavior, it is critical to study Asian and Native American and Hispanic groups, who are at opposite ends of the continuum for involvement of criminal behavior.

The third issue is that most analytical work focuses mainly on street or index crimes--especially violence (e.g., murder, rape, robbery, and assault) and property crime (e.g., larceny, motor vehicle theft, and burglary). The

⁶ <http://www.jointcenter.org/DB/factsheet/correctionalsys.htm>

types of crime covered in previous racial-crime relationship studies are not fully representative of the landscape of criminal behavior in the United States (Sampson and Lauritsen 1997). One example is that very little research examines the theoretical explanation of racial and ethnic disparities in drug abuse, although data collected by different sources show that not only are there large racial and ethnic differences in drug use, but also the patterns are different from other types of crime. For example, the National Household Survey of Drug Abuse data shows that the rates of current illicit drug use were 7.2 percent for whites, 7.4 percent for blacks, and 6.4 percent for Hispanics. The rate was highest among American Indian/Alaska Natives (9.9 percent) and persons reporting more than one race (12.6 percent). Asians had the lowest rate (2.8 percent). The proportion of black adolescents who use drugs is even lower than the proportion of white adolescents who do the same (9.7 percent for black adolescents, 11.4 percent for white adolescents). This finding has been replicated in household surveys, school based-surveys, and in surveys of institutionalized youth (for example, Austin, Prendergast, and Lee, 1989; Kandel, Single, and Kessler, 1976; Welte et al., 1999; Oetting and Beauvais, 1990; Prendergast, et al. 1989; National

Institute on Drug Abuse, 1995). Overall, the body of literature is very small, and many important topics relevant to race, ethnicity, and crime and delinquency have not been researched at all.

Purpose of This Study

To address existing issues and contribute to the literature on empirical analysis of racial and ethnic differences of criminal behavior, this study will develop an explanatory model that integrate three particularly dominant criminological theoretical perspectives, differential association, social bond and self-control theories, to examine relationships between drug use and delinquency and race and ethnicity (which include non-Hispanic whites, blacks Americans, Asian Americans, and Hispanic Americans⁷) in the United States. By using the 2001 National Household Survey of Drug Abuse dataset, this study will explore an integrated model that accounts for drug use and delinquency for the general population including all racial and ethnic groups. This study will examine the integrated model and test the causal processes across race and ethnicity, addressing the questions: do the

⁷ Due to the small sample size of Native Americans and Hawaii Natives in the dataset, they are not included in this study.

theoretical constructs vary across racial and ethnic groups? Are the causal processes invariant across racial and ethnic groups? What are the variations in parameters across racial and ethnic groups? And what is the relative importance of differential association, social bonds, and self-control in explaining drug use and delinquency for different racial and ethnic groups.

Because the socialization process and the social environment and experiences vary for adults and youths, the intervening factors that cause or prevent criminalities may differ for adults and youths. Youths' pro- or anti-criminal patterns are more likely to be affected by parents and school supervision, parents' child-rearing practices, and peer association, while adults are likely to be influenced by employment status and quality of marriage. To understand causal processes in crime and delinquency both of adults and youths, this study will examine all the questions separately for adults and youths.

Organization of Dissertation

This dissertation is divided into five chapters. Chapter Two reviews differential association, social bond and self-control theories, and discusses the implications

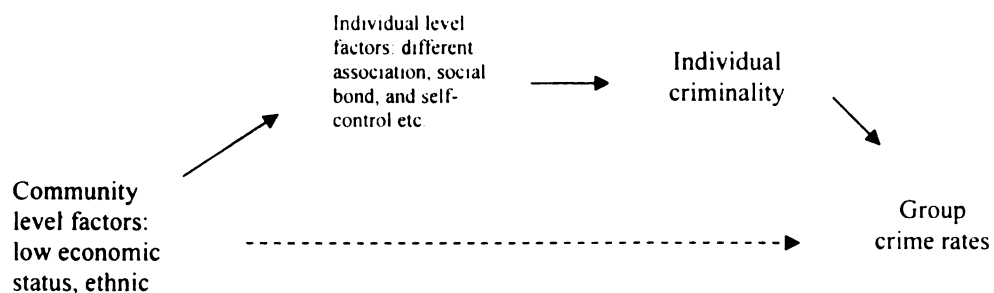
of different approaches for explaining the relationships between race/ethnicity and delinquent behavior. This chapter also demonstrates how the propositions of different theoretical approaches are incorporated within the integrated model. Chapter Three introduces the research hypotheses, describes the research design and methodology, and justifies the operationalization of the independent and dependent variables. Chapter Four presents the finding and results of the empirical analysis. Finally, Chapter Five discusses implications for theory, policy and future research.

CHAPTER II. LITERATURE REVIEW

This study focuses on the developing of an integrated model that incorporate three major individual level theoretical approaches of crime and delinquency: differential association, social bond and self-control theories. Besides the issues discussed in Chapter I, several reasons justify the selection of these three perspectives. First, although there is increased attention to the macro-level approach, which emphasizes the effects of community structures and community cultures on differential rates of crime (Sampson and Wilson 1995; Sampson and Lauritsen 1997), studies of community level factors cannot reveal the influences on individual decisions to break the law. Criminality of a group is a summery statement of the number of persons in the group who commit crimes and the frequency with which they commit crimes, thus the explanation of the criminal behavior of the person is consistent with the explanation of a crime rate (Sutherland and Cressey 1966). The relationships between macro-level, individual-level factors and crime as presented in Figure 2 indicates that even though there exists a strong correlation between community level factors and group crime rates, this correlation does not

necessarily reflect a causal relationship; rather, the core of the relationships is at the individual level, when a person is influenced to break the law. Second, the purpose of this study is not to explain why individuals or racial groups differ in the type of associations they have, or why individuals vary in social bond and self-control. Instead, this study focuses on the extent to which they differ in associations, social bonds and self-control; whether this variation could account for the racial and ethnic disparity of crime; and whether the causation of crime is the same across racial and ethnic groups.

Figure 2. Relationships between macro-level, individual-level factors and crime



Third, differential association theories and control theories are the two dominant sociological/social psychological perspectives on crime and deviance (Cullen and Agnew 1998; Erickson et al. 2000; Massey and Krohn 1986). Two of the social control theories, social bond and self-control theories are the most frequently discussed and tested of all theories in criminology (Stitt and Giacomassi 1992; Li, 2004). In a recent review of research on the correlates of juvenile delinquency, Edwards (1993) found that social control theory was used in about 75% of the studies reviewed. The book, "A general Theory of Crime," which developed self-control theory, ranks second in citations accorded to all books in the 1990s (Cohn and Farrington, 1999). A few previous studies examined the theoretical competition between the differential association and social control perspectives (e.g., Aseltine 1995; Matsueda and Heimer 1987; Costello and Vowell 1999), and some research joined together principles from each approach (Erickson et al. 2000; Elliott et al. 1985; Massey and Krohn 1986; Li 2004) to understand deviant behavior. However, little research has examined the three competing explanations of the race and crime relationship (the one exception is Matsueda and Heimer 1987). This study will contribute to the available literature by integrating

across the differential association, social bond, and self-control perspectives.

This chapter first reviews the principal themes of differential association, social bond and self-control theories. Results of empirical research testing hypotheses from each theory are then presented. The next part discusses the completion and integration between the theoretical approaches. And finally, based on the literature review, an integrated theoretical model is developed.

Differential Association Theories

Differential association theory was originally developed by Sutherland in an effort to explain the relationships between multiple factors, such as social class, broken homes, age, race, urban or rural location, and crime and criminality.

Sutherland viewed the nature of crime as involving three elements: "a value which is appreciated by a group or a part of a group which is politically important; isolation of or cultural conflict in another part of this group so that its members do not appreciate the value or appreciate it less highly and consequently tend to endanger it; and a

pugnacious resort to coercion decently applied by those who appreciate the value to those who disregard the values" (Sutherland and Cressey 1966: 15-16). When a crime is committed, these relationships are involved. Crime is this set of relationships when viewed from the point of view of the group rather than of the individual.

The principle ideas of Sutherland's differential association theory were specified in nine propositions. One proposition is that criminal behavior is learned in interaction with others, especially intimate others. This differential learning includes the techniques of committing crime, and specific direction of motives, drives, rationalizations, and attitudes. "A person becomes delinquent because of an excess of definitions favorable to violation of law over definitions unfavorable to violation of law" (Sutherland and Cressey 1966: 81). Sutherland pointed out that not all associations have an equal impact, and the influence of associations varies by frequency, duration, priority, and intensity. Definitions presented more frequently, for a longer time of exposure, earlier in life, and from either a more prestigious source or a more intense relationship, receive more weight in the differential association process (Matsueda, 1988).

Differential association theory is concerned with both individual criminality and society (group) crime rates (Sutherland and Cressey 1966). As indicated previously, differential association at the individual level explains the criminal behavior of a person. At the level of a society or group, Sutherland and Cressey developed a concept, "differential social organization," to explain the various rates of crime. They advanced the idea that "in a multi-group type of social organization, alternative and inconsistent standards of conduct are possessed by various groups, so that an individual who is a member of one group has a high probability of learning to use legal means for achieving success, or learning to deny the importance of success, while an individual in another group learns to accept the importance of success and to achieve it by illegal means" (1966: 96). This situation is called "differential social organization." The extent to which the group or society is organized in favor of crime versus against crime determines its rate of crime. Sutherland and Cressey (1966: 83) further pointed out that the individual differential association explanation of personal criminality and the society or group level differential social organization explanation of crime rate should be consistent with each other, "since the crime rate is a

summary statement of the number of persons in the group who commit crimes and the frequency with which they commit crimes."

Taken together, the individual and group components of differential association explain the differential association process by which race and ethnicity influence criminal behavior (Matsueda and Heimer 1987). According to the differential association theory, the race and ethnicity ratios in crime result from differential association with criminal and anti-criminal patterns. The differential association process should be invariant across race and ethnic groups; however, it is affected by social and economic levels at which members of a race or ethnic group must live, and it is also affected by the normal conflict between its traditional ways of behaving and the laws under which the group is expected to live (Sutherland and Cressey 1966). Social conditions such as region, sex, age, education, family status, and location of residence etc. have impact on the magnitude of the differences of crime rate across race and ethnic groups as well.

Differential association theory, as one of the most important sociological criminal theories, has stimulated theoretical refinements and revisions, empirical research, and applications to programs and policy through out the

years (Matsueda 1988). Cressey (Sutherland and Cressey 1966) identified two major weaknesses in differential association theory. The first was the difficulty of defining the concept of definitions. And because the concept of definitions was not precisely defined, the ratio of the "excess of definitions" could not be operationalized. Second, differential theory left the learning process unspecified, providing no clue about what in particular would be included in "all the mechanisms that are involved in any other learning." These two major weaknesses caused difficulty in conducting empirical tests of differential association theory (Glueck 1956). The criticism that the theory is untestable was partly due to the limitation of measurement and statistical techniques at that time. For example, another earlier criticism of differential association theory is that it is unclear which came first—the association with delinquent others or the illegal behavior itself (Glueck and Glueck 1950). Delinquents may select as friends other youths whose values and behaviors are similar to their own. If that is the case, then delinquency causes delinquent friends, but delinquent friends do not cause delinquency. This difficulty was solved by later longitudinal research; and findings support differential association theory (Tittle et

al. 1986). In a paper that evaluated the current status of differential association theory, Matsueda (1988) indicated that with the advances in statistical techniques, the ratio of definitions favorable and unfavorable to violating the law can be measured, and differential association theory can be tested empirically.

Empirical Research on Differential Association Theory

Tests of differential association theory have centered on several areas. These include analyses of the main concepts of differential association: peer relationships, and ratio of definitions favorable and unfavorable to law violation, and social factors that influence differential associations.

Association with Delinquent Peers

Early studies of differential association theory operationalized the concept of association as the association with delinquent peers, and the frequency, duration, priority and intensity of such associations (e.g. Short 1957, 1958). Research consistently has demonstrated that peers' delinquency is a strong predictor of individuals' delinquency (Gueck and Glueck 1950; Reiss and

Rhodes 1964; Voss 1964; Krohn 1974). As early as 1950, the Gluecks found that 98% of 500 delinquents had delinquent friends, but only 8% of 500 nondelinquents had delinquent friends (Glueck and Glueck 1950). Short (1957) designed a "specific differential association score" to reflect the cumulative effect of frequency, duration, priority, and intensity of interaction with delinquent friends. A significant correlation (.581 for boys, and .606 for girls) between the "differential association score" and delinquency was found. The correlations between delinquent peer association and individual delinquent behavior have been replicated in research using different measure or modeling designs (Akers et al. 1979; Matsueda 1982; Tittle et al. 1986; Elliott et al. 1985; Krohn et al. 1996; Warr 1993a, 1993b; Haynie 2002). For instance, Reiss (1964) and associates measured delinquent peer associations by asking respondents, on a four-point scale, how many of their friends had committed a property crime in the past year. They found that the number of friends who had committed a property crime is significantly correlated with the individual's involvement of property crime. In a very recent study Haynie (2002) used a relative measure of peer delinquency—the proportion of delinquent friends in a respondent's network—to test differential association

theory. Haynie found that the proportion of delinquent friends in a respondent's network is most strongly associated with respondents' subsequent delinquency. These findings again support the proposition that "delinquent peers" is a significant entity to predict delinquent behavior.

Although the concept of delinquent peers association is highly correlated with the concept of associations with definitions favorable and unfavorable to delinquency, a criticism is that this strategy does not measure the concept "definitions" directly. Several researchers developed a strategy to measure the content of definitions favorable to crime more directly. For instance, Cressey (1952) used verbalization and rationalization to make up a component of definitions favorable and unfavorable to delinquency. Sykes and Matza (1957) developed a measure of techniques of neutralization to demonstrate pro-delinquent definitions. Later researchers have developed survey instruments to measure learned definitions of law violation based on these refinements (Jensen 1972; Matsueda 1982; Tittle, Burke, and Jackson 1986; Matsueda and Heimer 1987).

Definitions Favorable and Unfavorable to Delinquency

The concept of definitions favorable and unfavorable

to delinquency is the core of differential association theory. It is predicted that the ratio of definitions favorable and unfavorable to delinquency affects the likelihood that a person will become delinquent. Mixed evidence has been found from previous studies. An early study by Jensen (1972) reported that there is not an independent effect of delinquent definitions on delinquency. Matsueda (1982) pointed out that the Jensen's results might be influenced by measurement error in the indicators of the ratio of definitions; they also might be affected by other social conditions such as age, social class, and broken home etc. In a study that has been described as a "classic contribution to theory testing in criminology" (Hagan 1992:4), Matsueda (1982) established a structural causal model. "Definitions favorable and unfavorable to delinquency" is treated as an unobservable variable with multiple indicators. The theoretical construct of the "ratio" concept in this study is transformed to a monotonic measure to capture associations with both procriminal and antiscriminal behavior patterns. The indicators include beliefs about police officers, delinquency or deviant behavior, and law. The results were consistent with differential association theory. The effects of social conditional factors, parents'

supervision, and peer relationships, as well as social control variables, were mediated by the ratio of definitions favorable and unfavorable to delinquency. Similar findings have been obtained from other studies using measures of the "ratio of pro-crime to anti-crime definitions" (e.g. Tittle et al. 1986; Matsueda and Heimer 1987).

Sutherland and Cressey (1966) indicated that social economic conditions such as region, sex, age, education, family status, and location of residence have an impact on the ratio of definitions pro-crime to anti-crime, which in turn influences delinquent behavior. Low social economic status may increase the probability of encountering many delinquent behavior patterns; it may also affect a child's denial or acceptance of conventional values.

Family Structure

Research on delinquency usually finds that female-headed households, unemployment, illegitimacy, and differential association influence the crime rates. Previous studies testing differential association theory have used broken home (a dichotomous variable indicating whether the adolescent lived in a two-parent family) as an indicator of family structure (Matsueda 1982; Matsueda and

Heimer 1987; Haynie 2002). Broken homes may promote delinquency by increasing children's association with delinquent definitions, and decreasing their association with anti-delinquent definitions (Sutherland and Cressey 1978). Matsueda and Heimer (1987) found broken homes do have impact on delinquency. However, the broken home's influence was mediated by learning of definitions of delinquency, and this impact is larger on delinquency among blacks than non-blacks. But in a multivariate analysis, Haynie (2002) did not find significant effects of broken homes after controlling peer delinquency, peer network, and other control variables. Thus, existing research is inconclusive.

Differential Association and Race and Delinquency

So far very few empirical studies have analyzed the efficacy of differential association theory in explaining the relationship between race and delinquency. One major study was conducted by Matsueda and Heimer (1987). In this study, Matsueda and Heimer examined differences in parameters across populations of black and non-black youth, and tested the efficacy of differential association versus social control theory across race. They found that effects of definitions on delinquency were invariant across race.

Delinquent friends had a slightly larger total effect in the model for non-blacks than for blacks. But definitions of delinquency had relatively less effect in the model for non-blacks than for blacks. The effects of background variables on determinants of definitions varied by race. Broken homes were more influential in producing delinquency among blacks than non-blacks. Matsueda and Heimer (1987) argued that this finding was due primarily to the larger effects of broken homes, parental supervision, and neighborhood trouble on the process of learning definitions among blacks. Thus, from the standpoint of differential association theory, the neighborhood and family organization of blacks is most influential in the process producing definitions of delinquency. The general findings support the hypothesis that the differential association causal models of delinquency are invariant across racial groups.

Social Bonding Theory

Control theories assume a person is free to commit criminal acts because his or her ties to the conventional order have been broken. In social control theories, deviance is taken for granted. It is conformity that needs

to be explained (Hirschi 1969). Hirschi (1969) therefore argued that social bond theory is designed to answer the question "Why don't we do it" instead of "Why do they do it", a question that most other theories try to answer. According to social bonding theory, the motivation for crime is constant across persons. It is not only those who finally commit a deviant act who have the impulse to do so but most people experience deviant impulses frequently (Hirschi 1969). When an individual's bond to conventional society is weak or broken, delinquent acts will be resulted. Hirschi (1969) identified four elements of the social bond—attachment, commitment, involvement, and belief.

According to Hirschi (1969), lack of attachment to others frees an individual from moral restraints, as the individual has no conscience or superego. If a person is insensitive to the opinion of others, then he or she is to that extent not bound by norms, and is free to deviate. The essence of internalization of norms, conscience, or superego thus lies in the attachment of the individual to others. A key idea in the theory is that commitment to conventional activities, such as getting an education, building up a business, acquiring a reputation for virtue, dissuades a person from crime and delinquency. When one

considers deviant behavior, one must consider the costs of this deviant behavior and calculate the risk of losing the investment of time and energy in conventional activities. Involvement in conventional activities limits one's time and reduces the opportunity to commit deviant acts. The element of belief is a reconceptualization of Sutherland's concept of definitions favorable to law violation. Hirschi denied that there exists subculture of violence. He argued that it is not necessary that a person construct a system of rationalizations in order to justify commission of acts he wants to commit, because in control theory there is no special motivational force to account for the neutralization. In contrast, control theory assumes the existence of a common value system within the society or group whose norms are being violated. It also assumes that "there is variation in the extent to which people believe they should obey the rules of society, and furthermore, that the less a person believes he should obey the rules, the more likely he is to violate them" (Hirschi 1969: 26). Hirschi (1969) argued that while the four elements of the social bond are correlated, each element could influence delinquency independently and additively.

Hirschi's control theory assumes that crimes are available to everyone, and need no special motivation. The

causes of crime and delinquency are the same across racial and ethnic groups. For both whites and minorities, delinquency is determined by the independent effects of the elements of the social bond. The racial disparities in the crime rate are the results of differences in elements of the bond to conventional society.

Empirical Research on Social Bond Theory

Since the publication of Hirschi's *Causes of Delinquency*, his original formulation has been tested, challenged, and revised numerous times. Some studies have reported findings contrary to predictions; there exist several proposals to refine the original theory or to integrate it with other theories (e.g., Elliott et al. 1985; Sampson and Laub 1993). Altogether, however, empirical tests are generally supportive of social control theory. Associations between indicators of attachment, belief, commitment, and involvement with delinquency have tended to be positive and significant (Siegel 1995:219).

Attachment

Hirschi's attachment construct includes affective and behavioral ties to parents, school, and peers. However,

the social control influences of parents, school, and peers are theoretically and empirically distinct. Researchers usually treat them as separate constructs.

Attachment to parents

Attachment to parents is a central concept in Hirschi's control theory. Hirschi argued that the more strongly a child is attached to his parents, the more strongly he is bound to their expectations, and therefore the more strongly he is bound to conformity with the legal norms of the larger system. Hirschi included mother's virtual supervision, intimacy of communication with father (mother), and affectional identification with father (mother) as components of attachment to parents. The bivariate analyses using the Richmond Youth Project data showed these three components of attachment to parents are significantly correlated with individual delinquency.

Some later studies distinguished between two different dimensions of attachment to parents (Rankin and Wells 1990, Costello and Vowell 1999). For instance, Rankin and Wells (1990) distinguished attachment (indirect control due to the affective bonds between children and parents) from direct control (parental discipline and the administration of punishments for deviant behaviors). Direct controls and

attachment were consistently related to various indicators of delinquency. However, the expected interactions among these variables were far less evident than prior theorizing predicts.

Attachment to school

In analyzing attachment to school, Hirchi (1969) presented a causal chain that runs from academic incompetence to poor school performance to disliking of school to rejection of the school's authority and to the commission of delinquent acts. He showed that dislike of school significantly predict individual's delinquency acts. Some researchers (e.g. Massey and Krohn 1986) have argued that Hirschi's construct of attachment to school is not clearly different from the commitment and involvement concepts. They pointed out that some predictive items such as school grades in commitment are redundant with each other and with school attachment (Massey and Krohn 1986).

Attachment to peers

There are three indicators of attachment to peers in Hirschi's analysis: whether a person wants to be the kind of person his or her best friends are, whether a person respect the best friends' opinions about the important

things in life, and how many close friends have been pricked up by police. Hirschi found that attachment to peers does not produce attitudes and values conducive to delinquency. There was no direct relationship between delinquency and attachment to adolescent peers. Instead, Hirschi argued that both delinquent acts and delinquent companions are the results of low stakes in conformity. Hirschi (1969:159) concluded, "Boy's stake in conformity affects his choice of friends rather than the other way around." However, subsequent studies have failed to replicate the findings (Conger 1976; Elliott et al. 1979; Hindelang 1973; Krohn and Massey 1980). Studies have found that attachment to peers positively relates to delinquent involvement. Because the social control influences of parents, school, and peers are theoretically and empirically distinct, later studies usually treat attachment to parents, attachment to peers and attachment to schools as different constructs (Elliott et al. 1985; Massey and Krohn 1986; Hindelang 1973; Costello and Vowell 1999).

Commitment to Conventional Lines of Action

Two important components of "commitment" are commitment to education and commitment to a high-status

occupation. Hirschi found that education expectation and educational aspirations were both related to delinquency. However, education expectations were more strongly related to delinquency than educational aspirations. Achievement orientation is also related to delinquent behavior. Occupational expectation and occupational aspirations were related to delinquency as well. Subsequent studies have generally supported the hypotheses that attachment and commitment are correlated with delinquency (Cernkovick and Giordano 1987; Hindelang 1973; Hirschi 1969; Jensen 1972; Junger and Marshall 1997; Krohn and Massey 1980; Rankin and Kern 1994; Rankin and Wells 1990; Sampson and Laub 1993).

Involvement

Control theory predicts that involvement in conventional activities is relevant to delinquent behavior, because spending time in conventional activities removes opportunities to commit delinquent acts. However, Hirschi found negative relations between dating and working and delinquent acts. Hirschi argued the negative relations might be because youths who date are less likely to be committed to higher education. Hirschi did find a relationship between time spent on homework and delinquency that was consistent with the hypothesis.

Research on the relationship between involvement in conventional activities and delinquency has been less supportive of social bond theory (Agnew 1993; Hirschi 1969; Kempf 1993). Because attachment to school, commitment to education, and involvement in school activities are three constructs that are highly correlated with each other, and indicators of these three concepts are similar, later studies usually used one construct to measure these concepts (e.g. Costello and Vowell 1999; Elliott et al. 1985; Massey and Krohn 1986; Rodrigues and Weisburd 1991).

Belief

Hirschi examined three sets of beliefs—beliefs to law and the legal system, beliefs to low-class values, and beliefs to middle-class values—and their relationships with delinquent acts. Hirschi (1969) found belief in the validity of the law is negatively related to delinquency and positively associated with attachment and commitment. With respect to lower-class culture, Hirschi found there are no significant differences between lower-class and middle-class children. The academically incompetent middle-class child was even more likely than the academically competent lower-class child to accept the norms, beliefs, and practices of the lower class. Evidence

that supports this conclusion is found in subsequent research (e.g. Matsueda 1982; Maros et al. 1986; Krohn et al. 1983; Costello and Vowell 1999).

Religiosity

Besides the four major elements of Hirschi's social bond, religiosity has been suggested by researchers as another important entity that impacts the delinquent decision (Johnson et al. 2000; Marcros et al. 1986; Evans et al. 1995). Marcros et al. (1986) argue that religion is a major and conventional institution that could serve to control deviant impulses. Their empirical findings support this argument. Johnson and associates (2000) hypothesized that individual religiosity is protective in helping at-risk youths such as those living in poor inner-city areas to escape from drug use and other illegal activities. Their research results indicated that youths' religiosity does have significant effect on various forms of deviance among inner-city black male youths.

Social control and race and delinquency

Hirschi suggests that the models predicting causes of crime and delinquency are the same across racial and ethnic groups. In examining control theory, Hirschi presents

empirical support based on white boys only. Hirschi does mention that the results are similar for Black youths but that the relations generally are weaker, which he attributes to the lower reliability of the answers of his Black respondents.

Several studies have analyzed how race or ethnic background influences the impact of social bonding variables on delinquency. Many of them concluded that, overall, the results are very much alike for different race and ethnic groups (e.g. Johnson 1979; Austin 1978; Cernkovich and Giordano 1992; Eve 1978; Rodriguez and Weisburd 1991; Wallace and Bachman 1991; Junger and Marshall 1997). For example, Johnson (1979) found that social control factors were, globally, the same for boys and girls and for Asian and White respondents. Junger and Marshall (1997) studied the interethnic generalizability of social control theory for four ethnic groups, Surinamese, Moroccan, Turkish, and Dutch boys in the Netherlands, and found that the dimensions of the social bond were interrelated in the same way among all four groups. They also found that social bonding variables predicted variations in a variety of types of delinquent involvement and deviance among the four groups. The variables most consistently related to delinquency among the four groups

were beliefs in conventional values, family supervision, school conflict, and participation in unconventional leisure activities.

On the other hand, a number of studies found that social bonding variables do hold differing explanatory power for various ethnic groups. For example, LeGrande and Shoemaker (1989) conducted a replication study of Hirschi's (1969) study. They found that the association between strength of social bond and delinquency is relatively strong among rural and white youths and relatively weak among urban and Black youths. Consistent with Hirschi's observations, they found that the scales measuring dimensions of the social bond were less reliable for Blacks than they were for whites. Similarly, Cernkovich and Giordano (1992) found that social bond variables do considerably better in accounting for the delinquency of whites than for that of nonwhites, although for both groups, control and supervision, identity support, disapproval of peers, and instrumental communication are important predictors. A study (Rodriguez and Weisburd 1991) using data from a survey of inner city Puerto Rican American male adolescents indicated that among Puerto Rican American adolescents, family bonding was a more important influence on delinquency whereas peer bonding was less

important than was the case in the national sample of more affluent white youths.

Self-Control Theory

The basic assumption about the nature of crime in Gottfredson and Hirschi's (1990) self-control theory is consistent with the assumption of classic social control theory. Gottfredson and Hirschi (1990: 89-90) asserted that criminal acts as well as analogous behaviors provide immediate, easy or simple gratification of desires, and few or meager long-term benefits. They require little skill or planning, and result in pain or discomfort for the victim. While the social control theory is based on the idea that the costs of crime depend on the individual's current location in or bond to society, the self-control theory noticed that people also differ in the extent to which they are vulnerable to the temptations of the moment. The social and individual restraints on behavior exist simultaneous (Gottfredson and Hirschi 1990: 87-88). In social bond theory, Hirschi focuses on the control in a person's relation to society, but in self-control theory, the focus is moved to control inside the individual.

Gottfredson and Hirschi indicated that the traits of low self-control include impulsivity, insensitivity, emphasis on the physical, risk-taking, shortsightedness, and being nonverbal (1990:90). These factors affect calculation of the consequences of one's acts. For instance, the impulsive or shortsighted person fails to consider the negative consequences of his or her acts; the insensitive person has fewer negative consequences to consider; the less intelligent person also has fewer negative consequences to consider and has less to lose. People with the characteristics associated with low self-control therefore will tend to engage in criminal and analogous acts (Gottfredson 1990: 90-95). Gottfredson and Hirschi emphasized that these components form a single, unidimensional latent construct:

Since these traits can be identified prior to the age of responsibility for crime, since there is a considerable tendency for these traits to come together in the same people, and since the traits tend to persist through life, it seems reasonable to consider them a stable construct useful in the explanation of crime (1990:90-91).

Gottfredson and Hirschi (1990) further pointed out there are two general sources of variation that affect the traits of self-control. The first variation appears in the early life of children, including low intelligence, high activity level physical strength, and adventurousness. They suggested that these individual differences may have an impact on the prospects for effective socialization. The second is the variation among caretakers in the degree to which they recognized low self-control and its consequences and the degree to which they are willing and able to correct it. Therefore, Gottfredson and Hirschi (1990) argued that the major cause of low self-control is ineffective child-rearing.

According to Gottfredson and Hirschi (1990: 97), the minimum conditions that are necessary for adequate child-rearing include: monitoring the child's behavior; recognizing deviant behavior when it occurs; and punishing such behavior. Two types of institutions play important roles to produce effective or complete socialization: family and school. The elements of the child-rearing model within familial institutions suggested by Gottfredson and Hirschi (1990: 98-104) contain: the attachment of the parent to the child; parental supervision; recognition of deviant behavior; punishment of deviant acts; parental

criminality; family size; the single-parent family; and the mother who works outside the home. School is seen as an alternative institution that provide effective socialization to people who are not socialized sufficiently by the family. Compared with the family, the school can more effectively monitor behavior, recognize deviant or disruptive behavior, discipline, and punish. Therefore school could be an effective socializing agency. According to Gottfredson and Hirschi, "mundane homework," "not liking school," and "school performance" are indicators of lack of socialization. Gottfredson and Hirschi (1990) also realize that although low self-control can result in a tendency to engage in crime and analogous acts, this tendency results in a crime or analogous behavior only when the opportunity to engage in the behavior is present.

Gottfredson and Hirschi (1990: 123-124) criticized other sociological theorists for ignoring individual correlates of crime in favor of social variables such as urbanization, class, and culture. In explaining the racial and ethnic differences in crime rate, they criticized that subculture theorists simply assert that black culture values violence more than white culture, and strain theorists explain the differences by making nonwhite racial status equivalent to membership in the lower class.

Gottfredson and Hirschi argued that race and ethnic differences are due to differences in levels of self-control. They claimed there are differences among racial and ethnic groups in levels of direct supervision by family, which may influence the crime rate. There also exist large differences among racial groups in the elements of child-rearing; and the differential child-rearing practice is the major reason that accounts for the racial differences of crime rate.

Empirical Research on Self-control Theory

Since the publication of "A General Theory of Crime," self-control theory has been the focus of extensive academic attention and considerable debate. In general, there is fairly consistent support for the theoretical predictions—the lower a person's self-control, the higher his or her involvement in criminal behavior and acts analogous to crime (Benson and Moore 1992; Evans et al. 1997; Grasmick et al. 1993; Pratt and Cullen 2000; Burton et al. 1994; Gibbs and Giever 1995; Gibbs et al. 1998; Piquero and Tibbetts 1996; Arneklev et al. 1993). Measures of low self-control have also been found to have statistically significant effects on crime and deviant behavior even

after controlling for measures of competing criminological theories, such as strain, social bond, and differential association theories/social learning theories (Brownfield and Sorenson 1993; Burton et al. 1994; Burton et al. 1998; Evans et al. 1997; Nagin and Paternoster 1993; Piquero and Tibbetts 1996). However, empirical tests show that low self-control cannot, as Gottfredson and Hirschi predict, explain away the effects on crime of other sociological factors, especially the effects of differential association variables (Brownfield and Sorenson 1993; Burton et al. 1994; Burton et al. 1998; Evans et al. 1997; Winfree and Bernat 1998; Partt and Cullen 2000).

Because there is only one major explanatory concept in self-control theory, low self-control, a main issue concerning the empirical research on self-control theory is the operationalization of self-control. Partt and Cullen (2000) in a study examining the empirical status of self-control theory pointed out there are three general types of measures of self-control: attitudinal measures, behavioral measures, and a mixture of attitudinal and behavioral measure. Partt and Cullen (2000)'s analysis indicates that regardless of measurement differences, low self-control is an important predictor of crime and of "analogous behaviors." Hirschi and Gottfredson (1990, 1993) preferred

a behavioral measure of self-control, and they argued that "the best indicators of self-control are the acts we use self-control to explain: criminal, delinquent, and reckless acts" (Hirschi and Gottfredson 1993:49). However, a research compared attitudinal and behavioral measures shows that although both measures produce supportive evidence for self-control theory, the behavioral measures provide no better predication than do the cognitive measures.

Although Gottfredson and Hirschi suggested that the traits of self-control should have equivalent factor structures across different types of racial and ethnic groups, little research is done to test this argument. According to Gottfredson and Hirschi (1990), the racial and ethnic disparities of crime rates are mainly caused by differences of child-rearing practices across racial and ethnic groups, however, very few criminological studies have examined self-control theory's arguments about child-rearing (Cochran et al. 1998; Gibbs et al., 1998; and Polakowski 1994; Hay 2001; Unnever et al. 2003), and none of these studies have analyzed the relations between race/ethnicity, child-rearing and self-control, and delinquency.

Competition Between Differential Association and Control Theories

Differential Association Theory and Social Bond Theory

Hirschi (1969), in "Causes of Delinquency" divided criminological theory into three main perspectives, which he identified by the terms "control theory," "strain theory," and "cultural deviance theory"—a term for differential association/learning approaches. He argued that these three perspectives were incompatible, and that they should be seen as rivals to be tested empirically against one another.

In "Causes of Delinquency," Hirschi (1969) analyzed the self-report delinquency data collected from the Richmond Youth Projects, and provided empirical evidence against differential association theory. Hirschi (1969) found that attachment to delinquent friends was negatively related to individuals' engaging in delinquent, which Hirschi argued contradicts Sutherland's differential association theory. Another finding was that when the number of delinquent friends is held constant, certain indicators of attachment to parents, attachment to school, and commitment to conventional achievement all affected

delinquency. Hirschi therefore concluded that the empirical results support social bond theory over differential association theory. Matsueda (1982) pointed out that Hirschi's findings are based on a misinterpretation and mis-operationalization of Sutherland's concept of definitions favorable and unfavorable to criminal behavior. Matsueda argued that Sutherland's theory pertains to associations with behavior patterns, which can be learned from nondelinquents as well as delinquents. Measures of the number of delinquent and nondelinquent friends should be used to investigate the sources of learning delinquent and antidelinquent behavior patterns. To test Sutherland's differential association theory, Matsueda (1982) suggested that a more direct operationalization of the core concept of delinquent and antidelinquent definitions was needed.

Matsueda (1982) reanalyzed Hirschi's data of Richmond Youth Project, and tested Sutherland's differential association theory against Hirschi's social bond theory. Matsueda found that indicators of definitions favorable and unfavorable to law violation mediated all of the social control and background variables' effects on delinquency. Matsueda therefore concluded that differential association theory was supported over social bond theory.

A more recent study evaluated Matsueda's analysis (Costello and Vowell 1999). Costello and Vowell argued that Matsueda's social control model did not provide a complete test of theory because of the omission of two of the theory's crucial constructs, commitment and intimacy of communication between children and parents. Matsueda operationalized attachment to parents solely with Hirschi's "virtual supervision" variables. Costello and Vowell operationalized Hirschi's concept of belief using similar indicators as Matsueda's operationalization of Sutherland's concept of definitions favorable and unfavorable to law violation. However, Costello and Vowell argued that belief is one component of social bond; the location of belief in the causal chain should be the same as other components. In other words, belief should not mediate the effects of other social bond variables. The findings from this specific model showed that social bond and friends' delinquency remained more important than did definitions. Thus they concluded that social bond theory is supported over differential association theory in explaining delinquency.

Self-control Theory and Social Bond Theory

Self-control theory and social bond theory are both

control theories and both share the assumption about human nature that people will naturally break the law. In self-control theory, crime is viewed as rooted in individual differences that developed early in life and have effects across the life course (Gottfredson and Hirschi 1990), and in social bond theory crime is rooted in social experiences (Hirschi 1969). Gottfredson and Hirschi assert that self-control, not social bonds, is the chief source of resistance against criminal temptations. Child-rearing through family and school impacts self-control, which in turn influences the individual to be involved in criminal behavior. Therefore the causal sequence in self-control theory is from attachment to parents, attachment to school, commitment to and involvement in education to self-control, and then to delinquent behavior. Self-control should mediate the effects of social bond variables. So far, little criminological research has tested the causal model indicated by Gottfredson and Hirschi (e.g. Cochran et al. 1998; Gibbs et al., 1998; and Polakowski 1994; Hay 2001; Unnever et al. 2003). Unnever et al. (2003) did find that parental monitoring not only increased self-control, but also had direct effects on delinquency. This result indicates that social bond variables have independent effects on delinquent.

Differential Association Theory and Self-control Theory

Several empirical tests have shown that low self-control cannot explain away the effects of differential association variables (Brownfield and Sorenson 1993; Burton et al. 1994; Burton et al. 1998; Evans et al. 1997; Winfree and Bernat 1998; Pratt and Cullen 2000). In a meta-analysis of low self-control, Pratt and Cullen (2000) found that studies including differential association variables in conjunction with self-control variables explained 15.3% more variation in crime than did studies that did not control for differential association variables. The mean effect size of differential association variables was still statistically significant after controlling for self-control.

Integration of Differential Association and Control Theories

Even though some researchers consider the causal models derived from differential association, social bond, and self-control theories to be competing or alternative, others recognize that factors deriving from different theories could contribute to the explanation of criminal

and delinquent behavior complementarily or interactively. Some integrated approaches have been developed to model the casual process and explain the deviant behavior. For instance, Elliott et al.'s integrated theory combines the strain, social control, and differential association (social learning) theories, and specifies an etiological sequence. In this sequence, strain, inadequate socialization, and social disorganization are the primary causes of weak bonding to conventional groups, activities, and norms. Weak conventional bonding and/or high levels of strain lead some youths to seek out and become bonded to peer groups that provide positive reinforcements for and modeling of delinquent behavior. And finally, bonding to delinquent groups, when combined with weak bonding to conventional groups and norms, lead to a high probability of involvement in delinquent behavior (Elliott et al. 1985:65). Using the National Youth Survey dataset, Elliott et al. tested the integrated theoretical model, and found that association with delinquent peers was the best predictor of delinquency. Further, low social control increased the likelihood of association with delinquent peers. Social control also conditioned the effect of delinquent peers on delinquency, such that association with delinquent peers had a much stronger effect on delinquency

when social control was low. Strain increased the likelihood that individuals would be low in social control. However, neither the strain nor social control measures had direct effects on delinquency. The results provided support for the integrated theory. Elliott et al.'s theory is among the most popular integrated theories in explaining delinquency and drug use. Subsequent models integrating differential association theory and social bond theory, like Elliott et al.'s model, generally have assumed that differential association with peers is the intervening variable, since low social control increases the likelihood of association with delinquent peers, which increase the likelihood of delinquency (e.g. Massey and Krohn 1986; Marcos et al. 1986; Erickson et al. 2000). Empirical findings support the integrated theoretical models.

Thornberry (1987) developed an interactional theory of delinquency by combining social bond theory and differential association theory. Thornberry's interactional theory, similar to Elliott et al.'s integrated theory, assumed that weak social bonds lead to delinquency by increasing the likelihood of association with delinquent peers. However, Thornberry argued that rather than relying on unidirectional causal structure, most variables have reciprocal causal effects on one

another. Thornberry also pointed out conventional theories tend to assume uniform causal effects throughout the social structure, and ignore the person's structural position. Therefore, in Thornberry's model, delinquency itself is involved in the pattern of reciprocal causation. Association with delinquent peers increases the likelihood of delinquency; delinquency could also increase the likelihood of association with delinquent peers. Only a few studies have examined the reciprocal relationships in Thornberry's interactional theory. The core arguments of Thornberry's theory have some support and the findings suggest that theories of crime need to consider reciprocal effects.

The Integrate Theoretical Model

The literature review shows that none of the theories alone could explain the criminality satisfactorily; factors deriving from different theories would contribute to the explanation of criminal and delinquent behavior complementarily or interactively. Based on the literature review and evidence from previous research, this study hypothesizes an integrated theoretical model that incorporates differential association, social bond, and

self-control theories into a single paradigm to account for the delinquent and criminal behavior.

A well-established theoretical model of differential association was developed by Matsueda (1982). Matsueda found that delinquent peers and definitions of law violation significantly affect delinquent behavior. Matsueda also found that effects of social bond and background variables are mediated by definitions favorable and unfavorable to law violation. In their integrated model explaining delinquency and drug use, Elliott and associates (1985) also found that bonding to delinquent peers is the only variable that exerted direct effects on delinquent behavior. Weak conventional bonding works through the strong bonding to delinquent friends to produce delinquent behavior. Following these schemes, the integrated model hypothesizes that delinquent peers and learned definitions of drug use mediate the effects of social bonds.

Gottfredson and Hirschi's (1990) self-control theory assumed that delinquent or criminal behavior is caused by a single factor, low self-control, which is formed through inconsistent and ineffective child-rearing. They further point out that the institutions of family and school play important roles to produce complete socialization. Factors

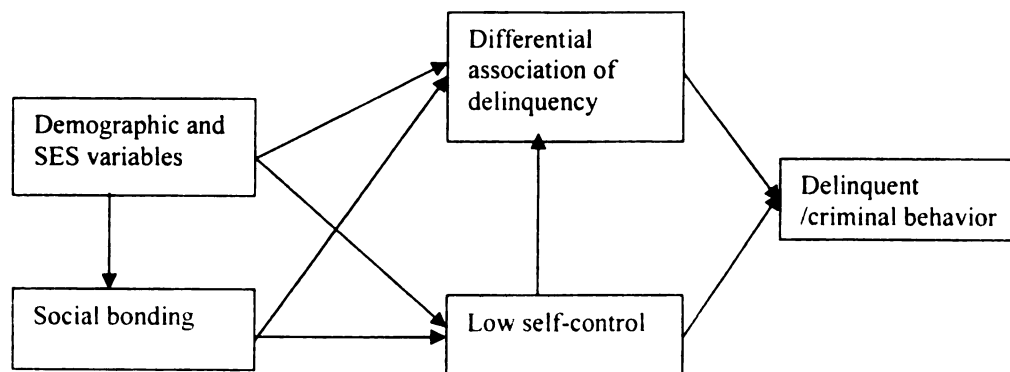
within familial institutions suggested by Gottfredson and Hirschi contain: the attachment to parents, and family structure etc. Therefore, according to the self-control model, elements of bond to conventional society are posited to influence low self-control, which in turn influence the drug use and delinquent behavior. A path between self-control and delinquent peers is also established. It is hypothesized that low self-control would lead to strong association with delinquent peers.

Many theorists believe that the causal processes of crime are the same across social demographic groups. They argued that differences in crime rate between groups are mainly caused by independent variables identified by the different theories, such as differences in number of delinquent peers, differences of definitions, and variations in social bonds and self-control. Therefore the background variables such as sex and age are hypothesized to operate through the main theoretical constructs. The independent effects of differential association and self-control had been supported in previous research.

This integrated theoretical model is presented in Figure 3. The integrated model incorporates the theoretical constructs from differential association, social bond, and self-control approaches. Weak bonding to conventional

social institution, social economic status, and demographic differences are hypothesized primary causes of differential association of crime or delinquency and low self-control. Low self-control would further lead to strong delinquent peer relationship. And finally, differential association combining with low self-control leads to a high probability of involvement in drug use and delinquent behavior.

Figure 3. The integrated theoretical model



Summary

The results of the literature review on differential association and control theories provide evidence that constructs of differential association, social bond, and self-control theories are influential in delinquency or deviant behavior. However, the causal structure of delinquency is still uncertain, and little research has tested the efficacy of theoretical models across racial and ethnic groups. The question of whether the existing theoretical models are sufficient to explain the racial and ethnic disparity of crime and delinquency has not been answered yet.

This study seeks to address several issues that remain unresolved. First, this study focuses on developing an explanatory model that integrates differential association, social bond and self-control theories, to understand the connection of race and ethnicity to drug use and delinquency.

Second, it is evident from the review that the research on racial and ethnic disparity of crime and delinquent is incomplete. Existing theoretical models are usually tested for the white population in the United States; little is know whether these models could be

applied to explain the criminality of minority groups, especially Native, Asian, and Hispanic Americans. This study examines the relative explanatory power of the theoretical model and specific causal linkages by racial and ethnic groups of whites, blacks, Asian American, and Hispanics in the United States.

Third, the literature review indicates that differential association theory assumes the crime rates differences across racial and ethnic groups are the results of different association with criminal and anti-criminal patterns. Social bond theory argues that the racial disparities of crime rate are the results of differences of elements of the bond to conventional society, while self-control theory asserts that the differences are the results of different child-rearing practices of different racial and ethnic groups. But few empirical studies have been relevant to these propositions. It is undecided that to what extent do blacks, Asian, and Hispanic Americans differ from whites in the ratio of definitions favorable to unfavorable of law violation. The variations of social bonds and self-control between different groups are unclear too. This current study seeks to improve the understanding of the racial and ethnic disparities of the delinquent and criminal patterns by answering these questions and deciding

the relative importance of each variable in explaining drug use and in explaining the racial and ethnic disparities of delinquent patterns.

CHAPTER III: RESEARCH METHODOLOGY

Hypotheses

The review of the literature on race and ethnicity and theoretical explanations of criminality suggests several hypotheses relevant to drug use and delinquency:

H₁: Differential association and self-control affect one's involvement of drug use and delinquent/criminal behavior.

H₂: Differential association and self-control mediated the effects of social bonds.

H₃: Differential association, self-control, and social bonds mediated the effects of background variables.

H₄: Blacks, Asian Americans and Hispanic Americans vary from non-Hispanic Whites on drug use and delinquent/criminal behavior.

H₅: Blacks, Asian Americans and Hispanic Americans vary from non-Hispanic Whites on variables reflecting

differential association, social bonds, and self-control respectively.

H₆: The effects of background variables on social bonds, differential associations, and self-control are invariant by race and ethnicity respectively.

H₇: The effects of social bonds on differential associations and self-control are invariant by race and ethnicity.

H₈: The effects of social bonds on self-control are invariant by race and ethnicity.

H₉: The effects of differential association on drug use and delinquent/criminal behavior are invariant by race and ethnicity.

H₁₀: The effects of self-control on drug use and delinquent/criminal behavior are invariant by race and ethnicity.

The Data

The National Household Survey on Drug Abuse

To test the hypotheses, a secondary data analysis was done of the National Household Survey on Drug Abuse (NHSDA) dataset. The NHSDA series measures the prevalence and correlates of drug use in the United States. The surveys are designed to provide quarterly, as well as annual, estimates. Information is provided on the use of illicit drugs, alcohol, and tobacco among members of United States households aged 12 and older. Questions include age at first use as well as lifetime, annual, and past-month usage for the following drug classes: marijuana, cocaine (and crack), hallucinogens, heroin, inhalants, alcohol, tobacco, and nonmedical use of prescription drugs, including pain relievers, tranquilizers, stimulants, and sedatives. Respondents are also asked about personal and family income sources and amounts. Since 1997 a new series of questions asked only of respondents aged 12 to 17 have been introduced. These "youth experiences" items covered a variety of topics, such as neighborhood environment, illegal activities, gang involvement, drug use by friends, social support, extracurricular activities, exposure to substance abuse prevention and education programs, and

perceived adult attitudes toward drug use and activities such as schoolwork. Another set of questions is asked only for adults (people aged 18 or older). These "social environment" items ask perceived neighborhood's attitudes toward drug use, friends' drug use and attitudes, marital status, relationship with conventional others, criminal behavior, and feelings about smoking/using drugs. Other questions are asked about perceived risk of using drugs, perceived availability of drugs, driving behavior and personal behavior, and cigar smoking. Demographic data include gender, race, age, ethnicity, marital status, educational level, job status, veteran status, and current household composition. The NHSDA dataset also includes information on several other topics which are not relevant to the current study.

The NHSDA uses multistage sampling design⁸. The sample is stratified on multiple levels, beginning with states. Eight states are considered large sample states and contribute approximately 3,600 respondents per state. The remaining states are sampled to yield 900 respondents per state. The second level of stratification divides states into Field Interviewer (FI) Regions. The third level of

⁸ Although the sample is not a simple random sample, it is treated as a random sample when inferring the results to the population. The overlook of the sample design may lead to biased estimates. However, the available techniques relating to structural equation modeling could not solve this problem yet.

stratification divides FI regions into area segments consisting of adjacent census blocks. These area segments are used as the primary sampling units. Dwelling units in area segments are listed in a standardized order and were selected by systematic sampling. Field interviewers visited each sample address to determine dwelling unit eligibility, to list all eligible persons at the address, and to conduct interviews. Persons were selected from the address roster using a handheld computer. To improve the precision of estimates, the sample allocation process targeted five age groups: 12-17, 18-25, 26-34, 35-49, and 50 and older. The size measures used in selecting the area segments were coordinated with the dwelling unit and person selection process so that a nearly self-weighting sample could be achieved in each of the five age groups. The sample design included approximately equal numbers of persons in the 12-17, 18-25, and 26 and older age groups. The achieved sample for the 2001 NHSDA was 68,929 persons. The public use file has 55,561 records due to a sub-sampling step used in the disclosure protection procedures. The study yielded a weighted screening response rate of 92 percent and a weighted interview response rate for the Computer Assisted Interview (CAI) of 73 percent.

Sample

The current study will use 2001 NHSDA to test the hypotheses. Since questions about "youth experiences" are asked only for respondents aged 12 to 17, and questions about "social environment" are asked primarily for respondents aged 18 or older, the 2001 NHSDA will be divided into two subgroups—youths and adults—to test the causal models for youths and adults respectively. The 2001 youth sub-sample has 17,429 persons, and the adult sub-sample has 38,132 persons. However, among the 17,429 youths in 2001 NHSDA dataset, 15,671 went to school during last 12 months. Since the questions concerning school participation, academic performance, and school involvement are important indicators of theoretical constructs of social bonding theory and self-control theory, and these questions were not applicable to youths who did not go to school, youths who did not go to school during the last 12 months are therefore eliminated from the analysis⁹. A further examination of the dataset found that among the students went to school 1,025 of them failed to answer questions concerning delinquent peers and parents' supervision. Those who did not answer one of these

⁹ Eliminating youths who did not go to school during the last 12 months might bias the sample. Youths who dropped out of school may have different patterns of criminality. The current study could not generalize the research results to this part of youths.

questions tend to not answer other related questions. The techniques of replacing missing values are not applicable under this circumstance. Because the dataset is a secondary dataset, the original dataset collecting information cannot be obtained, no further effort could be made in the current study. The study used listwise missing value exclusion to eliminate the missing case. This procedural produced 13,111 valid cases, which account for 75.2 percent of original cases in the dataset. Because there were not enough cases for Native Americans and Mixed racial groups, they are not included in this study. The same technique is applied to adults and produced 31,427 adults, which account for 82.4 percent of original cases in the dataset. The final sample size of youths and adults of each racial and ethnic group is displayed in table 2.

Table 2: Sample size by age and race/ethnicity

Race	Youth		Adult	
	Frequency	Percent	Frequency	Percent
non-Hispanic white	9,033	66.7	22,662	71.2
non-Hispanic black	1,618	13.4	3,393	11.0
non-Hispanic Asian	375	3.1	881	3.2
Hispanic	1,589	13.3	3,668	12.0
Total	13,111	100.0	31,427	100.0

Differential association theory and control theories claim that the casual model to explain crime and delinquent behavior does not change throughout the lifetime. However, the differential association approach admits that age and other social conditions do have impact on the differential association with criminal and anti-criminal patterns. Although social control theories assert that social bonds or self-control are mainly influenced by child-rearing in early life, researchers find that some transitions in the life course, such as employment and marriage, have significant impacts on criminal decisions (Sampson and Laub, 1992). Because theory suggests that causal factors may be different for youths and adults, to understand the casual process and identify the most predictive factors for each group, the current study will test the casual models for youths and adults separately.

Due to the information collection of NHSDA, the measures of some core concepts are different for youths and adults. For instance, the concept of "definitions favorable and unfavorable to law violation" is operationalized by three constructs, parents' definition, friends' definition, and the subjects' definition for youths; and is operationalized by two constructs, neighborhood's definition, and the subjects' definition for

adults. The measures of youths' social bonds are also different from the measures of adults' social bonds. While commitment or involvement to marriage and employment are assumed important for adults, the attachment to parents or school may play more important roles for youths. The detailed measurement differences between youths and adults will be discussed more fully below. Even though not all measures are available for both youth and adults, by testing models for both groups, this study is able to draw conclusions about whether the casual processes are consistent for youths and adults, and identify which factors are most important for youths and adults separately. If the results indicate that factors in adolescent and adulthood are both significant, this will provide information for future work that can test the full models, in some cases with the same measures, for both groups.

Study Variables

This study examined a casual model to explain delinquency and illegal drug use that integrates differential association, social bond, and self-control theories. The literature review suggests that the main

concepts of differential association, social bond, and self-control theories cannot be observed directly; therefore latent measurement models and confirmatory factor analysis were used to measure these unobservable concepts.

The Dependent Variables

Two dependent variables were examined in this study, drug use and delinquent behavior. Drug use is defined as self-report past year use of marijuana, cocaine (and crack), heroin, hallucinogens, inhalants, and psychotherapeutics¹⁰. Questions in the NHSDA ask whether or not a person used a specific type of drug during the past year instead of the frequency or quantity of the drug use. Each item is then a dichotomous variable, with 1 indicating use of drug in the past year, and 0 indicating no use in the last year. The "drug use" variable is an index of self-reported drug use in the past year—measured as a single latent variable with six indicators, one for each type of drug use (see Table 3).

¹⁰ Heroin was eliminated from the structure equation model because in Asian group, no one reported using Heroin in the past 12 months. However, it was included in descriptive analysis.

Table 3. Dependent variables and indicators

Dependent variables	Indicators		Measurement
	Youth	Adult	
Past year drug use	Marijuana (mrjyr)	Same as youth	0=no; 1=yes
	Cocaine (cocyr)		
	Hallucinogens (halyr)		
	Heroin (heryr)		
	Inhalants (inhyr)		
	Any psychotherapeutics (psyrr2)		
Delinquent/criminal behavior	During the last 12 months, how many times have you gotten into a serious fight at school or work?	Same as youth	The frequency is recoded as 0=have not done; 1=have done.
	During the last 12 months, how many times have you taken part in a fight where a group of your friends fought against another group	Same as youth	
	During the past 12 months, how many times have you carried a handgun?	Same as youth	
	During the last 12 months, how many times have you sold illegal drugs?	NA	
	During the last 12 months, how many times have you stolen or tried to steal anything worth more than \$50?	NA	
	During the last 12 months, how many times have you attacked someone with the intent to seriously hurt him or her?	NA	

Since the NHSDA survey is primarily designed for estimating drug use, questions about delinquent behavior are not as complete as those in other surveys that have been specifically designed to study juvenile delinquency. However, there are still some measures of deviant behavior in the NHSDA dataset. For the youths, the delinquency is measured as a latent dependent variable with six indicators. For the adults, criminality is measured as a latent variable with three indicators. The original questions asked about the frequency of delinquent behavior. The distribution of each item is skewed, because the majority of subjects indicated no involvement in illegal activities, a significant majority indicated one instance of involvement, and very few indicated involvement more than once. Therefore these indicators are dichotomized as 0, which means no crime, and 1, which means at least one crime in the past 12 months (see Table 3). Previous studies usually used an equivalent composite scale to measure drug use or delinquency by combining all the items into an unweighted scale (e.g., Hirschi 1969; Elliott et al. 1985). The unweighted scale or index ignores the measurement errors and assigns an equal predictive value to each item. It might well be that these items are not equally reflective of delinquency or drug use. Thus, the

latent variable analysis may provide a better measure of the dependent variable than summed scales.

Independent variables

Based on previous research and the availability of information from the 2001 NHSDA dataset, the current study identified a list of latent constructs, the observed indicators, and other directly observed control variable relevant to differential association theory, social bond theory and self-control theory respectively (Table 4).

Table 4. Independent Variables

Independent variables	Indicators		Measurement
	Youth	Adult	
Delinquent/ criminal peers	How many students you know in grade smoke cigarette	How many friends smoke cigarette	1=none; 2=a few; 3=most; 4=all
	How many students you know in grade use mj/hash	How many friends use mj/hash	
	How many students you know in grade drink alcohol	How many friends drink	
	How many students you know get drunk weekly	How many friends drunk at least once a week	
Attachment to friends	NA	#friends who you share personal issues/concerns with	1=none; 2=one; 3=2 or 3; 4=4or 5; 5=more than 5
		#friends who you spend time with	
		#friends who really like and care about you	
Learned Definition	Parents definition:		1=neither approve nor disapprove; 2=somewhat disapprove; 3=strongly disapprove
	How parents would feel you smoking 1+ pack cigarette per day	NA	
	How parents would feel you trying mj/hash		
	How parents would feel you using mj/hash monthly		
	How parents would feel you drinking alcohol daily		
	Friends definition:		
	How your friends would feel you smoking 1+ pack cigarette per day	NA	
	How your friends would feel you trying mj/hash		
	How friends would feel you using mj/hash monthly		
	How friends would feel you drinking alcohol daily		
	Your definition:		
	How you feel someone your age smoking 1+ pack cigarette per day	How you feel adults smoking 1+ pack cigarette per day	
	How you feel someone your age trying mj/hash	How you feel adults trying mj/hash	
	How you feel someone your age using mj/hash monthly	How you feel adults using mj/hash monthly	
	How you feel someone your age drinking alcohol daily	How you feel adults drinking alcohol daily	
		Neighborhood definition of drug:	
	NA	How neighbor feel adults smoking 1+ pack cigarette per day	
		How neighbor feel adults trying mj/hash	
		How neighbor feel adults using mj/hash monthly	
		How neighbor feel adults drinking alcohol daily	
Attachment to parents	Parents check if you've done homework past 12 months	NA	1=always; 2=a few; 3=seldom; 4=never
	Parents helped you with homework past 12 months		
	Parents made you do work/chores past 12 months		
	Parents limited your amount of TV time past 12 months		
	Parents limited your time out with friends pst 12 months		
	Parents let you know done a good job past 12 months		

Attachment to school	Parents tell you they're proud of sth you'd done	NA	
	How you felt overall abt going to school pst 12 months		
	How often felt school work meaningful		
	How important things learned pst 12 months are going to be to you later in life		
Involvement to social activities	How interesting are courses at school past 12 months	NA	0=none; 1=one; 2=two; 3=3 or more
	# of school based activities participate last 12 months		
	# of community based activities partic last 12 months		
	# of faith based activities participated last 12 months		
Religiosity	# of other activities participated past 12 months	Same as youths	1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree
	How many religious services in past 12 months		
	My religious beliefs are very important		
	My religious beliefs influence my decisions		
Low self-control	It is important that my friends share religious beliefs	Same as youths	1=never; 2=seldom; 3=sometimes; 4=always
	How often do you get a real kick out of doing things that are a little dangerous		
	How often do you like to test yourself by doing something a little risky		
	How often do you wear a seatbelt when ride front pass seat of a car		
Opportunity	A factor score from a list of low self-control behavior	Same as youths	1=probably impossible; 2=very difficult; 3=fairly difficult; 4=fairly easy; 5=very easy
	How difficult to get marijuana		
	How difficult to get LSD		
	How difficult to get cocaine		
Perceived Risk of drug use	How difficult to get crack	Same as youths	1=no risk; 2=slight risk; 3=moderate risk; 4=great risk
	How difficult to get heroin		
	How much do people risk harming themselves physically and in other ways when:		
	Risk smoking 1 + packs cigarette per day		
Sex	Risk smoking mj once a month	✓	0=female; 1=male
	Risk trying LSD once or twice		
	Risk trying heroin once or twice		
	Risk using cocaine once a month		
Age	Risk having 5 + drinks once or twice a week	✓	
Household income	✓	✓	Ordinal
Family structure	✓	NA	0=both parents 1=one parent
Education level	NA	✓	Continuous variable
Employment status	NA	✓	1=not in labor force 2=employed 3=part time employed 4=unemployed

Marital status	NA	✓	1=widowed 2=married 3=divorced 4=never married
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The core concept of differential association theory is "definitions favorable and unfavorable to violation of the law," which are learned through communication, primarily in intimate groups. The operationalization of this concept conventionally involves "delinquent peer relationships" and "learned definitions."

Delinquent peers

For youths, delinquent peers in this study was measured by four items that asked how many students the subject knows in his or her grade who smoke cigarettes, use Marijuana, drink alcohol, and get drunk weekly. For adults, criminal peers was measured by four items that asked how many friends smoke cigarettes, use Marijuana, drink alcohol, and get drunk at least once a week. These items were measured on four value scales (1=none, 2=a few, 3=most, and 4=all). Because the questions about youths' delinquent peers asked about the student population at the youth's grade level rather than asking about friends, it did not reflect the individual selection process. The respondent might not necessarily associate with delinquent

students. Therefore, this measurement of delinquent peers is imperfectly connected to the theoretical concept.

Learned Definitions

Several items in the dataset pertain to definitions that are favorable or unfavorable to drug use. For youths, the questions are about the viewpoints of respondents, parents and friends. For adults, the questions are about the viewpoints of respondents and people in the neighborhood. For example, four questions asked the respondents' opinion about drug use: How do you feel about someone your age smoking one or more pack cigarette per day? How do you feel about someone your age trying Marijuana? How do you feel about someone your age using Marijuana monthly? How do you feel about someone your age drinking alcohol daily? Since these questions represent the individual's exposure to definitions favorable and unfavorable to drug use, and the belief of respondents, parents and friends were expected to be highly correlated with each other, the "learned definitions" was measured as a second-order construct that accounts for the covariance among the dimensions of viewpoints of drug use from different sources (Figure 4.1 and 4.2). The matrix of intercorrelations of latent variables measuring the

viewpoints of respondents, people in the neighborhood, parents and friends will be factorized to a secondary factor—learned definitions of drug use.

Figure 4.1. Measurement of learned definitions of drug use-youths

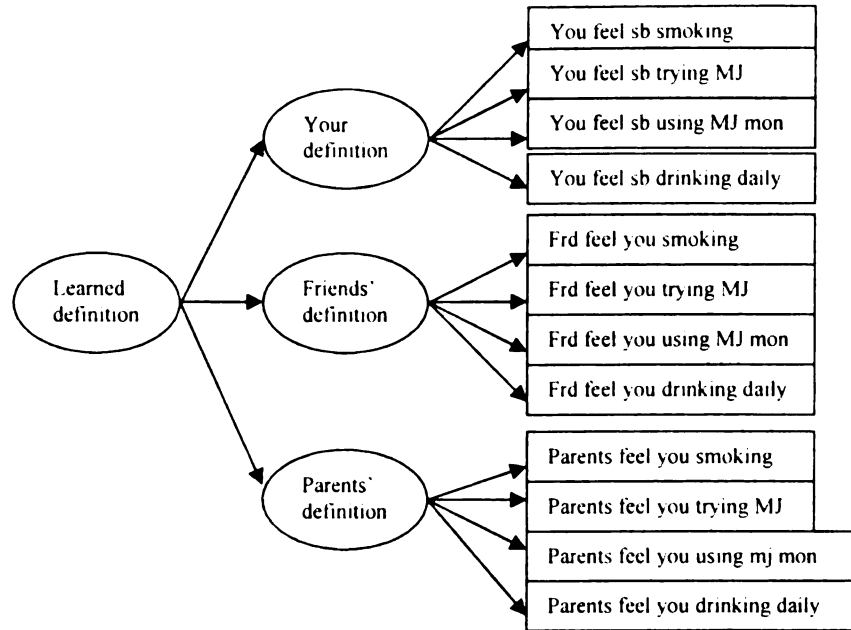
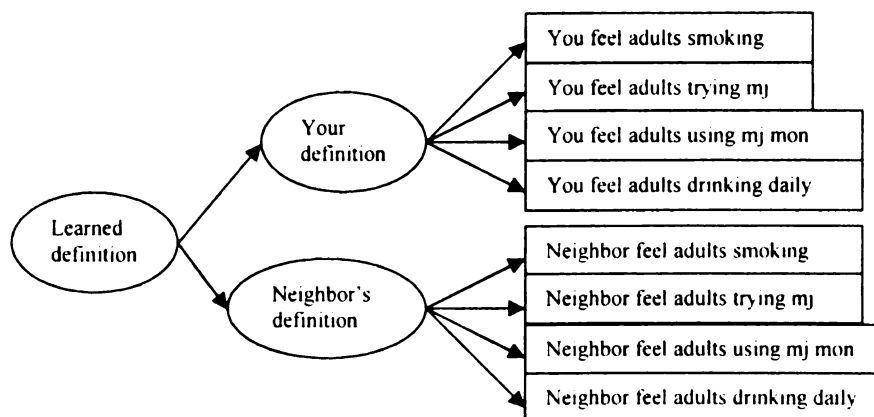


Figure 4.2. Measurement of learned definitions of drug use-adults



Attachment to Friends

Matsueda (1982) pointed out that the ratio of the learned definitions depends on not only delinquent but also non-delinquent friends. However, the 2001 NHSDA dataset does not provide information about attachment to friends for adolescents. For adults, attachment to friends is measured by three items that asked about number of friends with whom the subject shares personal issues and spends time, and who really like and care about the subject. Each item is on a five point scales: 1=none; 2=one; 3=2 or 3; 4=4 or 5; 5=more than 5.

Attachment to Parents

Hirschi operationalized attachment to parents with three elements: mother's virtual supervision, intimacy of communication with father, and affectional identification with father. The 2001 NHSDA dataset does not provide information identical to Hirschi's components. Instead, attachment to parents was measured by seven items, which asked questions about whether parents supervise homework, time out with friends, and similar activities (Table 4). These items were measured on four point scales, with 1=always, 2=sometimes, 3=seldom, and 4=never. The high value means low attachment to parents. The variable,

attachment to parents, was only applicable to youths.

Attachment to School

Involvement and commitment to academic activities according to Hirschi (1969) prevent individuals from committing delinquent acts. School is also an alternative institution to the family that could provide effective socialization. The variable attachment to school in this study was measured by four indicators assessing respondent's feeling about going to school, whether school work is meaningful, how important things learned in the past 12 months are to later life, and how interesting courses at school are. Attachment to school is also measured on a four point scales, 1=always, 2=sometimes, 3=seldom, and 4=never. A high value on this variable reflects low attachment to school. This variable is only applicable to youths.

Involvement

Involvement includes involvement in different types of conventional activities. However, as indicated previously, items that reflect involvement (school performance, time spent on homework) are redundant with items that reflect attachment to school and commitment to education ((Massey

and Krohn 1986). Studies usually used one construct to measure these concepts (e.g. Costello and Vowell 1999; Massey and Krohn 1986). Involvement in school then will not be a separate variable in the current study. The involvement measure is limited to social activities. Four items assessing number of school-based activities, number of community-based activities, number of faith-based activities, and number of other activities during the last 12 months were the indicators of involvement. The scale was: 0=none, 1=one, 2=two, and 3=3 or more. The high value of this variable indicates high involvement to social activities.

Religiosity

Religiosity was tested in previous research (Marcros et al. 1986) to indicate involvement in a major and conventional institution that could serve to control deviant impulses. In this study, religiosity was measured by four manifest variables measuring attendance at religious services, and asking respondents' beliefs of religious. A high value of this variable indicates strong beliefs of religious.

Education level

The three measures of attachment to parents, attachment to school and involvement to social activities, are not available for adults. For the adults, education level, employment status, and marital status establish a strong bond to conventional society. Education level was a directly observed continuous variable, with the lowest value (1) indicating completion of the 5th grade or less, and the highest value (11) indicating higher than a Bachelor degree. Education level was not applied to youths because all the youths in this study were school students, and education level is therefore highly correlated with adolescents' age.

Employment status

Employment status was a directly observed variable. The values were: 1=not in labor force, 2=employed full time, 3=employed part time, and 4=unemployed. The original employment status variable is a categorical variable. The bivariate analysis indicated that those not in the labor force had the lowest probability of drug use, and those unemployed had the highest probability of drug use. Therefore, in this study, employment status was treated as an ordinal variable, with

high value showing low employment status. Employment status was only applicable to adults in this study.

Marital status

Marital status was an observed variable. The values are: 1=widowed, 2=married, 3=divorced or separated, and 4=never been married. The bivariate analysis showed that widowed and married respondents had lower probability of drug use, and never been married respondents had the highest likelihood of drug use. Marital status was also treated as an ordinal variable, with the high value indicating the person was never married and the medium level indicating an unstable marital status. This variable was not applicable to youths.

Self-control

The study used behavioral measures of self-control. Six items asking different types of deviant behavior are used to construct the latent variable of self-control¹¹. These analogous behaviors concern risky acts, using seat belts, using steroids, and other imprudent actions¹² that

¹¹ Among these items, 3 questions were applied to the whole sample. However, with unknown reason, the sample was divided into 2 parts. The other 3 questions were asked separately to the two parts of sample. A factor score of risk acts was calculated for both parts of sample, and was used as an indicator of risk acts of self-control. Therefore, in table 4, there are only 4 indicators of self-control.

¹² These actions include drove a car more than 100 miles/hour (if age 18 or older), were injured when tried

according to Gottfredson and Hirschi's argument, are able to reflect the notion of self-control. These behaviors are distinguished from the dependent variables by the degree of seriousness. The high value is associated with a low self-control.

Opportunity

Another variable that is important in self-control theory is opportunity to break the law, which was measured as the availability of drugs in this study. Five indicators asked how difficult it was to get different types of drug. Each item was measured on a five point scale. The high value means the easier to get drug, and the big opportunity.

Perceived Risk of Drug Use

Research has shown that perceived risk of drug use is significantly correlated with drug use and other health behavior change (Bachman et al. 1998; Ma and Shive 2000; Perry et al. 2003). Perceived risk of drug use could result from negative information about drug use and the consequences by observing drug users in their

to stop a fight or an assault (if age 18 or older), ran away from home and slept on the street (if age 12-17), were seriously injured in a fight (if age 12-17), used steroids to become more muscular.

acquaintanceship circles and among public figures (Bachman et al. 1998). Previous studies found independent effects of perceived risk on drug use. However, it might also operate through definitions that are not favorable to breaking the law. Six items indicated perceived risk of drug use. The high value means a high perceived risk of drug use.

Age, Sex, Income, and Family Structure

Four background variables, age, sex, household income, and family structure are also included in the study, though family structure is available only for adolescents. Sutherland and Cressey (1978) pointed out that age has important direct and indirect effects on criminality. They also pointed out that low socioeconomic status affects delinquency because poverty areas are often areas of high delinquency, children from a low SES home then have greater probability of encountering delinquent behavior patterns. Matsueda and Heimer (1987) found that a broken family could increase children's association with delinquent definitions, and decrease their associations with anti-delinquent definitions. A broken family could also decrease parents' supervision and produce ineffective socialization. In this study age is an ordinal variable,

with lowest value (1) indicating 12 years old, and the largest value (17) indicating 65 years old or older. Sex is a dichotomous variable (0=female, 1= male). Household income is an ordinal variable. A high value indicates the household income is high. Family structure is a dichotomous variable, with 1=both mother and father in household, 0=both parents not present.

Structural Models

The integrated structural models (Figure 5.1 and 5.2) specify the causal structures of the variables reflecting the theoretical constructs of individual theory for youths and adults separately. Based on the model developed in Chapter Two, learned definitions, delinquent peers and self-control plus opportunity are expected to affect drug use and delinquent/criminal behavior directly. According to findings from previous study (Bachman et al.), perceived risk is anticipated to be related to drug use and delinquent behavior directly. Elements of social bonds including attachment to parents, attachment to school, involvement, and religiosity operate through definitions, delinquent peers, and self-control. Perceived risk of drug use might also affect learned definition, which are

indicated by feeling about drug use, his/her friends' feeling, and parents' feeling about drug use. it is reasonable to hypothesize that the perceived harmful consequence of drug use will influence one's feeling about drug use, that is, the learned definitions which are either favorable or unfavorable to using drugs. Self-control would also influence the association with delinquent peers. The background variables of sex, age, household income and family structure are mediated by social bonds, differential association, and self-control. In the adult model, elements of social bonds include education level, employment status, marital status, attachment to friends, and religiosity.

Figure 5.1. Integrated model-youth

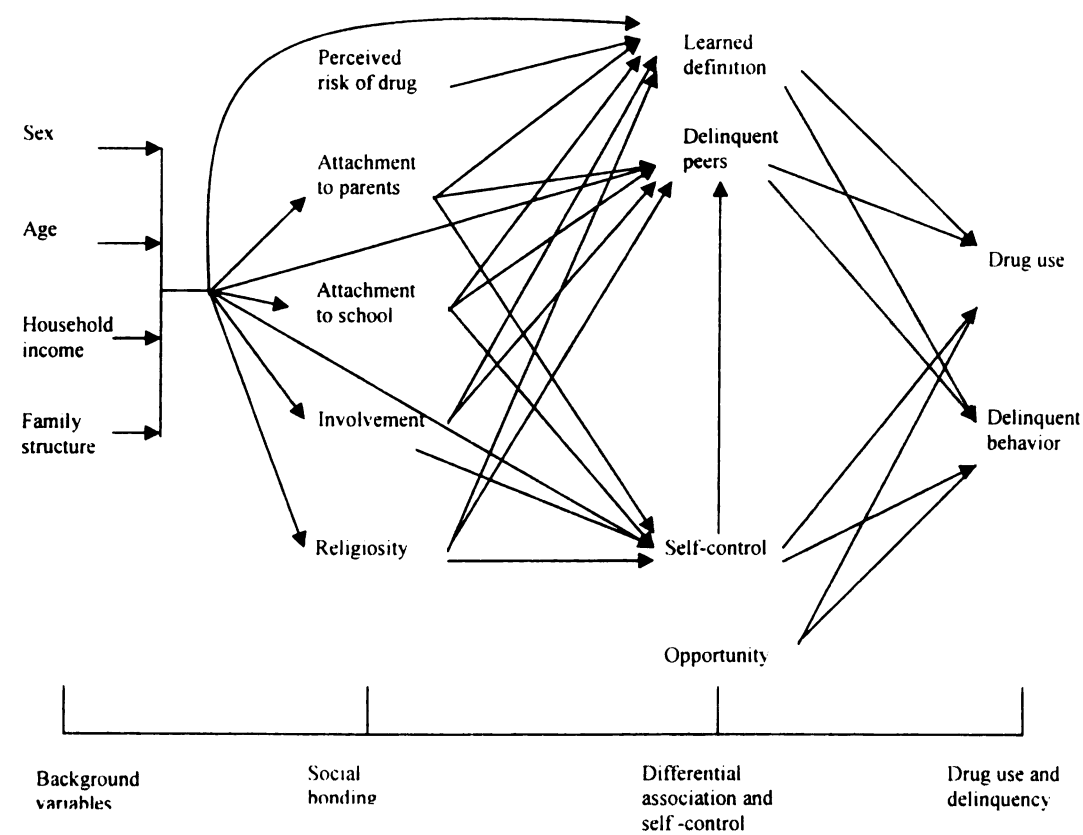
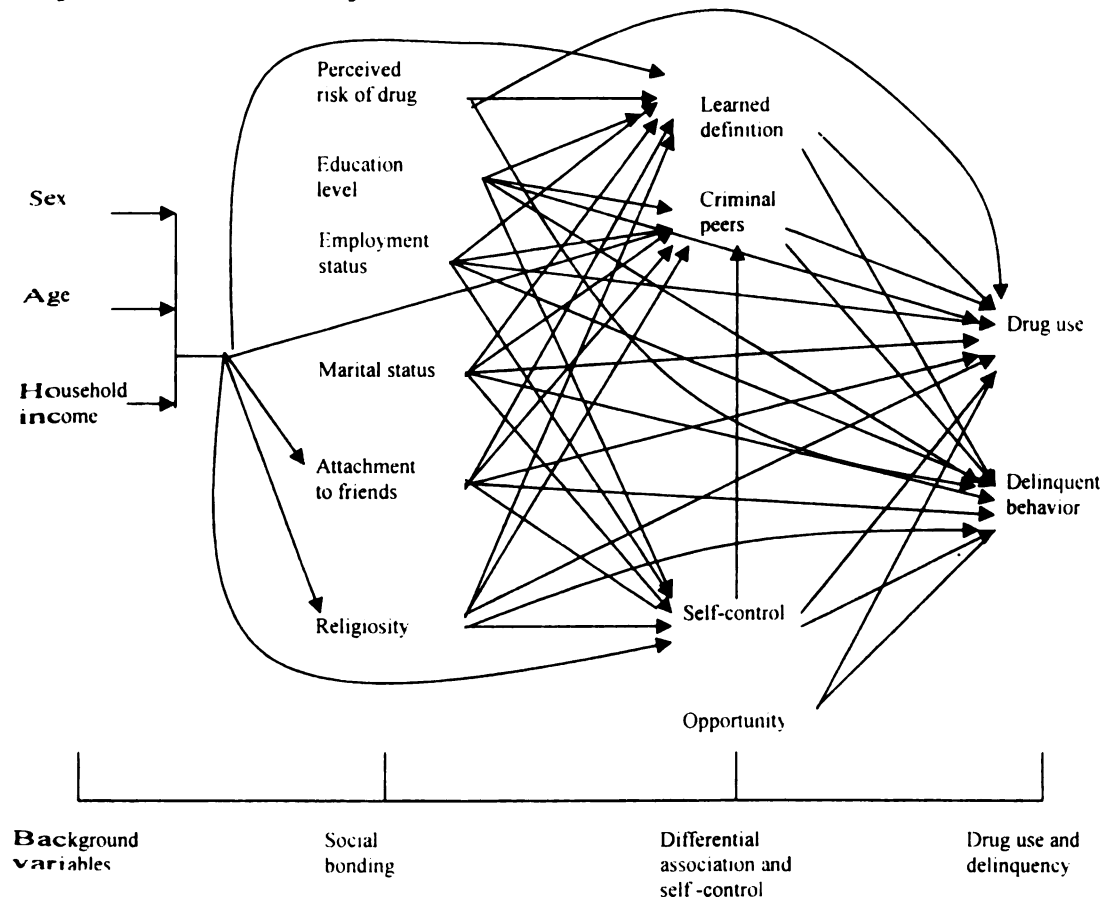


Figure 5.2. Integrated model-adults



Statistical Approach

Introduction

To examine the empirical relationships among the variables described in the integrated theoretical model, a structural equation model approach was used in this study. This approach allows the combination of latent variables measurement models with regression analyses and the examination of the full multivariate nature of the theoretical model. The structural equation model approach provides a method to examine the theoretical models across racial and ethnic groups, and to determine the relative importance of each of the variables. The next section introduces the latent variable and second-order factor analysis techniques. Then the techniques of structure equation modeling and the software Mplus are presented.

Latent variables

Social science variables can be either *observable* or *unobservable*. Examples of observable variables include gender, age, and race. The attributes of these variables can be observed and measured directly. Examples of unobservable variables are attachment to family, definitions favorable to breaking the law, and self-

control. These unobservable variables are called latent variables. Latent variables have two basic characteristics. The first is that they cannot be directly observed; rather, they must be inferred from other observable or "manifest" variables, which are sometimes called indicators of the latent variables. Second, the latent variables are responsible for systematic variation in the observables. Latent variables can be used to combine several related variables into composite measures, including principal components, factor scores, and components (Bartholomew, 1987). But more importantly, latent variables are theoretical constructs that are often placed in a theoretical context to make causal inferences.

Second-order Factors

Usually confirmatory factor analysis (CFA) is used to determine the relationship between a set of observed indicator variables and a set of continuous latent variables. These latent variables are likely to be intercorrelated. If the matrix of intercorrelations of these factors is factor analyzed, a new set of factors called second-order factors is produced. The second-order factors are fewer in number and may constitute a better basis for establishing theoretical constructs (Guertin and

Bailey 1970).

Structural Equation Modeling (SEM)

Structural equation modeling is a statistical methodology that is an extension of the general linear model (GLM) and that enables a researcher to test a set of regression equations simultaneously. Structural equation models can also explicitly take into account the measurement error and contain latent variables (Raykov and Marcoulides 2000). Therefore SEM can provide researchers with a comprehensive method for the quantification and testing of theories. There are four major characteristics of SEM models (Raykov and Marcoulides 2000:1-3):

First, the models are usually conceived in terms of not directly measurable, and possibly not well-defined, theoretical or hypothetical constructs. Second, the models usually take into account potential errors of measurement in all variables. Third, the models are usually fit to matrices of interrelationship indices (i.e., covariance or correlation matrices) between all pairs of observed variables, and sometimes to variable means.

Fourth, in addition to handling measurement error, SEM models also enable researchers to study both the direct and indirect effects of the various variables included in a

model. Direct effects are the effects that go directly from one variable to a second variable. Indirect effects are the effects between two variables that are mediated by one or more intervening variables (often referred to as a mediating variable). The combination of direct and indirect effects make up the total effect of the explanatory variable on a dependent variable.

Classical general linear modeling approaches encompass such methods as regression analysis, analysis of variance, analysis of covariance, and a large part of multivariate statistical methods (see Marcoulides & Hershberger, 1997). In the classical approaches, models are fit to raw data, and no error of measurement in the independent variables is assumed. As a result, regression estimates can be misleading and potentially lead to incorrect conclusions.

Four types of structural equation models will be used in the current study. Confirmatory factor analysis models will be used to examine the interrelationships among several constructs. Each construct included in the model is usually measured by its own set of observed indicators. Structural regression models will be used to test specific explanatory relationships among latent variables and observed variables. Mean structure analysis will be used to compare means of latent variables across multiple

groups, and finally the simultaneous analysis in multiple groups will be used to compare the explanatory relationship and parameters across multiple groups.

SEM uses the chi-square test as a measure of model fit. The chi-square test is a simultaneous test for the null hypothesis that the residual covariance matrix is zero, that is, each element in this matrix is zero (Baer 2002). Another measure of model fit is the Root Mean Residual. In a standardized model, one might regard a root mean residual of .03 or less as representing a good fit, and consider values higher than .07 to be fairly poor (Baer 2002:86). Fit indices are generally included in SEM to examine the model fitness. The most commonly used fit measures are the Goodness of Fit Index (GFI) and Bentler's Normed Fit Index (NFI). Many researchers consider a value of .90 or above to represent an adequate fit (Hayduk 1987).

A wide variety of programming is now available for the construction of SEM. Most major statistical packages come with such programs. Some examples include EQS, SIMPLIS, AMOS, and the SAS CALIS procedures. The current study will use Mplus to conduct the analyses.

Mplus

Mplus is a statistical modeling program that can estimate a variety of models for continuous and categorical observed variables as well as continuous and categorical latent variables. Besides the traditional regression modeling, Mplus can estimate a variety of models including confirmatory factor analysis and general structural equation modeling. Mplus also includes multiple group analysis including mean and threshold structures. This capability is important in the current study, which will compare the connection of differential association, social bond, and self-control to drug use and delinquent behaviors across four different racial and ethnic groups. Mplus provides several model fit measures including chi-square tests, root mean square error (RMSEA, cut off value is 0.06), standardized root mean square residual (SRMS, cut off value is 0.08), and fit indices CFI and TLI (Muthen and Muthen, 2003).

CHAPTER IV: ANALYSIS OF DATA

As indicated in Chapter One, the purpose of the research was to improve our understanding of the connection of drug use and delinquency to race and ethnicity. The analysis of data addressed the objective in several ways. First, the research describes the demographic and social economic characteristics of the sample, and analyzes the drug use and delinquent/criminal behavior across subgroups of Whites, Blacks, Asian Americans and Hispanic Americans. Second, using confirmatory factor analysis, the study examines the latent variables reflecting the various theoretical constructs. Then the mean structure analysis is applied to determine the variation of latent variables means between different racial and ethnic groups. Third, structural equation modeling is employed to examine the integrated theoretical model to explain drug use and delinquent/criminal behavior. And finally, using multiple group analysis, the key hypotheses comparing parameters between race and ethnic groups are tested. This chapter presents the results of these analyses.

Background Characteristics and Racial and Ethnic
Disparities of Drug Use and Delinquent/Criminal Behavior

Descriptive Statistics for Youths

A total of 12,678 adolescents having attended school
in the past 12 months comprised the sample of youths.
Table 5.1 provides the descriptive statistics for each
racial and ethnic group.

Table 5.1. Background characteristics and self-reported drug use and delinquency during past 12 months for racial and ethnic groups (percentage)-youths

	<u>Whites</u>	<u>Blacks</u>	<u>Asian Americans</u>	<u>Hispanic Americans</u>
<u>Background characteristics</u>				
<u>Sex</u>				
Male	50.4	48.3	49.9	50.2
Female	49.6	51.7	50.1	49.8
<u>Age</u>				
12 to 13	30.1	30.3	23.2	30.1
14 to 15	34.9	33.8	36.0	34.9
16 to 17	35.1	35.4	40.8	35.0
<u>Household income</u>				
Less than \$20,000	10.0	33.9	14.4	29.4
\$20,000-\$49,999	34.7	42.1	29.3	45.9
\$50,000-\$74,999	23.9	13.1	22.7	13.6
\$75,000 or more	31.4	10.9	33.6	11.1
<u>Family structure</u>				
Both mother and father in HH	76.0	41.6	86.1	68.0
Only mother in HH	16.9	46.2	9.6	24.8
Only father in HH	4.6	2.0	1.9	2.6
Neither mother nor father in HH	2.6	10.2	2.4	4.7
<u>Drug use</u>				
Hallucinogens	5.3	1.7	4.0	3.6
Heroin	.3	--	--	--
Marijuana	16.8	13.5	8.8	15.5
Cocaine	1.9	.2	.5	2.0
Inhalants	1.9	.2	.5	2.0
Any psychotherapeutics	8.8	6.6	5.3	7.8
Any illicit drug	22.2	19.3	13.6	21.9
Marijuana only	8.7	10.5	4.3	9.1
Illicit drug except for marijuana	13.5	8.8	9.3	12.8
<u>Delinquency</u>				
Serious fight at school or work	17.5	25.5	11.2	23.4
Taken part in fight where group fights group	13.8	18.5	11.7	18.2
Carried a handgun	3.0	4.4	1.9	3.6
Sold illegal drugs	4.0	3.9	2.1	4.0
Stolen/tried to steal anything worth > \$50	3.9	4.9	4.8	5.0
Attacked someone with intention to seriously hurt them	6.9	13.6	4.3	7.9
Total number	9038	1618	375	1589

The percentages of males and females for each racial and ethnic group are generally equivalent, except that females account for a little more among blacks than in other groups (51.7 females percent vs.48.3 percent males). The age distributions for each racial and ethnic group are similar. About 30 percent of the youths are aged 12 to 13 years old, 35 percent of the youths are aged 14 to 15 years old, and another 35 percent of the youths are aged 16 to 17 years old. One exception is the Asian group. In the Asian group, only 23.2 percent of adolescents are 12 to 13 years old, and 40.8 percent of adolescents are 16 to 17. Therefore, Asians are somewhat older than youth in other racial and ethnic groups.

The analysis of household income indicates that Black adolescents and Hispanic adolescents tend to live in a lower income household compared with White and Asian American adolescents. About 34 percent of Black youths and 29.4 percent of Hispanic youths lived in household with income less than \$20,000 during the last 12 months. Only about 11 percent of Black and Hispanic youths lived in household with income more than \$75,000. On the other hand, about 10 percent of White youths, and 14.4 percent of Asian youths lived in a household with income less than \$20,000. But more than 31 percent of White youths, and

more than 33 percent of Asian youths lived in households with income more than \$75,000.

Family structure differs considerably for different racial and ethnic groups. Most (86 percent) Asian youths lived in a family with both mother and father in the household, but more than half (58.4 percent) of the Black youths lived in a broken family. About 46 percent of Black adolescents, 24.8 percent of Hispanic adolescents and 16.9 percent of White youths lived in a family with only the mother in household. The percentage of Asian youths who lived in a family with only the mother in the household was relatively smaller (9.6 percent) compared with all the other groups. The descriptive examination hence shows that Asian youths and White youths lived in households with relatively higher social economic status comparing with Black and Hispanic youths. Youths in Asian and White groups might have had experienced more supervision from parents and established stronger social bonds than Black and Hispanic youths could have.

The study considered the use of six types of drugs: Hallucinogens, heroin, marijuana, cocaine, inhalants and any psychotherapeutics. White youths reported the highest overall illicit drug use rate (22.2 percent), followed by Hispanic adolescents (21.9 percent). The Black youths

reported lower overall illicit drug use rate (19.3 percent) than Whites and Hispanics did. Asian adolescents had the lowest drug use rate (13.6 percent) during the past 12 months. Black youths reported the highest rate (10.5 percent) of Marijuana as the only type of drug used in the past 12 months. In contrast, Black youths reported the lowest rate (8.8 percent) of other illicit drug except for Marijuana use. Very few White youths reported heroin use. No Blacks, Asians or Hispanics reported heroin use. Therefore this item was eliminated in the later structural equation analysis.

Table 5.1 presents the six types of juvenile delinquent behaviors examined in this research. Black youths reported the highest overall levels of delinquency. They had been most likely to be involved in assaults. For example, 25.5 percent of Black youths reported that they had gotten into a serious fight at school or work; 18.5 percent of Black Youths reported having taken part in a fight where one group fights another, and 13.6 percent reported having attacked someone with the intention to seriously hurt them in the past 12 months. Hispanic youths had the second highest prevalence of delinquency. Asian youths reported the lowest prevalence of all most all types of delinquent behavior except stealing. White youths reported the lowest

prevalence of having stolen or tried to steal anything worth more than \$50.

In summary, the demographic distributions for each racial and ethnic group are similar. However, Asian youths and White youths lived in households with relatively higher social economic status comparing with Black and Hispanic youths. More than half of White and Asian adolescents, yet less than a fourth of Black and Hispanic adolescents lived in household with income more than \$50,000. Asian youths and Black youths are very different in family structure. Most majorities of Asians lived in a family with both mother and father in the household, while only a third of Blacks lived in an unbroken family. The drug use patterns are consistent with previous research. White youths had the highest overall illicit drug use, but Black youths had the highest overall levels of delinquency. Asian youths had the lowest levels of illicit drug use as well as delinquency.

Descriptive Statistics for Adults

There are 30,609 adults in the sample. About 74 Percent of the respondents are Whites, 11 percent are Blacks, and 12 percent are Hispanics. Asians constituted the smallest group in the sample. Only 2.9 percent of the

sampled adults are Asian Americans. The descriptive statistics for adults are shown in Table 5.2. The examination of demographic and social economic characteristics for each racial and ethnic group indicated that males and females were almost the same proportions in the samples of White, Asian, and Hispanic groups. However, there was a considerable difference in the proportion of males and females for Black. About 58.3 percent of the Blacks in the sample were female, and only 41.7 percent of the Blacks in the sample were male. This sex composition of the sample might impact the average drug use rate and criminal behavior rate for the Black groups. Because females in general are less likely to be involved in deviant behaviors than are males, if there are more females in the sample, the pooled average rate of deviant behaviors then would be expected to be lower than the rate of a sample with more males.

Hispanics followed by Blacks had the largest Percentage (57.5 for Hispanics, and 55.5 for Blacks) of Young adults aged between 18 and 25 years old. Hispanics and Asians had the lowest percentage (6.1 and 6.0) of adults aged 50 or older. In contrast, Whites had the largest percentage (15.1) of adults aged 50 or older, and

the lowest percentage (45.4) of young adults aged 18 to 25 years old.

The average household income of Blacks and Hispanics was lower than that of Whites and Asians. Less than 10 percent of Blacks and Hispanics lived in a household with income of \$75,000 or more. However, about 27 percent of Asians, and 22.3 percent Whites lived in a household with income of \$75,000 or more.

Asians had the highest average education level. Less than 6 percent of Asians had less than high school education, 48 percent of Asians graduated from high school or went to college (but did not obtain a Bachelors degree), and about 46 percent obtained Bachelor degree or higher education. Hispanics had the lowest average education level. About 36 percent of Hispanics did not graduate from high school, and only about 8 percent of Hispanics obtained a Bachelor degree or higher education. The distribution of marital status is similar for each racial and ethnic group. But Blacks had the largest percentage of never married people. There were substantial differences in employment status between racial and ethnic groups. Blacks had the highest unemployment rate (6.9 percent), and Whites had the lowest unemployment rate (3.0 percent).

Table 5.2. Background characteristics and self-reported drug use and delinquency during past 12 months for racial and ethnic groups (percentage)-adults

	<u>Whites</u>	<u>Blacks</u>	<u>Asian Americans</u>	<u>Hispanic Americans</u>
Background characteristics				
Sex				
Male	48.5	41.7	51.6	49.5
Female	51.5	58.3	48.4	50.5
Age				
18 to 25	45.4	55.5	52.8	57.5
25 to 34	15.3	14.9	21.1	20.0
35 to 49	24.2	19.8	20.1	16.4
50 or older	15.1	9.8	6.0	6.1
Household income				
Less than \$20,000	20.3	36.4	24.6	33.4
\$20,000-\$49,999	38.3	41.8	27.9	47.2
\$50,000-\$74,999	19.0	12.2	20.4	11.3
\$75,000 or more	22.3	9.6	27.0	8.2
Education level				
Less than high school	12.0	20.4	5.9	35.9
High school and some college	63.8	68.5	48.2	55.6
Bachelor degree or higher	24.2	11.1	45.9	8.5
Marital status				
Widowed	2.5	2.6	.9	1.1
Married	45.8	23.2	40.7	42.4
Divorced or separated	8.0	8.9	2.7	6.7
Never married	43.7	65.3	55.6	49.8
Employment status				
Not in the labor force	19.8	21.3	23.3	21.0
Employed	59.3	57.4	54.0	61.3
Part time employed	17.9	14.4	19.2	12.7
Unemployed	3.0	6.9	3.5	4.9
Drug use				
Hallucinogens	5.2	2.2	5.1	3.5
Heroin	.3	.4	--	.2
Marijuana	17.6	16.7	9.5	12.6
Cocaine	3.6	1.9	1.4	3.7
Inhalants	8.5	4.3	5.3	5.9
Any psychotherapeutics	8.5	4.3	5.3	5.9
Any illicit drug	21.6	20.1	13.3	17.3
Marijuana only	9.3	12.9	4.2	7.2
Illicit drug except for marijuana	12.3	7.2	9.1	10.1
Criminal behavior				
Sold illegal drugs	2.9	4.4	1.7	3.1
Stolen/tried to steal anything worth > \$50	1.7	2.8	1.6	2.0
Attacked someone with intention to seriously hurt them	2.6	6.1	1.6	3.3
Total number	22662	3398	881	3668

The self-reported drug use patterns of adults are similar to those for youths. Whites reported the highest overall illicit drug use (21.6 percent) in the past 12 months, and Asians had the lowest illicit drug use (13.3 percent). Blacks reported the highest amount (12.9 percent) of Marijuana as the only type of drug used in the past 12 months. Conversely, Blacks reported the lowest amount of use (7.2 percent), and Whites reported the highest amount (12.3 percent) of other illicit drug except for Marijuana use in the past 12 months. Very few reported use of heroin in the past 12 months, and Asians reported no use of heroin. This item was eliminated in the later structural equation analysis for adults.

Three types of criminal behaviors—selling illegal drugs, stealing or trying to steal anything worth more than \$50, and attacking someone with intention to seriously hurt him or her—were reported for adults. Blacks reported the highest number of instances of all three types of crime. Asians reported the lowest crime number in the past 12 months.

To sum up, the sex and age distributions for adults are comparable for different racial and ethnic groups, except the proportion of females was significantly higher

than males for Black adults. Whites and Asians had more advantaged social economic status than did Blacks and Hispanics. Whites and Asians had relatively higher education level, more stable employment status, and lived in households with higher average income. The drug use patterns are consistent with youths. White adults had the highest overall illicit drug use; Black adults had the highest overall levels of criminal behavior. Asian adults again had the lowest levels of drug use and criminality.

Whites and Asians were in a relatively advantaged social-economic situation compared with Blacks and Hispanics. According to the differential association and social bond theories, we would expect that Whites and Asians are more likely associated with conventional norms, involved with conventional activities, and committed to higher education, and hence established stronger bond to conventional society. On the other hand, the low social economic status of Blacks and Hispanics may increase the probability of encountering delinquent behavior patterns, and weaken the attachment to conventional institutions. Analysis of the theoretical constructs and tests of the hypotheses are presented in the following section of this chapter.

Confirmatory Factor Analysis and Mean Structure Analysis of Latent Variables of the Theoretical Constructs

Analysis of Latent Variables for Youths

As described in Chapter 3, the major theoretical constructs in differential association, social bond, and self-control theories could not be observed directly. Confirmatory factor analysis was applied to examine the latent variables that represent the theoretical constructs. The results of the full measurement model for youths are displayed in Table 6.1. Because of the big sample size, the model chi-square is relatively large, and indicates that the null hypothesis that the residual covariance matrix is zero should be rejected. However, the Comparative fit index (CFI) of 0.91 indicates an acceptable fit measure (Hayduk 1987). The root mean square error of approximation (RMSEA) is 0.039, and the standardized root mean square residual (SRMR) is 0.056. Both of the model fit measures are less than the cut off values (.06 for RMSEA, and .08 for SRMR) suggested by Hu and Bentler (1999). Therefore the overall measurement fits fairly well.

After the determination of measures of latent variables, mean structure analysis was conducted to provide

the comparison of theoretical constructs across racial and ethnic groups. Table 6.2 presents the mean structure analysis results for latent variables for youths. The results for means of drug use and delinquency variables are consistent with the findings from the descriptive analysis. White youths had the highest mean score for drug use in the past 12 months. Hispanics had significantly lower mean score for drug use than whites, but reported more drug use than Blacks and Asians. Black youths reported a significantly higher level of delinquency than White youths, and Asians in contrast, reported significantly lower level of delinquency than White youths. There was not a significant difference between Hispanics and Whites in delinquent behavior.

Although delinquent peers have been showed to be one of the major predictors of deviant behavior in previous studies, no significant differences in delinquent peer relationships were found between racial and ethnic groups. An examination of the three dimensions of learned definitions favorable and unfavorable to drug use indicated that Asian adolescents, their friends, and their parents all disapproved of drug use more strongly than other racial and ethnic groups. Compared with White youths' parents, Black youths' parents were seen as paying significantly

less attention to their children's drug use issues, they were more likely to neither approve nor disapprove of drug use. Therefore, Asian youths' learned definitions were less favorable to drug use than other groups' definitions. Considering Asian youths had the lowest drug use and delinquency rates, the findings concerning group differences in learned definitions that support drug use support differential association theory.

Table 6.1. Confirmatory factor analysis of latent variables—youths

Construct/items	Unstandardized coefficients and S.E.	Standardized coefficients	R ²
Dependent latent variables:			
Drug use:			
Hallucinogens (halyr)	1.000	0.580	0.337
Marijuana (mrjyr)	2.143(0.041)	0.713	0.508
Cocaine (cocyr)	0.431 (0.011)	0.409	0.167
Inhalants (inhyr)	0.491 (0.017)	0.313	0.098
Any psychotherapeutics (psyyr2)	1.188 (0.027)	0.524	0.274
Delinquency:			
# Have you gotten into a serious fight at school or work?	1.000	0.449	0.202
# Have you taken part in a fight where a group of your friends fought against another group	0.789 (0.024)	0.391	0.153
# Have you carried a handgun?	0.381 (0.013)	0.380	0.144
# Have you sold illegal drugs?	0.705 (0.021)	0.639	0.409
# Have you stolen or tried to steal anything worth more than \$50?	0.495 (0.016)	0.434	0.188
# Have you attacked someone with the intent to seriously hurt him or her? (During last 12 months)	0.800 (0.025)	0.527	0.278
Independent latent variables:			
Delinquent peers:			
How many students you know in grade smoke cigarette	1.000	0.785	0.617
How many students you know in grade use mj/hash	1.066 (0.012)	0.792	0.628
How many students you know in grade drink alcohol	1.230 (0.013)	0.838	0.702
How many students you know get drunk weekly	1.116 (0.012)	0.819	0.671
Your definition:			
You feel someone your age smoking 1+ pack cigarette /day	1.000	0.719	0.517
You feel someone your age trying mj/hash	1.366 (0.015)	0.879	0.772
You feel someone your age using mj/hash monthly	1.464 (0.016)	0.933	0.871
You feel someone your age drinking alcohol daily	1.149 (0.013)	0.775	0.600
Friends definition:			
Friends feel you smoking 1+ pack cigarette per day	1.000	0.754	0.436
Friends feel you trying mj/hash	1.234 (0.013)	0.889	0.564
Friends feel you using mj/hash monthly	1.269 (0.013)	0.936	0.704
Friends feel you drinking alcohol daily	1.032 (0.011)	0.775	0.486
Parents definition:			
Parents feel you smoking 1+ pack cigarette per day	1.000	0.660	0.568
Parents feel you trying mj/hash	1.105 (0.019)	0.751	0.790
Parents feel you using mj/hash monthly	1.084 (0.017)	0.839	0.876
Parents feel you drinking alcohol daily	0.983 (0.016)	0.697	0.600
Definition (a second-order factor):			
Your definition	1.000	0.866	0.751
Friends' definition	1.100 (0.017)	0.849	0.721
Parents' definition	0.348 (0.008)	0.516	0.266
Attachment to parents:			
Parents check if you've done homework past 12 months	1.000	0.615	0.378
Parents helped you with homework past 12 months	1.063 (0.021)	0.648	0.419

Parents made you do work/chores past 12 months	0.256 (0.014)	0.196	0.039
Parents limited your amount of TV time past 12 months	0.705 (0.021)	0.404	0.163
Parents limited your time out with friends past 12 months	0.443 (0.020)	0.251	0.063
Parents let you know done a good job past 12 months	0.849 (0.021)	0.613	0.376
Parents tell you they're proud of sth you'd done	0.814 (0.020)	0.584	0.341
Attachment to school:			
How you felt overall abt going to school past 12 months	1.000	0.580	0.337
How often felt school work meaningful	1.109 (0.023)	0.679	0.461
How important things learned past 12 months are going to be to you later in life	1.090 (0.022)	0.684	0.468
How interesting are courses at school past 12 months	1.167 (0.020)	0.694	0.481
Involvement:			
# of school based activities participate last 12 months	1.000	0.418	0.175
# of community based activities partic last 12 months	1.202 (0.028)	0.489	0.239
# of faith based activities participated last 12 months	1.984 (0.061)	0.745	0.556
# of other activities participated past 12 months	0.863 (0.030)	0.405	0.164
Religiosity:			
Past 12 months how many religious services	1.000	0.534	0.285
My religious beliefs are very important	0.756 (0.012)	0.838	0.703
My religious beliefs influence my decisions	0.827 (0.014)	0.899	0.808
It is important that my friends share religious beliefs	0.543 (0.012)	0.609	0.370
Self-control:			
Freq get a real kick out of doing things a little dangerous	1.000	0.518	0.269
Freq test yourself by doing something a little risky	0.908 (0.015)	0.498	0.248
Freq wear a seatbelt when ride front pass seat of a car	-0.574 (0.020)	-0.342	0.117
A factor score from a list of low self-control behavior	1.133 (0.027)	0.563	0.317
Opportunity:			
How difficult to get marijuana	1.000	0.629	0.396
How difficult to get LSD	1.130 (0.013)	0.802	0.643
How difficult to get cocaine	1.332 (0.016)	0.917	0.841
How difficult to get crack	1.377 (0.017)	0.928	0.861
How difficult to get heroin	1.144 (0.015)	0.846	0.716
Perceived risk:			
Risk smoking 1 + packs cigarette per day	1.000	0.305	0.093
Risk smoking mj once a month	2.093 (0.071)	0.454	0.206
Risk trying LSD once or twice	2.948 (0.095)	0.752	0.566
Risk trying heroin once or twice	3.000 (0.0961)	0.805	0.649
Risk using cocaine once a month	2.789 (0.090)	0.752	0.566
Risk having 5 + drinks once or twice a week	1.258 (0.049)	0.312	0.097

Note: Model chi-square=33070.9, df=1675. CFI=.910, TLI=.902. RMSEA=.039. SRMR=.056.

Table 6.2. Comparison of means of latent independent and dependent variables between racial and ethnic groups—youths

	Black Means (S.E.)	Asian Means (S.E.)	Hispanic Means (S.E.)	Code
<u>Dependent variables</u>				
Drug use	-.033*** .002	-.033*** .005	-.014*** .003	It is coded so that the high values = more drug use
Delinquency	.017*** .004	-.028*** .006	.006 .004	It is coded so that the high values = more delinquency
<u>Independent variables</u>				
Delinquent peers	.012 .015	-.032 .029	-.001 .015	It is coded so that high values = more delinquent peers
Your definition	-.015 .014	.071** .025	-.011 .014	It is coded so that high values = stronger disagree with drug using
Friend definition	-.010 .016	.123*** .025	.015 .016	
Parents definition	-.045*** .011	.043** .013	-.006 .009	
Attachment to parents	.038* .019	.222*** .036	.077*** .019	It is coded so that the high values = less attached to parents
Attachment to school	-.253*** .013	-.188*** .023	-.209*** .014	It is coded so that the high values = less attached to school
Involvement	.026* .013	-.026 .022	-.150*** .013	It is coded so that the high values = more involvement in social activities
Religiosity	.243*** .023	-.012 .044	-.006 .023	It is coded so that the high values = stronger religiosity
Self-control	-.388*** .019	-.294*** .036	-.262*** .020	It is coded so that the high values = low self-control
Opportunity	-.019 .024	-.213*** .040	-.024 .023	It is coded so that the high values = easy access to drugs
Perceived risk	-.001 .006	-.018 .011	.004 .006	It is coded so that the high values = perceived greater risk

Note: the control group is whites. All the means of latent variables are set to zero for whites.

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

However, Asian youths were least attached to parents. White youths had significantly stronger attachment to parents than all the other racial and ethnic groups. Contradictory to Hirschi's (1969) findings, this study found that Black youths reported the strongest attachment to school followed by Hispanics, and then Asians. White youths were least attached to school in the past 12 months. The examination of the involvement variable also found that Black youths were most likely to be involved in social activities. There was no significant difference in involvement between Asian and White youths. Hispanic youths were least likely to be involved in social activities. Black youths reported stronger religious beliefs than White youths. No significant differences in religiosity were found between White and the other groups. The analysis of variables representing social bonding theoretical constructs showed that Black youths reported strong attachment to school, more involvement in social activities and strong religious believes, which does not support Hirschi's (1969) assertion that blacks had weak bonds to conventional institutions.

White youths had the lowest mean value for self-control. Black, Asian, and Hispanic youths all had significantly higher mean values for self-control than did

White youths, and Blacks had the highest mean value for self-control in this study. Asian youths thought it was difficult to obtain access to drugs. The mean value of opportunity to access drugs reported by Asians was significantly lower than that reported by White youths. According to Gottfredson and Hirschi's (1990) self-control theory, we would expect that Asians have the lowest probability to be involved in delinquent behavior, which is evidenced in this study.

In general, the variables of theoretical constructs vary significantly across racial and ethnic groups, except delinquent peers. Asian youths had strongest beliefs of definitions unfavorable to law violation. Whites had the lowest self-control, and Blacks in contrast, had the highest level of self-control. Whites reported stronger attachment to parents, but they were less attached to school and religiosity than other groups. Blacks reported strongest attachment to school, religiosity, as well as involvement. No significant differences were found between the perceived risk of drug use across racial and ethnic groups.

Analysis of Latent Variables for Adults

The confirmatory factor analysis of latent variables

for adults is presented in table 6.3. The sample size for adults in this study is 30,609. With such a big sample size, the model chi-square is relatively large. The measurement model chi-square is 46106.705 and degree of freedom is 754. Based on this statistics, it is appropriate to reject the null hypothesis that the residual matrix is zero. However, the CFI is 0.910, which is bigger than the cut off value of 0.90. The root mean square error of approximation (RMSEA) is 0.044, and the standardized root mean square residual (SRMR) is 0.055. Both of the model fit measures are less than the cut off values. This measurement model fits moderately well and is acceptable.

Table 6.4 presents the mean structure analysis results for latent variables for adults. The drug use and criminal patterns are consistent with findings of the descriptive analysis, and are comparable to patterns for youths. Whites reported significantly more drug use than other racial and ethnic groups. Blacks reported the highest level of criminal behaviors, and their score was significantly higher than the scores for other groups. Asians reported the lowest level of drug use and criminal behavior in the past 12 months. A check of the delinquent Peer relationship showed there were significant differences in number of delinquent peers between White adults and

other racial and ethnic groups. White adults reported significantly more delinquent peers than other groups. Asian adults had the least delinquent peers in the past 12 months. There also were significant differences of definitions of drug use between racial and ethnic groups. Asian, Hispanic, and Black adults disapproved of drug use more strongly than did White adults. Compared with White adults, Asian and Hispanic adults also had stronger feelings that their neighbors would disapprove of drug use. These results indicate that learned definitions for Asian and Hispanic adults were less favorable to drug use than for Whites adults.

Attachment to friends did not differ between White and Asian adults, but Black and Hispanic adults reported significantly smaller numbers of friends who cared for them, or with whom they could share feeling. Black adults had the highest religiosity of all the racial and ethnic groups. Hispanics also had stronger beliefs about religious than Whites. The mean analysis of latent variables for adults again provides evidence against Hirschi's assertion that Blacks have weaker bonds to conventional society than do Whites.

The measurement of self-control shows that White adults had significantly less self-control than did Blacks,

Asians, and Hispanics. The reported opportunity to access drugs is greater for Blacks than for others. On the other hand, Asian adults felt it was very difficult to get different types of drugs. The mean value of opportunity is the smallest for Asian adults. There were significant differences in perceived risk of drug use between Black and Hispanic adults and White adults. The perceived risk was greater for Blacks and Hispanics than for Whites.

To be brief, the theoretical constructs also vary significantly across racial and ethnic groups for adults. Asian adults had the smallest number of delinquent peers, and Whites had the largest number of delinquent peers. Both Asian and Hispanic adults had stronger beliefs of definitions unfavorable to law violation. Paralleling to youths, White adults had significantly less self-control than did Blacks, Asians, and Hispanics. Blacks and Hispanics had weaker attachment to friends, yet stronger beliefs of religiosity than did White adults.

Table 6.3. Confirmatory factor analysis of latent variables—adults

Construct/items	Unstandardized coefficients and S.E.	Standardized coefficients	R ²
<u>Dependent latent variables:</u>			
Drug use:			
Hallucinogens (halyr)	1.000	0.620	0.384
Marijuana (mrjyr)	1.856(0.0231)	0.659	0.435
Cocaine (cocyr)	0.736 (0.010)	0.531	0.281
Inhalants (inhyr)	0.309 (0.006)	0.352	0.124
Any psychotherapeutics (psyyr2)	1.078 (0.015)	0.529	0.280
Crime:			
# Have you sold illegal drugs?	1.000	0.771	0.595
# Have you stolen or tried to steal anything worth more than \$50?	0.415 (0.010)	0.414	0.172
# Have you attacked someone with the intent to seriously hurt him or her? (During last 12 months)	0.455 (0.012)	0.355	0.126
<u>Independent variables:</u>			
criminal peers:			
# Friends smoke cigarette	1.000	0.544	0.296
# Friends use mj/hash	1.314 (0.015)	0.723	0.523
# Friends drink	1.399 (0.018)	0.635	0.403
# Friends drunk at least once a week	1.470 (0.018)	0.728	0.531
Attachment to friends:			
#Friends who you share personal issues/concerns with	1.000	0.674	0.455
#Friends who you spend time with	1.399 (0.013)	0.862	0.743
#Friends who really like and care about you	1.094 (0.010)	0.699	0.489
Your definition:			
You feel adults smoking 1+ pack cigarette per day	1.000	0.568	0.323
You feel adults trying mj/hash	1.347 (0.016)	0.762	0.581
You feel adults drinking alcohol daily	1.349(0.016)	0.794	0.631
You feel adults driving after 1-2 drinks	0.883 (0.011)	0.570	0.325
Neighborhood definition of drug:			
Neighbor feel adults smoking 1+ pack cigarette per day	1.000	0.504	0.255
Neighbor feel adults trying mj/hash	1.573 (0.024)	0.676	0.457
Neighbor feel adults drinking alcohol daily	1.451 (0.022)	0.731	0.535
Neighbor feel adults driving after 1-2 drinks	1.220 (0.017)	0.541	0.292
Definitions:			
Your definition	1.000	0.890	0.808
Neighborhood definition	0.427 (0.009)	0.559	0.299
Religiosity:			
Past 12 months how many religious services	1.000	0.637	0.406
My religious beliefs are very important	0.559 (0.007)	0.649	0.422
My religious beliefs influence my decisions	0.642 (0.007)	0.758	0.575
It is important that my friends share religious beliefs	0.547 (0.006)	0.690	0.476
Self-control:			
Freq get a real kick out of doing things a little dangerous	1.000	0.629	0.395
Freq test yourself by doing something a little risky	0.886 (0.007)	0.602	0.362
Freq wear a seatbelt when ride front pass seat of a car	-0.479 (0.012)	-0.308	0.095
A factor score from a list of low self-control behavior	1.559 (0.052)	0.705	0.498
Opportunity:			
How difficult to get marijuana	1.000	0.630	0.397

How difficult to get LSD	1.275 (0.011)	0.838	0.702
How difficult to get cocaine	1.434 (0.011)	0.882	0.779
How difficult to get crack	1.550 (0.013)	0.943	0.888
How difficult to get heroin	1.284 (0.011)	0.851	0.724
Perceived risk:			
Risk smoking 1 + packs cigarette per day	1.000	0.317	0.1006
Risk smoking mj once a month	2.898 (0.060)	0.598	0.358
Risk trying LSD once or twice	2.768 (0.059)	0.754	0.569
Risk trying heroin once or twice	1.945 (0.043)	0.720	0.518
Risk using cocaine once a month	2.449 (0.053)	0.745	0.555
Risk having 5 + drinks once or twice a week	1.709 (0.034)	0.427	0.182

Note: model chi-square=46106.705, df=754. CFI=0.910, TLI=0.897. RMSEA=0.044, SRMR=0.055.

Table 6.4. Comparison of means of latent independent and dependent variables between racial and ethnic groups—adults

	Black Means (S.E.)	Asian Means (S.E.)	Hispanic Means (S.E.)	Code
<u>Dependent variables</u>				
Drug use	-.027*** .002	-.031*** .004	-.020*** .002	It is coded so that the high values = more drug use
Criminal behavior	.013*** .003	-.014*** .004	.000 .003	It is coded so that the high values = more delinquency
<u>Independent variables</u>				
Criminal peers	-.088*** .008	-.141*** .014	-.092*** .008	It is coded so that high values = more delinquent peers
Your definition	.091*** .010	.234** .017	.154*** .010	It is coded so that high values = stronger disagree with drug using
Neighborhood definition	-.009 .008	.129*** .014	.087*** .008	
Attachment to friends	-.406*** .015	.018 .028	-.506*** .016	It is coded so that high values=more friends
Religiosity	.484*** .021	-.041 .040	.172*** .020	It is coded so that the high values = stronger religiosity
Self-control	-.271*** .012	-.269*** .021	-.270*** .012	It is coded so that the high values = low self-control
Opportunity	.270*** .016	-.317*** .025	-.023 .015	It is coded so that the high values = easy access to drugs
Perceived risk	.038*** .004	-.008 .007	.030*** .004	It is coded so that the high values = perceived greater risk

Note: the control group is whites. All the means of latent variables are set to zero for whites.

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

The following part of this chapter presents the multivariate analysis of the model that integrated differential association, social bond and self-control theoretical constructs. First, the ability of the integrated model to explain drug use and delinquency was examined, and then the relative importance of variables derived from different theoretical approaches was estimated.

Structural Equation Modeling of the Integrated Theoretical Model

Structural Equation Modeling for Youths

The integrated model for youths shown in Figure 5.1 was tested by using Mplus structural equation modeling (Muthen and Muthen 2004). The measurement and substantive models were joined together as a structural model. Parameters were estimated using the maximum likelihood estimator with conventional standard errors and chi-square test statistic. The measures of model fit (displayed at the end of Table 7.1) indicate, overall, the model fits well (RMSEA=0.041). Table 7.1 presents the unstandardized parameter estimates of the model. Their standardized counterparts appear in table 7.2. The path relations are

presented in Figure 6.1. These estimates reveal three principal findings.

First, the model explains substantial variation in drug use ($R^2=0.48$) and delinquent behaviors ($R^2=0.40$) for youths. Measurements of theoretical constructs derived from differential association and self-control theories exert substantial independent effects on youths' drug use and delinquency.

As expected, delinquent peers has a significant positive effect on drug use. The more the number of delinquent peers an individual knows, the more likely he/she uses drug. Learned definitions favorable and unfavorable to breaking the law was coded so that a high value means strong disparagement of drug use, and a significant negative relationship between learned definitions and drug use is found, which means the more strongly one disapproves of drug use, the less likely one uses drug. Low self-control has significantly positive impact on drug use.

Accessibility of drug also shows some significant effects on drug use, but the effect is not as strong as other factors. The standardized coefficients in Table 7.2 indicate that the largest effect on drug use is exerted by learned definitions, followed by self-control, delinquent

peers and opportunity to obtain drugs.

Learned definitions, delinquent peers, self-control, and opportunity also have significant effects on delinquent behavior. However the largest effect on delinquent behavior is exerted by self-control, followed by learned definitions, delinquent peers and opportunity. Notice that delinquent peers has a negative relationship with delinquent behavior, which is contradictory to differential association theory. One possible reason is that the operationalization of the construct for delinquent peers for youths in this study does not fully reflect an individual's decision about whom to hang out with. As already noted, delinquent peers was measured by number of students known in grade who smoke cigarettes, use marijuana, drink or get drunk; this variables does not necessarily tell whether one's close friends have been involved in these acts. The limitation of the operationalization of delinquent peers for youths might also affect findings about the relationships between social bond variables and delinquent peers.

Second, the model also does well in explaining variation in learned definition ($R^2=0.322$), delinquent peers ($R^2=0.5142$), and self-control ($R^2=0.391$). These variables substantively mediate the effects of social bond variables.

As expected, attachment to parents, attachment to school, involvement and religiosity all are significantly related to one's definition of drug use. The variable, involvement, has half as strong an effect on learned definitions as do the other variables (attachment to parents, attachment to school, and religiosity). The effect sizes for the other three variables are substantial and similar to each other. Attachment to conventional social institutions and involvement in social activities are related to attitudes and values unfavorable to drug use and delinquency. Background variables also impact the learned definition. Sex and family structure have moderate but significant effects on definition. Age shows considerably strong connections to definitions. Being male, living in a broken family without both parents in household, and being old reduce the strength of conventional beliefs and increase the likelihood of approving of drug use.

Self-control also exerts a significant influence on delinquent peers. Low self-control substantially increases the number of delinquent friends. Background variables exert sizeable effects on delinquent peers. Actually age is the most important variable in predicting delinquent peers. Being old and living in a broken family increase

the number of delinquent peers. Surprisingly, males have fewer delinquent peers. The finding that social bond variables are not significantly related to delinquent peers, as discussed previously, could be a result of the operationalization of delinquent peers in this study. It is possible that females reported more students using drugs or getting drunk in their grade than males did, but they themselves did not have more delinquent friends than did males.

Consistent with self-control theory, attachment to parents and attachment to school are the most important factors for predicting self-control. Findings are consistent with the proposition that the lack of parents' supervising and dislike of school produce ineffective socialization, and cause low self-control. Involvement and religiosity also have significant effects on self-control. Therefore, involvement in social and religious activities, and religious beliefs are alternative institutions that could impact the process of socialization. Compared with other background variables, sex has the largest effect size on self-control. Being male, living in low-income household, and living in a broken family all are related to incomplete socialization, and result in low self-control behavior. Age was not significantly related to self-

control for youths. This finding indicates that the traits of low self-control tend to persist during the adolescent period.

Table 7.1. Unstandardized Coefficients of the Integrated Model: Youths (N=12,678)

Independent variables and Intervening variables	Dependent variables and Intervening variables								
	Attachment to parents	Attachment to school	Involvement	Religiosity	Learned definition	Delinquent peers	Self-control	Drug use	Delinquent behavior
Sex	-.05*** (.013)	.06*** (.01)	-.21*** (.014)	-.15*** (.018)	-.04*** (.008)	-.21*** (.009)	.20*** (.011)		
Age	.137*** (.004)	.04*** (.003)	-.03*** (.004)	-.07*** (.005)	-.06*** (.003)	.17*** (.003)	-.007 (.003)		
Household income	-.04*** (.007)	.05*** (.005)	.14*** (.008)	-.02* (.009)	-.002 (.004)	.002 (.004)	-.04*** (.005)		
Family structure	-.10*** (.016)	-.02 (.012)	.05** (.016)	.17*** (.022)	.05*** (.009)	-.03** (.01)	-.04*** (.012)		
Perceived risk of drug					.30*** (.022)				
Attachment to parents					-.15*** (.008)	.007 (.01)	.27*** (.013)		
Attachment to school					-.23*** (.01)	.08*** (.014)	.40*** (.016)		
Involvement					.08*** (.009)	-.016 (.009)	.13*** (.012)		
Religiosity					.09*** (.005)	.000 (.005)	-.10*** (.006)		
Learned definition							-.15*** (.005)		-.09*** (.005)
Delinquent peers							.02*** (.003)		-.04*** (.005)
Self-control						.37*** (.019)	.06*** (.006)		.20*** (.008)
Opportunity							.007*** (.001)		.02*** (.002)
R ²	.143	.038	.094	.027	.322	.514	.391	.480	.403

Note: *p< .05, **p< .01, ***p< .001. Standard errors appear in parentheses. Model Chi-square= 43.176 034, df= 1905, CFI=0.886, TLI=0.876, RMSEA=0.041, SRMR=0.081.

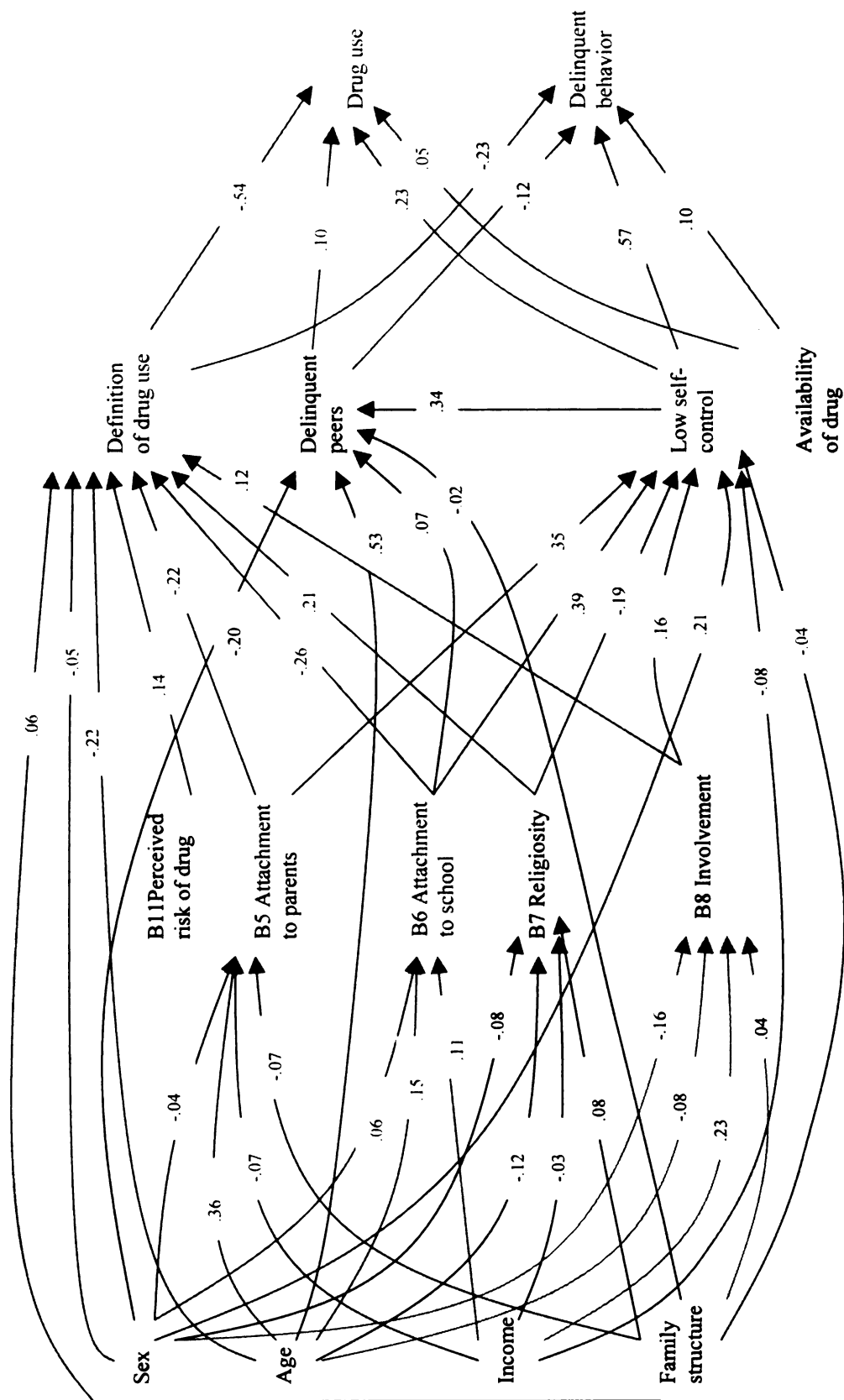
Note: *p<.05, **p<.01, ***p<.001. Standard errors appear in parentheses. Model Chi-square= 43176.034, df=1905, CFI=0.886, TLI=0.876, RMSEA=0.041, SRMR=0.081.

Table 7.2. Standardized Coefficients of the Integrated Model: Youths (N=12,678)

Independent variables and intervening variables	Dependent variables and Intervening variables								
	Attachment to parents	Attachment to school	Involvement	Religiosity	Learned definition	Delinquent peers	Self-control	Drug use	Delinquent behavior
Sex	-.04	.06	-.16	-.08	-.05	-.20	.21		
Age	.36	.15	-.08	-.12	-.22	.53	-.02		
Household income	-.07	.11	.23	-.03	-.004	.004	-.08		
Family structure	-.07	-.02	.04	.08	.06	-.02	-.04		
Perceived risk of drug					.14				
Attachment to parents					-.22	.009	.35		
Attachment to school					-.26	.07	.39		
Involvement					.12	-.02	.16		
Religiosity					.21	-.001	-.19		
Learned definition								-.54	-.23
Delinquent peers								.10	-.12
Self-control						.34		.23	.57
Opportunity								.05	.10

Note: Bold coefficients are significant at least at .05 level.

Figure 6.1: Integrated model of youth drug use and delinquency. Standardized coefficients, all statistically significant at .05 level (insignificant relationships are not displayed in the graph).



The third set of findings pertains to the relationships between background variables and social bond variables. Background variables generally have significant and sizable effects on social bond variables. Age is most strongly related to parents' supervision. Being male, young, living in high-income household, and living in a family with both mother and father in the household are predictive of parents' supervision. But being female, young, and living in low-income household is related to increased attachment to school. Females, young children, and children living in a two-parents family are more involved in social activities and religious services than are males. Household income has the largest effect size in the prediction of involvement. Children from high-income household are more involved in social activities. But children from low-income household have stronger religious beliefs.

In summary, the findings support the integrated theoretical model that delinquent peers and learned definition of drug use, and self-control have independent and significant effects on juvenile drug use and delinquency. These variables also mediate the effects of Social bond variables, and background variables

representing demographic and social economic characteristics. The lack of parents' supervision, weakened attachment to school, less involvement to social activities and weak commitment to religiosity are indirectly related to an increase in the likelihood of juvenile drug use and delinquency. The findings are consistent with the explanation that these relationships occur because the independent variables increase the number of delinquent peers, reduce the strength of conventional beliefs, and lessen self-control. The following analysis demonstrates whether the general model can be supported for adults.

Structural Equation Modeling for Adults

The adult model differs from the youth model mainly in variables representing social bond theoretical constructs. The two major dimensions of Hirschi's social bond theory: attachment to parents and attachment to school, which are also considered as the basic conditions of efficient child-rearing and socialization in self-control theory, are not available for adults in this study. Previous research (Sampson and Laub 1993) indicated that life course events such as marriage, and employment have significant impact on a person's pro- or anti-criminal patterns. In this study,

education level, marital status, and employment status were included as elements of social bond for adults, and were expected to affect both individual's definitions of drug use and delinquent peers, as well as the traits of self-control. Parameter estimates of the integrated model for adults appear in Table 8.1 in unstandardized form, and Table 8.2 in standardized form. The relations between the variables are also showed in Figure 6.2. These estimates reveal three principal findings.

First, the model explains substantial variation in drug use ($R^2=0.44$) but only limited variation in criminal behavior ($R^2=0.16$) for adults. Delinquent peers, definition favorable or unfavorable to drug use, and self-control have significant effects on drug use. However, unlike the findings for youths, definition of drug use only has modest effect on adults' decisions to use drug. The largest effect on adult's drug use is exerted by criminal peers, followed by self-control, perceived risk of drug use, and definitions favorable and unfavorable to breaking the law. The difficulty of accessing drugs is unrelated to drug use.

Definitions favorable or unfavorable to drug use does not appear to affect adult's criminal behavior. Self-control, criminal peers, and perceived risk of drug use exert substantial effects on adult's criminal behavior.

However, the largest effect on criminal behavior is exerted by self-control, followed by criminal peers, and perceived risk of drug use.

Because the perceived risk of drug use is controlled in the model for adults, the fact that learned definition has only a modest effect on drug use and does not affect the legal behavior for adults is not so surprising. Compared with youths, adults should be more mature and rationale. Understanding the risk and consequences of drug use may deter them from involvement of drug use despite their own opinion, or the opinion of peers about drugs.

Notice that the relationship between criminal peers and drug use and criminal behavior, as expected, are positive for adults, which means more criminal peers increase the probability of drug use and criminal behavior. Different from the measurement of delinquent peers for youths (which asked how many students in the grade smoke, use drugs, etc.), the measurement of criminal peers for adults was the number of friends smoking, using drug, or getting drunk etc. Comparing this finding with that for youths, the results suggest that the method of operationalization of the concept of "delinquent peers" has an important impact on how it would relate to the outcome variables.

Paralleling the findings for youths, the second finding is that the model for adults also explains substantial variation in learned definitions ($R^2=0.393$), criminal peers ($R^2=0.549$), and self-control ($R^2=0.408$). Religiosity plays an important role in determining an adult's definition of drug use, delinquent peers and self-control. In fact, religiosity exerts the largest effect on definition of drug use. People having strong religious beliefs are more likely to attach to conventional norms, and disapprove of drug use. Perceived risk of drug use also is significantly related to definitions of drug use. Attachment to friends, education level, marital status, employment status, and background variables all affect definitions of drug use modestly but significantly. The close relationship with friends, commitment to education and conventional marriage, and being employed are all associated with increased strength of conventional beliefs. On the other hand, being male, older, and living household with low income is associated with reduced strength of conventional beliefs.

The number of criminal peers for adults is mainly explained by self-control and one's religious beliefs. Low self-control and weak religious beliefs significantly increase the number of delinquent peers. Other social bond

factors and background variables are moderately related to having criminal peers.

Study findings support the proposition that religion is an important socializing institution. Weak religiosity is related to low self-control for adults. Strong attachment to friends also is connected to low self-control. Marital status exerts substantial effect on self-control. Staying unmarried and being unemployed is significantly related to low self-control. Different from the finding for youths, age exerts the largest effect on self-control for adults. Young male adults are more likely to have low self-control than others. This finding suggests that age matters in adulthood in shaping self-control. This finding and the evidence that marital and employment status do affect one's self-control contradict Gottfredson and Hirschi's (1990) assertion that the traits of low self-control do not change through life course, and ineffective child-rearing is the only cause of low self-control (1990:90-91).

The third finding is that one's sex and age relate to religiosity significantly. Female and old adults have stronger religious beliefs than young males. Attachment to friends does not differ significantly between male and female. But age and household income exerts substantial

influence on attachment to friends. Young adults living in high-income households have closer relationship with friends than old adults living in low-income households.

To sum up, similar to the findings for youths, the findings for adults partially support the integrated theoretical hypothesis that delinquent peers and self-control directly affect adults' drug use and criminal behavior. The learned definitions that support drug use did not exert a strong effect on the dependent variables. However, the perceived risk is significantly related to adults' drug use and criminal behavior. The effects of religiosity and attachment to friends are mediated by the differential and self-control variables. The findings are consistent with the explanation that committing to high education, being married, and being employed indirectly decrease the possibility of drug use and criminal behavior by reducing the number of delinquent peers and increasing self-control. All these variables that represent different theoretical constructs are related to background variables, and age is especially important in predicting the variable of self-control for adults.

Table 8.1. Unstandardized Coefficients of the Integrated Model: Adults (N=30,609)

Independent variables and Intervening variables	Intervening Variables and Dependent Variables						
	Attachment to friends	Religiosity	Learned definition	Delinquent peers	Self-control	Drug use	Delinquent behavior
Sex	-.009 (.010)	-.35*** (.016)	-.04*** (.005)	-.092*** (.006)	.31*** (.007)		
Age	-.04*** (.002)	.056*** (.003)	-.006*** (.001)	-.02*** (.001)	-.06*** (.002)		
Household income	.11*** (.005)	-.02* (.007)	-.014*** (.002)	.005* (.003)	.003 (.004)		
Education level			.008*** (.001)	.01*** (.001)	.02*** (.002)		
Marital status			.026*** (.003)	-.043*** (.004)	.084*** (.005)		
Employment status			.008** (.003)	-.007* (.004)	.023*** (.005)		
Attachment to friends			-.032*** (.004)	.04*** (.003)	.096*** (.005)		
Religiosity			.18*** (.004)	-.068*** (.002)	-.12*** (.004)		
Perceived risk of drug			.71*** (.02)			-.106*** (.005)	-.07*** (.005)
Learned definition						-.023*** (.002)	.004 (.003)
Criminal peers						.14*** (.005)	.06*** (.005)
Self-control				.38*** (.009)		.05*** (.003)	.055*** (.003)
Opportunity						.000 (.001)	.007*** (.001)
R ²	.033	.044	.393	.549	.408	.439	.158

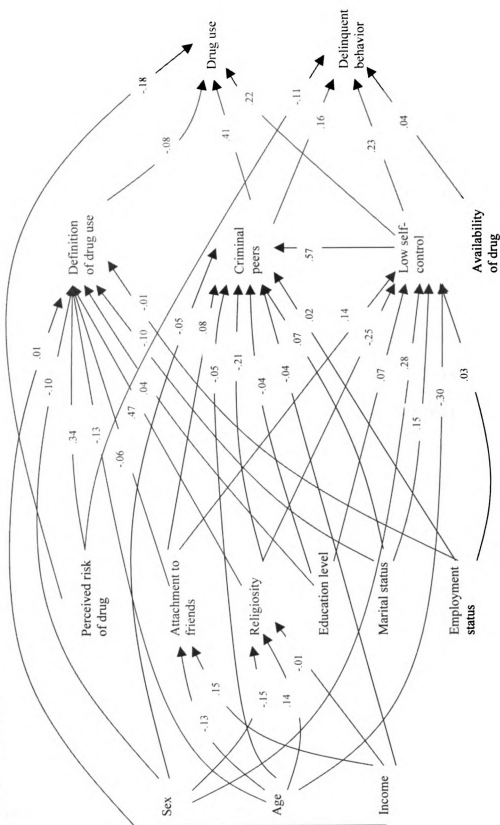
Note: *p<.05, **p<.01, ***p<.001. Standard errors appear in parentheses.

Model Chi-square= 66935.542, df=986. CFI=0.876, TLI=0.860. RMSEA=0.047, SRMR=0.074.

Table 8.2. Standardized Coefficients of the Integrated Model: Adults (N=30,609)

Independent variables and Intervening variables	Intervening Variables and Dependent Variables						
	Attachment to friends	Religiosity	Learned definition	Delinquent peers	Self-control	Drug use	Delinquent behavior
Sex	-.005	-.15	-.10	-.05	.28		
Age	-.13	.14	-.13	-.05	-.30		
Household income	.15	-.01	.01	-.04	.007		
Education level			.04	-.04	.07		
Marital status			-.10	.07	.15		
Employment status			-.01	.02	.03		
Attachment to friends			-.06	.08	.14		
Religiosity			.47	-.21	-.25		
Perceived risk of drug			.34			-.18	-.11
Learned definition						-.08	.012
Criminal peers						.41	.16
Self-control				.57		.22	.23
Opportunity						-.002	.04

Figure 6.2: Integrated model of adults drug use and delinquency. Standardized coefficients, all statistically significant at .05 level (insignificant relationships are not displayed in the graph).



Multiple Group Analysis

Mplus Multiple Group Analysis provides the means for simultaneous analysis of multiple groups. The software has the capacity to test for equivalence of construct equations and comparisons of parameters across groups, which would otherwise be constructed using analysis of variance and analysis of covariance techniques.

Multiple Groups Analysis for Youths

The results of the simultaneous analysis of the theoretical model that integrated differential association, social bond, and self-control theories across Whites, Blacks, Asian Americans and Hispanics for youths are presented in Tables 9.1a, 9.1b, 9.2a, 9.2b, 9.3a and 9.3b. In this particular model, the parameters examining the relationships between independent variables, intervening variables, and dependent variables are set to be free across racial and ethnic groups. To test the equivalence of specific parameters across groups, a variety of constrained¹³ models were examined, and the chi-square test results are presented in Table 9.4. Six major findings

¹³ The constrained model in this study means some parameters are forced to be equal between groups. Also see the example in footnotes 12.

emerge from this multiple group analysis.

First, the chi-square test comparing the fully constrained model—parameters are set to be equal across four racial and ethnic groups (Table 9.4, model 2)—with the no constraints model (Table 9.4, model 1) indicates that the parameters differ significantly across racial and ethnic groups. The overall relationships between demographic variables, variables representing theoretical constructs for social bond, differential association, and self-control theories, and drug use and delinquency are not identical across Whites, Blacks, Asian Americans, and Hispanics in the United States. Therefore the hypothesis that all substantive parameters are the same for all racial and ethnic groups is rejected ($\Delta\chi^2=1110.792$, $df=150$, $p<.000$). Further examinations of models that constrain parameters between two specific groups (model 3.1 constrains parameters between Blacks and Whites¹⁴, model 3.2 constrains parameters between Asian and Whites, and model 3.3 constrains parameters between Hispanics and Whites) provide evidence that the structural causation of drug use and delinquency vary significantly between Black and White youths ($\Delta\chi^2=853.007$, $df=50$, $p<.000$), between Asian and

¹⁴ Each parameter in the integrated model is forced to be equal between whites and blacks. For instance, the coefficient of delinquent peers (on drug use) is forced to be the same for whites and blacks.

Whites youths ($\Delta\chi^2=125.912$, $df=50$, $p<.000$), and between Hispanic and Whites youths ($\Delta\chi^2=241.906$, $df=50$, $p<.000$).

The second finding is relevant to hypothesis 6, that the effects of background variables on social bonding vary by race and ethnicity. Models 4.1, 4.2 and 4.3 constrained the effects of background variables on attachment to parents between Blacks and Whites, Asians and Whites, and Hispanic and Whites respectively. Chi-square tests indicate there are significant differences between Blacks and Whites ($\Delta\chi^2=41.575$, $df=4$, $p<.000$), and between Hispanics and Whites ($\Delta\chi^2=20.355$, $df=4$, $p<.000$). However, the overall effects of background variables on attachment to parents are similar for Asian youths and White youths ($\Delta\chi^2=3.848$, $df=4$, $p<.427$). The parameter estimation (Tables 9.1a and 9.1b) suggests an interactive effect of race and sex on attachment to parents. Being black and male significantly decreases the attachment to parents. Sex exerts no significant effect on Asian and Hispanic youths. There also are interactive effects of race and family structure, and race and household income. Family structure and household income only exert significant effects on White youths. Age has substantial effects on each group. Being old decreases the attachment to parents.

Models 5.1, 5.2 and 5.3 constrained the effects of background variables on attachment to schools in comparisons of Blacks and Whites, Asians and Whites, and Hispanic and Whites, respectively. Again, there are significant differences between Blacks and Hispanic and Whites correspondently, but no significant differences between Asians and Whites (see Table 9.4 for detail). Parameter estimation (Tables 9.1a and 9.1b) indicates an interactive effect of race and household income on youths' attachment to school. Living in a high-income household decreases Black and Hispanic youths' attachment to school, but it does not affect White and Asian youths' attachment to school. Family structure matters only for White youths, and it does not affect non-white minority youths in terms of attachment to school.

Models 6.1, 6.2, and 6.3 constrained the effects of background variables on religiosity, and models 7.1, 7.2 and 7.3 constrained the effects of background variables on involvement in comparisons of Blacks and Whites, Asians and Whites, and Hispanic and Whites. Significant differences are found between Blacks and Hispanic and Whites, but not between Asians and Whites (Table 9.4). Sex and household income have substantial and significant connection to youths' involvement in social activities for Whites,

Asians, and Hispanics, but not for Blacks. Non-black young females are more involved in social activities than others, especial older black male youths living in low-income households. Sex and family structure are significantly related for White, Black, and Hispanic youths, but not Asian youths. Age is the only factor that is associated with Asian youths' religious beliefs. Family structure again only exerts sizable and significant effects on involvement to social activities and religiosity for White youths. Although some significant relationships are found between family structure and religiosity for Blacks and Hispanics, the effects are modest in size.

The overall findings support the hypothesis that the effects of background variables on social bonding vary by race and ethnicity. Specifically, the general relationships between background variables and social bonding are significantly different between Black and Hispanic and White youths, but the relationships are parallel between Asians and Whites. There exist interactive effects of race and sex, and race and household income on attachment to parents and attachment to school. Sex plays a more important role in attachment to parents among Black youths than others. Household income significantly affects attachment to school for Black and

Hispanic youths, but not for Whites and Asians. There also exists an interactive effect of race and family structure on social bonding. A broken family exerts a larger impact on social bonding among White youths than non-white minorities. This finding is inconsistent with Matsueda and Heimer (1987)'s finding that broken homes have larger impact on delinquency among blacks than nonblacks.

The third finding addresses whether effects of background variables on differential associations vary by race and ethnicity. Models 8.1, 8.2, and 8.3 constrained the effects of background variables on delinquent peers, and models 9.1, 9.2 and 9.3 constrained the effects of background variables on learned definition in comparisons of Blacks and Whites, Asians and Whites, and Hispanic and Whites. The chi-square tests reveal that the effects of background variables on delinquent peers do not vary significantly between Blacks and White, and they do not vary significantly between Hispanics and Whites. But the effects differ significantly between Asians and Whites. The parameter estimation in Tables 9.2a and 9.2b shows that sex is substantially related to delinquent peers for Whites, Blacks, and Hispanics. Although there is a statistically significant relation between sex and delinquent peers among Asians, the effect size is moderate.

Contradicting expectations, females generally report more delinquent peers than do males. As discussed previously, this might relate to the approach of operationalization of delinquent peers for youths in this study. Age exerts substantially significant effects on delinquent peers for each group. Old youths generally report more delinquent peers than young youths. Household income and family structure do not have significant effects or they have only modest effects for each group.

The effects of background variables on learned definitions vary significantly between Blacks and White, and Asian and Whites respectively, but not between Hispanics and Whites. None of the background variables are significantly related to Asian youths' definition of drug use. For White and Hispanic youths, being male, old, and living in broken family are related to less conventional norms, and to a higher ratio of definitions favorable to law violation to definitions unfavorable to law violation. Sex exerts relatively larger effect on Blacks than on others.

In general, the findings reveal that effects of background variables on differential associations vary by race and ethnicity. However, the effects do not show a discrepancy between Hispanics and Whites. The

relationships between background variables and delinquent peers and definitions vary significantly between Whites and Asians. Whites differ significantly from Blacks only on the relationships between background variables and definitions.

The fourth finding concerns variation by race and ethnicity in the relationships of background variables to self-control. Models 11.1, 11.2, and 11.3 constrained the effects of background variables on self-control between Blacks and Whites, Asians and Whites, and Hispanic and Whites respectively. Chi-square tests indicate the effects differ only between Whites and Hispanics. No significant differences are found between Whites and Blacks, and Whites and Asians. Generally males tend to have lower self-control than female across racial and ethnic groups. Household income significantly affects non-Hispanics on self-control, but exerts no effect among Hispanics.

The fifth finding pertains to the relationships between social bonds, differential associations and self-control. Models 12.1, 12.2, and 12.3 constrained the effects of social bond and self-control on delinquent peers between Blacks and Whites, Asians and Whites, and Hispanic and Whites correspondingly. The chi-square tests indicate effects of social bonds and self-control on delinquent peers do not vary across racial and ethnic groups. Models

13.1, 13.2, and 13.3 constrained the effects of social bond and perceived risk of drug use on learned definitions between Blacks and Whites, Asians and Whites, and Hispanic and Whites respectively. The overall effects on learned definitions vary significantly between Blacks and Whites, and Hispanics and Whites but not between Asians and Whites. While all the other variables exert similar effects on definitions across racial and ethnic groups, involvement presents some differences. For Whites and Asians, involvement in social activities substantially increases the strength of conventional beliefs. However, involvement shows no significant effects on definitions of drug use among Blacks and Hispanics.

Models 14.1, 14.2, and 14.3 constrained the effects of social bonds on self-control between Blacks and Whites, Asians and Whites, and Hispanic and Whites respectively. The overall effects of social bonds on self-control vary significantly by race and ethnicity. For Whites and Hispanics, attachment to parents exerts the largest effect on self-control, followed by attachment to school. For Blacks and Asians, attachment to school exerts the largest effect on self-control. Attachment to parents present the second largest effect on self-control among Black youths. Nevertheless, attachment to parents does not affect self-

control among Asians. Religiosity and involvement in social activities present substantially effects on self-control among Asians.

The sixth finding addresses the question of whether the effects of delinquent peers, learned definitions, and self-control and opportunity on drug use and delinquency vary by race and ethnicity. Models 15.1, 15.2, and 15.3 constrained the effects of delinquent peers, definitions, and self-control and opportunity on drug use between Blacks and Whites, Asians and Whites, and Hispanic and Whites respectively. The chi-square tests demonstrate that the overall effects on drug use vary significantly across racial, and ethnic groups (Model 15.1, $\Delta\chi^2=419.498$, $df=4$, $p<.000$; Model 15.2, $\Delta\chi^2=18.4$, $df=4$, $p<.001$; Model 15.3, $\Delta\chi^2=57.359$, $df=4$, $p<.000$). This finding is the basis for rejecting the null hypothesis that the effects of differential associations and self-control and opportunity on drug use are invariant by race and ethnicity. Models 16.1 to 18.3 test whether the individual variable's effect on drug use equal across race and ethnicity. The chi-square test results presented in Table 9.4 indicate that only the variable of learned definitions is significantly related to drug use differently across groups. The effects

of delinquent peers and self-control on drug use do not vary by race and ethnicity. The parameter estimation (Tables 9.3a and 9.3b) shows that the definition favorable and unfavorable to breaking the law exerts the largest effect for White youths (standardized coefficients of learned definition is -0.60), followed by Black youths (-0.46), and then Hispanic youths (-0.42). The effect of definitions favorable and unfavorable to breaking the law on Asian youths is the smallest in size (-0.33). Although the sizes of effects of delinquent peers and self-control on drug use vary somewhat by race and ethnicity (for example, the standardized coefficients of self-control on drug use are 0.36 and 0.35 for Asians and Blacks respectively, and the coefficients of self-control on drug use are relatively smaller for Hispanics and Whites (0.26 and 0.19 correspondingly), the differences are not significant differences.

The overall effects of delinquent peers, learned definitions, and self-control and opportunity on delinquency vary only between Black and White youths (Model 19.1, $\Delta\chi^2=17.262$, $df=4$, $p<.002$). No significant differences were found between Asian and White youths (Model 19.2, $\Delta\chi^2=7.353$, $df=4$, $p<.118$), and Hispanic and White youths (Model 19.3, $\Delta\chi^2=4.955$, $df=4$, $p<.292$). Models 20.1 to 22.3

test the individual variable's effect on delinquency. The results show that only the variable of delinquent peers is related to delinquency differently for Whites and Asians (Model 21.2, $\Delta\chi^2=4.346$, $df=1$, $p<.037$). The effects of definitions and self-control on delinquency do not vary by race and ethnicity. The parameter estimation (Table 9.3) indicates that the variable of delinquent peers exerts substantial and significant effects on delinquency for Whites and Hispanics (the standardized coefficients are -0.15 and -0.12), but not for Blacks and Asians. Opportunity exerts significant effects on delinquency for Black and White youths. The effect size of opportunity on delinquency is modest for Hispanics, but is still significant. Opportunity is not significant related to delinquency for Asians. For Asians, self-control is the most important factor predicting involvement of delinquent behaviors.

Table 9.1a: Relationships between background variables and social bond variables, unstandardized coefficients—youths (Whites=9019, Blacks=1628, Asian=373, Hispanics =1589).

	Attachment to parents				Attachment to school				Involvement				Religiosity			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Sex	-.04** (.015)	-.17*** (.037)	.02 (.078)	-.057 (.038)	.06*** (.012)	.04 (.025)	.013 (.048)	.06* (.027)	-.24*** (.016)	-.06 (.037)	-.26** (.081)	-.09* (.036)	-.13*** (.022)	-.15*** (.047)	.032 (.099)	-.26*** (.047)
Age	.14*** (.005)	.15*** (.011)	.17*** (.024)	.11*** (.012)	.05*** (.004)	.03*** (.007)	.03* (.015)	.03*** (.008)	-.03*** (.005)	-.04*** (.011)	-.03 (.025)	-.006 (.011)	-.09*** (.007)	-.01 (.014)	-.11*** (.03)	-.046*** (.014)
Household income	-.05*** (.008)	-.002 (.021)	-.075 (.038)	-.028 (.022)	.01 (.006)	.08*** (.014)	.017 (.024)	.06*** (.015)	.13*** (.009)	.05* (.021)	.13** (.04)	.12*** (.021)	-.02 (.012)	.05 (.027)	-.089 (.049)	.018 (.027)
Family structure	-.17*** (.019)	.013 (.041)	-.011 (.12)	-.007 (.043)	-.07*** (.015)	.002 (.027)	.048 (.073)	-.001 (.03)	.11*** (.02)	-.008 (.041)	.076 (.124)	-.03 (.041)	.25*** (.028)	.010* (.052)	.036 (.152)	-.09* (.036)
R-square	.162	.155	.178	.081	.038	.055	.024	.029	.111	.022	.099	.045	.036	.016	.049	.044

Note: * p<.05; ** p<.01; *** p<.001. Standard errors appear in parentheses.

Table 9.1b: Relationships between background variables and social bond variables, standardized coefficients—youths (Whites=9019, Blacks=1628, Asian=373, Hispanics = 1589).

	Attachment to parents Std. Coef.				Attachment to school Std. Coef.				Involvement Std. Coef.				Religiosity Std. Coef.			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Sex	-.03**	-.13***	.01	-.04	.07***	.04	.02	.07*	-.20***	-.05	-.21**	-.08*	-.07***	-.09***	.02	-.15***
Age	.37***	.37***	.40***	.28***	.17***	.12***	.14*	.11***	-.09***	-.12***	-.08	-.02	-.14***	-.02	-.20***	-.09***
Household income	-.08***	-.003	-.12	-.04	.02	.18***	.046	.12***	.22***	.08*	.21**	.20***	-.02	.06	-.10	.02
Family structure	-.12***	.01	-.01	-.01	-.06***	.002	.04	-.001	.07***	-.01	.04	-.03	.11***	.06*	.01	-.08*

Note: * p<.05; ** p<.01; *** p<.001.

Table 9.2a: Relationships between independent variables and intervening variables, unstandardized coefficients—youths (Whites=9019, Blacks=1628, Asian=373, Hispanics =1589).

Intervening Var. → Ind. Variables ↓	Delinquent peers			Learned definition of drug use			Self-control		
	White	Black	Asian	White	Black	Asian	White	Black	Asian
Sex	-.22*** (.01)	-.21*** (.03)	-.10* (.045)	-.02* (.009)	-.09*** (.024)	-.05 (.042)	-.05* (.022)	.23*** (.028)	.11 (.059)
Age	.17*** (.003)	.18*** (.008)	.20*** (.015)	-.06*** (.003)	-.04*** (.008)	-.02 (.014)	-.05*** (.007)	-.01 (.01)	-.01 (.021)
Household income	.01* (.005)	-.01 (.015)	.04 (.023)	-.01* (.005)	.01 (.014)	.002 (.021)	-.01 (.013)	-.05** (.016)	-.07* (.029)
Family structure	-.02 (.012)	-.02 (.027)	-.13* (.066)	.05*** (.011)	-.01 (.026)	-.05 (.061)	.07* (.025)	-.01 (.03)	.13 (.087)
Attachment to parents	.01 (.012)	.02 (.028)	.06 (.042)	-.17*** (.01)	-.09*** (.023)	-.09* (.04)	-.14*** (.02)	.30*** (.015)	.08 (.055)
Attachment to school	.08*** (.014)	.04 (.05)	.10 (.076)	-.21*** (.011)	-.31*** (.036)	-.26*** (.064)	-.27*** (.029)	.37*** (.017)	.41*** (.09)
Religiosity	-.01 (.005)	.02 (.016)	.02 (.027)	.10*** (.005)	.09*** (.015)	.05* (.023)	.09*** (.014)	-.09*** (.007)	-.13*** (.033)
Involvement	-.02 (.01)	.04 (.029)	-.005 (.047)	.11*** (.01)	.01 (.024)	.09* (.042)	.04 (.026)	.10*** (.014)	.18** (.06)
Percept risk of drug use									
Self-control	.36*** (.022)	.41*** (.073)	.44*** (.09)	.29*** (.026)	.33*** (.063)	.43*** (.107)	.32*** (.06)	.16*** (.03)	.22*** (.037)
R-square	.538	.448	.627	.371	.205	.257	.287	.404	.286

Note: * p<.05; ** p<.01; *** p<.001. Standard errors appear in parentheses.

Table 9.2b: Relationships between independent variables and intervening variables, standardized coefficients—youths (Whites=9019, Blacks=1628, Asian=373, Hispanics =1589).

Intervening Var → Ind. Variables ↓	Delinquent peers			Learned definition of drug use			Self-control		
	White	Black	Asian	White	Black	Asian	White	Black	Asian
Sex	-.21***	-.19***	-.09*	-.03*	-.10***	-.07	.21***	.28***	.12
Age	.54***	.54***	.61***	-.24***	-.16***	-.09	-.03*	-.03	-.04
Household income	.02*	-.02	.07	-.02*	.03	.005	-.08***	-.12**	-.16*
Family structure	-.02	-.02	-.08*	.05***	-.02	-.05	-.03*	-.01	.10
Attachment to parents	.011	.02	.08	-.25***	-.14***	-.17*	.39***	.28***	.12
Attachment to school	.08***	.03	.07	-.24***	-.28***	-.28***	.37***	.43***	.35***
Religiosity	-.01	.03	.04	.22***	.17***	.13*	-.19***	-.17***	-.27***
Involvement	-.02	.05	-.006	.15***	.02	.16*	.12***	.23***	.25**
Percept risk of drug use				.13***	.15***	.24***			
Self-control	.33***	.31***	.37***						

Note: * p<.05; ** p<.01; *** p<.001.

Table 9.3a: Relationships between independent variables and drug use and delinquency, unstandardized coefficients—youths (Whites=9019, Blacks=1628, Asian=373, Hispanics = 1589).

Intervening variables ↓	Drug use				Delinquency			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Delinquent peers	.02*** (.003)	.01** (.004)	.02 (.014)	.03** (.007)	-.05*** (.005)	-.02 (.013)	-.005 (.017)	-.04** (.013)
Definitions of drug use	-.18*** (.005)	-.04*** (.004)	-.09*** (.019)	-.10*** (.009)	-.08*** (.006)	-.09*** (.014)	-.08** (.022)	-.10*** (.015)
Self-control	.05*** (.005)	.04*** (.007)	.08*** (.019)	.05*** (.009)	.21*** (.009)	.24*** (.024)	.18*** (.026)	.22*** (.019)
Opportunity	.01*** (.002)	.001 (.002)	-.004 (.007)	.01** (.003)	.02*** (.002)	.03*** (.005)	.00 (.008)	.01* (.006)
R-square	.514	.488	.336	.398	.433	.375	.745	.428

Note: * p<.05; ** p<.01; *** p<.001. Standard errors appear in parentheses.

Table 9.3b: Relationships between independent variables and drug use and delinquency standardized coefficients---youths (Whites=9019, Blacks=1628, Asian=373, Hispanics =1589).

Intervening variables →	Drug use					Delinquency				
	Ind. variables ↓	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.	
Delinquent peers		.08***	.15**	.12	.13**	-.15***	-.06	-.03	-.12**	
Definitions of drug use		-.60***	-.46***	-.33***	-.42***	-.21***	-.22***	-.27**	-.24***	
Self-control		.19***	.35***	.36***	.26***	.61***	.53***	.80***	.60***	
Opportunity		.05***	.03	-.03	.09**	.11***	.13***	-.001	.06*	

Note: * p<.05; ** p<.01; *** p<.001.

Note: * p<.05; ** p<.01; *** p<.001.

Table 9.4: A variety of models to test the significance of groups of parameters—youths

Model	Constraints	χ^2	df	$\Delta\chi^2$	df	p-value	Test implied in $\Delta\chi^2$
1	All groups free	51610.829	7800		--	--	
2	All groups equal	52721.621	7950	1110.792	150	.000	All groups are equal
31	B=w	52463.836	7850	853.007	50	.000	Coefficients are equal between racial and ethnic groups
32	A=w	51736.741	7850	125.912	50	.000	
33	H=w	51852.735	7850	241.906	50	.000	
41	On B5 b=w	51652.404	7804	41.575	4	.000	Effects of background variables on attachment to parents are equal between racial and ethnic groups
42	On B5 a=w	51614.677	7804	3.848	4	.427	
43	On B5 h=w	51631.184	7804	20.355	4	.000	
51	On B6 b=w	51654.945	7804	44.116	4	.000	Effects of background variables on attachment to schools are equal between racial and ethnic groups
52	On B6 a=w	51615.962	7804	5.133	4	.274	
53	On B6 h=w	51634.254	7804	23.425	4	.000	
61	On B7 b=w	51645.101	7804	34.272	4	.000	Effects of background variables on religiosity are equal between racial and ethnic groups
62	On B7 a=w	51619.515	7804	8.686	4	.069	
63	On B7 h=w	51624.758	7804	13.929	4	.008	
71	On B8 b=w	51660.683	7804	49.854	4	.000	Effects of background variables on involvement are equal between racial and ethnic groups
72	On B8 a=w	51611.023	7804	0.194	4	.996	
73	On B8 h=w	51643.220	7804	32.391	4	.000	
81	Bg On B1 b=w	51614.164	7804	3.335	4	.503	Effects of background variables on delinquent peers are equal between racial and ethnic groups
82	Bg On B1 a=w	51625.091	7804	14.262	4	.007	
83	Bg On B1 h=w	51617.661	7804	6.832	4	.145	
91	Bg On da b=w	51627.804	7804	16.975	4	.002	Effects of background variables on delinquent peers are equal between racial and ethnic groups
92	Bg On da a=w	51620.600	7804	9.771	4	.044	
93	Bg On da h=w	51613.335	7804	2.506	4	.644	
111	Bg On B9 b=w	51613.179	7804	2.35	4	.672	Effects of background variables on self-control are equal between racial and ethnic groups
112	Bg On B9 a=w	51616.448	7804	5.619	4	.229	
113	Bg On B9 h=w	51624.876	7804	14.047	4	.007	
121	On B1 b=w	51620.518	7805	9.689	5	.076	Social bond and self-control variables impact delinquent peers equally across groups
122	On B1 a=w	51614.769	7805	3.94	5	.558	
123	On B1 h=w	51618.976	7805	8.147	5	.148	
131	On da b=w	51635.186	7805	24.357	5	.000	Social bond variables and perceived risk impact definitions equally across racial and ethnic groups
132	On da a=w	51618.938	7805	8.109	5	.150	
133	On da h=w	51620.797	7805	9.968	5	.041	
141	On B9 b=w	51631.319	7804	20.49	4	.000	Social bond variables impact self-control equally across racial and ethnic groups
142	On B9 a=w	51624.494	7804	13.665	4	.008	
143	On B9 h=w	51620.710	7804	9.881	4	.042	
151	On fl b=w	52030.327	7804	419.498	4	.000	Delinquent peers, definitions and self-
152	On fl a=w	51629.229	7804	18.4	4	.001	

153	On f1 h=w	51668.188	7804	57.359	4	.000	control impact drug use equally across groups
161	Da ON f1 b=w	51915.274	7801	304.445	1	.000	Learned definitions affect drug use equally across racial and ethnic groups
162	Da ON f1 a=w	51627.207	7801	16.378	1	.000	
163	Da ON f1 h=w	51658.671	7801	47.842	1	.000	
171	B1 ON f1 b=w	51612.359	7801	1.53	1	.216	Delinquent peers affect drug use equally across racial and ethnic groups
172	B1 ON f1 a=w	51610.924	7801	.095	1	.758	
173	B1 ON f1 h=w	51611.453	7801	.624	1	.430	
181	B9 ON f1 b=w	51613.269	7801	2.44	1	.118	Self-control affects drug use equally across racial and ethnic groups
182	B9 ON f1 a=w	51612.788	7801	1.959	1	.162	
183	B9 ON f1 h=w	51610.914	7801	.085		.771	
191	On f2 b=w	51628.091	7804	17.262	4	.002	Delinquent peers, definitions and self- control affect delinquency equally across groups
192	On f2 a=w	51618.182	7804	7.353	4	.118	
193	On f2 h=w	51615.784	7804	4.955	4	.292	
201	Da ON f2 b=w	51611.391	7801	.562	1	.468	Learned definitions affect delinquency equally across racial and ethnic groups
202	Da ON f2 a=w	51610.867	7801	.038	1	.845	
203	Da ON f2 h=w	51612.565	7801				
211	B1 ON f2 b=w	51614.348	7801	3.519	1	.061	Delinquent peers affect delinquency equally across racial and ethnic groups
212	B1 ON f2 a=w	51615.175	7801	4.346	1	.037	
213	B1 ON f2 h=w	51610.949	7801	.12	1	.729	
221	B9 ON f2 b=w	51612.770	7801	1.941	1	.164	Self-control affects delinquency equally across racial and ethnic groups
222	B9 ON f2 a=w	51611.938	7801	1.109	1	.292	
223	B9 ON f2 h=w	51611.017	7801	.188	1	.665	

Multiple Groups Analysis for Adults

Parameter estimates of the multiple groups model for adults appear in Tables 10.1a 10.1b, 10.2a, 10.2b, 10.3a and 10.3b. Compatible with the model for youths, this model examines the relationships between independent variables, intervening variables, and dependent variables, and the parameters are set to be free across racial and ethnic groups. To test whether the effects of specific variables invariant by race and ethnicity, a variety of constrained models were examined. The chi-square test results of different models are presented in Table 10.4. These analyses reveal six principle findings.

First, using the overall test of invariance (Table 10.4, model 2), the hypothesis that all substantive parameters are the same for different racial and ethnic groups is rejected ($\Delta\chi^2=1449.534$, $df=126$, $p<.000$). Specific cross-group comparisons show that the processes of drug use and delinquency vary significantly between Blacks and Whites ($\Delta\chi^2=969.486$, $df=42$, $p<.000$), and Asians and Whites ($\Delta\chi^2=184.609$, $df=42$, $p<.000$), as well as Hispanics and Whites¹⁵.

¹⁵ The model that constrained the equivalence of parameters between Hispanics and Whites did not reach convergence. Even though the problem of non-convergence was not identified in this study, it indicates that the constrained model does not fit as well as the un-constrained model.

Second, the tests of hypotheses that the determinants of the processes of social bonding vary by race and ethnicity reveal that the total effect of background variables on attachment to friends varies significantly between Blacks and Whites (Model 4.1, $\Delta\chi^2=21.37$, $df=3$, $p<.000$). It also varies significantly between Hispanics and Whites ($\Delta\chi^2=28.602$, $df=3$, $p<.000$). However, no significant difference between Asians and White is found ($\Delta\chi^2=2.409$, $df=3$, $p<.492$). The results also show that the total effects of background variables on another element of social bonding—religiosity—for Blacks, Asians, and Hispanic are different from Whites respectively (Table 9.4, model 5.1, $\Delta\chi^2=7.71$, $df=3$, $p<.052$; Model 5.2, $\Delta\chi^2=9.403$, $df=3$, $p<.024$; Model 5.3, $\Delta\chi^2=14.622$, $df=3$, $p<.002$).

The third finding indicates whether the effects of background variables on elements of differential associations vary by race and ethnicity. Models 6.1, 6.2, and 6.3 constrained the parameters between Blacks, Asians and Hispanic and Whites correspondently. The chi-square tests reveal that the effects of background variables on criminal peers vary significantly between Blacks and Whites ($\Delta\chi^2=27.68$, $df=3$, $p<.000$), Hispanics and Whites ($\Delta\chi^2=12.445$, $df=3$, $p<.006$), as well as Asians and Whites ($\Delta\chi^2=30.936$,

df=3, $p < .000$). Sex, age and household income are unrelated to the number of criminal peers for Black, Asian and Hispanic adults. The effects of background variable on criminal peers for Whites are modest in size but statistically significant. The tests of relationships between background variables and learned definitions across race and ethnic groups (Table 10.4, Models 7.1, 7.2 and 7.3) show that the effects of background variables on learned definition are invariant by race and ethnicity. Findings about the relationships between background variables and elements of differential association for adults are inconsistent with findings for youths.

The fourth finding is that the effects of background variables on self-control vary by race and ethnicity. The chi-square tests of equivalence of parameters between racial and ethnic groups disclose that there are significant differences between Black and White adults, between Asian and White adults, and between Hispanic and White adults in terms of relationships between background variables and self-control. For White and Asian adults, age exerts larger effects on self-control than sex. However, for Blacks and Hispanic, Sex exerts larger effects than age.

The fifth finding concerns the relationships between social bonds, differential association and self-control. Models 9.1, 9.2, and 9.3 constrained the effects of social bonds and self-control on criminal peers between Blacks, Asians, Hispanics and Whites. The results suggest that criminal peers have different influences on illegal behavior depending on the racial and ethnic group. The parameter estimation (Tables 10.2a and 10.2b) reveals that self-control exerts the largest size of effect on criminal peers for each group. Education level, marital status, and employment status, attachment to friends and religiosity all present significant effects for White adults. Low education, staying unmarried or divorced, and being unemployed increase the number of criminal friends for Whites. Religiosity is substantial related to having criminal peers for Whites. Education level, marital status, attachment to friends and religiosity are similarly connected to criminal friends for Blacks, however, employment status is not significantly related to criminal friends for Blacks. For Asian adults, marital status, employment status, attachment to friends and religious beliefs do not affect the number of criminal peers. Nevertheless education level exerts much stronger effect on criminal peers for Asians than other groups. . For

Hispanics, adulthood events such as education level, marital status, and employment status do not affect the number of criminal peers significantly. Attachment to friends and religiosity are the two elements of social bonding that exert effect on the number of criminal peers for Hispanic adults.

Models 10.1, 10.2, and 10.3 constrained the effects of social bonds and perceived risk of drug use on learned definitions of drug use between Blacks, Asians, Hispanics and Whites. The overall effects on learned definitions vary significantly between Blacks and Whites, and Asian and Whites, but not between Hispanics and Whites. For both White and Hispanic adults, religiosity has the strongest connection to learned definitions, followed by perceived risk of drug use. Low education level, being unmarried or divorced, and close relationships with friends are associated with reduced strength of conventional beliefs for Whites and Hispanics. Religiosity also is strongly related to definitions for Black adults. Strong religious beliefs, high level of perceived risk, and high level of education, and being married are associated with increased strength of conventional beliefs for Blacks. For Asians, perceived risk of drug use exerts a stronger effect on definitions than religiosity. Being married has a

substantial effect on Asian adults' definitions of drug use.

Models 11.1, 11.2, and 11.3 (Table 10.4) constrained the effects of social bonds on self-control between Blacks and Whites, Asians and Whites, and Hispanic and Whites respectively. The overall effects of social bonds on self-control vary significantly between Blacks and Whites ($\Delta\chi^2=16.087$, $df=5$, $p<.007$), and Asians and White ($\Delta\chi^2=16.159$, $df=5$, $p<.006$), but not between Hispanics and Whites ($\Delta\chi^2=10.168$, $df=5$, $p<.071$). For Whites, Blacks, and Hispanics, religiosity again has the largest effect size. But for Asians, religiosity exerts no significant effect on self-control. Instead, marital status exerts the largest size of effect for Asians. Staying single or divorced, and having close relationships are most strongly connected to low self-control for Asians.

The final finding about the model for adults reveals the relationships between differential association, self-control, and perceived risk and drug use and criminal behaviors for different racial and ethnic groups. Models 12.1, 12.2, and 12.3 constrained the overall effects on drug use for adults between Blacks, Asians, Hispanics, and Whites respectively. The overall effects of differential

association and self-control plus perceived risk vary between Whites and other minorities. Tests of effects of individual variables on drug use by race and ethnicity indicate that the variable of criminal peers is related to drug use differently for Whites and other minority groups. The variable, criminal peers, has a substantially larger effect on drug use for Whites (standardized coefficient is 0.48) and Asians (0.41) than for Blacks (0.21) and Hispanics (0.23). The effect of definitions on drug use only varies between Hispanics and Whites. But the parameter estimates show that the effect of definitions on drug use is slightly larger for Blacks, Asians, and Hispanics than for Whites. Self-control presents significantly larger effects on drug use for Blacks (standardized coefficient is 0.40) and Hispanic (0.42) than for Whites (0.16) and Asians (0.18).

Models 16.1, 16.2, and 16.3 constrained the overall effects on drug use for adults between Blacks, Asians, Hispanics, and Whites respectively. The overall effects of differential association and self-control and perceived risk on criminal behavior vary significantly between Whites and other minorities. White group has the largest size of explained variance of criminal behavior (0.184), followed by Black (0.165) and Hispanic (0.164) groups. The size of

explained variance of criminal behavior is fairly small for Asian group (0.97). The relatively small size of explained variance of criminal behavior for adults suggest that some other crucial variables may need to be involved in order to understand the process of adult criminal behavior. Tests of effects of individual variables on criminal behavior reveal criminal peers affect criminal behavior differently between Whites and Blacks and Hispanics. The variable of criminal peers has significantly larger effects on criminal behavior for Whites (0.19) and Asians (0.22) than for Blacks (0.08) and Hispanics (0.07). The effect of definitions on criminal behavior varies between only Whites and Blacks. The overall effect of definitions on criminal behavior is trivial. Self-control exerts significantly larger effects on criminal behavior for Blacks (0.33) and Hispanics (0.30) than Whites (0.23). Self-control has no significant effect on criminal behavior for Asians. The parameter estimates also show that perceived risk of drug use has significant effects on criminal behavior for Whites, Asians, and Hispanics but not for Blacks.

Summary

As an overview of the results of the structural equation analysis of the integrated model, it appears that differential associations and self-control are the main factors directly influencing both drug use and delinquency/criminality, and these predictors mediate the effects of social bonds as well as background variables on the illegal behavior. The mean structure analysis and multiple groups analysis provide results showing that the theoretical constructs of differential association, social bond, and self-control theories vary significantly across racial and ethnic groups. The causal processes leading to drug use and delinquent/criminal behavior are not invariant between racial and ethnic groups.

Table 10.1a: Relationships between background variables and social bond variables, unstandardized coefficients---adults
(Whites=22,662, Blacks=3,398, Asian=881, Hispanics =3,668).

	Attachment to friends				Religiosity			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Sex	-.02 (.011)	.06* (.028)	-.02 (.056)	.002 (.029)	-.37*** (.018)	-.36 (.045)	-.28** (.092)	-.26*** (.043)
Age	-.04*** (.002)	-.02*** (.005)	-.03** (.011)	-.05*** (.006)	.06*** (.003)	.06*** (.008)	.10*** (.018)	.08*** (.008)
Household income	.07*** (.005)	.10*** (.015)	.03 (.026)	.16*** (.017)	.01 (.009)	.08*** (.024)	.07 (.042)	-.044 (.024)
R-square	.029	.024	.011	.051	.045	.058	.070	.051

Note: * p<.05; ** p<.01; *** p<.001. Standard errors appear in parentheses.

Table 10.1b: Relationships between background variables and social bond variables standardized coefficients—adults (Whites=22,662, Blacks=3,398, Asian=881, Hispanics =3,668).

	Attachment to friends Standardized Coef.				Religiosity Standardized Coef.			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Sex	-.01	.04*	-.01	.001	-.15***	-.17	-.12**	-.12***
Age	-.16***	-.10***	-.11**	-.16***	.14***	.16***	.21***	.19***
Household income	.10***	.12***	.05	.17***	.01	.07***	.07	-.04

Note: * p<.05; ** p<.01; *** p<.001.

Table 10.2a: Relationships between independent variables and intervening variables, unstandardized coefficients—adults (Whites=22,662, Blacks=3,398, Asian=881, Hispanics =3,668).

Intervening Variables → Ind. Variables ↓	Criminal peers			Definitions of drug use			Self-control				
	White	Black	Hispanic	White	Black	Asian	Hispanic	White	Black	Asian	Hispanic
Sex	-.05*** (.005)	-.02 (.017)	-.04 (.029)	-.09*** (.006)	-.08*** (.019)	-.11*** (.033)	-.12*** (.018)	.33*** (.008)	.26*** (.02)	.24*** (.038)	.23*** (.019)
Age	-.01*** (.001)	.006 (.003)	.02 (.008)	-.02*** (.001)	-.01*** (.004)	-.017 (.009)	-.02*** (.004)	-.06*** (.002)	-.04*** (.004)	-.06*** (.01)	-.04*** (.004)
Household income	-.01*** (.002)	-.02* (.008)	-.012 (.012)	.01* (.003)	-.008 (.011)	.015 (.015)	.006 (.011)	-.01 (.004)	-.02 (.011)	.03 (.017)	.04*** (.012)
Education level	-.01*** (.001)	-.01** (.004)	-.03*** (.009)	.01*** (.002)	.02** (.006)	-.005 (.012)	.02*** (.003)	.01*** (.002)	.01 (.006)	.024 (.013)	.02*** (.004)
Marital status	.03*** (.003)	.03** (.01)	.025 (.018)	-.04*** (.004)	-.05*** (.012)	-.07** (.023)	-.04*** (.011)	.10*** (.005)	.06*** (.013)	.10*** (.026)	.09*** (.012)
Employment status	.01*** (.003)	.000 (.009)	.023 (.017)	-.01* (.004)	.006 (.012)	.001 (.022)	-.006 (.012)	.03*** (.006)	-.006 (.012)	.009 (.025)	.03* (.013)
Attachment to friends	.04*** (.003)	.05*** (.011)	.02 (.018)	-.02*** (.004)	-.02 (.014)	-.06* (.023)	-.04*** (.012)	.07*** (.006)	.05*** (.014)	.08** (.027)	.10*** (.013)
Religiosity	-.08*** (.003)	-.06*** (.009)	-.02 (.012)	.18*** (.004)	.21*** (.012)	.09*** (.016)	.16*** (.01)	-.10*** (.004)	-.12*** (.012)	-.03 (.018)	-.13*** (.011)
Percept risk of drug use				.76*** (.022)	.49*** (.049)	.66*** (.076)	.70*** (.046)				
Self-control	.35*** (.009)	.44*** (.029)	.60*** (.057)								
R-square	.585	.390	.659	.491	.237	.233	.261	.438	.315	.362	.362

Note: * p<.05; ** p<.01; *** p<.001. Standard errors appear in parentheses.

Table 10.2b: Relationships between independent variables and intervening variables, standardized coefficients—adults (Whites=22,662, Blacks=3,398, Asian=881, Hispanics =3,668)

Intervening Variables → Ind. Variables ↓	Criminal peers			Definitions of drug use			Self-control		
	White	Black	Asian	White	Black	Asian	White	Black	Asian
Sex	-.06***	-.02	-.06	-.11***	-.08***	-.12***	.30***	.27***	.25***
Age	-.08***	.04	.11	-.13***	-.08***	-.093	-.33***	-.25***	-.35***
Household income	-.04***	-.05*	-.037	.02*	-.01	.036	-.01	-.03	.068
Education level	-.04***	-.05**	-.14***	.04***	.06**	-.014	.04***	.04	.075
Marital status	.08***	.07**	.069	-.10***	-.08***	-.14**	.17***	.11***	.21***
Employment status	.02***	.001	.048	-.02*	.009	.001	.03***	-.01	.015
Attachment to friends	.08***	.09***	.04	-.04***	-.03	-.09*	.10***	.08***	.13**
Religiosity	-.26***	-.15***	-.075	.52***	.42***	.22***	-.22***	-.26***	-.08
Percept risk of drug use				.38***	.19***	.34***			
Self-control	.54***	.53***	.78***						

Note: * p<.05; ** p<.01; *** p<.001

Table 10.3a: Relationships between independent variables and drug use and delinquency, unstandardized coefficients—adults
(Whites=22,662, Blacks=3,398, Asian=881, Hispanics =3,668).

Intervening variables →	Drug use Coef. (S.E.)				Delinquency Coef. (S.E.)			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Criminal peers	.18*** (.006)	.04*** (.007)	.12*** (.027)	.07*** (.011)	.07*** (.006)	.04** (.014)	.07* (.029)	.03 (.015)
Definitions of drug use	-.01*** (.003)	-.02*** (.004)	-.03** (.011)	-.03*** (.005)	.01** (.004)	-.02* (.007)	.006 (.011)	-.003 (.006)
Self-control	.04*** (.003)	.06*** (.006)	.04 (.02)	.09*** (.009)	.05*** (.004)	.12*** (.013)	.022 (.023)	.09*** (.011)
Opportunity	.001 (.001)	.000 (.002)	-.001 (.005)	-.004 (.002)	.01*** (.001)	.003 (.004)	-.004 (.006)	.003 (.003)
Perceived risk of drug use	-.13*** (.006)	-.05*** (.009)	-.05** (.019)	-.06*** (.011)	-.08*** (.006)	-.031 (.018)	-.05* (.021)	-.10*** (.014)
R-square	.458	.414	.392	.448	.184	.165	.097	.164

Note: * p<.05; ** p<.01; *** p<.001. Standard errors appear in parentheses.

Table 10.3b: Relationships between independent variables and drug use and delinquency, standardized coefficients—adults
(Whites=22,662, Blacks=3,398, Asian=881, Hispanics =3,668)

Intervening variables →	Drug use Std. Coef.				Delinquency Std. Coef.			
	White	Black	Asian	Hisp.	White	Black	Asian	Hisp.
Criminal peers	.48***	.21***	.41***	.23***	.19***	.08**	.22*	.07
Definitions of drug use	-.04***	-.16***	-.12**	-.13***	.03**	-.05*	.022	-.01
Self-control	.16***	.40***	.18	.42***	.23***	.33***	.09	.30***
Opportunity	.006	-.005	-.01	-.03	.04***	.014	-.024	.019
Perceived risk of drug use	-.19***	-.14***	-.11**	-.12***	-.13***	-.037	-.10*	-.15***

Note: * p<.05; ** p<.01; *** p<.001.

Table 10.4: A variety of models to test the significance of groups of parameters—adults

Model	Constraints	χ^2	df	$\Delta\chi^2$	df	p-value	Test implied in $\Delta\chi^2$
1	All groups free	72968.881	4040		--	--	
2	All groups =	74418.415	4166	1449.534	126	.000	Parameters are constrained to be equal across groups
31	B=w	73938.362	4082	969.486	42	.000	Coefficients are equal between racial and ethnic groups
32	A=w	73153.490	4082	184.609	42	.000	
33	H=w	*					
41	Bg On a2 b=w	72990.251	4043	21.37	3	.000	Effects of background variables on attachment to friends are equal between racial and ethnic groups
42	Bg On a2 a=w	72971.290	4043	2.409	3	.492	
43	Bg On a2 h=w	72997.483	4043	28.602	3	.000	
51	Bg On a5 b=w	72976.591	4043	7.71	3	.052	Effects of background variables on religiosity are equal between racial and ethnic groups
52	Bg On a5 a=w	72978.284	4043	9.403	3	.024	
53	Bg On a5h=w	72983.503	4043	14.622	3	.002	
81	Bg On a1 b=w	72996.561	4043	27.68	3	.000	Effects of background variables on delinquent peers are equal between racial and ethnic groups
82	Bg On a1 a=w	72981.326	4043	12.445	3	.006	
83	Bg On a1 h=w	72999.817	4043	30.936	3	.000	
91	Bg On da b=w	72972.019	4043	3.138	3	.371	Effects of background variables on delinquent peers are equal between racial and ethnic groups
92	Bg On da a=w	72969.427	4043	.546	3	.909	
93	Bg On da h=w	72970.966	4043	2.085	3	.555	
111	Bg On a6 b=w	73003.430	4043	34.549	3	.000	Effects of background variables on self-control are equal between racial and ethnic groups
112	Bg On a6 a=w	72978.516	4043	9.635	3	.022	
113	Bg On a6 h=w	73026.823	4043	57.942	3	.000	
121	Sb On a1 b=w	72985.023	4046	16.142	6	.013	Social bond and self-control variables impact delinquent peers equally across groups
122	Sb On a1 a=w	73017.357	4046	48.476	6	.000	
123	Sb On a1 h=w	*					
131	Sb On da b=w	73003.236	4046	34.549	6	.000	Social bond variables and perceived risk impact definitions equally across racial and ethnic groups
132	Sb On da a=w	73009.888	4046	41.007	6	.000	
133	Sb On da h=w	72977.288	4046	8.407	6	.210	
141	Sb On a6 b=w	72984.968	4045	16.087	5	.007	Social bond variables impact self-control equally across racial and ethnic groups
142	Sb On a6 a=w	72985.040	4045	16.159	5	.006	
143	Sb On a6 h=w	72979.049	4045	10.168	5	.071	
151	On fl b=w	73593.277	4045	624.396	5	.000	Delinquent peers, definitions and self-control impact drug use equally across groups
152	On fl a=w	73012.049	4045	43.168	5	.000	
153	On fl h=w	73128.751	4045	159.87	5	.000	
161	Da ON fl b=w	72971.245	4041	2.364	1	.124	Learned definitions affect drug use equally across racial and ethnic groups
162	Da ON fl a=w	72970.908	4041	2.027	1	.155	
163	Da ON fl h=w	72974.120	4041	5.239	1	.022	
171	al ON fl b=w	73249.969	4041	281.088	1	.000	Delinquent peers affect drug use equally across
172	al ON fl a=w	72973.081	4041	4.2	1	.040	

173	a1 ON f1 h=w	73058.797	4041	89.916	1	.000	racial and ethnic groups
181	A6 ON f1 b=w	72975.113	4041	6.232	1	.013	Self-control affects drug use equally across racial and ethnic groups
182	A6 ON f1 a=w	72968.883	4041	.002	1	.964	
183	A6 ON f1 h=w	72997.083	4041	28.202	1	.000	
191	On f2 b=w	73024.189	4045	55.308	5	.000	Delinquent peers, definitions and self-control affect delinquency equally across groups
192	On f2 a=w	72984.932	4045	16.051	5	.007	
193	On f2 h=w	72991.558	4045	22.677	5	.000	
201	Da ON f2 b=w	72978.835	4041	9.954	1	.002	Learned definitions affect delinquency equally across racial and ethnic groups
202	Da ON f2 a=w	72969.028	4041	.147	1	.701	
203	Da ON f2 h=w	72971.980	4041	3.099	1	.078	
211	a1 ON f2 b=w	72972.871	4041	3.99	1	.046	Delinquent peers affect delinquency equally across racial and ethnic groups
212	a1 ON f2 a=w	72968.897	4041	.016	1	.899	
213	a1 ON f2 h=w	72975.102	4041	6.221	1	.013	
221	A6 ON f2 b=w	72996.285	4041	27.404	1	.000	Self-control affects delinquency equally across racial and ethnic groups
222	A6 ON f2 a=w	72970.305	4041	1.424	1	.233	
223	A6 ON f2 h=w	72976.585	4041	7.704	1	.006	

*No convergence for these models.

CHAPTER V: DISCUSSION AND CONCLUSION

The purpose of this study was threefold: to develop an explanatory model that integrated differential association, social bond, and self-control theories into a single paradigm that accounts for drug use and illegal behavior, to examine whether the causal processes leading to drug use and delinquent behavior vary by race and ethnicity, and to determine whether the causal processes are consistent for youths and adults. This last objective led to the identification of the relative importance of explanatory factors for youths and adults separately. A series of hypotheses were tested in order to determine the relationships between race and ethnicity, differential association, social bond, and self-control, and drug use and delinquency. This final chapter provides an overview of the research and discusses major findings for each of the tested hypotheses. Limitations of the research and suggestions for future work will be discussed in detail. The chapter closes with a discussion of this study's implication for theory and policy.

Summary and Discussion

Predictive Efficacy of Integrated Model

The first objective of the research was to improve the understanding of the causal processes leading up to drug use and delinquent behaviors, and to provide empirical evidence of the predictive efficacy of the differential association, social bonds, and self-control.

Integrated Model for Youths

Research findings indicate that the model explains substantial variation in drug use and delinquent behaviors among youths. Delinquent peers, definitions of drug use, and self-control, as expected, are strong predictors of drug use and illegal delinquency. The strongest predictor of drug use is learned definitions favorable to drug use, and the strongest predictor of delinquency is low self-control. Opportunity displays modest but significant effects on drug use and delinquency. These findings support both differential association theory and self-control theory.

The effects of elements of social bond-attachment to parents, attachment to school, involvement, and religiosity—are mediated by learned definitions and self-

control. Social bonds operate indirectly through the process of learning an excess of definitions favorable to drug use, and through low self-control. This finding is consistent with Metseuda's (1982) causal modeling approach, and it also provides evidence that supports Gottfredson and Hirschi's (1990) argument about the causal process in self-control theory.

Additionally, a strong relationship is found between self-control and delinquent peers. Low self-control is highly related to having delinquent peers. This finding provides support that low self-control not only directly leads to law violation behavior, but also reinforces the delinquent behavior by increase the involvement with delinquent peers. Moreover, social bonds, differential association, and self-control mediate the effects of background variables. Sex, age, household income and having a broken family are associated with drug use and delinquent behavior through a process-by attenuating parental supervision and attachment to school, reducing the involvement in conventional activities, and weakening the bond to religiosity, which in turn increase delinquent companions, excess definitions favorable to law violation, and low self-control, and ultimately, drug use and delinquent behavior. The findings also suggest that

background variables directly impact the association with delinquent peers, and definitions of law violation, and self-control. However, the traits of self-control are relatively stable during the adolescent period.

Integrated Model for Adults

The structural equation modeling for adults produced findings analogous to those for youths. The model explains substantial variations of drug use among adults. However, the efficacy of the model to explain criminal behavior among adult is moderate. Definitions of drug use, and self-control as well as perceived risk of drug use were strong predictors of drug use and crime. However, the variable of criminal peers was the strongest predictor for adults' drug use, and self-control was still the strongest predictor of criminal behavior. Definitions of drug use were moderately related to drug use and have no significant relationship to criminal behavior. The effects of education, marriage, and employment status as well as attachment to friends and religiosity were mediated by the process of learning definitions favorable to drug use, hanging out with criminal peers, and low self-control. This result indicates that efficient socialization is not only the consequence of child-rearing practice, but could

also be affected by adulthood transitions. Religiosity, an alternative institution in addition to family and school, exerted substantial effects on definitions, delinquent peers, and self-control for adults. Consistent with the model for youths, low self-control substantially increase the number of criminal peers, and the effects of background variables were mediated by social bonds, differential association and self-control. Age, exerts significant effects on self-control among adults. This finding is contrary to the finding among youths. Taking together, Gottfredson and Hirschi's (1990) assertion that the traits of self-control persist through life is not supported in this study.

Summary

To sum up, the integrated structural equation model is applicable to both youths and adults to explain the patterns of drug use and delinquent behavior. However, the model's power in explaining criminal behavior among adults is moderate to low, which indicates that either the process of operationalization of the core theoretical constructs needs to be improved, or some other explanatory factors need to be considered. Although empirical support for the general causal linkages is parallel for youths and adults,

there are some crucial differences. Learned definitions favorable to breaking the law is the strongest predictor for a youth's drug use, conversely, criminal peers plays most significant role in predicting an adult's drug use. Nevertheless, low self-control seems to be an important predictor for both youths and adults' delinquent/criminal behavior. The determinants of social bond vary between youths and adults as well. While parents' supervision, and attachment to school were strong predictors for a child's bond to conformity with the legal norms, education, marriage, and employment status as well as religiosity were decisive for an adult. These findings plus the evidence that age has significant impact on adult's self-control suggest that the determinants of criminality change through life. It seems that child-rearing practice, adulthood transitions, and social demographic conditions all influence the patterns of criminality through the effects on differential associations, and self-control.

It was not possible to test for the degree to which child-rearing practices explained later differences in education level and marital status for adults. If child-rearing practices are confounded with education and marital status, then Gottfredson and Hirschi's (1990) idea that child-rearing is the basic reason for self-control may be

valid. But if child-rearing practices and education level, and marital status are independent, then there is evidence that challenges Gottfredson and Hirschi's proposition.

Causal Processes by Race and Ethnicity

The Chapter II literature review revealed that theorists assumed the causal processes for drug use and other illegal activity are similar across racial and ethnic groups, but little prior empirical research had tested the hypothesis. The second objective of this study was to provide empirical analyses that answered the question about whether the causal processes leading to drug use and delinquent/criminal behavior vary by race and ethnicity. The findings are mixed.

Variations of Theoretical Variables by Race and Ethnicity

Previous research shows that drug use is more common among white and Hispanic youths than black youths (Ma and Shive, 2000; NSDUH, 2003). But violent and property crime are more common among blacks. This study produces the similar results about the distribution of drug use and delinquent/criminal behavior among racial and ethnic groups. For both youths and adults, Whites reported the

highest level of drug use, followed by Hispanics, Blacks, and finally Asians. On the other hand, Blacks reported the highest level of delinquency and criminality, followed by White youths, and Hispanic youths. Asian youths had the lowest level of delinquent/criminal behavior.

The hypothesis that elements of social bond vary by race and ethnicity is supported. For youths, Whites reported the strongest attachment to parents followed by Blacks, and then Hispanics, and Asian s reported the weakest attachment to parents. Black children reported the strongest attachment to school, followed by Hispanics, and then Asians, and White children were least attached to school. Black children reported a higher level of religiosity than White children, but no variations of religiosity between Whites, Asians, and Hispanics were found.

Elements of social bond differ between youths and adults. For adults, the indicators of social bond such as education level, marital status, and employment status were different between racial and ethnic groups. Attachment to friends, and religiosity also vary significantly by race and ethnicity. Paralleling with finding for youths, Black adults reported higher level of religiosity than White adults as well.

The hypothesis that Blacks, Asian Americans and Hispanic Americans differ from Whites on variables reflecting differential association is partially supported. For youths, the number of delinquent peers was invariant by race and ethnicity. For adults, however, the number of criminal peers varied by race and ethnicity. Whites reported more criminal peers than other minority groups. For both youths and adults, definitions favorable or unfavorable to drug use vary significantly across racial and ethnic groups. Asians disapproved of drug use more strongly than all the other groups. Bearing in mind that the learned definitions of drug use is the strongest predictor of drug use, it is not surprise that Asians reported the lowest level of drug use. The hypothesis that self-control varies by race and ethnicity is supported for both youths and adults as well. Generally whites reported less self-control than minority groups. In brief, the hypotheses that the theoretical constructs of social bonds, differential association, and self-control vary across racial and ethnic groups are supported in the study.

Causal Processes leading to Drug Use and
Delinquency/Criminality by Race and Ethnicity

Causal Processes by Race and Ethnicity for Youths

Although the literature review suggests that influences and the causal processes leading to crime and delinquency are invariant across racial and ethnic groups, the results of the study do not suggest this regularity. The integrated causal model's explanatory power for drug use and delinquent/criminal behavior varies by racial and ethnic group. Generally, the model explains the largest variance in drug use for Whites, followed by Blacks, then Hispanics, and the least for Asians. However, the causal mechanisms explain the largest variance in delinquent behavior for Asians, followed by Whites, then Hispanics, and the least for Blacks.

Contrary to Matsueda and Heimer's (1987) finding that the effect of definitions on delinquency was invariant, this study finds that the effect of learned definitions on drug use vary significantly across racial and ethnic groups. The effect of learned definition on drug use is much larger for whites than for blacks and Hispanics, and it is almost as twice the effect for Asians. However, consistent with Matsueda and Heimer's (1987) finding, the

effect of learned definitions on delinquency was invariant across racial and ethnic groups.

Also, the effect of delinquent peers on drug use was invariant across racial and ethnic groups, and the effect of delinquent peers on delinquency varied only between Asians and Whites. As delinquent peers exerted substantial effect on delinquency for Whites, it did not affect an Asian's involvement in delinquent acts.

As postulated by Gottfredson and Hirschi (1990), the effects of self-control on drug use and delinquency are invariant across racial and ethnic groups in the study. Gottfredson and Hirschi (1990) suggested that crime or analogous behavior is carried out only when the opportunity to engage in the behavior is present. This assertion is supported among Whites and Hispanics. For Asians, opportunity does not affect drug use or delinquency, and for Blacks, opportunity only affect one's involvement of delinquent behavior but not drug use.

The associations of social bonds and self-control with delinquent peers are similar for the racial and ethnic groups. The effects of background variables on delinquent peers vary only between Asians and Whites. Age had a larger effect, and sex had a smaller effect on delinquent peers for Asians than for other groups.

Social bonds seem to affect learned definitions differently for Blacks, Hispanics, and Whites. Attachment to parents and religiosity had larger effects on learning definitions favorable and unfavorable to law violations for Whites than for Blacks and Hispanics. Age exerted larger effects on pro-drug definitions for Whites and Hispanics, but sex exerted larger effects on definition for Blacks than other groups.

The hypothesis that the effects of social bonds on self-control are invariant by race and ethnicity was not supported. For Whites and Hispanics, attachment to parents was most strongly related to self-control, but for Blacks and Asians, attachment to school was most strongly related to self-control. The effects of sex on self-control were much larger for Blacks and Whites than for Hispanics and Asians. Household income exerted larger effects on self-control for Asians and Blacks than for Whites and Hispanics.

The total effects of background variables on social control are significantly different between Blacks and Whites, and Hispanics and Whites respectively, but not different between Asians and Whites.

Broken family exerted very limited effects on social bonds across racial and ethnic groups. It affected the

learned definitions moderately but significantly only for Whites and Hispanics. This finding is inconsistent with Matsueda and Heimer's (1987) result that the total effect of broken homes on delinquency is much larger for blacks than nonblacks.

Causal Processes by Race and Ethnicity for Adults

The findings for adults are not fully parallel to the findings for youths. The causal process explains substantial variances of drug use for each group. The order of the sizes of explained variances of drug use is the most for Whites, second for Hispanics, then Blacks, and the least for Asians. The ability to explain the variance of criminal behavior, however, is very limited. The model explains less than 20 percent of variance in criminal behavior for Whites, Blacks, and Hispanics, and it explains less than 10 percent of variance of criminal behavior for Asians.

The learned definitions exert very limited effects for each group, instead, criminal peers present substantial effects on drug use and criminal behavior. Contrary to the findings for youths, the effect of criminal peers on drug use and criminal behavior varies by race and ethnicity. The effects on drug use and criminal behavior for Whites

and Asians are about twice that for Blacks and Hispanics. The effects of self-control on drug use and criminal behavior varied between Blacks and Whites, and Hispanics and Whites as well. The size of the effects of self-control on drug use for Blacks and Hispanics were more than twice that for Whites and Asians, but on the contrary, the effects of self-control on criminal behavior were larger for Blacks and Hispanics than for Whites and Asians.

Different from the findings for youth, the associations connecting social bonds and self-control to criminal peers vary significantly depending on the racial and ethnic group. Self-control exerts the largest effect on delinquent peers for each group, but the effect is much larger for Asians than for others. The effect of education level on delinquent peers is much larger for Asians than for others. On the other hand, religiosity exerted significant impact on the criminal peers for Whites and Blacks, and moderate effect for Hispanics, but no effect for Asians.

The effects of social bond and perceived risk on learned definitions vary between Blacks, Asians, and Whites. Perceived risk exerted least effect for Blacks than for others. Religiosity again, had the largest effect for Whites than for others. The effects of background

variables on learned definitions were invariant across racial and ethnic groups.

The hypothesis that the effects of social bonds on self-control are invariant by race and ethnicity was not supported for adults as well. Religiosity exerted substantial effects on self-control for Whites, Blacks, and Hispanics, but not for Asians. The effect of marital status on self-control was much larger for Asians than for others.

The hypothesis that effects of background variables on social bonds are invariant by race and ethnicity is not supported either. Household income exerted significant effect on attachment to friends for other groups except Asians.

Summary

In summary, the findings of the tests across racial and ethnic groups indicate the integrated model could be applied for each racial and ethnic group. However, the overall causal mechanisms between background variables, social bonds, differential associations and self-control seem to vary by race and ethnicity as well as age. In terms of explanatory power, for both youths and adults, the model explains the most variance in drug use for Whites,

and the least for Asians. On the other hand, it explains the most variances of delinquent behavior for Asians among youths, but the least variances in criminal behavior for Asians among adults. This finding suggests the need for further research to understand the determinants of criminal behavior for Asians youths and adults.

The parameters of the causal linkages specified in the model also vary between the racial and ethnic groups. Among youths, learned definitions has a much larger effect on drug use for Whites than for other groups. Self-control exerts the largest effect on delinquency for Asians. Among adults, the effects of association with delinquent peers on both drug use and criminal behavior for Whites, and Asians are twice that for Blacks, and Hispanics. On the other hand, the effects of self-control on both types of crime for Blacks, and Hispanics are more than twice that for Whites and Asians. In general, while differential associations and self-control are both significant determinants of criminality, differential associations have relatively stronger effects for Whites and Asians than for Blacks and Hispanics, and self-control is the leading factor of crime for Black and Hispanics.

The determinative process of differential associations, and self-control vary significantly across

race and ethnicity. Among youths, attachment to parents exerts much larger effects for Whites and Hispanics, but attachment to school has the leading effects for Blacks and Asians. The biggest gender difference in differential associations and self-control is among Blacks. Among adults, religiosity as an alternative institution has substantial effects on drug use and criminal behavior through the process of decreasing the association with delinquent peers, and increasing self-control for Whites, Blacks, as well as Hispanics. But religiosity does not affect Asians much. Instead, education and marriage are the two important predictors of an Asian's attachment to delinquent peers and self-control.

Limitations of the Present Study

Several limitations of the present study need to be address. First, the data are limited by being cross-sectional and by being collected just in 2001. The consequence is that some theoretical causal processes could not be tested in the current study. For example, a critical argument of differential association theory is whether delinquency causes delinquent peers, or delinquent peers causes delinquency. Without knowing the

delinquent/criminal history of the respondent, this controversy could not be addressed in the current study.

The second limitation concerns the measures of the core theoretical constructs. Limited by the available information, the latent variable of delinquent peers for youths was operationalized as perceived number of students in the grade who were involved in delinquent behavior. This variable was not able to reflect an individual's decision about who is chosen to hang out with; therefore it influenced the reliability of the model results.

It may be argued that the specific measures of social bonding used in the test of the integrated model do not adequately represent the relevant dimensions of bonding. The current study focused upon external controls reflecting involvement in and commitment to conventional institutions and activities. The four measures of social bonds for youths are attachment to parents, attachment to school, involvement, and religiosity. In the process of operationalization, attachment to parents focused on the items of parents' supervision of homework, how to spend the spare time etc. The items of intimacy that used by Hirschi (1969) are not available in the study.

Attachment to school mainly reflects respondent's overall feeling about school. The academic performance and

self-perceived ability—two elements that were included in Hirschi's (1969) study—are also not available in the current study. However, the study added religiosity as another institution that may influence conventional bonding. The results did indicate that religiosity is an important dimension of social bonding. Although the measures of social bonds may not perfectly reflect the original theoretical constructs, this study can assess the extent to which the variables used in the analysis captures the variance of the total set of social bonds.

Lacking the longitudinal information also limits the power of testing self-control theory. Gottfredson and Hirschi (1990) argued that crimes are events that provide immediate gratification, and the single factor of crime—self-control is mainly the consequence of insufficient child-rearing at the early age, therefore, longitudinal analysis was not necessary to understand the criminality. However, a series of empirical studies about life course development and delinquency and crime conducted by Sampson and Laub (1990, 1992, 1993) show that a broad range of social phenomena (e.g., occupational attainment, opportunity structures, marital attachment) over the life course explain changes in crime and deviance over the life span. Sampson and Laub suggest, there is much intra-

individual variability in the adult life-course that is not reducible to levels of self-control that remain constant within individuals. Findings of the current study also suggest that adulthood events such as education, marriage, and employment status are significant factors that influence self-control. However, the question of whether the child-rearing practices are confounded with the adulthood activities, could not be answered without the longitudinal analysis. Therefore, knowing the childhood experience and also the adulthood experience are necessary to determine the traits of self-control.

Implication for Theory

This study has examined an explanatory model of drug use and delinquent behavior from three theoretical perspectives by age and by race and ethnicity. Multiple findings have been derived from the current study, which provides several implications for theory and future study.

First, the study confirms the main theses of differential association and self-control theories. However, it also verifies that the main constructs of differential association, social bond, and self-control

theories are not competing or alternative. Instead, they are complementary and integrated with each other. Self-control cannot explain away the effects of the differential association variables on criminal behavior. Social bonds operate through delinquent/criminal peers, learned definitions, and self-control. The finding support the explanation that weak conventional bonding leads youths to become bonded to peer groups, and decreases the strength of conventional beliefs, and decreases self-control, which in turn provide positive reinforcements for delinquent/criminal behavior.

The cross-sectional data limited the model's explanatory power to verify the relationship between delinquent peers and delinquent/criminal behavior. This limitation also restricts the model's ability to understand the process of self-control. Are the adulthood transition activities related to child-rearing practice? Are there independent effects of these factors? To answer these questions, future study should use a longitudinal design instead of a cross-sectional dataset.

Another possible modification is to establish paths between drug use and delinquent/criminal behavior. Thornberry (1987) argued that most variables have reciprocal causal effects on one another. The cross-

sectional analysis could add paths in the model to test whether reciprocal causal effects exist between drug use and other delinquent/criminal behavior. However, it cannot tell the order of the two types of deviant behavior. Does drug use cause other criminal behavior or does criminal behavior cause drug use? Again, to answer this question, longitudinal analysis is necessary.

The second implication is that the current study provides further insight into the relationships between race, ethnicity and crime. Results from the current study have rejected the hypotheses that variables reflecting the core theoretical constructs are invariant across race and ethnicity. There is evidence of significant differences in the core theoretical variables between whites and other racial and ethnic groups. In contrast to previous research (Hirschi 1969), except for a stronger attachment to parents, white youths generally reported weaker bonds to conventional society than did youth in racial or ethnic minority groups. White youths also reported the lowest level of self-control. Since white youths did report the highest level of drug use relative to groups, these findings support the current theoretical themes. However, if the findings of social bonds, and self-control in this study could be generalized, the model's power of explaining

the racial and ethnic variations of more serious crime such as violent crimes, in which Blacks and Hispanics usually report higher crime rates, is then questionable.

In the current study, Asians reported relatively weak external social bond, such as attachment to parents, and religiosity, however, Asians reported strong internal control reflecting personal beliefs in the moral validity of conventional norms (definitions favorable and unfavorable to law violation). On the other hand, Blacks presented relatively strong external social bond as attachment to school and religiosity but weak internal control. Considering that Asians reported the lowest level of drug use and delinquent behavior, and Blacks reported relatively higher level of drug use and the highest level of delinquent behavior, this finding suggests that external social bonds work through the beliefs or the learned definitions of law violation to influence the decision of involvement in criminal behavior. This again favors the integrated theoretical approach over individual theoretical models.

Third, this study finds that gender differences of the core theoretical constructs are significant. In general, males reported significantly lower level of self-control and expressed more excessive definitions favorable to law

violation than female did. Furthermore, there are race, gender and age interactive effects. For instance, the gender differences of the number of delinquent peers was found only among white adults. Males and females reported the same level of learned definitions favorable and unfavorable to drug use, and self-control among Asian youths, while significant gender differences in these variables are found in other racial and ethnic groups. These issues have not been addressed in any depth in the current study. Further research into the theoretical model's explanations of gender differences is warranted.

Fourth, findings of this study suggest that youths and adults differ somehow in the processes leading to drug use and delinquent/criminal behavior. Self-control is a relatively stable factor during the adolescent period, however, it changes after one gets into the adulthood. Young adults presented lower level of self-control than old adults. This finding provides empirical evidence of Sampson and Laub's (1993) argument that social phenomena over the life course explain changes in crime and deviance over the life span. Self-control is not only the results of child-rearing practices in early childhood, it is also a function of social events over the life course.

Of more interesting is that the comparison of causal processes and parameters across race and ethnicity demonstrate that although the general integrated model could be applied across racial and ethnic groups, the causal linkages and the relative explanatory power of individual factor vary by race and ethnicity, especially for adults. This empirical evidence contradicts previous theorists' assertion that factors causing crime and delinquency are common across race and ethnic groups, and existing theories are applicable to racial and ethnic minorities equally well. Why the causal mechanisms and the power of each factor vary between different racial and ethnic groups?

As indicated by the descriptive analysis, Asians had relatively advanced socioeconomic situation. They had higher education level, and lived in a household with higher income. The most majorities of Asian youths lived in stable family with both parents presented. Asian adults also had more stable employment and marital status. Blacks and Hispanics, quite the opposite, are situated in a very different location in society. More than a third of Blacks lived in a household with income less than \$20,000 and more than 20 percent of Black adults had less than high school education. More than 60 percent of Black youths lived in a

broken family. Those individual social economic differences impact delinquency through the effects on social bonding, differential association and self-control variables. Viewed in a broader perspective, these results raise questions concerning the role of social structure on race, ethnicity, control, cultural norms, and delinquency.

In a study of relationships between race, crime and urban inequality, Sampson and Wilson (1995) point out the social transformation of the inner city in recent decades—for example the deindustrialization of central cities, the exodus of middle and upper-income black families from the inner city, urban renewal and forced migration, and deliberate policy decisions to concentrate minorities and the poor in public housing—has resulted in an increased concentration of the most disadvantaged segments of the urban black population—especially poor, female-headed families with children. This concentration and segregation of poverty, heterogeneity, mutual distrust, and institutional inability foster social isolation, which impede communication and obstruct the quest for common values, thereby fostering cultural diversity with respect to nondelinquent values. The observed differences of association with delinquent peers, and the definitions favorable to illegal behavior in this study, therefore,

could be the results of the social structural differences of different racial and ethnic groups. The social structural differences could also result in the differences in social control. As Rutter and Giller (1983:185) have argued, socioeconomic disadvantage has potentially adverse effects on parents, such that parental difficulties are more likely to develop and good parenting is impeded. Sampson and Laub (1993) also find that structural factors strongly affect family and school social control mechanisms. To understand why and how the social processes leading to delinquency are different between racial and ethnic groups, analyses of macro-social forces such as community-level structural social disorganization and cultural social disorganization on delinquent behavior are necessary.

Implications for policy

The results of this theoretical test draw attention to the critical role that learned definitions, delinquent peers, and self-control play in the production of delinquent behavior. It also has been evidenced that the chain of causation starts from the personal and family

social economic location in society. The background variables of individuals' age, sex, household income, and family structure influence one's bonding to conventional society as well as differential association and self-control. And the social bonds of attachment to parents, attachment to school, involvement in social activities plus religiosity influence delinquency through either increases or decrease delinquent companions, prodelinquent definitions, and ultimately delinquent behavior. Self-control is specifically important in the causal process. It not only directly impacts delinquency, but also influences delinquency through the effect on delinquent peers. These findings have palpable implications for delinquency prevention efforts and treatment programs.

First the integrated model of delinquency urges us to seriously consider the role that families play in delinquency causation. As evidenced in the study, parents' supervision and their definitions or beliefs about illegal behavior had significant influences on children's definitions favorable or unfavorable to law violation and their association with delinquent peers. Parents' supervision and beliefs also affect self-control substantially. Intervention programs that focus on enhancing the ability of parents to monitor, recognize, and

discipline the misbehavior of their children, as suggested by other researchers, would be most promising in increasing children's self-control and reducing antisocial behavior and delinquency (Gottfredson and Hirschi, 1990; Hirschi, 1995; Tremblay et al., 1992; Laub et al., 1995).

Findings of the study also imply that school is an effective socializing agency against delinquent behavior. Strong attachment to school provided sufficient socialization, lessened prodelinquent definitions, and enhanced children's self-control, which in turn reduced the involvement in delinquent behavior. As Hirschi (1969) pointed out, positive feelings toward controlling institutions and persons in authority are the first line of social control (pp.127). In order to establish a strong attachment to school, strategies should focus on improving students' school performance. The improvements in performance could reduce the adversity of school, change students' attitudes toward school and teachers (Agnew 1995), and improve interpersonal relations between individuals in the school system.

The third implication is that policies improving the development of social capital in adulthood would effectively change adult antisocial behaviors. The analysis of adult criminality in this research indicates

that education level, employment, and marital status are significantly related to adult criminal behavior. Sampson and Laub (1993) suggested that when an individual has cohesive ties in marriage or work, these ties involve investments made by both the individuals and their spouses and employers. The high impact and quality of these interdependent, reciprocal investments bring about informal social control, and deter individuals from acting in ways that threaten such investments. The programs suggested by Sampson and Laub (1993) include providing counseling, education, and job training in correctional facilities and using community-based corrections to assist the inmate in his or her reintegration into the normal world.

Finally the findings about differences in causal processes and parameters between racial and ethnic groups in the research suggest that the distinct racial and ethnic patterns of delinquency and criminality may relate to the distinct social location and variant patterns of social organization of the different racial and ethnic groups. Crime prevention policy therefore should target not only the elements of social process but also the social structure that sets the stages for process.

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