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CONTINGENCIES IN THE LONG-TERM IMPACT OF WORK ON CRIME AMONG YOUTH

By

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To my wife, Susan Ting, and my mother, Jui Lu,

who have been extremely supportive

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ABSTRACT

The impact of jobs on working American youth has not been examined thoroughly and the mechanism between employment and delinquency is not fully understood. Many prior studies that addressed the issue of youth employment and crime emphasized one variable, work intensity, and left plenty of unknown pieces in this puzzle. This study introduces the concept of "ladder jobs" that arguably deter job holders from committing delinquent and criminal behaviors. In this dissertation, "ladder jobs" are those with significant upward-moving occupational positions on a status ladder, and, to adolescents, these jobs encompass potential to be the start of an attractive career. Three promising mediating factors, job income, job stability, and parental control, are also examined. Data from the National Longitudinal Survey of Youth 97 and structural equation modeling are used to test hypotheses.

Results indicate that "ladder jobs" demonstrated a significant crime-decreasing effect, while employment exhibited a crime-increasing effect. In addition, the magnitude rate of "ladder jobs" versus employment increased as youth aged; that is, the advantages of "ladder jobs" gradually outweigh the disadvantages of employment in the sense of crime prevention. Furthermore, job income partially mediates the crime-increasing effect of employment on delinquency, and job stability partially mediates the crime-decreasing effect of "ladder jobs" on delinquency. However, parental control, which is measured as direct supervision, does not play a mediating role between employment and delinquency. In sum, from a crime-prevention standpoint, a job that pays little now, but improves the chances of a long-term career appears to better than a dead-end job that pays comparatively well in the short-term. The findings also imply that the discussions of employment and of internships among youth should address the importance of future-oriented feature of occupations, and not just the immediate monetary gains from the employment.

CHAPTER 1

INTRODUCTION

The job market is a significant institution of society in which most members would have participated at least some time in their life spans, among all the other economic activities. In the field of criminology, much attention and scholarly effort has been devoted to aggregate level economic factors, such as unemployment, poverty, and inequality, and those studies tend to yield inconsistent findings. However, our understanding of how job market participation affects individuals' delinquency remains relatively fragmented in the literature.

The study of job market participation (or, employment) and crime can be linked to a broader concern with the effect of the economy on crime. The general public also shares an interest in this issue because of the intuitive connection between two large concepts: economic deprivation and crime, especially the crimes against property that first come to mind. Previous research, using systematic analysis of empirical evidence, largely at the aggregate level, nevertheless, does not necessarily support the connection. Actually, the scholarly findings remain inconsistent in this broader field.

Macro-level research on crime and the economy lacks an explicit understanding of this social phenomenon, which limits plausible public policy alternatives. Politicians tend to misspecify this issue and naively claim that economic-stimulating policy could be used as a means to control crime at the national level (Rubin, 2003). The media typically focus on the rate of unemployment, oft-viewed as a measure of the overall health of the economy, and it is also often the primary concern within the field of research on work and crime. Thus, the policy implications that can be logically pursued are restricted to asking questions like how to boost or maintain a strong economy.

To individuals, having a job can have varied meanings that are affected by embedded social relationships. Generally, the meaning of holding a job is a function of related economic and labor market characteristics, such as pay, the skills required by the job, and labor market situations, as well as job holders' characteristics, including but

not limited to age, gender, social-economic background, and even criminal records. Understanding the wider interconnections between a job and the job holder's context could reveal the meaning of work experience and the social consequences of holding an occupational position.

Historical Context of Economy and Crime

The study of the relationship between the economy and crime in the Western scientific tradition can be traced back to the early 19th century in France when crime statistics first came available at a national scale. In contrast to the conventional wisdom, it was interesting that Quetelet found the wealthiest regions of France had more property crimes (Vold, Bernard, and Snipes, 2002). Faced with this seriously contradictory phenomenon, he offered several explanations which still largely characterize today's social science inquiries. He suggested that the greater opportunity of more targets for criminals might play a role in his findings. He also observed a great inequality between poverty and wealth in the affluent regions, which might generate resentment among the poor; more crimes could be a consequence.

Quetelet's legacy embodied several traditional approaches when studying economy and crime, but contemporary research has explored a wider array of aspects of the economy, at both aggregate and individual levels, to investigate its impact on criminal behaviors. At the aggregate level, for instance, the unemployment rate and the percentage of people under the poverty line have been studied extensively over time to assess their effects on crime rate. The impact of the economy on crime appears to be multi-faceted, and several highly related factors, such as unemployment, poverty and inequality, tend to blend together conceptually in prior research. This is most likely due to differing conceptualizations and measurements adopted by social scientists, and the findings remain wildly inconsistent.

Unemployment

Conventional wisdom suggests that crime increases when the unemployment rate soars, which is based on an assumption that, during economic depressions or recessions, there will be more financially desperate people who will be motivated to commit crimes. For the same reason, the crime rate should drop during economic booms. However, this was not always the observed empirical trend. In fact, the relationship between unemployment and crime continues to be subject to a "consensus of doubt" (Chiricos, 1987). A notable amount of research indicates that crime rates do not increase during economic downturns (Henry and Short, 1954; Long and Witte, 1981), and the crime rate does not necessarily decrease during times of economic prosperity (LaFree, 1998). Several meta-analyses also indicate an inconsistent relationship between the unemployment rate and crime rate (Chiricos, 1987; Freeman, 1983). Depending on the size of the unit of analysis and the timeframe of data, Chiricos (1987), in his review of sixty-four empirical studies, concluded there was a contingent nature to the unemployment rates-crime rates relationship. Specifically, analyses of smaller, more homogenous units of analysis such as cities or counties tended to reveal a positive relationship between the unemployment rate and the property crime rate.

Poverty

Usually, the term poverty refers to people who cannot sustain a marginal living standard in a society or those who "cannot live in ways which are ordinary for their own community" (Messner, 1983). It is a concept of relative wealth comparing what an individual has to what others, as the point of reference, have in a given region. Admittedly, this concept is subjective to a certain extent: the same living standard may be considered as below the poverty level by some but not by others.

In the empirical studies, scholars have attempted different approaches to quantify this concept that composites relativity in nature, however, there is little success in generating a consensus (for a review see Sampson and Lauritsen, 1994). Even though poverty in nature is conceptually relative, empirical studies rarely capture this essential fact. For example, Loftin and Hill (1974) proposed an index of structural poverty with a wide array of objective indicators (e.g., educational level, infant mortality rate, number of one-parent families, and income level), and this index has been found to be strongly

associated with the homicide rate, a highly reliable measure of crime. In contrast, Cho (1974) used a single indicator of poverty—officially defined poverty line—but did not find a significant association between the percentage of people below the poverty line and the seven index crimes in the Uniform Crime Report which reflects the U.S. official crime measures. Neither was Jacob (1981) able to find supportive evidence for a relationship between poverty and crimes against property.

Recent research in poverty-crime emphasize the effect of indigence concentration on the increase of criminal behaviors. For example, Lee (2000) found that the spatial concentration of poverty is a superior predictor of homicide rates in metropolitan areas across different racial groups, when compared with the level of overall poverty that reflected the proportion of population living under the poverty line. In his qualitative study, *Code of the Street*, Anderson (1999) also documented that the structural changes of economy followed by a massive amount of joblessness and concentrated poverty in inner-city communities lead to varied disorganized characteristics of urban communities (e.g., welfare dependency, teenage pregnancy, drug abuse, drug dealing, and violence) which lead to weaker informal social controls or low collective efficacy. As a consequence, younger generations are increasingly not being socialized into mainstream values and develop profound alienation which further enforces their social marginality. The constant high crime rate in inner-city neighborhoods was attributable to the concentration of grinding poverty among truly disadvantaged people that bred crime-prone sub-cultures (Wilson, 1975).

Inequality

Early empirical studies have yielded mixed results with regard to the association between inequality and crime, and this is most likely due to the difficulty of distinguishing the effect of inequality from other varieties of economic scarcity, including poverty (Jacob, 1981). A substantial amount of scientific effort has been devoted to investigate if and to what extent economic inequality attributes to crime levels, largely concentrated among minority groups (Blau and Blau, 1982; Reisig, Bales, Hay, and Wang, 2007; Shihadeh and Steffensmeier, 1994). In Blau and Blau's (1982) macro-sociological opportunity approach, the impact of economic inequalities on individuals'

criminal behaviors was evaluated by assessing the relationship between economic inequality and violent offenses in 125 U.S. metropolitan areas. Their findings suggest that economic inequality, which indirectly reflects the disproportionate distribution of unemployment among different racial/ethnic groups within communities is an important factor associated with crime. The disadvantaged may perceive unfairness behind unequal economic deprivation and their perception could undercut their commitment to conventional moral norms. When this relative economic deprivation is associated with some easily recognized grouping, such as race, Blau and Blau (1982) argue that minorities will perceive their poverty as illegitimate. These negative perceptions and emotions could trigger further adaptations and social alienation that are conducive to criminal behaviors. In addition, a relatively new approach of within-group measure of inequality that captures comparisons relative to fellow group members has been documented as a slightly better predictor (Martinez, 1996; Shihadeh and Steffensmeier, 1994). To summarize, the Western tradition of studying the relationship between economy and crime has yielded inconsistent findings in earlier research.

Employment among Youth

"In the progress of society, philosophy or speculation becomes, like every other employment, the principal or sole trade and occupation of a particular class of citizens. Like every other employment too, it is subdivided into a great number of different branches, each of which affords occupation to a peculiar tribe or class of philosophers, and this subdivision of employment in philosophy, as well as in every other business, improves dexterity, and saves time." ~ Adam Smith

Along with the civilization of human society, the complexity of employment is amplified, especially in the global economy. Today, holding a job could have varied inter- and intra-individual meanings that lead to different social consequences, including criminal justice involvement, and several characteristics of employment have been assessed scientifically to determine their impact on criminal and delinquent behavior.

Recently, for example, emerging individual-level studies have re-asserted the importance of employment in theories, such as turning points in life-course theory (Sampson and Laub, 1993; Uggen, 2000; Uggen and Staff, 2001). Empirical findings have also influenced public policy; for another example, studies of adolescent employment on delinquency have contributed to national public policy recommendations aimed at limiting the amount of time school-age youth should work (National Research Council, 1998).

It was traditionally believed by Americans that gainful employment is the key to success for both youths and adults. For adults, work was a symbol of independence, and obtaining meaningful employment was viewed as a milestone towards adulthood. For adolescents, work was viewed as a means for fostering personal responsibility, conformity, and other societal-encouraged values, which should prepare youths for the transition into the adult world. Overall, work had been viewed as a positive experience for individuals and facilitates their achievement of the "American dream" (Merton, 1968).

However, scholars began to raise challenging questions about employment and its outcomes on adolescents, after the U.S. economy was expanded by the service sector in the 1970s (Greenberger and Steinberg, 1986; Mihalic and Elliott, 1997). Many of these positions are filled by teenagers: millions of adolescents work in the booming service sector of the U.S. economy, such as fast-food restaurants and retail stores. This issue became critical also because work had become a substantial part of these young people's lives: most teenagers participate in the job market and roughly half of high school seniors work more than 20 hours a week (National Research Council, 1998). It was found that 9 in 10 students are employed sometime during high school years, and another report indicated that around 40% of school-aged youth are currently employed (summarized in Wright, Cullen, Williams, 1997). These statistics indicate that millions of youth are affected by employment, and some on a daily basis. Thus, work is probably the most common out-of-school activity among American teenagers, at least in the 1990s and the early 2000s[1]. Most employed youth are working in the so-called secondary labor markets, which require only lower skill levels, offer less autonomy, and

[1] Recent surveys concerning how youth spend their time suggest a substantial increase of online activities, including online gaming.

provide limited benefits. These jobs tend to be simple and repetitive, and generally do not provide opportunities of advancement (Agnew, 1986; Freeman, 1995; Mihalic and Elliott, 1997; National Research Council, 1998).

Given the nature of youth employment, scientific studies and the surrounding policy debates could be simplified to one fundamental issue: whether employment is beneficial or harmful to school-aged youth (Gottfredson, 1985; Steinberg and Darnbusch, 1991; Staff and Uggen, 2003). This issue has naturally concerned parents, educators, and public policy makers because of the involvement of minors in an American society in which the culture of child welfare is deeply rooted.

However, scholarly efforts that addressed this question have been limited in scope with few dimensions investigated. The mechanism of how these jobs may potentially affect youths' criminal conduct still remains under-studied. Interestingly, a significant number of empirical studies in the past two decades were further narrowed to focus on work intensity among working youth, i.e. how many hours per week they work (Apel, Bushway, Brame, Haviland, Nagin, and Paternoster, 2007; Apel, Paternoster, Bushway, and Brame, 2006; Gottfredson, 1985; Greenberger and Steinberg, 1986; Paternoster, Bushway, Brame, and Apel, 2003; Steinberg and Darnbusch, 1991). These studies struggled with selection bias, an issue which can never be completely eliminated in non-experimental designs (Cook and Campbell, 1979; Shadish, Cook, and Campbell, 2002). That is, youth with stronger pre-existing inclinations to commit delinquent acts may "select" themselves into (or out of) employment or more work hours. As a consequence, many delinquency-relevant variables were omitted from models used in the literature and deserve closer attention.

Summary

The purpose of this dissertation is to fill the gap by exploring the contingent effects of employment on antisocial behaviors, with an emphasis on adolescents. Precisely, the study is intended to assess the impact of 'ladder jobs' on future criminal and delinquent acts by using multi-wave longitudinal data collected in the 1997 National

Longitudinal Survey of Youth (NLSY97). A 'ladder job' is conceptualized as a job with significant potential to be the start of an attractive career, and of movement up a status ladder (this construct is defined in a greater detail in the methodology chapter). This conceptualization overcomes the shortcomings of past research by attending to more than just whether a person is employed, the number of hours worked per week, or the financial rewards of the employment. Ultimately, the goal of this dissertation is to contribute to criminological and public policy research by assessing whether and how different types of employment affect individuals' criminal behaviors in the long term by taking individuals' backgrounds into consideration. Up to seven waves of data collected in NLSY97, with one year interval of each wave, are used to assess the impact of "ladder jobs" on mid-teenaged adolescents' delinquent and criminal behaviors. In sum, via sophisticated statistical analyses to advance theoretical perspectives, this dissertation project will offer academic and practical utility.

CHAPTER 2

THEORETICAL FRAMEWORKS

In much discussion of the employment-crime relationship, it appears to be an association contingent on an array of factors. If so, what are the essential job-related factors that help explain and even predict the differences in criminal behavior among working individuals? More specifically, what mechanisms, if any, link an individual's employment and crime?

Various theories suggest that employment can have both crime-increasing and crime-decreasing effects on individuals, and the effects of employment may vary across different subgroups, defined by age, gender, particular racial/ethnic groups, and perhaps legal status. This chapter lists and explains the impact of employment from an array of theoretical perspectives, broken down by several contingent factors within each framework. To avoid the ambiguity of common phrases like "positive impact" that may imply a "good impact" or a "positive statistical association," this dissertation will consistently use "crime-decreasing effect" and "crime-increasing effect" instead.

Social Control Theory

Hirschi's (1969) social control (also known as social bonding) theory is one of the most-cited theories in social science that proposes a direct connection between individual's legitimate economic activities and a decline of criminal and delinquent behaviors. Hirschi formulated the basic tenets from a sociological perspective and tested it on a high-school age sample of youth. In his book, *Causes of Delinquency* (1969), he proposed four types of social bonds: commitment, attachment, involvement, and belief, asserting that the strength of these bonds is inversely associated with delinquency. Commitment probably provides the most intuitive connection when discussing the impact of individual employment on antisocial behaviors. Commitment is the long-term rational investment one has in the conventional society and the risk one takes when engaging in deviant behaviors. This concept extends Toby's (1957) concept of 'stake in conformity,' which is based on a rational calculation assumption: the

more one has invested in the conventional society, the more one may lose by breaking laws. It implies that the larger stake an individual holds in employment, the stronger motivation one would protect the investment. The underlying rationale is that the possibility of a devastating loss of earned reputation or status would deter people from taking illegal routes, ruining his or her cumulative investments in the position or in the professional field, and losing their invested "stakes." Therefore, an individual is less likely to offend if his/her employment entails more long-term commitment to conventional behavior.

Attachment is the affection component in Hirschi's theory, and it represents a close relationship between people, which is described as truly caring about the attached individuals' perceptions, expectations, and opinions. The emotional connection that ties an individual to significant others acts as a deterrent to crime because the individual will take these relationships into account before committing any offense. Attachment is considered as an essential element for internalizing the social values and norms that make humans social beings; therefore, this social bond can be generalized to the whole conventional society. Unfortunately, the mechanism by which this dimension operates is underdeveloped empirically in the employment-crime literature. Prior research omitted any adequate discussion about whether people might be emotionally attached to their jobs, coworkers, or employing institutions. Since attachment is considered as the essential element of internalizing social values and norms, it is relevant to investigate how this dimension functions, and whether criminals are more likely to have broken attachments, or no one to be attached to (Petersilia, 2003; Travis, 2005; Travis and Visher, 2005). Increased social attachment to ex-offenders' jobs or to somebody in the work setting may explain those who maintain stable employment and resist crime.

The concept of involvement is based on the truism that everyone has the same amount of time and limited energy every day. More time spent in conventional activities restricts his or her opportunity to commit crimes simply because of less available time. This idea is summarized in the expression "idle hands are the devil's workshop." From this perspective, the more time an individual works, the less time is left for the individual to engage in delinquent and criminal behaviors. Work also structures a pattern of

routine activities that conflict with, and leave little time for, the daily activities associated with crime (Shover, 1983).

"Belief" is acceptance of the legitimacy of conventional norms, and there is variation in the degree to which people believe in the moral validity of the law: the more one believes in obeying social norms, the less likely one is to break laws. If an individual believes getting employed is an important norm of social life, one would be eager to seek employment. This indicator of belief in conventional norms thus suggests that the individual would be less likely to commit delinquent and criminal behaviors. Although these four elements of social control could have independent influence on delinquency, Hirschi also argued that the more closely one is tied to conventional society in any one of these ways, the more likely the individual is tied in other ways. For an instance, the more one commits to his employment, the more likely a higher portion of time is spent in job or job-related activities.

Although social control theory traditionally views employment as a conventional activity that increases bonding and decreases crime involvement, Hirschi (1983) also provided an alternative path of causation: employment may decrease adolescents' dependency on their parents because non-parental financial inputs may reduce parents' control over their behaviors. As a consequence, financial independence may free adolescents from parental controls as a by-product of legitimate jobs. On the other hand, employment widens social networks and increases the time and money adolescents spend with friends in other unsupervised settings that are more likely to lead towards delinquency because adolescents tend to be more supportive or tolerant of rule-breaking (McMorris and Uggen, 2000; Ploeger, 1997). Rather than a type of purely conventional activity, as it is for adults, employment may mean something fundamentally different to adolescents (Wadsworth, 2006) and loosen the social bonds between adolescents and their families.

Informal Social Control Theory

Hirschi's theory is characterized by its static descriptions and explanations of the relationship between social bonds and delinquencies, and lacks a dynamic-oriented approach to employment and crime. It does not address the issue of whether a

weakened or broken bond can be strengthened or fixed, which potentially limits the policy implications in many criminal justice areas, such as prisoner reentry and rehabilitation. To a certain extent, social control theory fails to address process-oriented phenomena and longitudinal changes, such as the on-set, desistence, and persistence of delinquency (Sampson and Laub, 1993). Being employed, for instance, is conceptually and practically an ongoing social phenomenon; therefore, theories that are constructed on longitudinal data should provide a more comprehensive understanding of the impact of employment on crime.

By reanalyzing Gluecks' longitudinal data on 500 matched pairs of delinquent and non-delinquent male juveniles, Sampson and Laub (1990, 1993) extended the social control theory over the life course and explored what social structure and key life experiences might affect later social controls. Their age-specific social bond theory identified employment, marriage, school, military service, and parenthood as significant social events and institutions that might modify the life trajectory of adults. These "turning points" are more likely to enforce later development of social bonds and help individuals desist crime.

The mechanisms by which employment might alter criminal behaviors involve more than just having a job. Sampson and Laub (1993: 140) clearly indicate that employment alone does not increase social control: it is not that employment by itself increases social control but rather that work leads to some internalized social controls through the stability and commitment of the employment (emphases added). The mutual ties embedded in the trust and the association between employer and employee enhance social control through the mechanism of increasing social capital (Coleman, 1988; Paxton, 1999). Social capital (Forrest and Kearns, 2001) may include an enhanced feeling of belonging (e.g. employees feel connected to colleagues and to the institution/organization and feel they belong to the group), establish supporting networks and reciprocity (e.g. the cooperation between employees and the employing organization to provide mutual support and an expectation of available help if needed), and shared collective norms and values among employees and between employees and the employing institution). This investment in employment provides informal social

controls that deter individuals from engaging in crime-prone activities or even committing crime in the future.

Strain Theories

Another group of theories that provides theoretical connections between employment and criminal behaviors is strain theories (Merton, 1968; Cohen, 1955; Cloward and Ohlin, 1960). Although strain theorists have slightly different emphases, they all assume that human nature is inherently good, and that, if possible, human beings would adopt law-abiding behaviors living in conventional societies. They also assume that members of a society share a moral consensus on class hierarchy, cultural goals, and values. Strain theorists all tend to agree that material success is the essential component in America (Messner and Rosenfeld, 2001), and that society encourages individuals to achieve material goals by using legitimate means. However, access to legitimate means is not equally distributed in the social spectrum. As a result, strains are derived from the conflicts between cultural goals and opportunities of accessing legitimate means for achieving those goals. Criminals are pressured into law-violating behaviors by strained circumstances (e.g. being unemployed or underemployed) that interfere with conventional goals and opportunities. Because legitimate opportunities are not evenly distributed at different levels of social hierarchy, Merton (1968) proposed that higher rates of financially motivated crime would occur more often among groups at the lower end of socioeconomic continuum. In other words, the structural strain theory suggests that "pay and prestige of employment are important aspects of the legitimate opportunity structure" (Staff and Uggen, 2003: 263, emphases added).

According to classic strain theories, monetary resources that one gains from employment reduce strains by facilitating achievement of economic goals (Merton, 1968). These goals may include middle-class status, which requires a decent financial foundation (Cloward and Ohlin, 1960). In the American culture, being employed traditionally symbolizes economic success through a legitimate means that is accepted by the conventional society, and consequently, employment should lead to a reduction in crime involvement.

However, the financial gains derived from jobs could be used for different purposes, largely depending on one's life course stage. Unlike adults who are expected to live independently and who must spend their earnings on food, utilities, and other living costs and obligations, adolescents tend to spend a higher proportion of income on recreation. It could, for example, finance substance use, such as use of alcohol, tobacco, and marijuana.

Agnew (1992, 2006) revised and reconstructed the strain theories from an individual-level of perspective. His general strain theory (GST) provides an individual-level reformulation that covers a broader scope of strains, in comparison to the classic strain theories discussed above. He argued that the classic theories only cover the strain that individuals may be unable to achieve their goals (fail to get something they want), especially economic success or, in the case of Cohen (1955), the somewhat broader goal of middle-class status. Agnew also proposed two other major types of strains: individuals may lose something they value (lose something good), and individuals may be treated in an aversive or negative manner by others (receive something bad). The reaction to strain depends on an array of internal and external factors, such as self-control, self-efficacy, self-esteem, and differential association, and crime is one of possible ways to cope with strains. Agnew argues that strains lead to a range of negative emotions, such as anger, frustration, disappointment, and depression. These negative emotions generate pressure for corrective actions, and crime is one of the socially undesirable reactions when strains are not well-coped with cognitively, emotionally, or behaviorally.

Strains are most likely to lead to crime when they are seen as unjust, are severe, or are associated with low social control. These characteristics of strain are amplified in secondary labor markets, in which employees have a tendency to view themselves as victims of a vague and unfair social hierarchy. Agnew (2006) specifically pointed out that some working experiences, such as working in the secondary labor markets and chronic unemployment, would increase the likelihood of engaging in delinquency. A lack of income due to persistent unemployment places severe strains on individuals, especially when the unemployment is blamed on others (unjust). Although it is legal/conventional employment, working in the secondary labor market is often

perceived as unpleasant because it is associated with low pay (often minimum wage), poor benefits, less autonomy, unpleasant tasks (e.g. repetitive, simple, or physically demanding work), coercive control (e.g. threats of being fired) and limited opportunity for advancement. General strain theory predicts that participating in secondary labor markets would receive relatively more strains from the jobs, which consequently lead to a higher likelihood of criminal behaviors. For instance, Agnew (2006: 16) argued that employees may commit embezzlement to cope with their monetary strains.

Most adolescents are employed in the service sector of business, so many face the sort of unpleasant employment that is likely to increase their criminal and delinquency behaviors. School-aged adolescents are experiencing the ongoing development of personalities, cognitive abilities, self-esteem, and self-efficacy, which contribute to varying levels of ability to cope with strain. Since the reaction to strain depends on these internal and external factors, their experienced anger, frustration, disappointment, and depression from employment may be greater than among adults, encouraging them to engage in criminal conduct (Agnew, 2006). For instance, youth who have family or financial needs and must work in intensively stressful jobs may be more likely to act on the frustrations.

Similarly, Greenberg (1985) has argued that unemployment or nonmeaningful working experiences, for many adolescents, may generate strains. In addition to other strains adolescents often experience (e.g. inability to participate with peers in leisure activities, the frustration caused by the educational system, and anxiety over the inability to successfully fulfill traditional sex roles), a lack of employment opportunities or meaningful employment impair adolescents' ability to finance their social activities, achieve autonomy in the work place, or accomplish expected traditional sex roles. As a result, adolescents' job market experiences pressure them further to an extent that requires corrective actions to cope with the strain, and committing crime is one of the coping methods.

Social Learning Theories

Emphasizing the learning process of criminal behaviors, social learning theories could support the prediction that work either increases or reduces the risk of

delinquency (Sutherland, 1947; Akers, 1994). This group of theorists does not regard humans as evil, as control theorists hold, nor good, as strain theorists hold, but rather as "blank slates." Aligned with Aristotle's philosophical viewpoint of human behaviors that all knowledge is acquired through experience and that none is inborn, learning theorists think criminal behaviors are learned from others through different interactive mechanisms. In other words, criminal and delinquent behaviors are not different from other conventional behaviors: they are all learned through people's interactions within the social context.

Sutherland (1947) argued that criminal behaviors are learned by associating with others, and the learning mechanism in which differential association takes place might vary in frequency, duration, priority, and intensity. As a consequence, an individual could become delinquent because an excess of definitions favorable to violation of law over definitions unfavorable to violation of law. Working youth may associate with misconduct initiators at work and separate from conventional peers at school. Following the same logic, rule-obeying behaviors could be enhanced by associating with a group of pro-social coworkers in the work setting. Youth whose employment places them into greater contact with conventional adults who exercise effective supervision will likely be less tempted to commit delinquent behaviors.

Although Sutherland's theory was developed to address the learning process and content of misconduct, he never denied learning prosocial behaviors through association (Matsueda 1988). Actually, the essential component of the theory assumes human behaviors are learned, regardless of whether they are negatively or positively labeled by the society (Kornhauser 1978). Therefore, definitions, either favorable or unfavorable to delinquency, can be adopted from the work context that one is exposed to. This universal mechanism of studying criminal behaviors provides an alternative approach when we study the relationship between work and crime. Once an individual obtains a job, he or she is exposed to a work culture that is comprised of a group of coworkers other than family members, school mates, neighbors, and peer networks. Through interactions with coworkers, an individual is affected by their attitudes, regardless of they are prosocial or antisocial ones.

Burgess and Akers (1966) integrated the influential behavioral psychologist Skinner's operant conditioning principle into differential association theory and proposed a social learning theory that provided a better description of learning mechanisms. Fundamentally, they argued that the mechanism of learning criminal behaviors is a function of reinforcement, particularly from social sources. Their theory of vicarious learning emphasized one's learned anticipated consequence from observing other individuals who have experienced the real connection between stimulus and consequences. This approach suggests that crime is not committed by employed individuals because non-criminal behaviors are positively reinforced in the workplace. This approach also suggests that criminal behaviors are deterred because individuals learn to expect punitive consequences from observing coworkers' misconduct. On the other hand, their theoretical framework suggests that crime can be initiated because of differential association through imitation or modeling deviant others at work, especially valued others whose own criminal behavior is reinforced. Criminal behaviors are continued due to positive reinforcement, such as receiving illegal monetary rewards. Criminal behaviors can be continued due to negative reinforcement, such as a reduction of peer pressure from deviant coworkers after committing delinquent behaviors (e.g. drug use) (Jeffery, 1965). Therefore, the learning of criminal and non-criminal behaviors depends on which one is more reinforced. In addition, Burgess and Akers (1966) also argued that the strength of behavior is a direct function of the amount, frequency, and probability of its reinforcement. Their theory suggests that a delinquent individual can be reinforced to behave if he or she is overwhelmingly reinforced by pro-social coworkers, and vice versa. It is saying that "the quality and content of relationships that occur between coworkers, not necessarily with an employer or the institution of work, may determine whether or not social capital is created and transferred" (Wright and Cullen, 2004: 187).

In Akers' later revision of social learning theory, he integrated all the previous learning theories, principles of learning, and contemporary empirical evidence on learning mechanisms. However, the core component, that behaviors are learned, had remained essential: pro- and anti-social behaviors can be learned from interacting with others. Ploeger (1997) suggested that employment opened a path toward a broader

social network among youth. From the viewpoint of learning theories, employment likely brings youth in association with a group of people different from their immediate peers in their school and neighborhood, and this new social interaction could lead them in either crime-increasing or crime-decreasing directions. Therefore, there is a reason to suspect that the overall association between employment and crime among adolescents masks a significant amount of variation—under some circumstances, work can suppress delinquency, while it may encourage delinquency in other situations. Exposing school-age youth to pro-social work settings like home and school could bring "good outcomes" from their work experiences (Apel, Paternoster, Bushway, and Brame, 2006). In sum, young employees can learn both anti- and pro-social behaviors through differential interactions.

Economic Model: Employment as a Rational Choice

Traditionally, an economic model assumes that criminals, like other law-abiding individuals, behave rationally. The decision to commit crimes or choose legal employment is a function of costs and benefits. The assumption of human nature is that people will commit crime if they think the benefits are worth taking the risks after rational calculations, and people are viewed as utilitarian decision-makers who balance perceptual returns and risks from crime and work.

Adopting this fundamental principle, Becker (1968) proposed an economic model in which individuals choose between legal employment and crime based on their calculation of costs and benefits of the two activities. In such models, employment and financially-motivated crime are viewed as alternatives: choosing legal work or criminal behavior (as a means to gain financially) is a rational choice process that maximizes possible benefits and minimizes costs. The most straightforward gain from criminal behavior is the financial gain. Several obvious costs of criminal behaviors include materials (e.g., tools that are used to commit crimes), time (e.g., the same amount of time could be used to do something else), and the expected-punishment cost (e.g., the chance of arrest and conviction). Furthermore, other costs may not be easily seen by individuals (Hellman, 1980). For instance, the possible long-term cost of diminished

employment opportunity and reduced legal earnings to ex-convicts could be significant (Bushway, 1998; Pager and Quillian, 2005; Sampson and Laub, 1993).

However, it is not assumed that value systems are shared among people; that is, making choices between legitimate and illegitimate money-making means takes all kinds of possibilities into account, including the expectations of risk, legal wages, criminal returns, and even a taste or distaste for deviance based on personal moral beliefs. It is generally accepted that psychological rewards from crimes are conditioned by crime types and individual characteristics. For example, the psychological rewards derived from using drugs are different from those derived from a robbery. By the same token, the psychological rewards from the same job could vary widely from individual to individual, especially for those who are in dissimilar life stages, such as adolescents to adults.

Active criminals may learn that illegal activities are more profitable than the legal money-making activities available to them. Consequently, this higher expected return from crime suppresses their willingness to commit to the legal labor market. Or, at least, experienced criminals are not as committed to legal employment as their noncriminal counterparts.

From this perspective, legal employment should have a crime-decreasing effect if an individual thinks the returns from legal employment exceed the costs of committing crimes, particularly property crimes. With legitimate wages, the economic model would predict that even criminals would not need the income from criminal activity. In sum, the expected benefits and costs can vary significantly across life course stages, especially for those who “gained” experiences of anti-social behaviors.

Cantor and Land (1985) argued for a criminal-motivation conjunction that can explain the crime-decreasing effect of employment. Their idea builds upon the assumption that people are motivated to commit crime in order to obtain financial inputs because of a lack of monetary resources from employment to maintain their living standards. Therefore, people are less motivated to violate laws if they are employed. At the same time, Cantor and Land (1985) also argued for an opportunity-based crime-increasing effect of employment. Here, employment at an aggregate level reflects an active economy, which is a proximate measure of opportunities for criminals.

Particularly, employment increases people's consumption of goods and outdoor activities, which collectively lead to an increase in suitable targets for criminals (Cohen and Felson, 1979). As a result, the increase of employment leads to more criminal activities. Conversely, an increase in unemployment reduces available targets and increases property guardianship.

Social Role Perspective

Completing their education is supposed to be a student's primary and age-appropriate task for adolescents (Wright, Cullen, Williams, 1997). If school-aged adolescents devote too much time to work, the long working hours generate role conflict and strain (Agnew, 2006). It is foreseeable that the extremely long time that some youths spend on work restricts their investment in educational goals and involvement in other conventional activities (Hirschi, 1969). Long work hours and more payments, for example, may reduce adolescents' belief in the value of long-term investment in education, which may seem unattractive in the short-term. The "premature affluence" or early transition into adult roles burdens developing adolescents and seduces them into committing delinquency, especially status offenses (Bachman, 1983; Bachman and Schulenberg, 1993). Therefore, to reduce delinquency among employed youth, Staff and Uggen (2003) suggested that "good jobs" for adolescents must support academic roles. Essentially, whether employment will contribute to an increase or a decrease of criminal and delinquent behavior depends on what kind of jobs adolescents obtain.

The Challenge from Self Control Theory

In contrast to Sampson and Laub's attribution of different external events that bond individuals at varied life stages, Gottfredson and Hirschi's (1990) General Theory considers low self-control to be the ultimate cause of all types of crime. All other theories that predict different directions of the relationship between employment and crime are spurious from their perspective. Followed this logic, other significant factors, such as social bonds, are only relevant to explaining delinquency by associating them with internal low self-control.

People with low self-control are characterized as having insufficient capacity to carefully consider the consequences of their behaviors: they are less able to foresee the consequences of their behavioral decisions and are eager to seek their immediate needs as opposed to delayed gratification. Low self-control people' personal traits generally encourage less concern attitudes for the welfare of themselves as well as others; that is, they tend to be insensitive, unsympathetic, and unkind to others. Gottfredson and Hirschi (1990) argue that this group of people is also more likely to commit analogous behaviors, such as drunk-driving, drug abuse, accidents, etc. Personality characteristics like preference of physical reactions toward conflicts, risk and excitement seeking, impulsivity, self-centered, a short temper, and a preference for simple tasks are several dimensions of visible behaviors, and they all aim to construct the idea of low self-control (Grasmick, Tittle, Bursik, and Arneklev, 1993).

The characteristics of low self-control personalities have highly visible associations with employment. These personality traits not only affect job opportunities (e.g., going to a club the night before next morning's interview without reserving enough time for sleep and preparations) but also impact their duration of employment (e.g., being disliked because of indifference to colleagues and supervisors' situations; easily losing one's temper when there is a miscommunication or misunderstanding). Low self-control individuals are less likely to defer their gratifications and seek long-term benefits from the social institution, which may ruin their employment (e.g., they may argue and fight with supervisors or customers). Low self-control people are also more likely to commit dangerous behaviors (e.g., drunk-driving, drug abuse) that potentially lead to a higher risk level of endangering the employments.

From this theoretical viewpoint, any connection between employment and crime that appears on the surface level is spurious. Any theoretical connection between employment and crime will disappear after taking this personality trait into account. Theorists also argue that an individual's level of self-control remains relatively constant after around age 8 or 10. Gottfredson and Hirschi (1990) suggested that parenting in early childhood is the most important factor determining one's life-long self-control. Inadequate parenting, such as the failure to monitor children; detect deviance, and discipline deviant acts, leads to low self-control afterward. Additionally, they suggested

that the differing individual crime rates are due to varied opportunities for crime (see also Cohen and Felson, 1979).

Summary

Conceptualizing employment is critical in employment-crime research and consequently to different theoretical frameworks. Conceptualizing employment as an investment or 'stake in conformity' suggests non-financial aspects of the job: commitment, stability and a sense of security, involvement with conventional activities, position-associated social status, etc. That is, employment structures job-holders' routines that bring individuals into frequent contact with colleagues at work places and extends personal networks to social areas defined by the positions. Employment also provides financial resources that usually are used to pay essential living costs, affects one's living standard, and even fulfills individuals' economic aspirations. On the other hand, "poor jobs" that combine with low wages/salaries and limited benefits may amplify the gap between aspirations and expectations, which arguable encourages antisocial conducts. Following this line of reasoning, identifying "good jobs" (Staff and Uggen, 2003) or "quality jobs" (Crutchfield and Pitchford, 1997) becomes critical in the above discussion of the employment-crime connection. It is worth mentioning that the meaning of employment is very likely to be fundamentally different for adolescents and for adults (Wadsworth, 2006); therefore, some work qualities that are favorable to adults may be less meaningful, indifferent, or even harmful to teenage workers (Staff and Uggen, 2003). For instance, high autonomy, high work-derived status, and high wages are usually considered as desirable work characteristics in adults' job market. These characteristics of work suggest that the employee is responsible, reliable, and self-regulated; therefore, he or she enjoys the privilege of less supervision and superior status in the workplace. Nevertheless, these job qualities may lead towards an increase of adolescents' delinquent behaviors. Being left plenty of idle time during work hours is probably perceived by adolescents as less responsibility instead of the privilege of autonomy. Youth who report having this kind of "easy jobs" also report more delinquent

and deviant behaviors (Agnew, 1986). In sum, theories imply different predictions of the direction of the effect of employment on crime among adolescents because of the contingent nature of this relationship. In the following chapter, I will systematically examine the empirical evidence and identify the shortcomings in the previous studies.

CHAPTER 3

LITERATURE REVIEW

This chapter reviews prior studies focusing on the impact of employment on criminal and delinquent behaviors with an emphasis on those that utilize individual level data. Social scientists largely adopted aggregate level data in earlier research, which yielded inconsistent findings (Cantor and Land, 1985; Chiricos, 1987; Freeman, 1983, 1995). More recent research has benefited from the a larger accessibility of survey data, and employment has been conceptualized from a wide array of perspectives and more attention has been paid to job quality (Crutchfield and Pitchford, 1997; Uggen, 1999), job stability (Crutchfield and Pitchford, 1997; Sampson and Laub, 1993), wages (Grogger, 1998; Wright, Cullen, Agnew, and Brezina, 2001), level of participation (Crutchfield and Pitchford, 1997; Thornberry and Christenson, 1984), and employment status (Apel, Paternoster, Bushway, and Brame, 2006; Crutchfield and Pitchford, 1997). To start this chapter, a summary of research targeting the impact of unemployment on crime is provided, followed by a detailed assessment of research that conceptualized and operationalized employment from an array of key aspects.

Unemployment as an Employment Status

As an economic deprivation, joblessness has a straight-forward impact on individuals' choice of criminal behaviors. A substantial amount of empirical evidence, at both the aggregate (Cantor and Land, 1985; Chamlin and Cochran, 2000; Chiricos, 1987; Devine, Sheley, and Smith, 1988; Freeman, 1983, 1995; Lin, 2008; Young, 1993) and individual (Fagan and Freeman, 1999) level, has documented its impact on crime in different regions of the world (Carmichael and Ward, 2000; Lee and Holoviak, 2006; Parker and Horwitz, 1986).

It was asserted by Cantor and Land (1985) that time plays an important factor in unemployment-crime (U-C) research. In light of the rational choice approach of human behaviors, they proposed that unemployment affects crime both positively and negatively, but at different points in time. On the one hand, aligned with conventional wisdom, Cantor and Land (1985) agreed that unemployment increases the level of motivation to commit crimes. Higher levels of unemployment in a region would lead to higher levels of crime, particularly property crimes that ease offenders' financial motivation. They further argued, however, that this motivation would take effect only after a delay. Individuals would not experience the full impact of unemployment until they ran out of personal financial buffers (e.g., savings, insurance coverage), supports from social networks (e.g., families and friends), and public support (e.g., unemployment compensation). On the other hand, they also argued that the higher unemployment rate, as a reflection of the downturn of economic activity and decreased consumption, should immediately lead to fewer opportunities (e.g., suitable targets without guards) for potential criminals. This concurrent opportunity mechanism should take effect almost immediately when economic activities slow down or contract.

Although Cantor and Land proposed a logically persuasive relationship between unemployment and crime, the empirical evidence is ambiguous, largely due to the conceptual and measurement issues of the above two time-sensitive factors. Official records that count people who are able and available to work and actively seek employment in the previous week are often used to proximate joblessness-derived motivation. Conceptually, this unclear measure includes active job seekers who rationally would not commit illicit activities to endanger their opportunity to be employed but excludes those who do not actively look for jobs and lose their conventional commitment (Clarke and Cornish, 1985). The people criminologists and economists would consider most likely to commit crimes would be those not actively seeking employment and being jobless (or, officially classified as being out of the labor force), and thus not counted in the unemployment rate. Thus, it is not surprising to learn that even in Cantor and Land's (1985: 327) analysis of unemployment and official crime statistics at the aggregate level, the support for lagged motivation mechanism was somewhat weak. Even though Chamlin and Cochran (2000) advanced the measure of

joblessness-derived motivation by computing the number of people who are unemployed for fifteen weeks, their operationalization may not appropriately capture the lagged motivation effect because each unemployed individual has different levels of financial health, personal network support, insurance coverage, desires to participate in the labor market, self-esteem and educational attainment, which directly or indirectly affect the duration of unemployment and the resistance to crime while unemployed. After all, these efforts did not solve the problem that crime-prone people (e.g., people are not working and not seeking for a job) classified as out of the labor force, not as unemployed.

Another conceptual argument regarding Cantor and Land's assertion is that their theory is a macro-level one in which the changes of economic situation (or, business cycle) affect the changes of aggregate level crime measures. Specifically, economic hard times increase criminal motivation not only among those unemployed but also among part-time, marginally, and even gainful employed. Furthermore, the official unemployment rate serves as a poor indicator of the business cycle, and thus it does not appropriately reflect the level of criminal motivation stated in the theory (Paternoster and Bushway, 2001).

Furthermore, the validity of the argument regarding opportunity concerns theorists. Taking account of the fact that U.S. has been a developed country for decades, even during the economic down times the supply of targets is still sufficient for criminals to exploit. Even the increase of guardianship produced by the higher unemployment rate can not possibly protect all the valuable objects under any economic circumstance. In addition, even during recessions or depressions, those who remain employed still retain many valuable goods as suitable targets. The contemporaneous opportunity mechanism was also seriously challenged by Kleck and Chiricos' (2002) research, in which they failed to find an effect of the supply of targets (e.g. the number of automobiles, banks, and convenience stores per 100 thousand population) on crime rates in a county-level dataset in Florida.

Empirical research that employed data collected at the aggregate level was handicapped by their inherent limited nature: such studies cannot reveal the individual-level causal mechanism between the status of employment and criminal acts. In

addition, aggregate level data cannot be used to assess whether such an association is contingent on other co-existing variables, and the empirical findings in U-C remain "consensus of doubt" (Chiricos, 1987). In the same way, the impact of employment, the other side of spectrum, on deviance cannot be appropriately assessed by using measures at the aggregate level. To sufficiently appraise the social meaning of employment and to avoid the ecological fallacy, an individual-level approach, using self-report surveys is more appropriate.

Employment

Employment entails not only working on tasks in a daily routine but also implies a combination of social status, structured lifestyle, and expectations. Legitimate employment is comprised of financial and non-financial rewards, social rules and expectations that guide proper behaviors, and social networks that provide support and bond individuals to conventional others. In order to understand the mechanism of employment and criminal behaviors, it is necessary to measure varied aspects of employment at the individual level. Prior research have operationalized employment in a variety of ways. The most straightforward but somewhat oversimplified approach is simply asking if the individual is currently employed. More sophisticated measures of the employment account for specific dimensions: stability (Crutchfield and Pitchford, 1997; Sampson and Laub, 1993), quality (Crutchfield and Pitchford, 1997; Uggen, 1999), and career stakes (Apel, Paternoster, Bushway, and Brame, 2006; Huiras, Uggen, and McMorris, 2000). This section reviews these operationalizations of employment in the prior literature and discusses their strengths and weaknesses.

Job Stability

In Sampson and Laub's (1990, 1993) research revisiting Glueck and Glueck's 500 matched pairs of delinquent and general male youth, they studied the mechanisms of different factors through individuals' life course. One of the significant turning points in their age-graded theory of informal social control is employment. Specifically, their

findings pointed out that job stability plays a significant role in forming informal social control that later significantly alleviates individuals from crime-prone situations and individuals. The idea of stable employment is measured by a standardized scale that comprises three variables: current employment status, length of the current or the most current employment, and work habits. The current employment status is whether an individual was employed at the time of the interview. The length of employment measures how many months an individual was employed in the current or the most recent job. The variable "work habits" consists of a rating on a three-point scale: poor (whether an individual is unreliable in the work setting or whether an individual fails to give any effort to the job), fair (whether an individual has a generally good job performance except for periodic absences from work or whether an individual chooses to be unemployed for some periods of time), and good (whether an individual is evidenced to have reliable performance recognized by the employer or whether an individual is considered an asset to the organization).

This operationalization of job stability provides sufficient weight to three distinct aspects of employment, where the two most directly relevant variables are the measure of the length of employment in months, followed by whether the individual is currently employed. By taking these two variables into account, the measurement would not miss those who are currently unemployed for a variety of reasons (e.g. personal health issue, local job market changes, etc.), but were employed for a fairly long period of time in the recent past. This approach of measurement would not completely omit those who had several learning experiences from trial-and-error in the job market and currently have found a "right" one for them but have not accumulated enough time to be considered stable, which is more likely to be the case among young. In terms of meaningful bonding to an individual, these two variables capture the significance of the employment in the employment-crime context (Hirschi, 1969; Wadsworth, 2006). However, the third indicator—work habits—is somehow disconnected with the concept of "job stability." Rather than directly measuring the continuation of an employment, this variable seems to reflect how much commitment an individual has to the job and how much an individual is appreciated by the employing institution. The major concern is the validity of the measurement: "work habit" is conceptually less relevant to the content of

stability. Instead of assessing whether a person holds stable employment, "work habits" is conceptually closer to a measurement of mutual dependency between employer and employee that involves perceived evaluation from the other party. Consequently, this composite scale would have a higher chance of correlating with measures of other work-related dimensions, including, but not limited to, commitment.

Job Quality

A substantial component of employment is its pay and other rewards associated with the position, which directly affects the employees' economic resources and influences their job satisfaction. Therefore, job quality could have a significant impact on criminal acts via pay. This concept has been operationalized and measured in an objective approach, sometimes using very indirect proxies such as industrial categories (Crutchfield and Pitchford, 1997; Uggen, 1999). The rationale behind this operationalization is that different categories of positions should have a relative hierarchy of financial (e.g. wages and benefits) and non-financial (e.g. autonomy, power and influence, and training) rewards that ensure employees' stake in conformity. Crutchfield and Pitchford (1997) argued that the discussion of essential job quality should focus on key characteristics associated with occupational stratification (Bottero, 2005), and that can lead to lifestyles conducive to crime.

Crutchfield and Pitchford (1997: 96-97) provided a vivid scenario of how job quality affects individual's decision-making on whether to expose themselves to circumstances that could potentially ruin their conventional investments.

Consider the options on a weekday night of two young men. The first is a blue-collar employee of an economically strong production company, who is being trained by the company as a skilled craftsman. The firm offers a good medical plan and generous salaries. The plant where he works is a union shop with a local that has been very successful at protecting the jobs and benefits of its members. The second young man is employed by a fast food franchise. As is typical of these employers there are few benefits, pay is low, and there is little or no expectation on the part of this or any other employee of advancement within the company. Both men are approached in the late evening by an unemployed friend to "go out with the guys and have a few drinks." The first person considers and declines because he must be at work early and he cannot arrive there "hung over." His job, with all of its benefits, has given him a stake in conformity that leads his decision to not accept the invitation.

The second young man considers the opportunity to socialize with friends in the context of his "burger joint" job. He accepts. If he is late for work and if he loses his job, he can simply go to the fast food franchise across the street and get a job of equally dubious quality. Obviously, the characteristics of the fast food job will not provide the stake in conformity of the craftsman's job. When the guys go out for the evening there may be no intention to engage in crime. But when they are in a tavern, or a pool hall, or on a street corner, having consumed alcohol, two of the routine activities elements for the increased probability of crime occurring are present (Cohen and Felson, 1979). This group of young males are the most likely group to engage in and to be victimized by crime—to be both the motivated actors and the potential victims of crime. They may assault, even kill one another, or "mug" or be "mugged" by others. (Emphases added).

To investigate the intervening mechanism of job quality, they examine variables like "time out of labor force," "job duration," and "income," in addition to dichotomous coding of occupations from the dual labor market viewpoint that distinguishes jobs in the primary labor markets, in which the employment relationship has greater continuity, and those in the secondary labor markets, in which the employment is much less stable and less engaging. They found that it was not the financial part of the job that prevents people from being involved in criminal behaviors or from stepping into pro-crime circumstances. Instead, the central components of employment in work-crime research was job quality that retains employees and the time out of the labor force. Precisely, "quality job" is an indicator of crime prevention, and "time out of the labor force" is a risk factor for subsequent offense(s) in their findings.

Although Crutchfield and Pitchford (1997) attempted to isolate the factors embedded in stratification and to extract the 'quality' of job, they did not directly measure indicators of quality that lead to employees' stake in conformity and, consequently, longer duration on the job. Instead, their conception of "good jobs" emphasizes strong ties of employment that provides a mutually investing atmosphere in which deterrence takes effect and prevents workers from ruining the stake. Their findings also support the Sampson and Laub's (1993) idea of job stability, after controlling for implied job quality that usually associates with primary and secondary labor market.

Focusing on a homogenous group of special population, ex-offenders, Uggen (1999) also examined whether job quality affects ex-offenders' recidivism. In this study, he found that the quality of employment is more strongly associated with criminal

behaviors than the presence or absence of a job: High quality jobs significantly reduce the likelihood of both property and non-property crime across different demographic backgrounds. Indicators of quality jobs include "adequate hours and pay," "satisfying employment" that leads to "viable work careers." However, this study, like any other study that concerns inmates, did not successfully overcome the issue of self-selection: those who are already less likely to recidivate may self-select themselves into better jobs. Furthermore, this research lacks a pragmatic implication: how should policy makers justify allocating quality jobs to the least deserving members of a large underclass population? Uggen provided only a relatively vague suggestion for addressing this issue in a society in which fair competition is exercised as a norm in a free market: "perhaps work programs for ex-offenders would be most effective if they were embedded in a comprehensive, and correspondingly costly, national employment and training strategy" (Uggen, 1999: 145).

Over all, both Crutchfield and Pitchford (1997) and Uggen (1999) attempted to adopt an objective approach to measuring job quality. However, a lack of sophisticated distinctions between positions might make their approach become ambiguous and imprecise. For instance, both the chairmen of computer flagship companies and the managers of the local computer stores could fall in the same category: salaried manager (Jencks, Perman, and Rainwater, 1988). Neither the financial nor the non-financial rewards of employment is sufficiently reflected in the above example: financial payoff, the level of autonomy, further training opportunities and influence are not clearly appraised. In sum, job quality was never objectively assessed prior to the current research.

Career Stakes

Huiras, Uggen, and McMorris (2000) viewed perceived characteristics of employment as an important indicator of employee deviant behaviors. In particular, they operationalized how much stake an individual holds in their current job by asking subjects, "How is your present job related to your long-term career goals?" The response attributes include three categories: it will probably continue as a long-term career; it provides skills or knowledge that will prepare me for my future work; and, it is

not linked to my long-term career objectives. If individuals' current jobs matched their long-term career goals, the fitness implies a more permanent tenure that involves a greater degree of conventional activities. Consequently, a higher level of career stakes would associate with a lower level of employee deviance, after controlling for other objective work conditions (e.g. wages, benefits, authority, continuing training, and turnover).

The strength of this approach is that it captures subjective perceptions of employment, using survey methods. In prior research, the job quality of an employment was measured largely by some objective standards, such as income level, insurance and retirement benefits, position categories, and so on. Ultimately, however, how an individual perceives an employment is subject to interpretation. The subjective measure proposed by Huiras et al. (2000) reflects how much longer an individual would remain in a position or within an occupational field: the longer an individual would stay in the field, the less likely the individual would be to engage in criminal behaviors and ruin the stakes.

While Huiras et al.'s (2000) conception is persuasive, their measure is fairly limited with few options available to respondents. Additionally, to provide a valid answer to this question, a given survey respondent has to know his/her career goal as a prerequisite, but the younger the respondent is, the less likely it is that the respondent would know his/her career path. As a result, even though this variable has good predictive power, the measure itself may not be valid. Since the authors did not statistically control the age variable in their models, whether there is a true causal link between career stakes and criminal behaviors is questionable.

Work among Adolescents

In the past quarter century, the majority of the empirical evidence concerning working youth leads to the conclusion that work is negatively associated with young individuals' overall wellbeing[2], including, but not limited to, an increase of anti-social

[2] The increase of delinquent and deviant behaviors is only one of the unwanted consequences of intensive work, and the other "side effects" of long work hours include declining grade performances, school involvements, psychological health, and psychosocial development (Steinberg and Dornbusch 1991).

behaviors, such as delinquency and substance abuse (Greenberger and Steinberg, 1986; Mihalic and Elliott, 1997; Staff and Uggen, 2003). Adolescents who work intensively, such as 15 to 20 hours or more a week, have been frequently documented to engaging more delinquency and substance use, which appears to be net of low self-control, job quality, and prior misbehaviors (McMorris and Uggen, 2000; Ploeger, 1997; Steinberg and Dornbusch, 1991; Wright et al., 1997). Completing their education is supposed to be the social-expected and age-appropriate task for adolescents in school, and long working hours can generate role conflict and strain among this group of youth (Staff and Uggen 2003; Wright et al., 1997). Logically, it is foreseeable that the extremely long time youths spend at work, in addition to their routine school participation, restricts their investment in educational goals and involvement in other conventional activities.

Long work hours also restrict the available time that parents exercise their direct control over their teenage children. In their national-sampled study, Wright et al. (1997) explored the mechanism of work intensity and delinquency; in line with the social control theory, they learned that parental controls, parental support, and school commitment mediated the impact of work intensity on delinquency, after controlling for its direct effect. Also, the impact of lengthy involvement in work appeared to be contingent on youths' demographic characteristics (e.g. greater for males) and familial structural risks (household monetary resources, residential mobility, family size, and completeness). One of their conclusions was that at-risk young males particularly suffer from employment when they work intensively.

The monetary gains allowed by work also contribute to a given individual's economic independence, which, in adolescents' circumstances, could consequently free them from parental controls and finance activities with friends (McMorris and Uggen, 2000; Ploeger, 1997). According to traditional strain theory, monetary resources that one gains from jobs should reduce strains by facilitating one to achieve culturally desirable goals (Merton 1968). However, greater financial resources from higher paying jobs empirically lead to an increase of unwanted consequences among young workers. The crime-increasing effect of higher wages remains even after controlling for other financial sources, such as allowance, when youth's working hours are taken into

account (Wright et al. 2001). Working youths from higher income families, which are more capable of providing a larger amount of allowance, also tend to have higher levels of alcohol use and public drunkenness (Ploeger, 1997: table 5). Other empirical studies that took income from employment into consideration also documented its crime-increasing effect, net of work intensity (McMorris and Uggen, 2000; Staff and Uggen, 2003).

In addition, employment exposes adolescents to a new setting that is very often different from their primary social institutions (e.g., home and school) and to associations with a group of coworkers. Working adolescents may associate with peers, other adolescents, and young adults at the work place who hold antisocial attitudes that consequently contribute to their own delinquent attitudes and behaviors (Warr, 1998).

Within the framework of differential association, Pleoger (1997) explained the mechanism of generating delinquent behaviors among working adolescents. With the assistance of the first three waves data from National Youth Survey (NYS), a nationally representative panel, it was found that youth who work while going to school are more likely to report violent behaviors, burglary, public drunkenness, and drug use/sale than those who do not – the employment widened friend networks and brought young workers into contact with delinquent friends. As a result of holding a job, working youth spent more time with friends, who might suggest to him or her to break the law as a group. This longitudinal study evidenced that youth who continually worked more than 2 years (across two waves of data collection) significantly increased their likelihood of committing delinquent acts. It is worth noting that after controlling for delinquent associations in the analysis, employment itself becomes insignificant in Pleoger's statistical models (table 5). Instead of arguing that employment itself is criminogenic, Ploeger's analysis might suggest that working youth's delinquent acts are more attributable to the association peers in the workplace. However, the impact of coworkers remained unknown in this study because Ploeger did not distinguish changes in the effects of association with pre-existing delinquent friends from the effects of the new peers at work.

By analyzing data collected from the same group of panel, Wright and Cullen (2004) investigated whether association with prosocial coworkers has any impact on the

changes of delinquency. Both waves 5 and 6 of NYS data, with a three year gap in between, were studied when the panel turned into late adolescents and young adults. Their study indicated that the association with prosocial coworkers consistently appeared to be a strong predictor of lower levels of criminal behavior and drug use, as well as the reduction of these antisocial behaviors, after taking subjects' job stability, hourly wages, work hours, important life transitions, job commitment, neighborhood problems, and delinquent peers into consideration. Certainly, the effect of prosocial coworkers serves an empirically important role in desistance, and their study also suggests that employment might fracture old social networks and replace them with more prosocial networks. Their findings suggest that the quality of peer associations occurring within the work context is more important than the quality of work itself when studying the work-crime relationship. Similar to Sampson and Laub's (1993) perspective, Wright and Cullen (2004) concluded that coworkers should be viewed as a potentially important source of social capital that could increase informal social control. However, it is problematic to include both adolescents and young adults in this topic: the studied subjects were 15 to 21 years old at wave 5 and turned into 18 to 24 years old at wave 6. Some of the subjects were high school students, while others had joined the labor force. Employment that serves as a turning point probably is more likely to occur at the time when this group of youth face significant life transitions (e.g., high school graduation) or become adults. Taking the surrounding context of youth employment into consideration, arguing that prosocial work settings shift their life trajectories is not valid on its face: school is a more important social institution where teenagers interact with other young individuals. In sum, Wright and Cullen's study probably masks the true variance across different age groups, and more importantly the mechanisms of jobs on crime were not specified among teenagers.

Therefore, to reduce delinquency, prior research suggests "good jobs" that possess crime-decreasing effects for adolescents must support academic roles (Staff and Uggen, 2003). Rather than debating whether this group of individuals should work or how much time they should work, Apel et al. (2006) specifically argued that whether youths would benefit more from being in other prosocial settings like the school and home is a more important social issue.

Summary

Whether work has a crime-increasing, a crime-reducing, or a neutral effect on law violating behaviors among young people is contingent on job-related factors and job-holders' surrounding circumstances. Given the complex fact of the occupational status and social rank of paid employment, each prior study addresses only a portion of job characteristics and assesses its consequences within varied social groups. In addition, workers' demographic and social characteristics seem to condition the impact of work on crime. Collectively, prior research lacks an integrated measure capturing essential job qualities associated with antisocial behaviors, and thus has been unable to provide credible policy implications or to fully assess different theoretical frameworks. Also, the exact mechanisms through which employment reduces or triggers offending behaviors have not been exhaustively specified in the literature. This dissertation attempts to provide another piece of the puzzle by constructing a concept of a 'ladder job' that better reflects the core features of employment that may discourage criminal acts but was not appropriately measured in prior research. In the following chapter, research design, data, and analytical strategy will be discussed to empirically test the hypotheses that are derived from prior empirical studies and theoretical frameworks.

CHAPTER 4

METHODOLOGY

Research Design

To explore the causal links between employment and crime (E-C), a research design that utilizes a longitudinal panel study (or fixed-sample panel) arguably is the most appropriate approach (Bachman and Schutt, 2007; Maxfield and Babbie, 2008; Shadish, Cook, and Campbell, 2002). Ultimately, scientific inquiries aim to establish causality by carefully assessing whether the following three criteria are met: the independent variable must precede the dependent variable, the independent variable must be associated with the dependent variable, and the association must not be spurious. In E-C research, longitudinal panel studies outperform many other non-experimental designs for several critical reasons.

Firstly, the time dimension of the causation can be determined in longitudinal studies. A longitudinal study is designed to include multiple observations over an extended period of time, such as years or decades. This characteristic can be utilized to study trends of varied social and natural phenomena by repeatedly observing the same indicators across time, or it can be used to study life developments throughout life courses or even across generations. Essentially, researchers can determine whether variation in the independent variable precedes variation in the dependent variable by utilizing the measured value of subjects on an independent variable at an earlier time point and a dependent variable at a later time point.

One particular type of longitudinal study is the panel design, which utilizes information gathered from *the same units* at *several different time points*. Such a design is commonly used to test theories of individual and social change because it is better able to assess causal relationships. From multiple observations of the same subjects, causal effects of the main independent variable can be isolated by largely

controlling for time-stable differences across individuals; that is, the time-invariant unobserved individual differences can be excluded when repeated measures are compared. Typically, the variable of interest that is repeatedly measured at earlier time points is included or controlled in statistical equations. In contrast to cross-sectional analyses that only take *one* "snapshot" of the subjects, the changes in the individual are explicitly incorporated into the design and measurement in panel studies (Bachman and Schutt, 2007; Maxfield and Babbie, 2008).

Secondly, longitudinal panel studies can help determine whether there is full or partial spuriousness between suspected cause and effect. The very nature of multiple observations of the same variables across time enables researchers to examine whether there is a true causation between an independent and dependent variable by controlling for a third variable observed at the earlier time point(s). Specifically, in this dissertation, the panel design allows me to rule out the possibility that a negative association between a higher ladder-job score and delinquent behavior is spuriously due to pre-existing personal attributes, such as greater self-control, that influences both delinquent behavior and employment in a ladder job. Since a personality trait like self-control remains relatively stable after age 8 or 10, theoretically speaking, indicators of self-control observed at any time point prior to the end of childhood could be extracted to assess their impact on the association between the suspected independent and dependent variables that are measured at later time points.

Thirdly, controlling for prior delinquent behaviors in the longitudinal panel design of this dissertation provides important advantages over cross-sectional designs for drawing inferences about the relationship between employment and crime. Whereas spurious association in a cross-sectional analysis can be tested only by actually including the outside variables in the statistical models, in panel studies, certain patterns of spuriousness caused by unmeasured factors may also be ruled out. That is, by measuring changes in employment and delinquency, it can be ensured that unchanging personal traits, such as self-control, are not responsible for changes in delinquency or employment. Finally, three-wave and multi-wave panel data allow researchers to estimate the possible reciprocal causation without incorporating "instrumental variables" or two stage least squares analysis (Finkel, 1995).

Ideally, the best design to control for all threats to the internal validity of causation is the classical experiment. However, this design is less applicable in real social settings for ensuring the causal link between employment and crime. Under most circumstances, social science researchers cannot randomly allocate experimental treatments (e.g. type of employment or pay rate) to gauge their effects on delinquency and criminal acts. Such types of design unavoidably face ethical and legal challenges with regard to the assignment of the treatment; a justification of *experimental manipulations* (e.g. employment opportunity, occupational position, or pay rate difference) needs to be provided. In contrast, longitudinal data are *observational* in real social settings, and potential ethical and legal concerns are avoided (Cook and Campbell, 1979; Shadish, Cook, and Campbell, 2002).

In sum, panel data provide several benefits, including a clear distinction of time order of variables and the capacity to filter out spurious relationships (or, allow controls for individual unobserved heterogeneity). Panel data are also more informative (e.g., more variability, more degree of freedom) because of multiple measures for the same variables from the same individuals. Thus, statistical estimates are more efficient.

Conceptual Definition of Ladder Jobs

Before detailing data and strategies of analysis, the conceptual definition of "ladder jobs" should be established. The key independent variable in this dissertation is the distinction of "ladder jobs," which includes information about occupational position and stake in conformity, in which job stability should, theoretically speaking, be reinforced. A ladder job is conceptualized as a job with significant potential to be the start of an attractive career, with a realistic possibility of upward movement on the status ladder, especially when cumulative experiences are credited. A non-ladder job, on the other hand, is a "dead-end job" in the sense that it usually does not lead to a career path in which upward mobility is foreseeable or even feasible. In other words, regardless of an individual's cumulative working experience and training, their experience is not considered as a valuable asset that will help them gain higher ranked

positions and substantial increases in pay and/or benefits, escalate their social status, or meaningfully increase their influence and opportunities within the institution.

Another central characteristic of a ladder job is "stability" or "continuity," which implies that employees typically hold the same position for a long time, or move on to a closely related job within the same occupational field that is at least as attractive as the previous position. At the very least, a ladder job should sustain or enlarge the employee's stake in conformity by, for example, retaining the job holder on the status ladder, including but not limited to the pursuit of continuing the same position or being employed by the same employer. Also, stability implies that experience in the job is likely to yield an accumulation of skills that will be valued by later employers. In other words, the learned skills and gained experience are "transferable" assets accompanying with employees' seniority.

Financial reward is not always a good indicator of ladder jobs, especially for young people just starting their careers. In fact, some ladder jobs may pay less at the beginning of the career than non-ladder jobs. On the other hand, a non-ladder job offers little possibility of a meaningful increase in salary/wages or benefits, and little chance to advance skills, which is essential in today's economic era. For teenagers, some non-ladder jobs may appear to be more financially attractive than ladder jobs because certain types of non-ladder jobs probably pay more in the short term than the ladder jobs do. However, a ladder job should contain a particular quality that promotes occupational progress from a wider array of aspects, such as skill levels, social status, fringe benefits, schedule flexibility, and advancement opportunities.

The distinction between ladder and non-ladder jobs is different from the distinction between jobs in the primary and secondary labor markets. Primary labor market jobs usually require higher skill levels and relatively advanced knowledge, provide higher payment and competitive benefits, and generally offer opportunities for advancement. Although ladder jobs require advancement of skill level, vocational trajectories do not necessarily guarantee well-paid positions at the front-end of the careers. In addition, some ladder jobs may involve sophisticated but repetitive tasks. Most importantly, the concept of "ladder jobs" emphasizes the sustaining and upward

mobility of the job holders' status in the long term, whereas the binary distinction of primary and secondary labor market jobs offers little insight in this regard.

Listed below are the indicators of a ladder job. A ladder job may hold one or all of these characteristics:

1. a realistic potential for financial and/or non-financial upward mobility
2. wages or salaries that grow with employee's seniority
3. the job requires entry-level skills beyond high school education
4. the job requires learning new skills, the continuation of training, or possibly employers' investment in employees' human capital
5. management level or above

Inter-rater Reliability of "Ladder Jobs"

To appropriately measure the "ladder job" concept, it is critical to establish the reliability of the construct. One well-developed approach to meet this critical criterion is employing the inter-rater (inter-coder) reliability technique. The inter-rater reliability is the extent to which variations occur between two or more raters' judgments of the same item, and a measure is reliable if there is a high level of consensus among raters (coders). In other words, the consistency in scoring—the correlation between different raters' scores of the same object—measures inter-rater reliability.

For the present study, inter-rater reliability can be established from the consensus among experts who have extensive knowledge about occupations and career paths in the U.S. Furthermore, these experts must have publicly recognized credentials to ensure their qualifications to conduct the task of occupation classification. That is, qualified professionals are expected to have both professional training and practice and be able to independently classify occupations listed in the Census 2002 Industry and Occupation Codes (Appendix A). To overcome the concern of raters' subjectivity, the recruited career counselors were directed to follow uniform instructions and standardized coding rules (Appendix B) developed from the conceptual definition of "ladder job" discussed above. Based on the provided instructions and coders'

professional knowledge and experience, they assessed the nature of the occupational positions and scored each position accordingly[3]. Here are the tasks in order:

- Develop coding rules and instructions for coders based on the conceptual definition of "ladder job."
- Recruit qualified professionals to act as raters.
- Request each coder (rater) to independently classify occupational positions listed in the Census 2002 Industry and Occupation Codes, based on the provided scale, uniform instructions, and their own professional training and experience.
- Determine "ladder job score" of all the occupational positions based on the consensus of the coders.

Hypotheses

Several hypotheses concerning the mechanisms of employment and crime are derived from the theoretical frameworks, empirical literature, and the conceptual definition of "ladder job." Given the fact that millions of adolescents are exposed to different work settings and are working a substantial number of hours while also going to school, testing these hypotheses is important.

Hypothesis 1: The higher the ladder status of positions youths hold, the lower the level of delinquent and criminal behaviors youths would commit.

Hypothesis 2: Job income mediates the impact of "ladder jobs" on youths' delinquent and criminal behaviors.

Hypothesis 3: Job income mediates the impact of employment on youths' delinquent and criminal behaviors.

Hypothesis 4: Job stability mediates the impact of "ladder jobs" on delinquent and criminal behaviors.

[3] An IRB approval letter was issued by the Human Subjects Committee, Office of the Vice President For Research, FSU, before recruiting career counselors (Appendix C).

Hypothesis 5: Parental control mediates the impact of youths' employment status on delinquent and criminal behaviors.

Analytical Strategies: Structural Equation Modeling

Structural Equation Modeling (SEM) is utilized to estimate models of delinquent behavior. It offers several significant features and advantages that complement this research design. First of all, SEM outperforms older analytical techniques like Analysis of Variance (ANOVA) and multiple regression that are concerned respectively with means and inter-correlations among observed variables only. With a diagrammatic presentation, SEM is a multivariate technique that assesses the causal relationships among variables, with a special capacity to assess varied causal links to or from unobserved constructs (or latent variables). As an advanced path analysis, SEM estimates the relationships between observed and latent variables where the goal is to select a model that best accounts for the data. Similar to path analysis, coefficients are the standard regression coefficients from multiple regressions, and both direct and indirect effects are estimated. However, SEM outperforms path analysis because path analysis can only test individual pathways, and SEM has the capacity to test the entire model and assess the model fit. That is, SEM offers an additional capacity to assess whether the data support the identified variables and their causal paths structured by the theoretical framework.

Secondly, SEM is used not only to test causal relationships but also to determine the minimum number of relationships (causal influences) needed to account for the data and the directions of these relationships. This is done by observing the sizes of the regression coefficients with and without certain variables entered into equations. In that capacity, SEM permits the modeling of multiple dependent and mediating variables simultaneously. Similar to path analysis, SEM provides plausible explanations of observed correlations by constructing cause-and-effect relations.

Thirdly, SEM can model the non-recursive relationship between employment and crime (Hagan, 1993; Thornberry and Christenson, 1984), while traditional regression

and path analysis can only model the recursive relationship, which may lead to biased and inconsistent parameter estimates (Finkel, 1995). This unique feature offers an opportunity to assess whether a non-recursive model, which is less parsimonious, should be incorporated into the structure in the E-C relationship. Also, this feature can benefit research that utilize panel data in which a relatively long data collection interval, ranging from months to years, could lead to simultaneity.

As a special type of SEM, cross-lagged panel models are useful for questions about causal order (or, causal directionality) and change over a discrete interval with passive observational data, such as those generated by a survey. Cross-lagged panel models examine the association between two variables over time, with each variable controlling for its effects at earlier time points (Table 4.1). That is, the change of a variable can be modeled within the SEM framework. Additionally, the concern of simultaneity can be incorporated into the models, after controlling for the effects from the same variable measured at earlier time points. However, when the time gap between two waves is not large enough, such model may suffer from a drawback of "overly control" which leaves little variation to be regressed.

Simultaneity is a concern of causal structure in which two variables or events occurring at the same time point or within the same timeframe affect each other. As described in Finkel (1995), the SEM framework allows for simultaneous estimation of two variables' impact on each other in a longitudinal design in which the observed variables are measured repeatedly at several time points. Specifically, the cross-lag model in SEM framework can estimate the impact of the suspected independent variable at time 1 on the suspected dependent variable at time 2, controlling for the dependent variable's impact at the time 1, while the impact of the suspected dependent variable at time 1 on the suspected independent variable at time 2 is estimated simultaneously. A statistically significant relationship suggests one causal direction, when two statistically significant relationships suggest two variables affect each other.

Constructing SEM involves four primary steps: specification, identification, estimation, and assessment. Specification involves formal definitions of the various components of the model, as well as the assumptions. Once the model has been specified, identification is the next step in determining whether there is a unique solution

for the parameters of the model. If a model is under-identified and parameters cannot be estimated, the specification of the model needs to be reconsidered. Just-identified or over-identified are ideal situations which allow researchers to select a best-justified model. Specifically, the over-identified model leaves degree(s) of freedom, allowing researchers to choose among several alternatives of model modifications (MacCallum, 1995). Next, once one has a specified and identified a model, estimation of model parameters can proceed. This usually involves utilizing computer statistical software packages (e.g. Mplus, LISREL, AMOS, EQS, etc.). In this dissertation, Mplus version 5.2 statistical software (Muthén and Muthén, 2007) is employed to estimate the hypothesized models and to assess the model fits. Finally, model fit can be assessed by employing a wide array of indices: the Chi-Square measure of overall goodness-of-fit (CHISQ), comparative fit index (CFI), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and Chi-Square difference test (ΔCHISQ).

CHISQ is traditionally used to assess how well the model fits the data in SEM, based on the Chi-Square distribution, which is a function of the degrees of freedom. However, this test is arguably not always appropriate to evaluate SEM (Browne and Cudeck, 1992), especially when the sample size is large: a larger sample size typically yields statistical significance for the same size of the difference seen in a smaller sample. Therefore, other indices need to be taken into consideration when the model is over-identified. Comparative or relative fit refers to a situation where two or more models are compared to see which one provides the best fit to the data. The comparative fit index (CFI) is the primary measure used here and ranges from 0 to 1, with values above 0.9 considered to indicate a good fit. Since my sample size is close to 9,000 subjects, the inclusion of standardized root mean square residual (SRMR) should also provide a fairly robust measure, using the recommended cutoff point of .05: an SRMR value less than this indicates a good data-model fit. The RMSEA is a "badness-of-fit index" which concerns the discrepancy between the hypothesized model and the covariance matrix per degrees of freedom, with the suggested cutoff point as .05: RMSEA value less than this value indicates a close model fit. In addition, an RMSEA value smaller than .08 is thought to be indicative of a reasonable fit. For the

comparison of competing models (e.g., nested models), the chi-square difference test (ΔCHISQ) can be adopted to select a more parsimonious model (Kline, 2005; McDonald and Ho, 2002).

Joreskog and Sorbom (1993) describe three strategies of analysis: strictly confirmatory, model generation, and model comparison. These three approaches using SEM can be integrated into a series of analyses. Guided by the hypotheses, I will confirm the initial models and adopt a model generation strategy with the aid of the Modification Index (MI) which offers the capacity to improve the model fit by providing information regarding changes in parameter restrictions. In addition, the Chi-Square difference test (ΔCHISQ) will be useful to evaluate the best-justified model among nested ones, which share the same causal structure among factors.

The maximum likelihood (ML) will be adopted as the iteration method to estimate the parameters of coefficients in the models. This method is reasonably robust to modest violations of the normality assumption, while generalized least squares (GLS), another often utilized estimator, has been documented to have a higher likelihood of negatively biased estimates, especially when the estimate model is not correctly specified (Chou and Bentler, 1995; Finney and DiStefano, 2006).

Data

To test the above hypotheses, this dissertation uses the self-report measures of delinquent/criminal behaviors and labor market participation experiences collected from the 1997 cohort of the National Longitudinal Survey of Youth (NLSY97), which includes a nationally representative sample of the U.S. youths who were aged 12 to 16 years by the end of 1996. NLSY97 initially surveyed 8,984 youth, including an over-sample of 2,236 black and Hispanic youths meeting the same age restriction. On the Inter-University Consortium for Political and Social Research (ICPSR) website, the NLSY97 has released seven waves of publicly accessible data, covering interviews from 1997 through 2003, with a one-year interval between waves. By the wave 7, the retention rate is around 86%, which is uncommonly good for studies of this type. Its exhaustively

detailed job market participation information and rich information about illegal activities collected from respondents makes NLSY97 an excellent dataset to answer the research questions raised in this dissertation.

In addition to its unusual data quality as a nationally representative survey concerning employment of young Americans, NLSY97 is especially meaningful because the sample period coincides with the emergence of the information technology industry. The period between 1960 and 1990 has been described as a transition from an industrial economy to a postindustrial society, when the United States, like many other developed countries, experienced an unprecedented pace of globalization. When the economy of the U.S. is closely tied to the economies of other countries around the world, its job market and the demand on the labor force are substantially shaped by the global economy. NLSY97 collects working experience from a generation of young Americans who grew up in the transition period from the postindustrial to the information economy characterized by fast-developing information technology, such as affordable personal computers, widespread Internet connections, and mobile tele/communication devices. Findings from this dataset should provide great potential for policy implications in the era of the global economy.

Table 4.2 displays the descriptive statistics of all the NLSY97 youth. There were slightly more males (51% or 4,599) than females (49% or 4,385) selected into the sample initially. Race and ethnicity were combined into one variable with four groups: white, black, Latino, and others. Youths who identified themselves as being of Hispanic origin are grouped into the Latino category; “white youth” refers to non-Latino Caucasian, and “black youth” refers to non-Latino African Americans. Overall, white youths account for 49% of the entire sample, while black, Latino, and youths of other racial-ethnic group account for 26%, 21% and 4%, respectively. Each gender and race-ethnicity is evenly distributed across age groups. Since it is a nationally representative sample, the weighted distribution of gender and other demographic variables should closely reflect the characteristics of the entire youth population in America, except in race and ethnicity, since both black and Latino youths were intentionally oversampled in the original survey for statistical reasons.

However, like other secondary analyses, there are a few drawbacks of using the NLSY97 for this research. As one of six National Longitudinal Surveys sponsored by the Bureau of Labor Statistics of the U.S. Department of Labor, NLSY97 mainly focuses on explicitly gaining employment information from youth. Although each wave collects respondents' self-reports of delinquent and criminal acts, there is little attention paid to time-varying variables derived from learning theories, such as delinquent peers, pro- and anti-social coworkers, and the opportunity to learn or to commit delinquent acts on the job. Consequently, this dataset is inadequate for testing hypotheses derived from learning theories and cannot control for such variables.

Next, there is a lack of attitudinal indicators of low self-control in NLSY97. Low self-control is manifested by impulsive behaviors, lack of persistence in tasks, physical responses to conflict, risk seeking, preference for easy tasks, and a hot temper. These personality traits remain relatively stable over the life course (Gottfredson and Hirschi, 1990: 89-94) and may affect both the decision and opportunity to take a ladder job position and the decision to commit delinquency. From this theoretical perspective, individuals are predisposed to different propensities of delinquency, as well as different likelihoods of holding long-term-oriented positions. Low self-control is usually measured in empirical studies by utilizing an attitudinal scale, such as the most often replicated one developed by Grasmick, Tittle, Bursik, and Arneklev (1993). Even though this most widely used scale faces validity and reliability challenges (DeLisi, Hochstetler, and Murphy, 2003), in their meta-analysis, Pratt and Cullen (2000) pointed out that the connection between low self-control and delinquency is strongly tied across measurement strategies. However, NLSY97 lacks items from the Grasmick scale or other adequate questionnaire items that capture attitudinal characteristics of low self-control. To overcome this shortcoming accompanying the survey design, I argue that low self-control also "expresses itself as delinquency and crime when individuals bump into opportunities for crime after childhood" (Gottfredson and Hirschi, 1990: 140). What these two theorists imply was that the act of delinquency and crime is a function of low self-control, contingent upon prompt opportunities. Following the logic, if an individual *self reports* delinquent or criminal behavior during childhood, the behavioral term should serve as a *more conservative but solid indicator* of low self-control. Thus, in this

dissertation, I use the variety score of delinquent behavior occurring before age 10 as the measure of low self-control. This variable is controlled when assessing the link between ladder jobs and later criminal acts.

Final Cases Selection

The design of the NLSY97 questionnaire placed multiple restrictions on the selection of subjects for data analyses. The primary restriction is about the legal constraint on youth employment in the U.S. Federal regulations and the vast majority of state statutes restrict the eligibility of youth employment to a minimum age 14 (Apel, et al., 2006). Given the fact that NLSY97 youth were between 12 and 16 by the end of 1996, around two-fifths of the surveyed youth could not to be formally employed at wave 1, which significantly reduced the variation of employment. Thus, I decided to use employment data on and after wave 3 because, by the third interview, the youths were all over age 14 and eligible for formal employment. Specifically, I used the data from waves 3 through 5 (dataset A) to test the first four hypotheses. Regarding missing data, I utilized the listwise deletion method to exclude youths who did not report whether they engaged in criminal and delinquent activities at wave 5 because that is the key dependent variable in the study. I further excluded those who did not participate in wave 3 and wave 4 surveys. Their absence was largely attributable to the retention issue that is often seen in longitudinal survey studies. These steps reduced the sample size from 8,984 to 7,322.

The first four hypotheses tested in the previous paragraph and the models built were validated by using different waves of NLSY97. That is, following the same procedure of case selection described previously, the data from waves 4 through 6 (dataset B) and the data from waves 5 through 7 (dataset C) were used to estimate the models for the purpose of testing the first four hypotheses. The purpose of using multiple datasets is twofold: (1) the variation of employment measures, including “ladder job” score, increased as youths were getting older, and (2) the impacts of employment and “ladder jobs” on delinquency can be confirmed through utilizing multiple datasets. The sample sizes were 7,234 and 7,114 in datasets B and C respectively. Table 4.3

provides a clear picture regarding which waves of data are used to test which hypotheses.

To assess whether parental control plays a mediating role, variables of parental control had to be collected in the survey. This information, however, was only collected from youth who were living with a father figure and/or a mother figure and were aged 12 to 14 as of the end of 1996. This information was also only asked before youth reached 18 years old. In addition, this information was no longer asked in the survey by wave 6. The above triple restrictions of NLSY97 survey design limited my selection of waves and subjects to test the remaining hypothesis.

Because parental control questions were asked only of relevant respondents in NLSY97, the filter question *with whom youth lived* created skip patterns in which contingent questions collected information on parental controls from the father and/or mother in the survey. Given the fact that youth might have several types of living situations (e.g., lived with both parents, lived with mother (figure) only, lived with father (figure) only, or lived independently) that conditioned information collection, there are logically two sub-groups for testing direct parental supervision as a mediating factor: youth lived with both parents and youth lived with a single parent.

Similar to the data selection procedure for testing the first four hypotheses, I used multiple datasets to test the last hypothesis, which concerned parental control as a mediating factor between youth employment experience and delinquency. In the dataset D, in order to assess the mediating effect of direct parental control from both parents, I had to exclude those who were not asked to report parental control information; that is, I eliminated two age groups—ages 15 and 16 as of the end of 1996—from the dataset. The parental control variables were measured at wave 4 when the remaining youth were aged 15 to 17, and the dependent variable was measured at wave 5. These restrictions considerably reduced the sample size from 8,984 to 2,805.

The last hypothesis and the model were validated by using dataset E, which covered waves 4 though 6. The parental control variables were measured at wave 5, and the variety score of delinquency was measured at wave 6 in order to meet the time-order criterion of causality. The oldest remaining age group was dropped from the subsample because this group of youth had turned 18, which left the two youngest age

groups in the dataset E. These procedures significantly reduced the sample size from 8,984 to 1,768.

The data selection procedure described in the previous paragraph was repeated to select those who lived with a single parent. Two other datasets (F and G) were used to test the last hypothesis and to estimate the model. The sample sizes were 1,386 and 846 respectively.

Measurements

Criminal and Delinquent Behaviors

The "variety" score of measuring the number of different types of delinquent acts reported at wave 5 was used as the dependent variable of concern in dataset A of testing the first two hypotheses. "Indeed, it appears that the best available operational measure of the propensity to offend is a count of the number of distinct problem behaviors engaged in by a youth (that is, a variety scale)" (Hirschi and Gottfredson, 1995:134). Even though this operationalization does not take the frequency and severity of offense into account, it does provide one of the best estimates of juvenile delinquency and has been adopted in many studies (Wright, Caspi, Moffitt, and Silva, 1999), including those that concerned youth employment and utilized NLSY97 (e.g., Apel et al., 2006; Apel et al., 2007; Paternoster et al., 2003). A list of eleven self-reported criminal and delinquent behaviors was dichotomously coded. In each item, youths who reported committing at least one of a particular type of delinquency since the last interview were coded 1. Behavioral measures include vandalism (damaging property on purpose), minor theft (stealing items worth less than $50), serious theft (stealing items worth more than $50), other property crimes (receiving, possessing, or selling stolen property), aggravated assault (assault with the intent of inflicting serious harm), selling drugs (marijuana or hard drugs), carrying a handgun, and substance use (smoking; using hard drugs, alcohol, and marijuana).

Ladder Job Scores

Through several formal communications requesting of information from the Career Center at Florida State University[4], I identified two national associations comprised of members who have extensive knowledge about a wide array of occupations in the United States. These two professional associations are the National Career Development Association (NCDA) and National Board for Certified Counselors (NBCC). NCDA is a division of the American Counseling Association (ACA), which emphasizes career development counseling over a person's lifetime. Members include both professionals and students, graduate and undergraduate. NBCC, on the other hand, is an accredited not-for-profit organization that certifies counselors at the national level. Their certified members have to pass standardized exams and receive 100 hours of continuing education annually to remain certified. One particular credential certified by NBCC is National Certified Career Counselor (NCCC), which specifically focuses on accrediting individual counselors' career counseling practices. After reviewing the affiliation criteria of both organizations, I decided to use NCCCs as the group of professionals to help with the task of occupation classification.

NBCC has stopped certifying new NCCCs but has continued to offer the NCC (National Certified Counselor) and other specialized certifications. Junior career counseling related counselors usually hold Master Career Counselor (MCC) or Master Career Development Professional (MCDP) of NCDA. However, many NCCCs are also MCCs. It is uncertain why there are two different societies certifying career counselors, however, active NCCCs are usually senior counselors who have practiced more than a decade. Through conversations with contacted NCCCs, I also learned that the majority of them either have a doctoral degree, currently teach related courses at the college level, currently operate a career counseling business, or have a mix of prior professional practices, in addition to their professional practice of career counseling.

A list of NCCCs and their contact information was obtained from NBCC's website which is equipped with an online counselor search feature. In August, 2009, I retrieved contact information of NCCCs, including names, phone numbers, and locations of

[4] The person who advised me in this regard was the director, Dr. Carrin Carr. His center's career counselors, Elizabeth Ruff, M.S. and Brook Greene, M.S., also provided useful information and helped with development of the occupation classification procedure. They served as career consultants and advised college students through their tenures in the graduate program. In addition, they all hold at least a graduate degree in the area of school counseling or educational psychology.

practice, from NBCC's website. There were 173 NCCCs listed on NBCC's website. Simple random sampling was then used to draw a small group of counselors from the final list that excluded those without contact information. The NBCC website did not list 10 NCCCs' phone numbers. Thus, these ten counselors were excluded from the sampling frame. Since there is no prior literature documenting the likelihood of NCCCs' participation in tasks of this kind, I conservatively estimated the acceptance rate was 50%. Thus, to have 20 coders who agreed to conduct occupation classification, I randomly selected 40 NCCCs from the list. While a larger number of coders might have been desirable, 20 coders was the limit that the research grant[5] could afford.

The sampled counselors were first contacted via phone and asked about for their willingness to participate. I successfully talked to twelve NCCCs on my first attempt, and eight of them agreed to provide the service. For the remaining 28 NCCCs, I left a fairly concise message about the research project, how they were found and selected for participation, the content and the estimated time for the occupation classification task, the payment, the funding agencies, and my contact information. Ten of them returned my phone call, most within 24 hours, and agreed to provide the service. In total, I recruited 18 NCCCs (Appendix D). All were blind to the purpose of the occupation classification to avoid biases (Fraenkel and Wallen, 2009).

The results of the occupational classification were collected via a pre-formatted Microsoft Excel file that contained the list of occupational positions. Communications between me and recruited counselors were all completed via email. In the pre-formatted Excel file, each coder was requested to classify positions based on a 4-point scale, ranging from ladder job (1) to non-ladder job (4), with scores 2 and 3 indicating somewhat ladder job and somewhat non-ladder job, respectively. The purpose of utilizing Microsoft Excel to collect data was two-fold. Its popularity on the majority of personal computers was the primary reason. The secondary reason was that the capacity of the software enabled me to manage the classification data in an efficient manner. Since the format of Excel sheets sent to the coders was identical, I could quickly assess the data quality upon receiving their responses.

[5] This dissertation was financially supported by the National Institute of Justice-Graduate Research Fellowship ($20,000) and Florida State University Dissertation Grant ($750).

Data on occupational classification were carefully examined when I received coders' completed Excel forms. Any errors such as missing data or out-of-range scores were identified, and the corresponding coders were requested via email to correct the errors. It is worth noting that there was no incident of out-of-range error of coding, which indirectly evidenced NCCCs' commitment to this task. Upon the end of this stage, every coder submitted a completed Excel form with no missing data.

To derive the consensus of ladder scores from the coders, I sought to identify any coder(s) whose scores consistently deviated from the group consensus by using the following steps: First I calculated the arithmetic average score and the standard deviation of all occupational positions based on 18 coders' scoring. Next, I calculated the arithmetic average score of all occupational positions per coder to compare with the overall mean and standard deviation for the purpose of generating Z scores. These calculations revealed that one career counselor's average score was more than one standard deviation below the overall average, while the average scores of the remaining 17 counselors were within 0.6 standard deviation of the overall mean. For whatever reason, the coder appeared to consistently and optimistically rated almost all positions as "ladder jobs" or "somehow ladder jobs." The consistently optimistic classification result from this career counselor was noticed when I received the filled-out pre-formatted Excel file. Efforts of further clarification were also made to ensure the idea of "ladder job" was clearly communicated. Thus, I decided to exclude that particular counselor's classifications. The remaining 17 counselors' classification demonstrated high consensus across the vast majority of occupational positions (please view Table 4.4).

For the purpose of data analysis, I reversely coded the classification scale; that is, a higher ladder job score represents a higher ladder status of the occupational position. Table 4.5 demonstrates the arithmetic average scores and standard deviations, classified by 17 coders, of all occupational positions. Then, each working youth's primary job position (the one that youth holds the longest in the timeframe) was matched to a ladder job score.

Direct Parental Control

This latent factor has several indicators measuring respondents' perceived parental control. Depending on subjects' living situations (e.g., live with a single parent or live with both parents), youths were asked to reflect on their father's and/or mother's supervision. For each parental figure that lived with the youth, three questions were asked: (1) how well does s/he know your close friends, that is, who they are; (2) how well does s/he know your close friends' parents, that is, who they are; and (3) how much does s/he know about whom you are with when you are not at home. Responses were rated on a five-point Likert-type scale, with 4 meaning "knows everything," 3 meaning "knows most things," 2 meaning "knows some things," 1 meaning "knows just a little," and 0 meaning "knows nothing."

Job Income and Monetary Resources from Family

The surveyed youth were asked to report or estimate their annual incomes from jobs in any form, including wages, salary, commissions, and tips, before deductions for taxes or for anything else in the previous year. Regarding monetary resources from family, the questionnaire broke them down into several categories: money from father, money from mother, and allowances from family. Similarly, youths were asked to either report the exact amount or make their best estimation, if they could not recall or felt uncomfortable answering in the first inquiry. These indicators were summed to form a variable named "monetary resources from family," which reflects youths' overall financial support from his/her family.

The NLSY97 data of youth income, including job income and monetary resources from family, had been manipulated before its release. In the third wave of NLSY97, for example, 3,428 youths reported a valid annual income from jobs within the previous year, while 781 youths could not exactly recall and 24 youths refused to answer in the first inquiry. Among youth who reported valid income from jobs, values of the top 2 percent were truncated and replaced by the lowest value of this top 2 percent, which was $25,249. This data manipulation was conducted by the original researchers before the NLSY97 data were released. Among those who did not respond (e.g., they didn't know, forgot, or refused) in the first attempt, the interviewers used cards showing an order of income brackets and obtained the best estimates from 759 youths. The middle

points of brackets were then used to substitute the missing value among these youth, unless the middle point exceeded the truncated value indicated above.

Similar truncations were applied to allowance-excluded cash from mother and allowance-excluded cash from father. The truncation amounts were $6,864 and $6,770 at the third wave, respectively.

Employment Stability

In line with the core idea of increasing stake in conformity, the operationalization of employment stability focused on the continuation of the job-holders' investment in the conventional society in which job-associated status is sustained or scored. While a given youth could have up to eight to eleven different employers in a survey wave, employment continuity has to be appraised from a fairly wide array of aspects (e.g., young ages, limited possible working experience, etc.) within the context of youth employment, especially since involvement in the labor market is so dynamic in nature.

The first variable measured whether a working youth continued employment with the same employer across two waves, with 1 indicating yes. This variable credited the continuing impact of an employer-employee bond, regardless of whether the working youth held the same position or not. The second variable, taking into account the fact a youth might have a number of employers in a given year, assessed whether a working youth continued holding the same occupational position, regardless of which employer he or she worked for. In other words, the transferability of occupational experience and training was taken into consideration in the second variable. An index was created by adding the binary variables discussed in the following paragraph. One downside of this operationalization is not being able to directly compare this index with measures used in the previous classic studies, such as Sampson and Laub's (1993).

Parents' Educational Level and Income Level

Father's and mother's education levels were collected in the initial interview from youths' parents. Educational level was measured by a 8-point Likert-type scale, with 0 representing none, 1 representing grades 1 to 8, 2 representing grades 9 to 11, 3 representing high school graduate, 4 representing some college education, 5

representing a college degree, 6 representing some graduate school, and 7 representing a graduate/professional degree. Parents' income was also collected from youths' parents at wave 1 when NLSY97 was initiated.

Missing Data Assessments

The attrition of cases in any longitudinal study is a common concern. Most methods adopted to remedy incomplete observations assume that the data loss pattern is either missing completely at random (MCAR) or missing at random (MAR). MCAR exists when missing values are randomly distributed across all observations; that is, missingness on a variable is unrelated to the values of other observed variables as well as to the values of the variable itself. MAR, on the other hand, is a less restrictive condition in which missing values are randomly distributed within subsamples but not across all observations. Empirically, the missingness on a variable is related to one or more other observed variables in the model, but is unrelated to the values of the variable itself. Both missing data patterns assume no systematic difference between complete and incomplete records and would not distort findings. Essentially, the observed data can be viewed as a random sample of the hypothetically complete dataset in these two situations (Allison, 2002; Little and Rubin, 1987). The MCAR and MAR are ignorable conditions of missing data in the sense that unbiased parameter estimates can be obtained utilizing ML estimation.

Thus, the first step to check a missing data pattern is to examine pairwise correlations of dummy-coded missing values among all the variables. A high correlation of a pair of variables indicates that a MCAR or MAR assumption is potentially violated. Specifically, a statistically significant correlation suggests a low confidence in missing data randomness.

Generally, two post-hoc remedy methods, listwise deletion and pairwise deletion, are employed while missing data are present. In listwise deletion, cases with missing values on any variable are excluded from the analysis, which can potentially reduce the number of cases significantly. Because the missing cases were relatively few in this

dissertation, listwise deletion would not reduce the size of the final dataset dramatically. Further, this method enjoys the advantage of consistent effective sample size in all conducted analyses. The latter method, pairwise deletion, only removes cases from an analysis in which variables with missing data are involved in a particular computation. Consequently, the number of cases may vary from one analysis to another, and this very feature posts a drawback for SEM. Different numbers of cases potentially can generate values that are mathematically out of range; that is, it would be impossible to derive such values if the covariances are all calculated using data from the same cases. Because SEM is conducted using correlation or covariance matrixes, out-of-range values in a matrix can lead to a failure in mathematical computations. Therefore, pairwise deletion is usually not recommended, unless the number of missing cases is the same across analyses (Kline, 2005).

Enders (2006) suggests three more advanced and contemporary missing data treatments in SEM. The first method is Hot Deck (HD) imputation replacement. In HD, missing values are replaced with the observed data from another case, randomly selected from a group of individuals who are similar with respect to a set of covariates. The second method is Expectation Maximization (EM) which involves a two-step iterative procedure: expectation and maximization. The missing values are replaced with residual-adjusted conditional means. However, Enders (2006) also points out a disadvantage that the model fit statistic is quite sensitive to the sample size, and the model fit should be assessed with caution when EM is utilized. The third method is Full Information Maximum Likelihood (FIML) which does not replace missing data with imputed values. Parameter estimates and standard errors are estimated directly from the observed data by applying iterative computational algorithms to the sample log-likelihood. Also, parameter estimates are unbiased and efficient under MAR. Enders (2001) indicated that FIML estimation is also superior to listwise deletion, pairwise deletion, and mean imputation in multiple regression. Since FIML is one of the default methods adopted in Mplus, it is legitimate and efficient to apply this treatment of missing values. Thus, I utilized the FIML method when the data were further analyzed in Mplus software.

CHAPTER 5

FINDINGS

This chapter presents (1) the results of occupation classification, (2) the findings from SEM analyses, including tests of hypotheses concerning the effect of "ladder jobs" on delinquent behaviors, and (3) tests of the three mediating factors, job income, job stability, and parental control. The following sections present the results of the occupational classification first, followed by the results of analyses from datasets A through G. The data analysis section includes descriptive statistics of the datasets and the results of SEM analyses. This chapter concludes with a summary of findings and a final model.

Occupation Classification and Datasets

Recall that the panel of raters assigned a score from 1 to 4 for each occupation that a youth might hold, with higher scores indicating that the occupation had strong potential for resulting in an attractive long-term career. Table 5.1 presents the descriptive statistics of ladder job scores and employment by seven datasets. For instance, in dataset A, delinquency was measured at wave 5; 66% of youth were employed sometime at wave 3; the arithmetic average ladder job score of working youths' primary position was 1.042, with the standard deviation as 0.89. By wave 3, about 6% of youths held a ladder job, defined as a ladder job score equaled or exceeded the middle point of the scale (2.5), and the proportion of ladder job holders increased to 9% and 11% at waves 4 and 5 respectively. Overtime, the proportion of youth who were employed increased as they grew up. Likewise, within each dataset, the proportion of youths who held ladder jobs increased as the youth aged.

Analyses

Hypothesis 1: The higher the ladder status of jobs youths hold, the lower the level of their delinquent and criminal behaviors.

Hypothesis 2: Job income mediates the impact of "ladder jobs" on youths' delinquent and criminal behaviors.

Hypothesis 3: Job income mediates the impact of employment on youths' delinquent and criminal behaviors.

Hypothesis 4: Job stability mediates the impact of "ladder jobs" on delinquent and criminal behaviors.

Hypothesis 5: Parental control mediates the impact of youths' employment status on delinquent and criminal behaviors.

American youths are legally constrained by federal and state regulations for their eligibility of formal employment; so about two-fifths of NLSY97 youth could not be formally employed at wave 1. Thus, the sample size and employment variation was substantially reduced by using earlier waves of data. To overcome the issue of employment eligibility, datasets with employment measured at wave 3, the earliest wave when youths were all over age 14 and eligible for employment, were used. In addition, as youths grew older, the variation of employment increased. Consequently, employment measured at later waves provided much larger job variations. For the above reasons, I used three sets of data (A, B, and C) to estimate the models. The first dataset included variables collected between wave 3 and wave 5 from all the NLSY97 youth. By wave 3, youth were ages 14 to 18, and they were between 16 and 20 by wave 5. The rest of controlled and static variables were measured at wave 1 of NLSY97. Dataset B included variables measured at waves 4 through 6 from all the NLSY97 youth, and Dataset C included variables measured at waves 5 through 7 from all the NLSY97 youth.

I also empirically assessed the time lag for youth employment to take effect. Given the absence of any clear theoretical implication for any particular time lag, when using dataset A, I first estimated the model with two years as the time lag, followed by a model with a one year lag and then a model with no time lag between employment and

delinquent behavior, notwithstanding the potential simultaneity issue. Second, I tested job income as a mediating variable, with no time-lag or one year lag between employment and delinquency. A two-year lag in the effect of employment on delinquency did not seem theoretically plausible, so such models were not considered. Next, I introduced job stability as a mediating variable, with a one year lag between employment variables and delinquency. Because the concept of job stability required at least two waves of data, the relationship between employment and job stability, by definition, cannot be simultaneous. It is worth noting that models with employment measured at wave 6 were not estimated because there was no variation; that is, all the youth remained in the datasets had working experience at wave 6.

Lastly, I used another four sets of data (D, E, F, and G) to test the last hypothesis regarding the mediating role of parental control. Because of the triple restrictions built into the survey design, parental control indicators were only measured among youths with particular characteristics and in particular waves of survey (for details, see Chapter 4). Dataset D included variables collected between wave 3 and wave 5 from youths who lived with *both* parents. By wave 3, youth were between 14 and 16 years old, and they were between 16 and 18 years old by wave 5. Dataset E included variables collected between wave 4 and wave 6 from youths who lived with *both* parents. Datasets F and G included variables collected between waves 3 and 5 and between waves 4 and 6, respectively, from youths who lived with a *single* parent.

Descriptive Statistics

Dataset A: Wave 3 through Wave 5 – All NLSY97 Youth

Table 5.2 shows the basic descriptive statistics of dataset A, including mean, standard deviation, skewness, kurtosis, minimum value, and maximum value, of the endogenous and the exogenous variables. On average, youth committed close to two different types of criminal and delinquent behaviors between wave 4 and wave 5, with the minimum value of 0 and the maximum value of 11. Except for the three monetary figures (youth job income at wave 4, youth monetary income from family at wave 4, and

parent(s)' income at wave 1), other variables were normally distributed, and values of skewness and kurtosis did not exceed the recommended cutoff points in SEM[6] (Bentler and Wu, 2002). These three monetary figures were transformed in order to satisfy the normality assumption of SEM. The square roots of youth job income at wave 4, youth monetary resources from family at wave 4, and parent(s)' income at wave 1 were used in the analyses. Since the distributions of these three monetary figures were highly skewed across waves and across datasets, the same transformation was applied to these three monetary variables in all other datasets as well.

The mean age of the youth was 13.9 by the end of 1996, and half were males. Around 26% of the youth were black, and 21% were Hispanic. The average educational level of the youths' parents was between middle and high school. On average, youth made $4,655 from their jobs, with a maximum income of $30,623 and a relatively large standard deviation, which indicated that the job income level varied widely among the surveyed youth. The average annual income received by youth from their family was $586, with a fairly large maximum of $95,488 and a large standard deviation, which indicated that the monetary resources from the youth's family varied substantially.

Dataset B: Wave 4 through Wave 6 – All NLSY97 Youth

Dataset B used measures of delinquent and criminal behaviors at wave 6, which is one year after dataset A. Table 5.3 displays the basic descriptive statistics of the variables in dataset B that was used to test the first four hypotheses. On average, youth committed 1.7 types of criminal and delinquent behaviors between wave 5 and wave 6, with a minimum of 0 and a maximum of 11. The mean age of the youth was 13.9 as of the end of 1996 or 19.9 when delinquency was measured; half of the youth were males. Around 26% of the youth were black, and 21% were Hispanic. The average educational level of the youths' parents was between middle and high school.

[6] It is recommended that if the measure of skewness exceeds ±2 or the measure of kurtosis exceeds ±7, the assumption of univariate normality is considered to be violated in SEM. Though parameter estimates are generally unbiased, there are several unwanted consequences. First, standard errors associated with parameters tend to be small, and t tests for parameters are often significant. Next, Chi-Squares tend to be inflated, which lead to a rejection of the null hypothesis of model-data fit when it is true. In other words, Type I error rate increases as a consequence of a highly skewed data distribution. Also, other fit indices that are a function of Chi-Square tend to be inflated, and they collectively could send out inconsistent information. Therefore, ML is not an appropriate estimator under this situation, and other estimators are preferable.

On average, youths' annual job income was about $6,557, with a maximum income of $35,558 and a relatively large standard deviation, which indicated that the job income level varied widely among the surveyed youth. Youth received, on average, $586 from their families, with a fairly large maximum value as $41,500 and a large standard deviation, which indicated that the monetary resources from youth families also varied widely.

Dataset C: Wave 5 through Wave 7 – All NLSY97 Youth

Dataset C used measures of delinquent and criminal behaviors at wave 7, which is one year after dataset B. Table 5.4 exhibits the basic descriptive statistics of the variables in the dataset C that was used to test the first four hypotheses. On average, youth committed 1.6 types of criminal and delinquent behaviors between wave 6 and wave 7, with a minimum of 0 and a maximum of 11. The mean age of the youth was 20.9 by the end of 7th survey year, with half being male. Around 27% of the youth were black, and 21% were Hispanic. The average educational level of the youths' parents was between middle and high school, with fathers having a slightly higher average educational level. By wave 6, on average, youths' annual job income was about $6,226, with a maximum of $42,458. A relatively large standard deviation (Std. Dev. = 8,048) indicated that the job income level varied even wider among the surveyed youth than in previous waves. Youth received, on average, $676 from their families, with a fairly large maximum value of $49,179 and a large standard deviation, which indicated that the monetary resources from youth families varied widely across individuals.

Dataset D: Wave 3 through Wave 5 — Youth Who Lived with Both Parents

Table 5.5 shows the basic descriptive statistics of the variables in dataset D that was used to test the last hypothesis regarding parental control as an intervening variable. On average, youth committed 1.6 types of criminal and delinquent behaviors between waves 4 and 5, with the minimum value of 0 and the maximum value of 11. The mean age of the youth was 12.9 as of the end of 1996, with 53% of the youth being male. Around 17% of the youth were black, and 22% were Hispanic. The average educational level of the youths' parents was between middle and high school. On

average, youths' annual job income was about $2,439, with a maximum income of $30,623 and a relatively large standard deviation, which indicated that the job income level varied widely among the working youth who lived with both parents. Youth received, on average, $332 from their families in a year, with a maximum of $82,375 and a large standard deviation, which indicated that the monetary resources from youth families also varied broadly and the distribution of this variable was positively skewed. At wave 1, the mean annual income of youths' parent(s) was $45,056, with the maximum value exceeding $400,000, which was very close to the statistics of the entire sample of NLSY97.

Dataset E: Wave 4 through Wave 6 — Youth Who Lived with Both Parents

Table 5.6 displays the descriptive statistics of the variables in dataset E that were used to test the last hypothesis. On average, youth committed 1.6 types of criminal and delinquent behavior between wave 5 and wave 6, with a minimum of 0 and a maximum of 11. The mean age of the youth was 12.5 as of the end of 1996, with 54% being male. Around 17% of the youth were black, and 23% were Hispanic. The average educational level of the youths' parents was between middle and high school. On average, youths' annual job income was around $2,952, with a maximum income of $35,558. The large standard deviation of youth job income indicated that the job income level varied widely among the working youth, and the skewness value (3.1) indicated a positive skew distribution of youth job income. Youth received, on average, $328 from their families in a year, with a fairly large maximum value of $15,926 and a fairly large standard deviation, which indicated that the monetary resources from youth families also varied broadly. At wave 1, the mean annual income of youth parent(s) was $43,732, with the maximum value exceeding $400,000, which was very close to the statistics of all the NLSY97 youths.

Dataset F: Wave 3 through Wave 5 — Youth Who Lived with a Single Parent

Table 5.7 displays the descriptive statistics of the variables in dataset F used to test the last hypothesis. On average, youth committed 1.8 different types of delinquent behaviors between wave 4 and wave 5, with a minimum of 0 and a maximum of 11.

The mean age of the youth was 13 as of the end of 1996, with 49% being male. It was worth addressing that around 40% of the youth were black which was almost double that of other datasets, and 20% of the youth were Hispanic. Their parents' educational level was between middle and high school. On average, youths' annual job income was around $2,585, with a maximum income of $22,000. The large standard deviation of youth job income indicated that the job income level varied widely among the working youth, and the skewness value (2.5) also indicated a positive skew distribution of youth job income, with the majority of working youth making less than the group average. Youth received, on average, $304 from their families in a year, with a fairly large maximum of $14,833 and a fairly large standard deviation, which indicated that the monetary resources from youth families also varied broadly. At wave 1, the mean annual income of youths' parent was $19,808, with the maximum income closed to $200,000, which was slightly less than half of youths who lived with both parents.

Dataset G: Wave 4 through Wave 6 — Youth Who Lived with a Single Parent

Table 5.8 displays the descriptive statistics of the variables in dataset G used to test the last hypothesis. On average, youth committed almost two different types of criminal and delinquent behavior between wave 5 and wave 6, with the minimum value of 0 and the maximum value of 10. The mean age of the youth was 12.5 as of the end of 1996; 48% of the youth were male. Around 39% of the youth were black, and 20% were Hispanic. The educational level of youth parent(s) was between middle high and high school. The mean value of youths' annual job income was around $3,102, with a maximum income of $35,558. The large standard deviation of youth job income indicated that the job income level varied widely among the working youth, and the skewness value (3.61 before transforming the variable) also indicated a positively skewed distribution of youth job income, with the majority of working youth making less money than the mean. Youth received around $349 from their families in a year, with a fairly large maximum value of $17,450 and a fairly large standard deviation, which indicated that the monetary resources from youth families also varied widely. At wave 1, the mean income of youths' parent was $21,239, with the maximum annual income

close to $230,000. The average parental income of youths living with a single parent was, not surprisingly, about half that of youths who lived with both parents.

SEM Results

Impacts of Ladder Jobs and Employment

Figure 5.1 presents the results of testing the first hypothesis (the effect of ladder jobs) when using dataset A (waves 3-5, all youth). The result of this analysis did not support the impact of "ladder jobs" on youths' delinquent behaviors. However, when job related variables were measured at later waves, as in datasets B and C, "ladder jobs" showed a significant crime-decreasing effect. In 7 estimated models (Table 5.9), "ladder jobs" significantly suppressed delinquency in six models, with one that was marginally significant. In A1 model (see also Figure 5.1) with employment and ladder jobs measured at wave 3, it is very likely that youths were too young to be impacted by ladder jobs, especially since variation of the ladder job score was minimal because few youth held ladder jobs. In addition, employment consistently demonstrated a statistically significant positive relationship with delinquency, after controlling for a conservative indicator of low self-control, demographics, family backgrounds, monetary resources from family, and work hours. That is, being employed, regardless of whether it was measured regarding two years earlier or pertained to the same period for which delinquency was measured, increased youths' self-reported delinquent and criminal acts.

It is worth mentioning that the ratio of the ladder job score coefficient to the employment coefficient increased when later waves data were used within each dataset. Thus, the crime-decreasing effect of holding ladder jobs gradually canceled out the crime-increasing effect of being employed among young individuals as they aged. In sum, the first hypothesis was largely supported by the data, and the documented crime-increasing effect of jobholding among adolescents was confirmed.

The Mediating Role of Job Income

Figure 5.2 presents the results of testing the second and third hypotheses by using dataset B. The result of this analysis did not support the hypothesis regarding the intervening role of job income between "ladder jobs" and youths' delinquent behaviors, but the third hypothesis, which proposed that job income mediates the impact of employment on delinquency, was supported. When job related variables were measured at later waves, including those in datasets B and C, job income consistently mediated the impact of employment on youth delinquency (Table 5.10). Among 11 models, job income was positively and significantly associated with delinquent and criminal behaviors in nine models, controlling for monetary resources from family, an indicator of low self-control, demographics, family background traits, and work hours. In other words, increase in monetary resources resulting from employment increased the chance of committing varied delinquent behaviors among working youths.

Not surprisingly, being employed is positively associated with job income, an association that was significant level at the 0.001 level across eleven models. However, a higher ladder job score was not significantly related to job income, except in one model that the association was marginally significant (<.1). That is, holding a ladder job position generally did not translate into a higher pay, at least not the case among adolescents. The results confirmed the notion that ladder jobs pay off in the long run once attractive careers are well underway, but do not necessarily pay well in the short run. In sum, the second hypothesis regarding the indirect route of ladder job on delinquency via job income was not supported. On the other hand, the third hypothesis was supported—job income significantly and consistently mediated the crime-increasing impact of employment on youths' delinquent and criminal behaviors.

The Mediating Role of Job Stability

By using dataset C (wave 5-7, all youth), Figure 5.3 presents the results of testing the fourth hypothesis that job stability mediates the effect of "ladder jobs" on delinquent behaviors. The results of this analysis supported this hypothesis. When job related variables and job stability were measured at later waves, including those in datasets B and C, job stability consistently mediates the impact of "ladder jobs" on youth delinquency (Table 5.11). Job stability was negatively and significantly associated with

youths' self-reported anti-social behaviors, and the finding was consistent across 11 models. Net of other job related factors (e.g., job income, working hours, ladder jobs), a stable job appeared to be associated with a lower level of delinquency among adolescents. The continuing association between employers and employees and/or between employees and the occupation bonded working youths to the conventional side of society and provided a suppressing force against delinquency. In sum, the fourth hypothesis was supported – and job stability mediated the impact of ladder jobs on delinquency.

The Mediating Role of Parental Control

To test this hypothesis, four datasets (D, E, F, and G) were used because of restrictions of the survey design—parental control indicators were only measured from particular youths in some age groups at particular waves.

Figure 5.4 presents estimates of a model used to test this hypothesis by using dataset D, in which parental control indicators were measured from both parents at wave 3. The results did not support the hypothesis that parental control mediates the impact of youth employment on delinquency. Although parental control was significantly and negatively associated with delinquent and criminal behaviors, as expected, it did not help explain how employment affected delinquency because employment showed no significant impact on parental control, either directly or via job income.

When using dataset D, the overall model fit was adequate. The model Chi-Square value was approximately 1196.7 with 119 degrees of freedom, indicating a likelihood ratio statistic of over 10 and a poor model fit. However, other model fit indices, such as CFI (0.907), RMSEA (0.057), and SRMR (0.049) suggested an adequate fit between the data and the specified model, when compared with the recommended cutoff points of these indices: 0.9, 0.08, and 0.1, respectively.

Figure 5.5 displays the estimates of a model testing this hypothesis by using dataset E, which covers variables measured one wave later than in dataset D, i.e. when the youth were one year older. Again, the results did not support the hypothesis that parental control mediates the impact of youth employment on delinquency. Again, although parental control was significantly and negatively associated with youth

delinquent and criminal behaviors, the association between employment and parental control was not statistically significant, for either the direct relationship or the indirect relationship via job income.

Using dataset E, the overall model fit was adequate. The model Chi-Square value was approximately 745 with 120 degrees of freedom, indicating a likelihood ratio statistic of over 6 and a relatively poor model fit. Nevertheless, other model fit indices, such as CFI (0.903), RMSEA (0.054), and SRMR (0.048) suggested an adequate fit between the data and the specified model, when compared with the recommended cutoff points of these indices: 0.9, 0.08, and 0.1, respectively.

Figure 5.6 presents the results of testing the last hypothesis by using dataset F, which comprised youths who lived with a single parent. The results of this analysis did not support the last hypothesis either. That is, parental control did not mediate the impact of youth employment. In this dataset, parental control was significantly and negatively associated with youth delinquent and criminal behaviors; however, youth employment was not significantly associated with parental control. Thus, contrary to expectation, youth employment did not appear to reduce a single parent's control of the youth.

When using dataset F, the overall model fit was good. The model Chi-Square value was approximately 261.4 with 67 degrees of freedom, indicating a likelihood ratio statistic under the oft-cited cutoff value 5 and a fairly good model fit. In addition, other model fit indices, such as CFI (0.923), RMSEA (0.046), and SRMR (0.036), all suggested an adequate fit between the data and the specified model, when compared with the recommended cutoff points of these indices: 0.9, 0.08, and 0.1, respectively.

Figure 5.7 shows the results of testing the fifth hypothesis by using dataset G, which includes variables measured one wave later than in dataset F, and again the results did not support the last hypothesis regarding parental control as an intervening variable. Even though a higher level of parental control was significantly associated with a lower level of youth delinquent and criminal behaviors, youth employment was not significantly associated with parental control, either directly or indirectly via job income.

When using dataset G, the overall model fit was good. The model Chi-Square value was approximately 189.2 with 67 degrees of freedom, indicating a likelihood ratio statistic below 3, which was under the oft-cited cutoff value 5. Additionally, other model fit indices, including CFI (0.929), RMSEA (0.046), and SRMR (0.039), all suggested an adequate fit between the data and the specified model, when compared with the recommended cutoff points of these indices: 0.9, 0.08, and 0.1, respectively.

Summary

Overall, three out of five proposed hypotheses were supported. The final model includes both job income and job stability as mediating variables. The first hypothesis was supported. Out of seven models (models A1 through C3 in Table 5.9) tested using datasets A, B, and C, "ladder jobs" demonstrated a significant crime-decreasing effect in six models, with the remaining model, which measured "ladder jobs" at the earliest wave (wave 3), showed no significant effect. This insignificant finding possibly was attributed to the subjects' relative young age and the limited variation in employment. The career potential of a job may not be all that important to younger teens. The second hypothesis regarding whether job income mediates the impact of "ladder jobs" on delinquency was not supported. Even though job income exhibited a significant crime-increasing effect in 9 out of 12 models (models A11 through C31 in Table 5.10), the impact of "ladder jobs" on job income was not significant, except for one significant at the marginal level. The third hypothesis regarding whether job income mediates the impact of employment on delinquency was supported. Employment was indirectly associated with a higher level of delinquency via a higher level of job income, when the direct crime-increasing effect of employment was taken into account. Having a job increases delinquent behavior among young people, and does so partly because employment increases the money available to them.

The fourth hypothesis regarding the mediating role of job stability was supported. Job stability consistently demonstrated a significant crime-decreasing effect in all ten models (models A111 through C121 in Table 5.11). In addition, a higher ladder job

score was significantly associated with a higher score of job stability. That is, youths who held more future-oriented positions tended to continue the association with the same employers or to hold the same type of positions in the following year. Collectively, ladder jobs both directly and indirectly (via job stability) suppressed youths' delinquent and criminal behaviors.

The last hypothesis regarding parental control as a mediating variable was not supported when using any of four different datasets, with two comprised of youths who lived with both parents (D and E) and the other two comprised youths who lived with a single parent (F and G). In all the models tested with the four datasets, the latent factor of parental control was significantly and negatively associated with youth delinquency, but direct supervisions of the youths' father and/or mother did not serve as a mediating factor between youth employment and self-reported anti-social behaviors. Youths' employment status had no significant impact on the subsequent parental control, in either two-parent or single-parent households.

After reviewing the case components across these seven datasets, the most notable differences are the age of youth when their employment information was asked and the amount of variation in the ladder job scores. "Ladder jobs" significantly decreased self-report delinquency when dataset C was used, in which youths were 18 and above by the time when they reported their delinquent and criminal behaviors. In addition, about 11% of youth held an occupational position rated 2.5 or higher on the ladder job scale at wave 5 in dataset C. In the rest of datasets, youths were younger because earlier waves of data were used. The variation of "ladder job" was smaller, with 6%, 9%, 2%, 5%, 3%, and 4% of youth holding an occupational position rated 2.5 or higher on the ladder job scale at the first wave covered in datasets A, B, D, E, F, and G, respectively. The possibility that the effect of job on delinquency is contingent on youths' age is further discussed and elaborated in the following chapter.

CHAPTER 6

CONCLUSIONS AND DISCUSSION

The purpose of this dissertation is two-fold: to assess the impact of "ladder jobs" on delinquent behavior and to evaluate factors that could mediate the effect of employment on delinquent behavior. It was first hypothesized that an occupational position with a higher "ladder job score" should initiate a more attractive career, establishing a stronger "commitment to conventional activities," and thus a stronger stake in conventional society, which would in turn lead to a less delinquent behavior. Within this framework, three mediating factors – job income, job stability, and parental control – were then introduced to further detail the mechanism, to test whether they mediated the effect of employment on delinquency.

Varied theoretical frameworks offer different predictions concerning the effect of employment on crime, with scholars foreseeing opposite directions of the impact (Hirschi, 1969, 1983; Sampson and Laub, 1993; Merton, 1968). These forecasts are diverse for an important reason—there are many different characteristics of occupations, and these characteristics can be linked to varied theoretical frameworks from different angles. As a consequence, prior research, based on different standpoints, conceptualized and operationalized employment substantially differently emphasizing career stake, the financial and non-financial rewards of jobs, employment stability, the difference between first and secondary labor market jobs, the commitment and involvement implications of employment, and so forth. These different emphases lead to very dissimilar expectations as to findings and conclusions (Apel, et al., 2006; Crutchfield and Pitchford, 1997; Grogger, 1998; Huiras, Uggen, and McMorris, 2000; McMorris and Uggen, 2000; Ploeger, 1997; Sampson and Laub, 1993; Uggen, 1999). Furthermore, the impact of employment on criminal behaviors seems to be highly contingent upon age, and at different life stages (e.g., early adolescence, late adolescence, and young adulthood). Prior research also suggested that the impact of some job characteristics (e.g., pay, work intensity, autonomy, job quality, prestige) can

fluctuate dramatically for individuals at different life stages, especially before and after the transition from adolescence to adulthood (Agnew, 1986; Staff and Uggen, 2003).

In this dissertation, I attempted to avoid the last concern by using a set of longitudinal data collected from a relatively homogenous group of youth who were eligible for employment in the U.S. labor market by their mid-adolescence. In addition, I explored the innovative idea of "ladder jobs" that should increase young working Americans' human and social capital, increase their stake in conformity, enhance their commitments, bond them to the conventional society, deter them from stepping into deviant situations, and ultimately suppress their delinquent and criminal behaviors.

The results provided supportive but mixed evidence for the five hypotheses formulated in Chapter 4. In the following sections, I will summarize and discuss the findings from SEM analyses, accompanied by my interpretations and explanations. Discussions of research limitations and future directions are provided as well.

Ladder Job, Employment, and Delinquency

SEM analyses support the conclusion that ladder jobs generally have a crime-decreasing effect, while employment in general has a crime-increasing effect on American youths. The variable "ladder job scores" showed a significant crime-decreasing effect in 6 out of 7 base models, when a conservative indicator of self-control, demographics, family backgrounds, monetary resources, and working hours were statistically controlled. The direct crime-decreasing effect of "ladder jobs" remained when the mediating variables, job income and job stability, were introduced. The theoretical sound framework of "ladder jobs," particularly those characteristics extended from the social control perspective, was supported empirically.

Furthermore, it is worth noting that the relative magnitude of the effect of "ladder jobs" versus employment increased as youths grew up. In these datasets, the age range spanned the transitional stage from high school student to young adult. As youths grew older, the crime-decreasing effect of "ladder jobs" gradually increased, even though the crime-increasing effect of employment cancelled out at least part of the

beneficial impact of "ladder jobs." As suggested by Sampson and Laub's (1993) age-graded life course theory, the choice of occupation may become a more important turning point that influences the propensity for subsequent delinquency. A much more extended follow-up is necessary to carefully assess whether the trajectory of delinquency is altered by employment in a ladder job, especially when later waves of NLSY97 become available.

An alternative explanation of the crime-reducing impact of holding a ladder job is that youths who hold "ladder jobs" may also tend to associate with more pro-social co-workers in the workplace. As Wright and Cullen (2004) asserted, the transitional period offered an opportunity for individuals to associate with a new group of colleagues and gradually sanitized the impact of old peers. The significant effect of "ladder jobs" probably partially reflects pro-social working environments that youths are exposed to. Assuming employees tend to associate with colleagues who hold similar kind of jobs, youths who hold occupational positions with higher ladder job scores should also associate with others holding positions with higher ladder job scores. Conceptually, people who hold more career-oriented positions should exhibit more pro-social attitudes or characteristics because of their commitment to and investment in a conventional future. Collectively, youths who hold positions with higher "ladder job scores" should associate with and/or identify with a group of more pro-social individuals. As a result, a lower level of delinquent and criminal acts is expected. However, NLSY97 did not collect any data that measured how pro-social youths' co-workers were in the first seven waves, and thus, I was not able to assess any effects of pro-social co-workers. In the future, any dataset that collect both pro-social work setting measures and Census Occupation Codes (or parallel standardized occupational codes) could will help distinguish different effects, particularly those of "ladder jobs" and of pro-social co-workers, during the transitional period from late adolescence to young adulthood.

In all the estimated models, employment showed a significantly positive association with delinquency. Such findings were generally consistent with prior research focusing on the impact of adolescents' work which generally concluded that there was a crime-increasing effect of work while youth are going to school

(Greenberger and Steinberg, 1986; Mihalic and Elliott, 1997; Staff and Uggen, 2003). This unfortunate effect is confirmed in this dissertation.

Financial Resources, Parental Control, Job Stability, and Delinquency

Among 12 models (Table 5.10), job income demonstrated a positive association with delinquency in 9 models. The findings suggested that a higher level of income from jobs, including salary, wages, tips and other compensation, may not function primarily as a strain-reliever among adolescents. Thus, the findings did not support traditional strain theories, which argue that more economic resources reduce strain and consequently decrease criminal acts (Merton, 1968; Cohen, 1955; Cloward and Ohlin, 1960). Instead, the results supported Wright et al.'s (2001) empirical finding that there is a crime-increasing effect of job income, net of other job-related variables and other financial resources (e.g., money from family).

Indeed, more monetary resources appear to increase the variety of delinquent behavior. All the estimated models showed positive associations between money from family and delinquency (results are available upon request). Even though the public policy implication is unclear at this point, the practical implication to parent(s) probably is more straight-forward. Some might expect that a stronger parental control could be enhanced by a more sufficient or resourceful supply of money from families, but the findings did not consistently support this viewpoint. The impact of money from family on the level of parental control was only marginally significant in one of four models.

Job stability was significantly and negatively associated with youths' delinquent and criminal behaviors in all ten models (Table 5.11). In addition, although the variation of "ladder job scores" was fairly small in earlier waves, this variable was positively associated with job stability, with significance levels of at least at .01, across models. That is, occupational positions with higher ladder job scores significantly increase the likelihood of job holders' continuing to hold the same position and/or being employed by the same employer.

Aligned with the finding in Sampson and Laub's (1993) classic study *Crime in the Making*, obtaining a career-oriented ladder job could be a substantial turning point among late-adolescents and young adults. However, taking into account the fact that the vast majority of working adolescents were employed in positions that required only lower-level skills (Agnew, 1986; Freeman, 1995; Mihalic and Elliott, 1997; National Research Council, 1998), it is generally agreed that not much meaningful social capital can accumulated in the typical job held by young people. In this dissertation it was confirmed that a only very small proportion of youths' primary job positions were classified as ladder jobs (rated 2.5 or above on a four-point ladder job scale). If it is not too soon to exclude the benefits of cumulated social capital from stable jobs, further research should be devoted to investigating other aspects of job stability that help explain the reduction of delinquency among stable young workers.

Consistent with the expectation, parental control was negatively associated with youths' self-reported delinquent and criminal behaviors in all four models that tested this effect (Figure 5.4 through 5.7), but the mediating role of parental control was not supported. Similar to Ploeger's (1997) finding, the evidence did not support the hypothesis that the crime-increasing effect of job income was routed through diminished parental control. One possible explanation why Wright et al.'s (2001) obtained results supporting a mediating effect of parental control was that their measures focused on parental affection, while those of the NLSY97 focused on the degree of direct-supervision exercised by parents. Specifically, youths' emotional closeness with parents may reflect a different aspect of parental control from parents' knowledge of youths' peer associations. If that is the case, the implication of the empirical findings in Wright et al. is that they point to the importance of emotional bonding between parents and youths, which will exhibit weakening influence on youths' behaviors and decision-makings as adolescents come to spend more time with peers as they grow up, less time with parents, and have more opportunities to associate with new people in varied institutional settings.

Another plausible explanation of the impact of monetary resources on delinquency is that more monetary resources better finance youth's social activities and increase the frequency and the duration of time spent with peers. Consequently, the

chance to meet other delinquents or to step into crime-prone situations increases. Ploeger (1997) suggested that a broader social network is open to working youth – they have both the financial means and social opportunities to escalate their chance of delinquency, even if the level of parental supervision is unaffected by the youth's employment.

Limitations of Methodology

Data-Model Fit

Even though the Chi-Square test of data-model fit in all twelve models testing job income as a mediating variable (A11 through C31), all ten models testing both job income and job stability as mediating variables (A111 through C121), and four models testing parental control were significant, it should not invalidate the proposed models. Several statistical reasons should be considered here. It was suggested that moderately to severely non-normal data could distort findings in regards to data-model fit: fit indices tend to over-reject correctly specified models (Finney and DiSteFano, 2006). Although data transformations were applied to several variables before conducting analyses, quite a few other variables still exceeded the traditional range of acceptable skewness and kurtosis levels (from +1 to -1), which might suggest a moderate violation of this assumption. In addition, leptokurtic distributions tend to inflate Chi-Square, and Chi-Square-based fit indices are thus inflated. Several variables in the analyses, including the delinquency variable, demonstrated such a pattern of distribution.

Next, one camp of statisticians has argued that ordinal data are inherently non-normal, which can adversely affect fit indices. The estimate of parameters could be seriously biased when the ordinal variables have four or fewer categories. In this dissertation, parental control indicators were measured by a 5-point scale, which is relatively robust against the above concern. However, job stability is an index that is the sum of two dichotomous variables, and "ladder job scores" are the arithmetic average of a four-point scale. Collectively, these statistical problems could explain the less

satisfactory data-model fit measures, particularly the Chi-Square test results. As a consequence, a correctly specified model derived from theories may not fit the data well which could lead researchers to wrongly reject a plausible model.

Measure of Delinquency[7]

An alternative approach for measuring delinquency and crime is to treat the concept as a latent factor within the structure of SEM. The measuring items will serve as indicators that reflect the construct of criminality. This approach allows researchers to also take measurement errors, which appears to be the norm in criminological research, into consideration when modeling. However, the individual measures of delinquent behavior were dichotomously coded in NLSY97. The latent factor approach would therefore fall afoul of the problem of non-normality. Future research can consider utilizing different estimators, such as WLS, WLSM, or WLSMV, that are developed to provide adjusted parameter estimates and fit indices.

Job Variation

Still, another limitation is the smaller job variation in this study, which is a consequence of the case selection criteria used in the NLSY97. It was unfortunate that NLSY97 only collected parental control variables, one of the key mediating variables in this dissertation, for three age groups (ages 12 to 14 as of 12/31/1996) since wave 1 and stopped collecting these indicators by wave 6. This placed a necessary restriction on the qualified cases (for details, see the "Final Cases Selection" section of Chapter 4). As a consequence, when youths were 14 to 18 years old by wave3, the case selection criteria further decreased the variation of "ladder job scores" because the remaining subjects were younger when surveyed. In conjunction with the available jobs for young, youths' ages further limited their attractiveness to employers for competitive-pay employment. In addition, government enforce other age-based restrictions on work intensity. Since many "ladder jobs" may require full-time employment, the combination

[7] Some readers may believe that the structural difference between juvenile delinquency and criminal conducts may impact the result of analyses. With substance abuse as the measure of delinquency, the findings remain the same. The results are available upon request.

of youth's school obligations and these employment restrictions further limited the variation of employment among youth in several datasets[8].

Another aspect of youth employment that was not covered in this dissertation is worth addressing in future research – whether early working experience in "non-ladder jobs" predicts later employment in "ladder jobs." Although jobs available to adolescents are limited and largely classified as "non-ladder," even work experience in non-ladder jobs may help youth learn the expectations and professional standard of "ladder jobs" which they may qualify for down the road. Some prior research has suggested that high school employment with moderate intensity of work hours is beneficial in the sense of improving the transition to employment upon high school graduation (D'Amico, 1984; Meyer and Wise, 1982).

I found that jobs with more potential for career growth show evidence of both direct and indirect (via job stability) crime-decreasing effects among working adolescents. These affects may be strongest at the time in their lives when they face a significant transition in life, as they graduate from high school. Also, working youths who hold positions with higher "ladder job scores" are more likely to continue working for the same employer and/or in the same position, and such stable contexts translate into a lower level of delinquency among adolescents. On the other hand, the increased income that results from employment appears to backfire and produce a crime-increasing effect among youth. Future research in employment/crime studies should further explore the arena of "ladder jobs" to help understand more fully the relationship between youth employment and crime. The longitudinal design of this study provides important advantages over cross-sectional designs for drawing causal inferences about the relationship between job types and delinquency. The crime-decreasing impact of "ladder jobs" on working youth requires further investigation, though it probably would be difficult to justify any programmatic assignment of "ladder jobs" to any particular group of individuals. Policymakers might address the importance of future-oriented features of occupations and of internships, and not just the immediate monetary gains

[8] I also operationized employment as "percentage of employed weeks in a year" and conducted another set of analyses. However, such operationalization shifted the focus of the concept from "working experience" (D'Amico, 1984; Meyer and Wise, 1982) to "duration of work." While the mainstream focus of this filed is on "work intensity" (e.g., how many hours youth work?), the duration reflects another different aspect of employment. The results are available upon request.

from the employment. A job that pays little now, but improves the chances of a long-term career appears to better from a crime-prevention standpoint than a dead-end job that pays relatively well in the short run.

APPENDIX A

THE LIST OF OCCUPATIONS IN THE CENSUS 2002 INDUSTRY AND OCCUPATION CODES

This appendix lists occupations and their definitions borrowed from the Census 2002 Industry and Occupation Codes.

Classification*	Title	Definition
	Chief Executives	Determine and formulate policies and provide the overall direction of companies or private and public sector organizations within the guidelines set up by a board of directors or similar governing body. Plan, direct, or coordinate operational activities at the highest level of management with the help of subordinate executives and staff managers.
	General and Operations Managers	Plan, direct, or coordinate the operations of companies or public and private sector organizations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services. Include owners and managers who head small business establishments whose duties are primarily managerial. Exclude "First-Line Supervisors/Managers of Retail Sales Workers" (41-1011) and workers in other small establishments.
	Legislators	Develop laws and statutes at the Federal, State, or local level. Include only elected officials.
	Advertising and Promotions Managers	Plan and direct advertising policies and programs or produce collateral materials, such as posters, contests, coupons, or give-aways, to create extra interest in the purchase of a product or service for a department, an entire organization, or on an account basis.
	Marketing Managers	Determine the demand for products and services offered by a firm and its competitors and identify potential customers. Develop pricing strategies with the goal of maximizing the firm's profits or share of the market while ensuring the firm's customers are satisfied. Oversee product development or monitor trends that indicate the need for new products and services.
	Sales Managers	Direct the actual distribution or movement of a product or service to the customer. Coordinate sales distribution by establishing sales territories, quotas, and goals and establish training programs for sales representatives. Analyze sales statistics gathered by staff to determine sales potential and inventory requirements and monitor the preferences of customers.
	Public Relations Managers	Plan and direct public relations programs designed to create and maintain a favorable public image for employer or client; or if engaged in fundraising, plan and direct activities to solicit and maintain funds for special projects and nonprofit organizations.
	Administrative Services Managers	Plan, direct, or coordinate supportive services of an organization, such as recordkeeping, mail distribution, telephone operator/receptionist, and other office support services. May oversee facilities planning and maintenance and custodial operations. Exclude "Purchasing Managers" (11-3061).
	Computer and Information Systems Managers	Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming. Exclude "Computer Specialists" (15-1011 through 15-1099).
	Financial Managers	Plan, direct, and coordinate accounting, investing, banking, insurance, securities, and other financial activities of a branch, office, or department of an establishment.
	Compensation and Benefits Managers	Plan, direct, or coordinate compensation and benefits activities and staff of an organization. Include job analysis and position description managers.
	Training and Development Managers	Plan, direct, or coordinate the training and development activities and staff of an organization.
	Human Resources Managers, All Other	All Human Resources Managers not listed separately.
	Industrial Production Managers	Plan, direct, or coordinate the work activities and resources necessary for manufacturing products in accordance with cost, quality, and quantity specifications.
	Purchasing Managers	Plan, direct, or coordinate the activities of buyers, purchasing officers, and related workers involved in purchasing materials, products, and services. Include wholesale or retail trade merchandising managers and procurement managers.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Transportation, Storage, and Distribution Managers	Plan, direct, or coordinate transportation, storage, or distribution activities in accordance with governmental policies and regulations. Include logistics managers.
	Farm, Ranch, and Other Agricultural Managers	On a paid basis, manage farms, ranches, aquacultural operations, greenhouses, nurseries, timber tracts, cotton gins, packing houses, or other agricultural establishments for employers. Carry out production, financial, and marketing decisions relating to the managed operations following guidelines from the owner. May contract tenant farmers or producers to carry out the day-to-day activities of the managed operation. May supervise planting, cultivating, harvesting, and marketing activities. May prepare cost, production, and other records. May perform physical work and operate machinery.
	Farmers and Ranchers	On an ownership or rental basis, operate farms, ranches, greenhouses, nurseries, timber tracts, or other agricultural production establishments which produce crops, horticultural specialties, livestock, poultry, finfish, shellfish, or animal specialties. Include operators of cotton gins, packing houses, and other post-harvest operations. May plant, cultivate, harvest, perform post-harvest activities, and market crops and livestock; may hire, train, and supervise farm workers or supervise a farm labor contractor; may prepare cost, production, and other records. May maintain and operate machinery and perform physical work.
	Construction Managers	Plan, direct, coordinate, or budget, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems. Participate in the conceptual development of a construction project and oversee its organization, scheduling, and implementation. Include specialized construction fields, such as carpentry or plumbing. Include general superintendents, project managers, and constructors who manage, coordinate, and supervise the construction process.
	Education Administrators, Preschool and Child Care Center/Program	Plan, direct, or coordinate the academic and nonacademic activities of preschool and child care centers or programs. Exclude "Preschool Teachers" (25-2011).
	Education Administrators, Elementary and Secondary School	Plan, direct, or coordinate the academic, clerical, or auxiliary activities of public or private elementary or secondary level schools.
	Education Administrators, Postsecondary	Plan, direct, or coordinate research, instructional, student administration and services, and other educational activities at postsecondary institutions, including universities, colleges, and junior and community colleges.
	Education Administrators, All Other	All education administrators not listed separately.
	Engineering Managers	Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields. Exclude "Natural Sciences Managers" (11-9121).
	Food Service Managers	Plan, direct, or coordinate activities of an organization or department that serves food and beverages.
	Funeral Directors	Perform various tasks to arrange and direct funeral services, such as coordinating transportation of body to mortuary for embalming, interviewing family or other authorized person to arrange details, selecting pallbearers, procuring official for religious rites, and providing transportation for mourners.
	Gaming Managers and Gaming Department Heads	Plan, organize, direct, control, or coordinate gaming operations in a casino. Formulate gaming policies for their area of responsibility.
	Lodging Managers	Plan, direct, or coordinate activities of an organization or department that provides lodging and other accommodations. Exclude "Food Service Managers" (11-9051) in lodging establishments.
	Medical and Health Services Managers	Plan, direct, or coordinate medicine and health services in hospitals, clinics, managed care organizations, public health agencies, or similar organizations.
	Natural Sciences Managers	Plan, direct, or coordinate activities in such fields as life sciences, physical sciences, mathematics, statistics, and research and development in these fields. Exclude "Engineering Managers" (11-9041) and "Computer and Information Systems Managers" (11-3021).
	Postmasters and Mail Superintendents	Direct and coordinate operational, administrative, management, and supportive services of a U.S. post office; or coordinate activities of workers engaged in postal and related work in assigned post office.
	Property, Real Estate, and Community Association Managers	Plan, direct, or coordinate selling, buying, leasing, or governance activities of commercial, industrial, or residential real estate properties. Include managers of homeowner and condominium associations, rented or leased housing units, buildings, or land (including rights-of-way).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Social and Community Service Managers	Plan, organize, or coordinate the activities of a social service program or community outreach organization. Oversee the program or organization's budget and policies regarding participant involvement, program requirements, and benefits. Work may involve directing social workers, counselors, or probation officers.
	Managers, All Other	All managers not listed separately.
	Agents and Business Managers of Artists, Performers, and Athletes	Represent and promote artists, performers, and athletes to prospective employers. May handle contract negotiation and other business matters for clients.
	Purchasing Agents and Buyers, Farm Products	Purchase farm products either for further processing or resale. Include Christmas tree contractors, grain brokers and market operators, grain buyers, and tobacco buyers.
	Wholesale and Retail Buyers, Except Farm Products	Buy merchandise or commodities, other than farm products, for resale to consumers at the wholesale or retail level, including both durable and nondurable goods. Analyze past buying trends, sales records, price, and quality of merchandise to determine value and yield. Select, order, and authorize payment for merchandise according to contractual agreements. May conduct meetings with sales personnel and introduce new products. Include assistant buyers.
	Purchasing Agents, Except Wholesale, Retail, and Farm Products	Purchase machinery, equipment, tools, parts, supplies, or services necessary for the operation of an establishment. Purchase raw or semi-finished materials for manufacturing. Include contract specialists, field contractors, purchasers, price analysts, tooling coordinators, and media buyers. Exclude "Purchasing Agents and Buyers, Farm Products" (13-1021) and "Wholesale and Retail Buyers, Except Farm Products" (13-1022).
	Claims Adjusters, Examiners, and Investigators	Review settled claims to determine that payments and settlements have been made in accordance with company practices and procedures, ensuring that proper methods have been followed. Report overpayments, underpayments, and other irregularities. Confer with legal counsel on claims requiring litigation.
	Insurance Appraisers, Auto Damage	Appraise automobile or other vehicle damage to determine cost of repair for insurance claim settlement and seek agreement with automotive repair shop on cost of repair. Prepare insurance forms to indicate repair cost or cost estimates and recommendations.
	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	Examine, evaluate, and investigate eligibility for or conformity with laws and regulations governing contract compliance of licenses and permits, and other compliance and enforcement inspection activities not classified elsewhere. Exclude "Tax Examiners, Collectors, and Revenue Agents" (13-2081) and "Financial Examiners" (13-2061).
	Cost Estimators	Prepare cost estimates for product manufacturing, construction projects, or services to aid management in bidding on or determining price of product or service. May specialize according to particular service performed or type of product manufactured.
	Emergency Management Specialists	Coordinate disaster response or crisis management activities, provide disaster preparedness training, and prepare emergency plans and procedures for natural (e.g., hurricanes, floods, earthquakes), wartime, or technological (e.g., nuclear power plant emergencies, hazardous materials spills) disasters or hostage situations.
	Employment, Recruitment, and Placement Specialists	Recruit and place workers.
	Compensation, Benefits, and Job Analysis Specialists	Conduct programs of compensation and benefits and job analysis for employer. May specialize in specific areas, such as position classification and pension programs.
	Training and Development Specialists	Conduct training and development programs for employees.
	Human Resources, Training, and Labor Relations Specialists, All Other	All human resources, training, and labor relations specialists not listed separately.
	Logisticians	Analyze and coordinate the logistical functions of a firm or organization. Responsible for the entire life cycle of a product, including acquisition, distribution, internal allocation, delivery, and final disposal of resources.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Management Analysts	Conduct organizational studies and evaluations, design systems and procedures, conduct work simplifications and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Include program analysts and management consultants. Exclude "Computer Systems Analysts" (15-1051) and "Operations Research Analysts" (15-2031).
	Meeting and Convention Planners	Coordinate activities of staff and convention personnel to make arrangements for group meetings and conventions.
	Business Operations Specialists, All Other	All business operations specialists not listed separately.
	Accountants and Auditors	Examine, analyze, and interpret accounting records for the purpose of giving advice or preparing statements. Install or advise on systems of recording costs or other financial and budgetary data.
	Appraisers and Assessors of Real Estate	Appraise real property to determine its fair value. May assess taxes in accordance with prescribed schedules.
	Budget Analysts	Examine budget estimates for completeness, accuracy, and conformance with procedures and regulations. Analyze budgeting and accounting reports for the purpose of maintaining expenditure controls.
	Credit Analysts	Analyze current credit data and financial statements of individuals or firms to determine the degree of risk involved in extending credit or lending money. Prepare reports with this credit information for use in decision-making.
	Financial Analysts	Conduct quantitative analyses of information affecting investment programs of public or private institutions.
	Personal Financial Advisors	Advise clients on financial plans utilizing knowledge of tax and investment strategies, securities, insurance, pension plans, and real estate. Duties include assessing clients' assets, liabilities, cash flow, insurance coverage, tax status, and financial objectives to establish investment strategies.
	Insurance Underwriters	Review individual applications for insurance to evaluate degree of risk involved and determine acceptance of applications.
	Financial Examiners	Enforce or ensure compliance with laws and regulations governing financial and securities institutions and financial and real estate transactions. May examine, verify correctness of, or establish authenticity of records.
	Loan Counselors	Provide guidance to prospective loan applicants who have problems qualifying for traditional loans. Guidance may include determining the best type of loan and explaining loan requirements or restrictions.
	Loan Officers	Evaluate, authorize, or recommend approval of commercial, real estate, or credit loans. Advise borrowers on financial status and methods of payments. Include mortgage loan officers and agents, collection analysts, loan servicing officers, and loan underwriters.
	Tax Examiners, Collectors, and Revenue Agents	Determine tax liability or collect taxes from individuals or business firms according to prescribed laws and regulations.
	Tax Preparers	Prepare tax returns for individuals or small businesses but do not have the background or responsibilities of an accredited or certified public accountant.
	Financial Specialists, All Other	All financial specialists not listed separately.
	Computer and Information Scientists, Research	Conduct research into fundamental computer and information science as theorists, designers, or inventors. Solve or develop solutions to problems in the field of computer hardware and software.
	Computer Programmers	Convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. Develop and write computer programs to store, locate, and retrieve specific documents, data, and information. May program web sites.
	Computer Software Engineers, Applications	Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. Exclude "Computer Hardware Engineers" (17-2061).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Computer Software Engineers, Systems Software	Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. Apply principles and techniques of computer science, engineering, and mathematical analysis.
	Computer Support Specialists	Provide technical assistance to computer system users. Answer questions or resolve computer problems for clients in person, via telephone or from remote location. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Exclude "Network and Computer Systems Administrators" (15-1071).
	Computer Systems Analysts	Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software. Exclude persons working primarily as "Engineers" (17-2011 through 17-2199), "Mathematicians" (15-2021), or "Scientists" (19-1011 through 19-3099). May supervise computer programmers.
	Database Administrators	Coordinate changes to computer databases, test and implement the database applying knowledge of database management systems. May plan, coordinate, and implement security measures to safeguard computer databases.
	Network and Computer Systems Administrators	Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet system or a segment of a network system. Maintain network hardware and software. Monitor network to ensure network availability to all system users and perform necessary maintenance to support network availability. May supervise other network support and client server specialists and plan, coordinate, and implement network security measures. Exclude "Computer Support Specialists" (15-1041).
	Network Systems and Data Communications Analysts	Analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems. Perform network modeling, analysis, and planning. Research and recommend network and data communications hardware and software. Include telecommunications specialists who deal with the interfacing of computer and communications equipment. May supervise computer programmers.
	Computer Specialists, All Other	All computer specialists not listed separately.
	Actuaries	Analyze statistical data, such as mortality, accident, sickness, disability, and retirement rates and construct probability tables to forecast risk and liability for payment of future benefits. May ascertain premium rates required and cash reserves necessary to ensure payment of future benefits.
	Mathematicians	Conduct research in fundamental mathematics or in application of mathematical techniques to science, management, and other fields. Solve or direct solutions to problems in various fields by mathematical methods.
	Operations Research Analysts	Formulate and apply mathematical modeling and other optimizing methods using a computer to develop and interpret information that assists management with decision making, policy formulation, or other managerial functions. May develop related software, service, or products. Frequently concentrates on collecting and analyzing data and developing decision support software. May develop and supply optimal time, cost, or logistics networks for program evaluation, review, or implementation.
	Statisticians	Engage in the development of mathematical theory or apply statistical theory and methods to collect, organize, interpret, and summarize numerical data to provide usable information. May specialize in fields, such as bio-statistics, agricultural statistics, business statistics, economic statistics, or other fields. Include mathematical statisticians.
	Mathematical Scientists, All Other	All mathematical scientists not listed separately.
	Mathematical Technicians	Apply standardized mathematical formulas, principles, and methodology to technological problems in engineering and physical sciences in relation to specific industrial and research objectives, processes, equipment, and products.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Architects, Except Landscape and Naval	Plan and design structures, such as private residences, office buildings, theaters, factories, and other structural property.
	Landscape Architects	Plan and design land areas for such projects as parks and other recreational facilities, airports, highways, hospitals, schools, land subdivisions, and commercial, industrial, and residential sites.
	Cartographers and Photogrammetrists	Collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data. Research, study, and prepare maps and other spatial data in digital or graphic form for legal, social, political, educational, and design purposes. May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems.
	Surveyors	Make exact measurements and determine property boundaries. Provide data relevant to the shape, contour, gravitation, location, elevation, or dimension of land or land features on or near the earth's surface for engineering, mapmaking, mining, land evaluation, construction, and other purposes.
	Aerospace Engineers	Perform a variety of engineering work in designing, constructing, and testing aircraft, missiles, and spacecraft. May conduct basic and applied research to evaluate adaptability of materials and equipment to aircraft design and manufacture. May recommend improvements in testing equipment and techniques.
	Agricultural Engineers	Apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products.
	Biomedical Engineers	Apply knowledge of engineering, biology, and biomechanical principles to the design, development, and evaluation of biological and health systems and products, such as artificial organs, prostheses, instrumentation, medical information systems, and heath management and care delivery systems.
	Chemical Engineers	Design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper, and pulp, by applying principles and technology of chemistry, physics, and engineering.
	Civil Engineers	Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. Include architectural, structural, traffic, ocean, and geo-technical engineers. Exclude "Hydrologists" (19-2043).
	Computer Hardware Engineers	Research, design, develop, and test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacturing and installation of computer or computer-related equipment and components. Exclude "Computer Software Engineers, Applications" (15-1031) and "Computer Software Engineers, Systems Software" (15-1032).
	Electrical Engineers	Design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use. Exclude "Computer Hardware Engineers" (17-2061).
	Electronics Engineers, Except Computer	Research, design, develop, and test electronic components and systems for commercial, industrial, military, or scientific use utilizing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls. Exclude "Computer Hardware Engineers" (17-2061).
	Environmental Engineers	Design, plan, or perform engineering duties in the prevention, control, and remediation of environmental health hazards utilizing various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.
	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	Promote worksite or product safety by applying knowledge of industrial processes, mechanics, chemistry, psychology, and industrial health and safety laws. Include industrial product safety engineers.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Industrial Engineers	Design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. Exclude "Health and Safety Engineers, Except Mining Safety Engineers and Inspectors" (17-2111).
	Marine Engineers and Naval Architects	Design, develop, and evaluate the operation of marine vessels, ship machinery, and related equipment, such as power supply and propulsion systems.
	Materials Engineers	Evaluate materials and develop machinery and processes to manufacture materials for use in products that must meet specialized design and performance specifications. Develop new uses for known materials. Include those working with composite materials or specializing in one type of material, such as graphite, metal and metal alloys, ceramics and glass, plastics and polymers, and naturally occurring materials. Include metallurgists and metallurgical engineers, ceramic engineers, and welding engineers.
	Mechanical Engineers	Perform engineering duties in planning and designing tools, engines, machines, and other mechanically functioning equipment. Oversee installation, operation, maintenance, and repair of such equipment as centralized heat, gas, water, and steam systems.
	Mining and Geological Engineers, Including Mining Safety Engineers	Determine the location and plan the extraction of coal, metallic ores, nonmetallic minerals, and building materials, such as stone and gravel. Work involves conducting preliminary surveys of deposits or undeveloped mines and planning their development; examining deposits or mines to determine whether they can be worked at a profit; making geological and topographical surveys; evolving methods of mining best suited to character, type, and size of deposits; and supervising mining operations.
	Nuclear Engineers	Conduct research on nuclear engineering problems or apply principles and theory of nuclear science to problems concerned with release, control, and utilization of nuclear energy and nuclear waste disposal.
	Petroleum Engineers	Devise methods to improve oil and gas well production and determine the need for new or modified tool designs. Oversee drilling and offer technical advice to achieve economical and satisfactory progress.
	Engineers, All Other	All engineers not listed separately.
	Architectural and Civil Drafters	Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Utilize knowledge of building materials, engineering practices, and mathematics to complete drawings.
	Electrical and Electronics Drafters	Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for manufacture, installation, and repair of electrical equipment in factories, power plants, and buildings.
	Mechanical Drafters	Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.
	Drafters, All Other	All drafters not listed separately.
	Aerospace Engineering and Operations Technicians	Operate, install, calibrate, and maintain integrated computer/communications systems consoles, simulators, and other data acquisition, test, and measurement instruments and equipment to launch, track, position, and evaluate air and space vehicles. May record and interpret test data.
	Civil Engineering Technicians	Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.
	Electrical and Electronic Engineering Technicians	Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. Exclude "Broadcast Technicians" (27-4012).
	Electro-mechanical Technicians	Operate, test, and maintain unmanned, automated, servo-mechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment at worksites, such as oil rigs, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Environmental Engineering Technicians	Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental pollution, including waste treatment and site remediation. May assist in the development of environmental pollution remediation devices under direction of engineer.
	Industrial Engineering Technicians	Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May study and record time, motion, method, and speed involved in performance of production, maintenance, clerical, and other worker operations for such purposes as establishing standard production rates or improving efficiency.
	Mechanical Engineering Technicians	Apply theory and principles of mechanical engineering to modify, develop, and test machinery and equipment under direction of engineering staff or physical scientists.
	Engineering Technicians, Except Drafters, All Other	All engineering technicians, except drafters, not listed separately.
	Surveying and Mapping Technicians	Perform surveying and mapping duties, usually under the direction of a surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of topographical maps. Exclude "Surveyors" (17-1022), "Cartographers and Photogrammetrists" (17-1021), and "Geoscientists, Except Hydrologists and Geographers" (19-2042).
	Animal Scientists	Conduct research in the genetics, nutrition, reproduction, growth, and development of domestic farm animals.
	Food Scientists and Technologists	Use chemistry, microbiology, engineering, and other sciences to study the principles underlying the processing and deterioration of foods; analyze food content to determine levels of vitamins, fat, sugar, and protein; discover new food sources; research ways to make processed foods safe, palatable, and healthful; and apply food science knowledge to determine best ways to process, package, preserve, store, and distribute food.
	Soil and Plant Scientists	Conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity.
	Biochemists and Biophysicists	Study the chemical composition and physical principles of living cells and organisms, their electrical and mechanical energy, and related phenomena. May conduct research to further understanding of the complex chemical combinations and reactions involved in metabolism, reproduction, growth, and heredity. May determine the effects of foods, drugs, serums, hormones, and other substances on tissues and vital processes of living organisms.
	Microbiologists	Investigate the growth, structure, development, and other characteristics of microscopic organisms, such as bacteria, algae, or fungi. Include medical microbiologists who study the relationship between organisms and disease or the effects of antibiotics on microorganisms.
	Zoologists and Wildlife Biologists	Study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management, including the collection and analysis of biological data to determine the environmental effects of present and potential use of land and water areas.
	Biological Scientists, All Other	All biological scientists not listed separately.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Conservation Scientists	Manage, improve, and protect natural resources to maximize their use without damaging the environment. May conduct soil surveys and develop plans to eliminate soil erosion or to protect rangelands from fire and rodent damage. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. Exclude "Zoologists and Wildlife Biologists" (19-1023) and "Foresters" (19-1032).
	Foresters	Manage forested lands for economic, recreational, and conservation purposes. May inventory the type, amount, and location of standing timber, appraise the timber's worth, negotiate the purchase, and draw up contracts for procurement. May determine how to conserve wildlife habitats, creek beds, water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine the best time for harvesting. Develop forest management plans for public and privately-owned forested lands.
	Epidemiologists	Investigate and describe the determinants and distribution of disease, disability, and other health outcomes and develop the means for prevention and control.
	Medical Scientists, Except Epidemiologists	Conduct research dealing with the understanding of human diseases and the improvement of human health. Engage in clinical investigation or other research, production, technical writing, or related activities. Include medical scientists such as physicians, dentists, public health specialists, pharmacologists, and medical pathologists. Exclude practitioners who provide medical or dental care or dispense drugs.
	Astronomers	Observe, research, and interpret celestial and astronomical phenomena to increase basic knowledge and apply such information to practical problems.
	Physicists	Conduct research into the phases of physical phenomena, develop theories and laws on the basis of observation and experiments, and devise methods to apply laws and theories to industry and other fields.
	Atmospheric and Space Scientists	Investigate atmospheric phenomena and interpret meteorological data gathered by surface and air stations, satellites, and radar to prepare reports and forecasts for public and other uses. Include weather analysts and forecasters whose functions require the detailed knowledge of a meteorologist.
	Chemists	Conduct qualitative and quantitative chemical analyses or chemical experiments in laboratories for quality or process control or to develop new products or knowledge. Exclude "Geoscientists, Except Hydrologists and Geographers" (19-2042) and "Biochemists and Biophysicists" (19-1021).
	Materials Scientists	Research and study the structures and chemical properties of various natural and manmade materials, including metals, alloys, rubber, ceramics, semiconductors, polymers, and glass. Determine ways to strengthen or combine materials or develop new materials with new or specific properties for use in a variety of products and applications. Include glass scientists, ceramic scientists, metallurgical scientists, and polymer scientists.
	Environmental Scientists and Specialists, Including Health	Conduct research or perform investigation for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or the health of the population. Utilizing knowledge of various scientific disciplines may collect, synthesize, study, report, and take action based on data derived from measurements or observations of air, food, soil, water, and other sources. Exclude "Zoologists and Wildlife Biologists" (19-1023), "Conservation Scientists" (19-1031), "Forest and Conservation Technicians" (19-4093), "Fish and Game Wardens" (33-3031), and "Forest and Conservation Workers" (45-4011).
	Geoscientists, Except Hydrologists and Geographers	Study the composition, structure, and other physical aspects of the earth. May use geological, physics, and mathematics knowledge in exploration for oil, gas, minerals, or underground water; or in waste disposal, land reclamation, or other environmental problems. May study the earth's internal composition, atmospheres, oceans, and its magnetic, electrical, and gravitational forces. Include mineralogists, crystallographers, paleontologists, stratigraphers, geodesists, and seismologists.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Hydrologists	Research the distribution, circulation, and physical properties of underground and surface waters; study the form and intensity of precipitation, its rate of infiltration into the soil, movement through the earth, and its return to the ocean and atmosphere.
	Physical Scientists, All Other	All physical scientists not listed separately.
	Economists	Conduct research, prepare reports, or formulate plans to aid in solution of economic problems arising from production and distribution of goods and services. May collect and process economic and statistical data using econometric and sampling techniques. Exclude "Market Research Analysts" (19-3021).
	Market Research Analysts	Research market conditions in local, regional, or national areas to determine potential sales of a product or service. May gather information on competitors, prices, sales, and methods of marketing and distribution. May use survey results to create a marketing campaign based on regional preferences and buying habits.
	Survey Researchers	Design or conduct surveys. May supervise interviewers who conduct the survey in person or over the telephone. May present survey results to client. Exclude "Statisticians" (15-2041), "Economists" (19-3011), and "Market Research Analysts" (19-3021).
	Clinical, Counseling, and School Psychologists	Diagnose and treat mental disorders; learning disabilities; and cognitive, behavioral, and emotional problems using individual, child, family, and group therapies. May design and implement behavior modification programs.
	Industrial-Organizational Psychologists	Apply principles of psychology to personnel, administration, management, sales, and marketing problems. Activities may include policy planning; employee screening, training and development; and organizational development and analysis. May work with management to reorganize the work setting to improve worker productivity.
	Psychologists, All Other	All psychologists not listed separately.
	Sociologists	Study human society and social behavior by examining the groups and social institutions that people form, as well as various social, religious, political, and business organizations. May study the behavior and interaction of groups, trace their origin and growth, and analyze the influence of group activities on individual members.
	Urban and Regional Planners	Develop comprehensive plans and programs for use of land and physical facilities of local jurisdictions, such as towns, cities, counties, and metropolitan areas.
	Anthropologists and Archeologists	Study the origin, development, and behavior of humans. May study the way of life, language, or physical characteristics of existing people in various parts of the world. May engage in systematic recovery and examination of material evidence, such as tools or pottery remaining from past human cultures, in order to determine the history, customs, and living habits of earlier civilizations.
	Geographers	Study nature and use of areas of earth's surface, relating and interpreting interactions of physical and cultural phenomena. Conduct research on physical aspects of a region, including land forms, climates, soils, plants and animals, and conduct research on the spatial implications of human activities within a given area, including social characteristics, economic activities, and political organization, as well as researching interdependence between regions at scales ranging from local to global.
	Historians	Research, analyze, record, and interpret the past as recorded in sources, such as government and institutional records, newspapers and other periodicals, photographs, interviews, films, and unpublished manuscripts, such as personal diaries and letters.
	Political Scientists	Study the origin, development, and operation of political systems. Research a wide range of subjects, such as relations between the United States and foreign countries, the beliefs and institutions of foreign nations, or the politics of small towns or a major metropolis. May study topics, such as public opinion, political decision making, and ideology. May analyze the structure and operation of governments, as well as various political entities. May conduct public opinion surveys, analyze election results, or analyze public documents.
	Social Scientists and Related Workers, All Other	All social scientists and related workers not listed separately.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Agricultural and Food Science Technicians	Work with agricultural scientists in food, fiber, and animal research, production, and processing; assist with animal breeding and nutrition work; under supervision, conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects. Include technicians who assist food scientists or food technologists in the research, development, production technology, quality control, packaging, processing, and use of foods.
	Biological Technicians	Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.
	Chemical Technicians	Conduct chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for purposes, such as research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences.
	Geological and Petroleum Technicians	Assist scientists in the use of electrical, sonic, or nuclear measuring instruments in both laboratory and production activities to obtain data indicating potential sources of metallic ore, gas, or petroleum. Analyze mud and drill cuttings. Chart pressure, temperature, and other characteristics of wells or bore holes. Investigate and collect information leading to the possible discovery of new oil fields.
	Nuclear Technicians	Assist scientists in both laboratory and production activities by performing technical tasks involving nuclear physics, primarily in operation, maintenance, production, and quality control support activities.
	Social Science Research Assistants	Assist social scientists in laboratory, survey, and other social research. May perform publication activities, laboratory analysis, quality control, or data management. Normally these individuals work under the direct supervision of a social scientist and assist in those activities which are more routine. Exclude "Graduate Teaching Assistants" (25-1191) who both teach and do research.
	Environmental Science and Protection Technicians, Including Health	Performs laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health. Under direction of an environmental scientist or specialist, may collect samples of gases, soil, water, and other materials for testing and take corrective actions as assigned.
	Forensic Science Technicians	Collect, identify, classify, and analyze physical evidence related to criminal investigations. Perform tests on weapons or substances, such as fiber, hair, and tissue to determine significance to investigation. May testify as expert witnesses on evidence or crime laboratory techniques. May serve as specialists in area of expertise, such as ballistics, fingerprinting, handwriting, or biochemistry.
	Forest and Conservation Technicians	Compile data pertaining to size, content, condition, and other characteristics of forest tracts, under direction of foresters; train and lead forest workers in forest propagation, fire prevention and suppression. May assist conservation scientists in managing, improving, and protecting rangelands and wildlife habitats, and help provide technical assistance regarding the conservation of soil, water, and related natural resources.
	Life, Physical, and Social Science Technicians, All Other	All life, physical, and social science technicians not listed separately.
	Substance Abuse and Behavioral Disorder Counselors	Counsel and advise individuals with alcohol, tobacco, drug, or other problems, such as gambling and eating disorders. May counsel individuals, families, or groups or engage in prevention programs. Exclude "Social Workers" (21-1021 through 21-1029), "Psychologists" (19-3031 through 19-3039), and "Mental Health Counselors" (21-1014) providing these services.
	Educational, Vocational, and School Counselors	Counsel individuals and provide group educational and vocational guidance services.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Marriage and Family Therapists	Diagnose and treat mental and emotional disorders, whether cognitive, affective, or behavioral, within the context of marriage and family systems. Apply psychotherapeutic and family systems theories and techniques in the delivery of professional services to individuals, couples, and families for the purpose of treating such diagnosed nervous and mental disorders. Exclude "Social Workers" (21-1021 through 21-1029) and "Psychologists" of all types (19-3031 through 19-3039).
	Mental Health Counselors	Counsel with emphasis on prevention. Work with individuals and groups to promote optimum mental health. May help individuals deal with addictions and substance abuse; family, parenting, and marital problems; suicide; stress management; problems with self-esteem; and issues associated with aging and mental and emotional health. Exclude "Social Workers" (21-1021 through 21-1029), "Psychiatrists" (29-1066), and "Psychologists" (19-3031 through 19-3039).
	Rehabilitation Counselors	Counsel individuals to maximize the independence and employability of persons coping with personal, social, and vocational difficulties that result from birth defects, illness, disease, accidents, or the stress of daily life. Coordinate activities for residents of care and treatment facilities. Assess client needs and design and implement rehabilitation programs that may include personal and vocational counseling, training, and job placement.
	Counselors, All Other	All counselors not listed separately.
	Child, Family, and School Social Workers	Provide social services and assistance to improve the social and psychological functioning of children and their families and to maximize the family well-being and the academic functioning of children. May assist single parents, arrange adoptions, and find foster homes for abandoned or abused children. In schools, they address such problems as teenage pregnancy, misbehavior, and truancy. May also advise teachers on how to deal with problem children.
	Medical and Public Health Social Workers	Provide persons, families, or vulnerable populations with the psychosocial support needed to cope with chronic, acute, or terminal illnesses, such as Alzheimer's, cancer, or AIDS. Services include advising family care givers, providing patient education and counseling, and making necessary referrals for other social services.
	Mental Health and Substance Abuse Social Workers	Assess and treat individuals with mental, emotional, or substance abuse problems, including abuse of alcohol, tobacco, and/or other drugs. Activities may include individual and group therapy, crisis intervention, case management, client advocacy, prevention, and education.
	Social Workers, All Other	All social workers not listed separately.
	Health Educators	Promote, maintain, and improve individual and community health by assisting individuals and communities to adopt healthy behaviors. Collect and analyze data to identify community needs prior to planning, implementing, monitoring, and evaluating programs designed to encourage healthy lifestyles, policies and environments. May also serve as a resource to assist individuals, other professionals, or the community, and may administer fiscal resources for health education programs.
	Probation Officers and Correctional Treatment Specialists	Provide social services to assist in rehabilitation of law offenders in custody or on probation or parole. Make recommendations for actions involving formulation of rehabilitation plan and treatment of offender, including conditional release and education and employment stipulations.
	Social and Human Service Assistants	Assist professionals from a wide variety of fields, such as psychology, rehabilitation, or social work, to provide client services, as well as support for families. May assist clients in identifying available benefits and social and community services and help clients obtain them. May assist social workers with developing, organizing, and conducting programs to prevent and resolve problems relevant to substance abuse, human relationships, rehabilitation, or adult daycare. Exclude "Rehabilitation Counselors" (21-1015), "Personal and Home Care Aides" (39-9021), "Eligibility Interviewers, Government Programs" (43-4061), and "Psychiatric Technicians" (29-2053).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Community and Social Service Workers, All Other	All community and social service specialists not listed separately.
	Clergy	Conduct religious worship and perform other spiritual functions associated with beliefs and practices of religious faith or denomination. Provide spiritual and moral guidance and assistance to members.
	Directors, Religious Activities and Education	Direct and coordinate activities of a denominational group to meet religious needs of students. Plan, direct, or coordinate church school programs designed to promote religious education among church membership. May provide counseling and guidance relative to marital, health, financial, and religious problems.
	Religious Workers, All Other	All religious workers not listed separately.
	Lawyers	Represent clients in criminal and civil litigation and other legal proceedings, draw up legal documents, and manage or advise clients on legal transactions. May specialize in a single area or may practice broadly in many areas of law.
	Administrative Law Judges, Adjuducators, and Hearing Officers	Conduct hearings to decide or recommend decisions on claims concerning government programs or other government-related matters and prepare decisions. Determine penalties or the existence and the amount of liability, or recommend the acceptance or rejection of claims, or compromise settlements.
	Arbitrators, Mediators, and Conciliators	Facilitate negotiation and conflict resolution through dialogue. Resolve conflicts outside of the court system by mutual consent of parties involved.
	Judges, Magistrate Judges, and Magistrates	Arbitrate, advise, adjudicate, or administer justice in a court of law. May sentence defendant in criminal cases according to government statutes. May determine liability of defendant in civil cases. May issue marriage licenses and perform wedding ceremonies.
	Paralegals and Legal Assistants	Assist lawyers by researching legal precedent, investigating facts, or preparing legal documents. Conduct research to support a legal proceeding, to formulate a defense, or to initiate legal action.
	Court Reporters	Use verbatim methods and equipment to capture, store, retrieve, and transcribe pretrial and trial proceedings or other information. Include stenocaptioners who operate computerized stenographic captioning equipment to provide captions of live or prerecorded broadcasts for hearing-impaired viewers.
	Law Clerks	Assist lawyers or judges by researching or preparing legal documents. May meet with clients or assist lawyers and judges in court. Exclude "Lawyers" (23-1011) and "Paralegals and Legal Assistants" (23-2011).
	Title Examiners, Abstractors, and Searchers	Search real estate records, examine titles, or summarize pertinent legal or insurance details for a variety of purposes. May compile lists of mortgages, contracts, and other instruments pertaining to titles by searching public and private records for law firms, real estate agencies, or title insurance companies.
	Legal Support Workers, All Other	All legal support workers not listed separately.
	Business Teachers, Postsecondary	Teach courses in business administration and management, such as accounting, finance, human resources, labor relations, marketing, and operations research. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Computer Science Teachers, Postsecondary	Teach courses in computer science. May specialize in a field of computer science, such as the design and function of computers or operations and research analysis. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Mathematical Science Teachers, Postsecondary	Teach courses pertaining to mathematical concepts, statistics, and actuarial science and to the application of original and standardized mathematical techniques in solving specific problems and situations. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Architecture Teachers, Postsecondary	Teach courses in architecture and architectural design, such as architectural environmental design, interior architecture/design, and landscape architecture. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Engineering Teachers, Postsecondary	Teach courses pertaining to the application of physical laws and principles of engineering for the development of machines, materials, instruments, processes, and services. Include teachers of subjects, such as chemical, civil, electrical, industrial, mechanical, mineral, and petroleum engineering. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research. Exclude "Computer Science Teachers, Postsecondary" (25-1021).
	Agricultural Sciences Teachers, Postsecondary	Teach courses in the agricultural sciences. Include teachers of agronomy, dairy sciences, fisheries management, horticultural sciences, poultry sciences, range management, and agricultural soil conservation. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Biological Science Teachers, Postsecondary	Teach courses in biological sciences. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Forestry and Conservation Science Teachers, Postsecondary	Teach courses in environmental and conservation science. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research. Exclude "Agricultural Science Teachers" (25-1041).
	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	Teach courses in the physical sciences, except chemistry and physics. Include both teachers primarily engaged in teaching, and those who do a combination of both teaching and research.
	Chemistry Teachers, Postsecondary	Teach courses pertaining to the chemical and physical properties and compositional changes of substances. Work may include instruction in the methods of qualitative and quantitative chemical analysis. Include both teachers primarily engaged in teaching, and those who do a combination of both teaching and research. Exclude "Biological Science Teachers, Postsecondary" (25-1042) who teach biochemistry.
	Environmental Science Teachers, Postsecondary	Teach courses in environmental science. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Physics Teachers, Postsecondary	Teach courses pertaining to the laws of matter and energy. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Anthropology and Archeology Teachers, Postsecondary	Teach courses in anthropology or archeology. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Area, Ethnic, and Cultural Studies Teachers, Postsecondary	Teach courses pertaining to the culture and development of an area (e.g., Latin America), an ethnic group, or any other group (e.g., women's studies, urban affairs). Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Economics Teachers, Postsecondary	Teach courses in economics. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Geography Teachers, Postsecondary	Teach courses in geography. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Political Science Teachers, Postsecondary	Teach courses in political science, international affairs, and international relations. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Psychology Teachers, Postsecondary	Teach courses in psychology, such as child, clinical, and developmental psychology, and psychological counseling. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Sociology Teachers, Postsecondary	Teach courses in sociology. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Social Sciences Teachers, Postsecondary, All Other	All postsecondary social sciences teachers not listed separately.
	Health Specialties Teachers, Postsecondary	Teach courses in health specialties, such as veterinary medicine, dentistry, pharmacy, therapy, laboratory technology, and public health. Exclude "Nursing Instructors and Teachers, Postsecondary" (25-1072) and "Biological Science Teachers, Postsecondary" (25-1042) who teach medical science.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Nursing Instructors and Teachers, Postsecondary	Demonstrate and teach patient care in classroom and clinical units to nursing students. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Education Teachers, Postsecondary	Teach courses pertaining to education, such as counseling, curriculum, guidance, instruction, teacher education, and teaching English as a second language. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Library Science Teachers, Postsecondary	Teach courses in library science. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Criminal Justice and Law Enforcement Teachers, Postsecondary	Teach courses in criminal justice, corrections, and law enforcement administration. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Law Teachers, Postsecondary	Teach courses in law. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Social Work Teachers, Postsecondary	Teach courses in social work. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Art, Drama, and Music Teachers, Postsecondary	Teach courses in drama, music, and the arts including fine and applied art, such as painting and sculpture, or design and crafts. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Communications Teachers, Postsecondary	Teach courses in communications, such as organizational communications, public relations, radio/television broadcasting, and journalism. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	English Language and Literature Teachers, Postsecondary	Teach courses in English language and literature, including linguistics and comparative literature. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Foreign Language and Literature Teachers, Postsecondary	Teach courses in foreign (i.e., other than English) languages and literature. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	History Teachers, Postsecondary	Teach courses in human history and historiography. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Philosophy and Religion Teachers, Postsecondary	Teach courses in philosophy, religion, and theology. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Graduate Assistants, Teaching	Assist department chairperson, faculty members, or other professional staff members in college or university by performing teaching or teaching-related duties, such as teaching lower level courses, developing teaching materials, preparing and giving examinations, and grading examinations or papers. Graduate assistants must be enrolled in a graduate school program. Graduate assistants who primarily perform non-teaching duties, such as laboratory research, should be reported in the occupational category related to the work performed.
	Home Economics Teachers, Postsecondary	Teach courses in child care, family relations, finance, nutrition, and related subjects as pertaining to home management. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Recreation and Fitness Studies Teachers, Postsecondary	Teach courses pertaining to recreation, leisure, and fitness studies, including exercise physiology and facilities management. Include both teachers primarily engaged in teaching and those who do a combination of both teaching and research.
	Vocational Education Teachers, Postsecondary	Teach or instruct vocational or occupational subjects at the postsecondary level (but at less than the baccalaureate) to students who have graduated or left high school. Include correspondence school instructors; industrial, commercial and government training instructors; and adult education teachers and instructors who prepare persons to operate industrial machinery and equipment and transportation and communications equipment. Teaching may take place in public or private schools whose primary business is education or in a school associated with an organization whose primary business is other than education.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Postsecondary Teachers, All Other	All postsecondary teachers not listed separately.
	Preschool Teachers, Except Special Education	Instruct children (normally up to 5 years of age) in activities designed to promote social, physical, and intellectual growth needed for primary school in preschool, day care center, or other child development facility. May be required to hold State certification. Exclude "Child Care Workers" (39-9011) and "Special Education Teachers" (25-2041 through 25-2043).
	Kindergarten Teachers, Except Special Education	Teach elemental natural and social science, personal hygiene, music, art, and literature to children from 4 to 6 years old. Promote physical, mental, and social development. May be required to hold State certification. Exclude "Special Education Teachers" (25-2041 through 25-2043).
	Elementary School Teachers, Except Special Education	Teach pupils in public or private schools at the elementary level basic academic, social, and other formative skills. Exclude "Special Education Teachers" (25-2041 through 25-2043).
	Middle School Teachers, Except Special and Vocational Education	Teach students in public or private schools in one or more subjects at the middle, intermediate, or junior high level, which falls between elementary and senior high school as defined by applicable State laws and regulations. Exclude "Middle School Vocational Education Teachers" (25-2023) and "Special Education Teachers" (25-2041 through 25-2043).
	Middle School Vocational Education Teachers	Teach or instruct vocational or occupational subjects at the middle school level. Exclude "Special Education Teachers" (25-2041 through 25-2043)
	Secondary School Teachers, Except Special and Vocational Education	Instruct students in secondary public or private schools in one or more subjects at the secondary level, such as English, mathematics, or social studies. May be designated according to subject matter specialty, such as typing instructors, commercial teachers, or English teachers. Exclude "Vocational Education Secondary School Teachers" (25-2032) and "Special Education Teachers" (25-2041 through 25-2043).
	Secondary School Vocational Education Teachers	Teach or instruct vocational or occupational subjects at the secondary school level.
	Special Education Teachers, Preschool, Kindergarten, and Elementary School	Teach elementary and preschool school subjects to educationally and physically handicapped students. Include teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired.
	Special Education Teachers, Middle School	Teach middle school subjects to educationally and physically handicapped students. Include teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired.
	Special Education Teachers, Secondary School	Teach secondary school subjects to educationally and physically handicapped students. Include teachers who specialize and work with audibly and visually handicapped students and those who teach basic academic and life processes skills to the mentally impaired.
	Adult Literacy, Remedial Education, and GED Teachers and Instructors	Teach or instruct out-of-school youths and adults in remedial education classes, preparatory classes for the General Educational Development test, literacy, or English as a Second Language. Teaching may or may not take place in a traditional educational institution.
	Self-Enrichment Education Teachers	Teach or instruct courses other than those that normally lead to an occupational objective or degree. Courses may include self-improvement, nonvocational, and nonacademic subjects. Teaching may or may not take place in a traditional educational institution.
	Teachers and Instructors, All Other	All teachers and instructors not listed separately.
	Archivists	Appraise, edit, and direct safekeeping of permanent records and historically valuable documents. Participate in research activities based on archival materials.
	Curators	Administer affairs of museum and conduct research programs. Direct instructional, research, and public service activities of institution.
	Museum Technicians and Conservators	Prepare specimens, such as fossils, skeletal parts, lace, and textiles, for museum collection and exhibits. May restore documents or install, arrange, and exhibit materials.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Librarians	Administer libraries and perform related library services. Work in a variety of settings, including public libraries, schools, colleges and universities, museums, corporations, government agencies, law firms, non-profit organizations, and healthcare providers. Tasks may include selecting, acquiring, cataloguing, classifying, circulating, and maintaining library materials; and furnishing reference, bibliographical, and readers' advisory services. May perform in-depth, strategic research, and synthesize, analyze, edit, and filter information. May set up or work with databases and information systems to catalogue and access information.
	Library Technicians	Assist librarians by helping readers in the use of library catalogs, databases, and indexes to locate books and other materials; and by answering questions that require only brief consultation of standard reference. Compile records; sort and shelve books; remove or repair damaged books; register patrons; check materials in and out of the circulation process. Replace materials in shelving area (stacks) or files. Include bookmobile drivers who operate bookmobiles or light trucks that pull trailers to specific locations on a predetermined schedule and assist with providing services in mobile libraries.
	Audio-Visual Collections Specialists	Prepare, plan, and operate audio-visual teaching aids for use in education. May record, catalogue, and file audio-visual materials.
	Farm and Home Management Advisors	Advise, instruct, and assist individuals and families engaged in agriculture, agricultural-related processes, or home economics activities. Demonstrate procedures and apply research findings to solve problems; instruct and train in product development, sales, and the utilization of machinery and equipment to promote general welfare. Include county agricultural agents, feed and farm management advisers, home economists, and extension service advisors.
	Instructional Coordinators	Develop instructional material, coordinate educational content, and incorporate current technology in specialized fields that provide guidelines to educators and instructors for developing curricula and conducting courses. Include educational consultants and specialists, and instructional material directors.
	Teacher Assistants	Perform duties that are instructional in nature or deliver direct services to students or parents. Serve in a position for which a teacher or another professional has ultimate responsibility for the design and implementation of educational programs and services.
	Education, Training, and Library Workers, All Other	All education, training, and library workers not listed separately.
	Art Directors	Formulate design concepts and presentation approaches, and direct workers engaged in art work, layout design, and copy writing for visual communications media, such as magazines, books, newspapers, and packaging.
	Craft Artists	Create or reproduce hand-made objects for sale and exhibition using a variety of techniques, such as welding, weaving, pottery, and needlecraft.
	Fine Artists, Including Painters, Sculptors, and Illustrators	Create original artwork using any of a wide variety of mediums and techniques, such as painting and sculpture.
	Multi-Media Artists and Animators	Create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials.
	Artists and Related Workers, All Other	All artists and related workers not listed separately.
	Commercial and Industrial Designers	Develop and design manufactured products, such as cars, home appliances, and children's toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.
	Fashion Designers	Design clothing and accessories. Create original garments or design garments that follow well established fashion trends. May develop the line of color and kinds of materials.
	Floral Designers	Design, cut, and arrange live, dried, or artificial flowers and foliage.
	Graphic Designers	Design or create graphics to meet a client's specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Interior Designers	Plan, design, and furnish interiors of residential, commercial, or industrial buildings. Formulate design which is practical, aesthetic, and conducive to intended purposes, such as raising productivity, selling merchandise, or improving life style. May specialize in a particular field, style, or phase of interior design. Exclude "Merchandise Displayers and Window Trimmers" (27-1026).
	Merchandise Displayers and Window Trimmers	Plan and erect commercial displays, such as those in windows and interiors of retail stores and at trade exhibitions.
	Set and Exhibit Designers	Design special exhibits and movie, television, and theater sets. May study scripts, confer with directors, and conduct research to determine appropriate architectural styles.
	Designers, All Other	All designers not listed separately.
	Actors	Play parts in stage, television, radio, video, or motion picture productions for entertainment, information, or instruction. Interpret serious or comic role by speech, gesture, and body movement to entertain or inform audience. May dance and sing.
	Producers and Directors	Produce or direct stage, television, radio, video, or motion picture productions for entertainment, information, or instruction. Responsible for creative decisions, such as interpretation of script, choice of guests, set design, sound, special effects, and choreography.
	Athletes and Sports Competitors	Compete in athletic events.
	Coaches and Scouts	Instruct or coach groups or individuals in the fundamentals of sports. Demonstrate techniques and methods of participation. May evaluate athletes' strengths and weaknesses as possible recruits or to improve the athletes' technique to prepare them for competition. Those required to hold teaching degrees should be reported in the appropriate teaching category. Exclude "Athletic Trainers" (29-9091).
	Umpires, Referees, and Other Sports Officials	Officiate at competitive athletic or sporting events. Detect infractions of rules and decide penalties according to established regulations. Include all sporting officials, referees, and competition judges.
	Dancers	Perform dances. May also sing or act.
	Choreographers	Create and teach dance. May direct and stage presentations.
	Music Directors and Composers	Conduct, direct, plan, and lead instrumental or vocal performances by musical groups, such as orchestras, choirs, and glee clubs. Include arrangers, composers, choral directors, and orchestrators.
	Musicians and Singers	Play one or more musical instruments or entertain by singing songs in recital, in accompaniment, or as a member of an orchestra, band, or other musical group. Musical performers may entertain on-stage, radio, TV, film, video, or record in studios. Exclude "Dancers" (27-2031).
	Entertainers and Performers, Sports and Related Workers, All Other	All entertainers and performers, sports and related workers not listed separately.
	Radio and Television Announcers	Talk on radio or television. May interview guests, act as master of ceremonies, read news flashes, identify station by giving call letters, or announce song title and artist.
	Public Address System and Other Announcers	Make announcements over loud speaker at sporting or other public events. May act as master of ceremonies or disc jockey at weddings, parties, clubs, or other gathering places.
	Broadcast News Analysts	Analyze, interpret, and broadcast news received from various sources.
	Reporters and Correspondents	Collect and analyze facts about newsworthy events by interview, investigation, or observation. Report and write stories for newspaper, news magazine, radio, or television. Exclude "Broadcast News Analysts" (27-3021).
	Public Relations Specialists	Engage in promoting or creating good will for individuals, groups, or organizations by writing or selecting favorable publicity material and releasing it through various communications media. May prepare and arrange displays, and make speeches.
	Editors	Perform variety of editorial duties, such as laying out, indexing, and revising content of written materials, in preparation for final publication. Include technical editors.

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Classification*	Title	Definition
	Technical Writers	Write technical materials, such as equipment manuals, appendices, or operating and maintenance instructions. May assist in layout work.
	Writers and Authors	Originate and prepare written material, such as scripts, stories, advertisements, and other material. Exclude "Public Relations Specialists" (27-3031) and "Technical Writers" (27-3042).
	Interpreters and Translators	Translate or interpret written, oral, or sign language text into another language for others.
	Media and Communication Workers, All Other	All media and communication workers not listed separately.
	Audio and Video Equipment Technicians	Set up or set up and operate audio and video equipment including microphones, sound speakers, video screens, projectors, video monitors, recording equipment, connecting wires and cables, sound and mixing boards, and related electronic equipment for concerts, sports events, meetings and conventions, presentations, and news conferences. May also set up and operate associated spotlights and other custom lighting systems. Exclude "Sound Engineering Technicians" (27-4014).
	Broadcast Technicians	Set up, operate, and maintain the electronic equipment used to transmit radio and television programs. Control audio equipment to regulate volume level and quality of sound during radio and television broadcasts. Operate radio transmitter to broadcast radio and television programs.
	Radio Operators	Receive and transmit communications using radiotelegraph or radiotelephone equipment in accordance with government regulations. May repair equipment.
	Sound Engineering Technicians	Operate machines and equipment to record, synchronize, mix, or reproduce music, voices, or sound effects in sporting arenas, theater productions, recording studios, or movie and video productions.
	Photographers	Photograph persons, subjects, merchandise, or other commercial products. May develop negatives and produce finished prints. Include scientific photographers, aerial photographers, and photojournalists.
	Camera Operators, Television, Video, and Motion Picture	Operate television, video, or motion picture camera to photograph images or scenes for various purposes, such as TV broadcasts, advertising, video production, or motion pictures.
	Film and Video Editors	Edit motion picture soundtracks, film, and video.
	Media and Communication Equipment Workers, All Other	All media and communication equipment workers not listed separately.
	Chiropractors	Adjust spinal column and other articulations of the body to correct abnormalities of the human body believed to be caused by interference with the nervous system. Examine patient to determine nature and extent of disorder. Manipulate spine or other involved area. May utilize supplementary measures, such as exercise, rest, water, light, heat, and nutritional therapy.
	Dentists, General	Diagnose and treat diseases, injuries, and malformations of teeth and gums and related oral structures. May treat diseases of nerve, pulp, and other dental tissues affecting vitality of teeth. Exclude "Prosthodontists" (29-1024), "Orthodontists" (29-1023), "Oral and Maxillofacial Surgeons" (29-1022) and "Dentists, all other specialists" (29-1029)
	Oral and Maxillofacial Surgeons	Perform surgery on mouth, jaws, and related head and neck structure to execute difficult and multiple extractions of teeth, to remove tumors and other abnormal growths, to correct abnormal jaw relations by mandibular or maxillary revision, to prepare mouth for insertion of dental prosthesis, or to treat fractured jaws.
	Orthodontists	Examine, diagnose, and treat dental malocclusions and oral cavity anomalies. Design and fabricate appliances to realign teeth and jaws to produce and maintain normal function and to improve appearance.
	Prosthodontists	Construct oral prostheses to replace missing teeth and other oral structures to correct natural and acquired deformation of mouth and jaws, to restore and maintain oral function, such as chewing and speaking, and to improve appearance.
	Dentists, All Other Specialists	All dentists not listed separately.

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Classification*	Title	Definition
	Dietitians and Nutritionists	Plan and conduct food service or nutritional programs to assist in the promotion of health and control of disease. May supervise activities of a department providing quantity food services, counsel individuals, or conduct nutritional research.
	Optometrists	Diagnose, manage, and treat conditions and diseases of the human eye and visual system. Examine eyes and visual system, diagnose problems or impairments, prescribe corrective lenses, and provide treatment. May prescribe therapeutic drugs to treat specific eye conditions.
	Pharmacists	Dispense drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. May advise physicians and other health practitioners on the selection, dosage, interactions, and side effects of medications.
	Anesthesiologists	Administer anesthetics during surgery or other medical procedures.
	Family and General Practitioners	Diagnose, treat, and help prevent diseases and injuries that commonly occur in the general population.
	Internists, General	Diagnose and provide non-surgical treatment of diseases and injuries of internal organ systems. Provide care mainly for adults who have a wide range of problems associated with the internal organs. Include subspecialists, such as cardiologists and gastroenterologists, with "All Other Physicians" (29-1069).
	Obstetricians and Gynecologists	Diagnose, treat, and help prevent diseases of women, especially those affecting the reproductive system and the process of childbirth.
	Pediatricians, General	Diagnose, treat, and help prevent children's diseases and injuries.
	Psychiatrists	Diagnose, treat, and help prevent disorders of the mind.
	Surgeons	Treat diseases, injuries, and deformities by invasive methods, such as manual manipulation or by using instruments and appliances.
	Physicians and Surgeons, All Other	All physicians and surgeons not listed separately.
	Physician Assistants	Provide healthcare services typically performed by a physician, under the supervision of a physician. Conduct complete physicals, provide treatment, and counsel patients. May, in some cases, prescribe medication. Must graduate from an accredited educational program for physician assistants. Exclude "Emergency Medical Technicians and Paramedics" (29-2041), "Medical Assistants" (31-9092), and "Registered Nurses" (29-1111).
	Podiatrists	Diagnose and treat diseases and deformities of the human foot.
	Registered Nurses	Assess patient health problems and needs, develop and implement nursing care plans, and maintain medical records. Administer nursing care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management. Licensing or registration required. Include advance practice nurses such as: nurse practitioners, clinical nurse specialists, certified nurse midwives, and certified registered nurse anesthetists. Advanced practice nursing is practiced by RNs who have specialized formal, post-basic education and who function in highly autonomous and specialized roles.
	Audiologists	Assess and treat persons with hearing and related disorders. May fit hearing aids and provide auditory training. May perform research related to hearing problems.
	Occupational Therapists	Assess, plan, organize, and participate in rehabilitative programs that help restore vocational, homemaking, and daily living skills, as well as general independence, to disabled persons.
	Physical Therapists	Assess, plan, organize, and participate in rehabilitative programs that improve mobility, relieve pain, increase strength, and decrease or prevent deformity of patients suffering from disease or injury.
	Radiation Therapists	Provide radiation therapy to patients as prescribed by a radiologist according to established practices and standards. Duties may include reviewing prescription and diagnosis; acting as liaison with physician and supportive care personnel; preparing equipment, such as immobilization, treatment, and protection devices; and maintaining records, reports, and files. May assist in dosimetry procedures and tumor localization.

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Classification*	Title	Definition
	Recreational Therapists	Plan, direct, or coordinate medically-approved recreation programs for patients in hospitals, nursing homes, or other institutions. Activities include sports, trips, dramatics, social activities, and arts and crafts. May assess a patient condition and recommend appropriate recreational activity.
	Respiratory Therapists	Assess, treat, and care for patients with breathing disorders. Assume primary responsibility for all respiratory care modalities, including the supervision of respiratory therapy technicians. Initiate and conduct therapeutic procedures; maintain patient records; and select, assemble, check, and operate equipment.
	Speech-language Pathologists	Assess and treat persons with speech, language, voice, and fluency disorders. May select alternative communication systems and teach their use. May perform research related to speech and language problems.
	Therapists, All Other	All therapists not listed separately.
	Veterinarians	Diagnose and treat diseases and dysfunctions of animals. May engage in a particular function, such as research and development, consultation, administration, technical writing, sale or production of commercial products, or rendering of technical services to commercial firms or other organizations. Include veterinarians who inspect livestock.
	Health Diagnosing and Treating Practitioners, All Other	All health diagnosing and treating practitioners not listed separately.
	Medical and Clinical Laboratory Technologists	Perform complex medical laboratory tests for diagnosis, treatment, and prevention of disease. May train or supervise staff.
	Medical and Clinical Laboratory Technicians	Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.
	Dental Hygienists	Clean teeth and examine oral areas, head, and neck for signs of oral disease. May educate patients on oral hygiene, take and develop X-rays, or apply fluoride or sealants.
	Cardiovascular Technologists and Technicians	Conduct tests on pulmonary or cardiovascular systems of patients for diagnostic purposes. May conduct or assist in electrocardiograms, cardiac catheterizations, pulmonary-functions, lung capacity, and similar tests. Include vascular technologists.
	Diagnostic Medical Sonographers	Produce ultrasonic recordings of internal organs for use by physicians.
	Nuclear Medicine Technologists	Prepare, administer, and measure radioactive isotopes in therapeutic, diagnostic, and tracer studies utilizing a variety of radioisotope equipment. Prepare stock solutions of radioactive materials and calculate doses to be administered by radiologists. Subject patients to radiation. Execute blood volume, red cell survival, and fat absorption studies following standard laboratory techniques.
	Radiologic Technologists and Technicians	Take X-rays and CAT scans or administer nonradioactive materials into patient's blood stream for diagnostic purposes. Include technologists who specialize in other modalities, such as computed tomography and magnetic resonance. Include workers whose primary duties are to demonstrate portions of the human body on X-ray film or fluoroscopic screen.
	Emergency Medical Technicians and Paramedics	Assess injuries, administer emergency medical care, and extricate trapped individuals. Transport injured or sick persons to medical facilities.
	Dietetic Technicians	Assist dietitians in the provision of food service and nutritional programs. Under the supervision of dietitians, may plan and produce meals based on established guidelines, teach principles of food and nutrition, or counsel individuals.
	Pharmacy Technicians	Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications.
	Psychiatric Technicians	Care for mentally impaired or emotionally disturbed individuals, following physician instructions and hospital procedures. Monitor patients' physical and emotional well-being and report to medical staff. May participate in rehabilitation and treatment programs, help with personal hygiene, and administer oral medications and hypodermic injections.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Respiratory Therapy Technicians	Provide specific, well defined respiratory care procedures under the direction of respiratory therapists and physicians.
	Surgical Technologists	Assist in operations, under the supervision of surgeons, registered nurses, or other surgical personnel. May help set up operating room, prepare and transport patients for surgery, adjust lights and equipment, pass instruments and other supplies to surgeons and surgeon's assistants, hold retractors, cut sutures, and help count sponges, needles, supplies, and instruments.
	Veterinary Technologists and Technicians	Perform medical tests in a laboratory environment for use in the treatment and diagnosis of diseases in animals. Prepare vaccines and serums for prevention of diseases. Prepare tissue samples, take blood samples, and execute laboratory tests, such as urinalysis and blood counts. Clean and sterilize instruments and materials and maintain equipment and machines.
	Licensed Practical and Licensed Vocational Nurses	Care for ill, injured, convalescent, or disabled persons in hospitals, nursing homes, clinics, private homes, group homes, and similar institutions. May work under the supervision of a registered nurse. Licensing required.
	Medical Records and Health Information Technicians	Compile, process, and maintain medical records of hospital and clinic patients in a manner consistent with medical, administrative, ethical, legal, and regulatory requirements of the heath care system. Process, maintain, compile, and report patient information for health requirements and standards.
	Opticians, Dispensing	Design, measure, fit, and adapt lenses and frames for client according to written optical prescription or specification. Assist client with selecting frames. Measure customer for size of eyeglasses and coordinate frames with facial and eye measurements and optical prescription. Prepare work order for optical laboratory containing instructions for grinding and mounting lenses in frames. Verify exactness of finished lens spectacles. Adjust frame and lens position to fit client. May shape or reshape frames. Include contact lens opticians.
	Orthotists and Prosthetists	Assist patients with disabling conditions of limbs and spine or with partial or total absence of limb by fitting and preparing orthopedic braces or prostheses.
	Health Technologists and Technicians, All Other	All health technologists and technicians not listed separately.
	Occupational Health and Safety Specialists	Review, evaluate, and analyze work environments and design programs and procedures to control, eliminate, and prevent disease or injury caused by chemical, physical, and biological agents or ergonomic factors. May conduct inspections and enforce adherence to laws and regulations governing the health and safety of individuals. May be employed in the public or private sector. Include environmental protection officers.
	Occupational Health and Safety Technicians	Collect data on work environments for analysis by occupational health and safety specialists. Implement and conduct evaluation of programs designed to limit chemical, physical, biological, and ergonomic risks to workers.
	Athletic Trainers	Evaluate, advise, and treat athletes to assist recovery from injury, avoid injury, or maintain peak physical fitness.
	Healthcare Practitioners and Technical Workers, All Other	All healthcare practitioners and technical workers not listed separately.
	Home Health Aides	Provide routine, personal healthcare, such as bathing, dressing, or grooming, to elderly, convalescent, or disabled persons in the home of patients or in a residential care facility.
	Nursing Aides, Orderlies, and Attendants	Provide basic patient care under direction of nursing staff. Perform duties, such as feed, bathe, dress, groom, or move patients, or change linens. Exclude "Home Health Aides" (31-1011) and "Psychiatric Aides" (31-1013).
	Psychiatric Aides	Assist mentally impaired or emotionally disturbed patients, working under direction of nursing and medical staff.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Occupational Therapist Assistants	Assist occupational therapists in providing occupational therapy treatments and procedures. May, in accordance with State laws, assist in development of treatment plans, carry out routine functions, direct activity programs, and document the progress of treatments. Generally requires formal training.
	Occupational Therapist Aides	Under close supervision of an occupational therapist or occupational therapy assistant, perform only delegated, selected, or routine tasks in specific situations. These duties include preparing patient and treatment room.
	Physical Therapist Assistants	Assist physical therapists in providing physical therapy treatments and procedures. May, in accordance with State laws, assist in the development of treatment plans, carry out routine functions, document the progress of treatment, and modify specific treatments in accordance with patient status and within the scope of treatment plans established by a physical therapist. Generally requires formal training.
	Physical Therapist Aides	Under close supervision of a physical therapist or physical therapy assistant, perform only delegated, selected, or routine tasks in specific situations. These duties include preparing the patient and the treatment area.
	Massage Therapists	Massage customers for hygienic or remedial purposes.
	Dental Assistants	Assist dentist, set up patient and equipment, and keep records.
	Medical Assistants	Perform administrative and certain clinical duties under the direction of physician. Administrative duties may include scheduling appointments, maintaining medical records, billing, and coding for insurance purposes. Clinical duties may include taking and recording vital signs and medical histories, preparing patients for examination, drawing blood, and administering medications as directed by physician. Exclude "Physician Assistants" (29-1071).
	Medical Equipment Preparers	Prepare, sterilize, install, or clean laboratory or healthcare equipment. May perform routine laboratory tasks and operate or inspect equipment.
	Medical Transcriptionists	Use transcribing machines with headset and foot pedal to listen to recordings by physicians and other healthcare professionals dictating a variety of medical reports, such as emergency room visits, diagnostic imaging studies, operations, chart reviews, and final summaries. Transcribe dictated reports and translate medical jargon and abbreviations into their expanded forms. Edit as necessary and return reports in either printed or electronic form to the dictator for review and signature, or correction.
	Pharmacy Aides	Record drugs delivered to the pharmacy, store incoming merchandise, and inform the supervisor of stock needs. May operate cash register and accept prescriptions for filling.
	Veterinary Assistants and Laboratory Animal Caretakers	Feed, water, and examine pets and other nonfarm animals for signs of illness, disease, or injury in laboratories and animal hospitals and clinics. Clean and disinfect cages and work areas, and sterilize laboratory and surgical equipment. May provide routine post-operative care, administer medication orally or topically, or prepare samples for laboratory examination under the supervision of veterinary or laboratory animal technologists or technicians, veterinarians, or scientists. Exclude "Nonfarm Animal Caretakers" (39-2021).
	Healthcare Support Workers, All Other	All healthcare support workers not listed separately.
	First-Line Supervisors/Managers of Correctional Officers	Supervise and coordinate activities of correctional officers and jailers.
	First-Line Supervisors/Managers of Police and Detectives	Supervise and coordinate activities of members of police force.
	First-Line Supervisors/Managers of Fire Fighting and Prevention Workers	Supervise and coordinate activities of workers engaged in fire fighting and fire prevention and control.
	Supervisors, Protective Service Workers, All Other	All protective service supervisors not listed separately above.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Fire Fighters	Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster management.
	Fire Inspectors and Investigators	Inspect buildings to detect fire hazards and enforce local ordinances and State laws. Investigate and gather facts to determine cause of fires and explosions.
	Forest Fire Inspectors and Prevention Specialists	Enforce fire regulations and inspect for forest fire hazards. Report forest fires and weather conditions.
	Bailiffs	Maintain order in courts of law.
	Correctional Officers and Jailers	Guard inmates in penal or rehabilitative institution in accordance with established regulations and procedures. May guard prisoners in transit between jail, courtroom, prison, or other point. Include deputy sheriffs and police who spend the majority of their time guarding prisoners in correctional institutions.
	Detectives and Criminal Investigators	Conduct investigations related to suspected violations of Federal, State, or local laws to prevent or solve crimes. Exclude "Private Detectives and Investigators" (33-9021).
	Fish and Game Wardens	Patrol assigned area to prevent fish and game law violations. Investigate reports of damage to crops or property by wildlife. Compile biological data.
	Parking Enforcement Workers	Patrol assigned area, such as public parking lot or section of city to issue tickets to overtime parking violators and illegally parked vehicles.
	Police and Sheriff's Patrol Officers	Maintain order, enforce laws and ordinances, and protect life and property in an assigned patrol district. Perform combination of following duties: patrol a specific area on foot or in a vehicle; direct traffic; issue traffic summonses; investigate accidents; apprehend and arrest suspects, or serve legal processes of courts.
	Transit and Railroad Police	Protect and police railroad and transit property, employees, or passengers.
	Animal Control Workers	Handle animals for the purpose of investigations of mistreatment, or control of abandoned, dangerous, or unattended animals.
	Private Detectives and Investigators	Detect occurrences of unlawful acts or infractions of rules in private establishment, or seek, examine, and compile information for client.
	Gaming Surveillance Officers and Gaming Investigators	Act as oversight and security agent for management and customers. Observe casino or casino hotel operation for irregular activities such as cheating or theft by either employees or patrons. May utilize one-way mirrors above the casino floor, cashier's cage, and from desk. Use of audio/video equipment is also common to observe operation of the business. Usually required to provide verbal and written reports of all violations and suspicious behavior to supervisor.
	Security Guards	Guard, patrol, or monitor premises to prevent theft, violence, or infractions of rules.
	Crossing Guards	Guide or control vehicular or pedestrian traffic at such places as streets, schools, railroad crossings, or construction sites.
	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	Monitor recreational areas, such as pools, beaches, or ski slopes to provide assistance and protection to participants.
	Protective Service Workers, All Other	All protective service workers not listed separately.
	Chefs and Head Cooks	Direct the preparation, seasoning, and cooking of salads, soups, fish, meats, vegetables, desserts, or other foods. May plan and price menu items, order supplies, and keep records and accounts. May participate in cooking.
	First-Line Supervisors/Managers of Food Preparation and Serving Workers	Supervise workers engaged in preparing and serving food.
	Cooks, Fast Food	Prepare and cook food in a fast food restaurant with a limited menu. Duties of the cooks are limited to preparation of a few basic items and normally involve operating large-volume single-purpose cooking equipment.
	Cooks, Institution and Cafeteria	Prepare and cook large quantities of food for institutions, such as schools, hospitals, or cafeterias.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Cooks, Private Household	Prepare meals in private homes.
	Cooks, Restaurant	Prepare, season, and cook soups, meats, vegetables, desserts, or other foodstuffs in restaurants. May order supplies, keep records and accounts, price items on menu, or plan menu.
	Cooks, Short Order	Prepare and cook to order a variety of foods that require only a short preparation time. May take orders from customers and serve patrons at counters or tables. Exclude "Fast Food Cooks" (35-2011).
	Food Preparation Workers	Perform a variety of food preparation duties other than cooking, such as preparing cold foods and shellfish, slicing meat, and brewing coffee or tea.
	Bartenders	Mix and serve drinks to patrons, directly or through waitstaff.
	Combined Food Preparation and Serving Workers, Including Fast Food	Perform duties which combine both food preparation and food service.
	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	Serve food to diners at counter or from a steam table. Include counter attendants who also wait tables with "Waiters and Waitresses" (35-3031).
	Waiters and Waitresses	Take orders and serve food and beverages to patrons at tables in dining establishment. Exclude "Counter Attendants, Cafeteria, Food Concession, and Coffee Shop" (35-3022).
	Food Servers, Nonrestaurant	Serve food to patrons outside of a restaurant environment, such as in hotels, hospital rooms, or cars. Exclude "Door-to-Door Sales Workers, News and Street Vendors, and Related Workers" (41-9091) and "Counter Attendants, Cafeteria, Food Concession, and Coffee Shop" (35-3022).
	Dining Room and Cafeteria Attendants and Bartender Helpers	Facilitate food service. Clean tables, carry dirty dishes, replace soiled table linens; set tables; replenish supply of clean linens, silverware, glassware, and dishes; supply service bar with food, and serve water, butter, and coffee to patrons.
	Dishwashers	Clean dishes, kitchen, food preparation equipment, or utensils.
	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	Welcome patrons, seat them at tables or in lounge, and help ensure quality of facilities and service.
	Food Preparation and Serving Related Workers, All Other	All food preparation and serving related workers not listed separately.
	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers	Supervise work activities of cleaning personnel in hotels, hospitals, offices, and other establishments.
	First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers	Plan, organize, direct, or coordinate activities of workers engaged in landscaping or groundskeeping activities, such as planting and maintaining ornamental trees, shrubs, flowers, and lawns, and applying fertilizers, pesticides, and other chemicals, according to contract specifications. May also coordinate activities of workers engaged in terracing hillsides, building retaining walls, constructing pathways, installing patios, and similar activities in following a landscape design plan. Work may involve reviewing contracts to ascertain service, machine, and work force requirements; answering inquiries from potential customers regarding methods, material, and price ranges; and preparing estimates according to labor, material, and machine costs.
	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Keep buildings in clean and orderly condition. Perform heavy cleaning duties, such as cleaning floors, shampooing rugs, washing walls and glass, and removing rubbish. Duties may include tending furnace and boiler, performing routine maintenance activities, notifying management of need for repairs, and cleaning snow or debris from sidewalk.
	Maids and Housekeeping Cleaners	Perform any combination of light cleaning duties to maintain private households or commercial establishments, such as hotels, restaurants, and hospitals, in a clean and orderly manner. Duties include making beds, replenishing linens, cleaning rooms and halls, and vacuuming.
	Building Cleaning Workers, All Other	All building cleaning workers not listed separately.
	Pest Control Workers	Spray or release chemical solutions or toxic gases and set traps to kill pests and vermin, such as mice, termites, and roaches, that infest buildings and surrounding areas.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Landscaping and Groundskeeping Workers	Landscape or maintain grounds of property using hand or power tools or equipment. Workers typically perform a variety of tasks, which may include any combination of the following: sod laying, mowing, trimming, planting, watering, fertilizing, digging, raking, sprinkler installation, and installation of mortarless segmental concrete masonry wall units. Exclude "Farmworkers and Laborers, Crop, Nursery, and Greenhouse" (45-2092).
	Pesticide Handlers, Sprayers, and Applicators, Vegetation	Mix or apply pesticides, herbicides, fungicides, or insecticides through sprays, dusts, vapors, soil incorporation or chemical application on trees, shrubs, lawns, or botanical crops. Usually requires specific training and State or Federal certification. Exclude "Commercial Pilots" (53-2012) who operate aviation equipment to dust or spray crops.
	Tree Trimmers and Pruners	Cut away dead or excess branches from trees or shrubs to maintain right-of-way for roads, sidewalks, or utilities, or to improve appearance, health, and value of tree. Prune or treat trees or shrubs using handsaws, pruning hooks, sheers, and clippers. May use truck-mounted lifts and power pruners. May fill cavities in trees to promote healing and prevent deterioration. Exclude workers who primarily perform duties of "Pesticide Handlers, Sprayers, and Applicators, Vegetation" (37-3012) and "Landscaping and Groundskeeping Workers" (37-3011).
	Grounds Maintenance Workers, All Other	All grounds maintenance workers not listed separately.
	Gaming Supervisors	Supervise gaming operations and personnel in an assigned area. Circulate among tables and observe operations. Ensure that stations and games are covered for each shift. May explain and interpret operating rules of house to patrons. May plan and organize activities and create friendly atmosphere for guests in hotels/casinos. May adjust service complaints. Exclude "Slot Key Persons" (39-1012).
	Slot Key Persons	Coordinate/supervise functions of slot department workers to provide service to patrons. Handle and settle complaints of players. Verify and payoff jackpots. Reset slot machines after payoffs. Make minor repairs or adjustments to slot machines. Recommend removal of slot machines for repair. Report hazards and enforces safety rules.
	First-Line Supervisors/Managers of Personal Service Workers	Supervise and coordinate activities of personal service workers, such as supervisors of flight attendants, hairdressers, or caddies.
	Animal Trainers	Train animals for riding, harness, security, performance, or obedience, or assisting persons with disabilities. Accustom animals to human voice and contact; and condition animals to respond to commands. Train animals according to prescribed standards for show or competition. May train animals to carry pack loads or work as part of pack team.
	Nonfarm Animal Caretakers	Feed, water, groom, bathe, exercise, or otherwise care for pets and other nonfarm animals, such as dogs, cats, ornamental fish or birds, zoo animals, and mice. Work in settings such as kennels, animal shelters, zoos, circuses, and aquariums. May keep records of feedings, treatments, and animals received or discharged. May clean, disinfect, and repair cages, pens, or fish tanks. Exclude "Veterinary Assistants and Laboratory Animal Caretakers" (31-9096).
	Gaming Dealers	Operate table games. Stand or sit behind table and operate games of chance by dispensing the appropriate number of cards or blocks to players, or operating other gaming equipment. Compare the house's hand against players' hands and payoff or collect players' money or chips.
	Gaming and Sports Book Writers and Runners	Assist in the operation of games such as keno and bingo. Scan winning tickets presented by patrons, calculate amount of winnings and pay patrons. May operate keno and bingo equipment. May start gaming equipment that randomly selects numbers. May announce number selected until total numbers specified for each game are selected. May pick up tickets from players, collect bets, receive, verify and record patrons' cash wagers.
	Gaming Service Workers, All Other	All Gaming Service Workers not listed separately.
	Motion Picture Projectionists	Set up and operate motion picture projection and related sound reproduction equipment.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Ushers, Lobby Attendants, and Ticket Takers	Assist patrons at entertainment events by performing duties, such as collecting admission tickets and passes from patrons, assisting in finding seats, searching for lost articles, and locating such facilities as rest rooms and telephones.
	Amusement and Recreation Attendants	Perform variety of attending duties at amusement or recreation facility. May schedule use of recreation facilities, maintain and provide equipment to participants of sporting events or recreational pursuits, or operate amusement concessions and rides.
	Costume Attendants	Select, fit, and take care of costumes for cast members, and aid entertainers.
	Locker Room, Coatroom, and Dressing Room Attendants	Provide personal items to patrons or customers in locker rooms, dressing rooms, or coatrooms.
	Embalmers	Prepare bodies for interment in conformity with legal requirements.
	Funeral Attendants	Perform variety of tasks during funeral, such as placing casket in parlor or chapel prior to service; arranging floral offerings or lights around casket; directing or escorting mourners; closing casket; and issuing and storing funeral equipment.
	Barbers	Provide barbering services, such as cutting, trimming, shampooing, and styling hair, trimming beards, or giving shaves.
	Hairdressers, Hairstylists, and Cosmetologists	Provide beauty services, such as shampooing, cutting, coloring, and styling hair, and massaging and treating scalp. May also apply makeup, dress wigs, perform hair removal, and provide nail and skin care services.
	Makeup Artists, Theatrical and Performance	Apply makeup to performers to reflect period, setting, and situation of their role.
	Manicurists and Pedicurists	Clean and shape customers' fingernails and toenails. May polish or decorate nails.
	Shampooers	Shampoo and rinse customers' hair.
	Skin Care Specialists	Provide skin care treatments to face and body to enhance an individual's appearance.
	Baggage Porters and Bellhops	Handle baggage for travelers at transportation terminals or for guests at hotels or similar establishments.
	Concierges	Assist patrons at hotel, apartment or office building with personal services. May take messages, arrange or give advice on transportation, business services or entertainment, or monitor guest requests for housekeeping and maintenance.
	Tour Guides and Escorts	Escort individuals or groups on sightseeing tours or through places of interest, such as industrial establishments, public buildings, and art galleries.
	Travel Guides	Plan, organize, and conduct long distance cruises, tours, and expeditions for individuals and groups.
	Flight Attendants	Provide personal services to ensure the safety and comfort of airline passengers during flight. Greet passengers, verify tickets, explain use of safety equipment, and serve food or beverages.
	Transportation Attendants, Except Flight Attendants and Baggage Porters	Provide services to ensure the safety and comfort of passengers aboard ships, buses, trains, or within the station or terminal. Perform duties, such as greeting passengers, explaining the use of safety equipment, serving meals or beverages, or answering questions related to travel.
	Child Care Workers	Attend to children at schools, businesses, private households, and child care institutions. Perform a variety of tasks, such as dressing, feeding, bathing, and overseeing play. Exclude "Preschool Teachers" (25-2011) and "Teacher Assistants" (25-9041).
	Personal and Home Care Aides	Assist elderly or disabled adults with daily living activities at the person's home or in a daytime non-residential facility. Duties performed at a place of residence may include keeping house (making beds, doing laundry, washing dishes) and preparing meals. May provide meals and supervised activities at non-residential care facilities. May advise families, the elderly, and disabled on such things as nutrition, cleanliness, and household utilities.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Fitness Trainers and Aerobics Instructors	Instruct or coach groups or individuals in exercise activities and the fundamentals of sports. Demonstrate techniques and methods of participation. Observe participants and inform them of corrective measures necessary to improve their skills. Those required to hold teaching degrees should be reported in the appropriate teaching category. Exclude "Athletic Trainers" (29-9091).
	Recreation Workers	Conduct recreation activities with groups in public, private, or volunteer agencies or recreation facilities. Organize and promote activities, such as arts and crafts, sports, games, music, dramatics, social recreation, camping, and hobbies, taking into account the needs and interests of individual members.
	Residential Advisors	Coordinate activities for residents of boarding schools, college fraternities or sororities, college dormitories, or similar establishments. Order supplies and determine need for maintenance, repairs, and furnishings. May maintain household records and assign rooms. May refer residents to counseling resources if needed.
	Personal Care and Service Workers, All Other	All personal care and service workers not listed separately.
	First-Line Supervisors/Managers of Retail Sales Workers	Directly supervise sales workers in a retail establishment or department. Duties may include management functions, such as purchasing, budgeting, accounting, and personnel work, in addition to supervisory duties.
	First-Line Supervisors/Managers of Non-Retail Sales Workers	Directly supervise and coordinate activities of sales workers other than retail sales workers. May perform duties, such as budgeting, accounting, and personnel work, in addition to supervisory duties.
	Cashiers	Receive and disburse money in establishments other than financial institutions. Usually involves use of electronic scanners, cash registers, or related equipment. Often involved in processing credit or debit card transactions and validating checks.
	Gaming Change Persons and Booth Cashiers	Exchange coins and tokens for patrons' money. May issue payoffs and obtain customer's signature on receipt when winnings exceed the amount held in the slot machine. May operate a booth in the slot machine area and furnish change persons with money bank at the start of the shift, or count and audit money in drawers.
	Counter and Rental Clerks	Receive orders for repairs, rentals, and services. May describe available options, compute cost, and accept payment.
	Parts Salespersons	Sell spare and replacement parts and equipment in repair shop or parts store.
	Retail Salespersons	Sell merchandise, such as furniture, motor vehicles, appliances, or apparel in a retail establishment. Exclude "Cashiers" (41-2011).
	Advertising Sales Agents	Sell or solicit advertising, including graphic art, advertising space in publications, custom made signs, or TV and radio advertising time. May obtain leases for outdoor advertising sites or persuade retailer to use sales promotion display items.
	Insurance Sales Agents	Sell life, property, casualty, health, automotive, or other types of insurance. May refer clients to independent brokers, work as independent broker, or be employed by an insurance company.
	Securities, Commodities, and Financial Services Sales Agents	Buy and sell securities in investment and trading firms, or call upon businesses and individuals to sell financial services. Provide financial services, such as loan, tax, and securities counseling. May advise securities customers about such things as stocks, bonds, and market conditions.
	Travel Agents	Plan and sell transportation and accommodations for travel agency customers. Determine destination, modes of transportation, travel dates, costs, and accommodations required.
	Sales Representatives, Services, All Other	All services sales representatives not listed separately.
	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Sell goods for wholesalers or manufacturers where technical or scientific knowledge is required in such areas as biology, engineering, chemistry, and electronics, normally obtained from at least 2 years of post-secondary education.
	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific	Sell goods for wholesalers or manufacturers to businesses or groups of individuals. Work requires substantial knowledge of items sold.
	Demonstrators and Product Promoters	Demonstrate merchandise and answer questions for the purpose of creating public interest in buying the product. May sell demonstrated merchandise.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Models	Model garments and other apparel to display clothing before prospective buyers at fashion shows, private showings, retail establishments, or photographer. May pose for photos to be used for advertising purposes. May pose as subject for paintings, sculptures, and other types of artistic expression.
	Real Estate Brokers	Operate real estate office, or work for commercial real estate firm, overseeing real estate transactions. Other duties usually include selling real estate or renting properties and arranging loans.
	Real Estate Sales Agents	Rent, buy, or sell property for clients. Perform duties, such as study property listings, interview prospective clients, accompany clients to property site, discuss conditions of sale, and draw up real estate contracts. Include agents who represent buyer.
	Sales Engineers	Sell business goods or services, the selling of which requires a technical background equivalent to a baccalaureate degree in engineering. Exclude "Engineers" (17-2011 through 17-2199) whose primary function is not marketing or sales.
	Telemarketers	Solicit orders for goods or services over the telephone.
	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers	Sell goods or services door-to-door or on the street.
	Sales and Related Workers, All Other	All sales and related workers not listed separately.
	First-Line Supervisors/Managers of Office and Administrative Support Workers	Supervise and coordinate the activities of clerical and administrative support workers.
	Switchboard Operators, Including Answering Service	Operate telephone business systems equipment or switchboards to relay incoming, outgoing, and interoffice calls. May supply information to callers and record messages.
	Telephone Operators	Provide information by accessing alphabetical and geographical directories. Assist customers with special billing requests, such as charges to a third party and credits or refunds for incorrectly dialed numbers or bad connections. May handle emergency calls and assist children or people with physical disabilities to make telephone calls.
	Communications Equipment Operators, All Other	All communications equipment operators not listed separately.
	Bill and Account Collectors	Locate and notify customers of delinquent accounts by mail, telephone, or personal visit to solicit payment. Duties include receiving payment and posting amount to customer's account; preparing statements to credit department if customer fails to respond; initiating repossession proceedings or service disconnection; keeping records of collection and status of accounts.
	Billing and Posting Clerks and Machine Operators	Compile, compute, and record billing, accounting, statistical, and other numerical data for billing purposes. Prepare billing invoices for services rendered or for delivery or shipment of goods.
	Bookkeeping, Accounting, and Auditing Clerks	Compute, classify, and record numerical data to keep financial records complete. Perform any combination of routine calculating, posting, and verifying duties to obtain primary financial data for use in maintaining accounting records. May also check the accuracy of figures, calculations, and postings pertaining to business transactions recorded by other workers.
	Gaming Cage Workers	In a gaming establishment, conduct financial transactions for patrons. May reconcile daily summaries of transactions to balance books. Accept patron's credit application and verify credit references to provide check-cashing authorization or to establish house credit accounts. May sell gambling chips, tokens, or tickets to patrons, or to other workers for resale to patrons. May convert gaming chips, tokens, or tickets to currency upon patron's request. May use a cash register or computer to record transaction.
	Payroll and Timekeeping Clerks	Compile and post employee time and payroll data. May compute employees' time worked, production, and commission. May compute and post wages and deductions. May prepare paychecks.
	Procurement Clerks	Compile information and records to draw up purchase orders for procurement of materials and services.
	Tellers	Receive and pay out money. Keep records of money and negotiable instruments involved in a financial institution's various transactions.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Brokerage Clerks	Perform clerical duties involving the purchase or sale of securities. Duties include writing orders for stock purchases and sales, computing transfer taxes, verifying stock transactions, accepting and delivering securities, tracking stock price fluctuations, computing equity, distributing dividends, and keeping records of daily transactions and holdings.
	Correspondence Clerks	Compose letters in reply to requests for merchandise, damage claims, credit and other information, delinquent accounts, incorrect billings, or unsatisfactory services. Duties may include gathering data to formulate reply and typing correspondence.
	Court, Municipal, and License Clerks	Perform clerical duties in courts of law, municipalities, and governmental licensing agencies and bureaus. May prepare docket of cases to be called; secure information for judges and court; prepare draft agendas or bylaws for town or city council; answer official correspondence; keep fiscal records and accounts; issue licenses or permits; record data, administer tests, or collect fees. Include chief clerks with "Managers, All Other" (11-9199).
	Credit Authorizers, Checkers, and Clerks	Authorize credit charges against customers' accounts. Investigate history and credit standing of individuals or business establishments applying for credit. May interview applicants to obtain personal and financial data; determine credit worthiness; process applications; and notify customers of acceptance or rejection of credit.
	Customer Service Representatives	Interact with customers to provide information in response to inquiries about products and services and to handle and resolve complaints. Exclude individuals whose duties are primarily sales or repair.
	Eligibility Interviewers, Government Programs	Determine eligibility of persons applying to receive assistance from government programs and agency resources, such as welfare, unemployment benefits, social security, and public housing.
	File Clerks	File correspondence, cards, invoices, receipts, and other records in alphabetical or numerical order or according to the filing system used. Locate and remove material from file when requested.
	Hotel, Motel, and Resort Desk Clerks	Accommodate hotel, motel, and resort patrons by registering and assigning rooms to guests, issuing room keys, transmitting and receiving messages, keeping records of occupied rooms and guests' accounts, making and confirming reservations, and presenting statements to and collecting payments from departing guests.
	Interviewers, Except Eligibility and Loan	Interview persons by telephone, mail, in person, or by other means for the purpose of completing forms, applications, or questionnaires. Ask specific questions, record answers, and assist persons with completing form. May sort, classify, and file forms.
	Library Assistants, Clerical	Compile records, sort and shelve books, and issue and receive library materials such as pictures, cards, slides and microfilm. Locate library materials for loan and replace material in shelving area, stacks, or files according to identification number and title. Register patrons to permit them to borrow books, periodicals, and other library materials.
	Loan Interviewers and Clerks	Interview loan applicants to elicit information; investigate applicants' backgrounds and verify references; prepare loan request papers; and forward findings, reports, and documents to appraisal department. Review loan papers to ensure completeness, and complete transactions between loan establishment, borrowers, and sellers upon approval of loan.
	New Accounts Clerks	Interview persons desiring to open bank accounts. Explain banking services available to prospective customers and assist them in preparing application form.
	Order Clerks	Receive and process incoming orders for materials, merchandise, classified ads, or services such as repairs, installations, or rental of facilities. Duties include informing customers of receipt, prices, shipping dates, and delays; preparing contracts; and handling complaints. Exclude "Dispatchers, Except Police, Fire, and Ambulance" (43-5032) who both dispatch and take orders for services.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Human Resources Assistants, Except Payroll and Timekeeping	Compile and keep personnel records. Record data for each employee, such as address, weekly earnings, absences, amount of sales or production, supervisory reports on ability, and date of and reason for termination. Compile and type reports from employment records. File employment records. Search employee files and furnish information to authorized persons.
	Receptionists and Information Clerks	Answer inquiries and obtain information for general public, customers, visitors, and other interested parties. Provide information regarding activities conducted at establishment; location of departments, offices, and employees within organization. Exclude "Switchboard Operators, Including Answering Service" (43-2011).
	Reservation and Transportation Ticket Agents and Travel Clerks	Make and confirm reservations and sell tickets to passengers for large hotel or motel chains. May check baggage and direct passengers to designated concourse, pier, or track; make reservations, deliver tickets, arrange for visas, contact individuals and groups to inform them of package tours, or provide tourists with travel information, such as points of interest, restaurants, rates, and emergency service. Exclude "Travel Agents" (41-3041), "Hotel, Motel, and Resort Desk Clerks" (43-4081), and "Cashiers" (41-2011) who sell tickets for local transportation.
	Information and Record Clerks, All Other	All information and record clerks not listed separately.
	Cargo and Freight Agents	Expedite and route movement of incoming and outgoing cargo and freight shipments in airline, train, and trucking terminals, and shipping docks. Take orders from customers and arrange pickup of freight and cargo for delivery to loading platform. Prepare and examine bills of lading to determine shipping charges and tariffs.
	Couriers and Messengers	Pick up and carry messages, documents, packages, and other items between offices or departments within an establishment or to other business concerns, traveling by foot, bicycle, motorcycle, automobile, or public conveyance. Exclude "Truck Drivers, Light or Delivery Services" (53-3033).
	Police, Fire, and Ambulance Dispatchers	Receive complaints from public concerning crimes and police emergencies. Broadcast orders to police patrol units in vicinity of complaint to investigate. Operate radio, telephone, or computer equipment to receive reports of fires and medical emergencies and relay information or orders to proper officials.
	Dispatchers, Except Police, Fire, and Ambulance	Schedule and dispatch workers, work crews, equipment, or service vehicles for conveyance of materials, freight, or passengers, or for normal installation, service, or emergency repairs rendered outside the place of business. Duties may include using radio, telephone, or computer to transmit assignments and compiling statistics and reports on work progress.
	Meter Readers, Utilities	Read meter and record consumption of electricity, gas, water, or steam.
	Postal Service Clerks	Perform any combination of tasks in a post office, such as receive letters and parcels; sell postage and revenue stamps, postal cards, and stamped envelopes; fill out and sell money orders; place mail in pigeon holes of mail rack or in bags according to State, address, or other scheme; and examine mail for correct postage.
	Postal Service Mail Carriers	Sort mail for delivery. Deliver mail on established route by vehicle or on foot.
	Postal Service Mail Sorters, Processors, and Processing Machine Operators	Prepare incoming and outgoing mail for distribution. Examine, sort, and route mail by State, type of mail, or other scheme. Load, operate, and occasionally adjust and repair mail processing, sorting, and canceling machinery. Keep records of shipments, pouches, and sacks; and other duties related to mail handling within the postal service. Must complete a competitive exam. Exclude "Postal Service Clerks" (43-5051) and "Postal Service Mail Carriers" (43-5052).
	Production, Planning, and Expediting Clerks	Coordinate and expedite the flow of work and materials within or between departments of an establishment according to production schedule. Duties include reviewing and distributing production, work, and shipment schedules; conferring with department supervisors to determine progress of work and completion dates; and compiling reports on progress of work, inventory levels, costs, and production problems. Exclude "Weighers, Measurers, Checkers, and Samplers, Recordkeeping" (43-5111).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Shipping, Receiving, and Traffic Clerks	Verify and keep records on incoming and outgoing shipments. Prepare items for shipment. Duties include assembling, addressing, stamping, and shipping merchandise or material; receiving, unpacking, verifying and recording incoming merchandise or material; and arranging for the transportation of products. Exclude "Stock Clerks and Order Fillers" (43-5081) and "Weighers, Measurers, Checkers, and Samplers, Recordkeeping" (43-5111).
	Stock Clerks and Order Fillers	Receive, store, and issue sales floor merchandise, materials, equipment, and other items from stockroom, warehouse, or storage yard to fill shelves, racks, tables, or customers' orders. May mark prices on merchandise and set up sales displays. Exclude "Laborers and Freight, Stock, and Material Movers, Hand" (53-7062), and "Shipping, Receiving, and Traffic Clerks" (43-5071).
	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	Weigh, measure, and check materials, supplies, and equipment for the purpose of keeping relevant records. Duties are primarily clerical by nature. Include workers who collect and keep record of samples of products or materials. Exclude production "Inspectors, Testers, Sorters, Samplers, and Weighers" (51-9061).
	Executive Secretaries and Administrative Assistants	Provide high-level administrative support by conducting research, preparing statistical reports, handling information requests, and performing clerical functions such as preparing correspondence, receiving visitors, arranging conference calls, and scheduling meetings. May also train and supervise lower-level clerical staff. Exclude "Secretaries" (43-6012 through 43-6014).
	Secretaries, Legal	Perform secretarial duties utilizing legal terminology, procedures, and documents. Prepare legal papers and correspondence, such as summonses, complaints, motions, and subpoenas. May also assist with legal research.
	Secretaries, Medical	Perform secretarial duties utilizing specific knowledge of medical terminology and hospital, clinic, or laboratory procedures. Duties include scheduling appointments, billing patients, and compiling and recording medical charts, reports, and correspondence.
	Computer Operators	Monitor and control electronic computer and peripheral electronic data processing equipment to process business, scientific, engineering, and other data according to operating instructions. May enter commands at a computer terminal and set controls on computer and peripheral devices. Monitor and respond to operating and error messages. Exclude "Data Entry Keyers" (43-9021).
	Data Entry Keyers	Operate data entry device, such as keyboard or photo composing perforator. Duties may include verifying data and preparing materials for printing. Exclude "Word Processors and Typists" (43-9022).
	Word Processors and Typists	Use word processor/computer or typewriter to type letters, reports, forms, or other material from rough draft, corrected copy, or voice recording. May perform other clerical duties as assigned. Include composing data keyers. Exclude "Data Entry Keyers" (43-9021), "Secretaries and Administrative Assistants" (43-6011 through 43-6014), "Court Reporters" (23-2091), and "Medical Transcriptionists" (31-9094).
	Desktop Publishers	Format typescript and graphic elements using computer software to produce publication-ready material.
	Insurance Claims and Policy Processing Clerks	Process new insurance policies, modifications to existing policies, and claims forms. Obtain information from policyholders to verify the accuracy and completeness of information on claims forms, applications and related documents, and company records. Update existing policies and company records to reflect changes requested by policyholders and insurance company representatives. Exclude "Claims Adjusters, Examiners, and Investigators" (13-1031).
	Mail Clerks and Mail Machine Operators, Except Postal Service	Prepare incoming and outgoing mail for distribution. Use hand or mail handling machines to time stamp, open, read, sort, and route incoming mail; and address, seal, stamp, fold, stuff, and affix postage to outgoing mail or packages. Duties may also include keeping necessary records and completed forms.
	Office Clerks, General	Perform duties too varied and diverse to be classified in any specific office clerical occupation, requiring limited knowledge of office management systems and procedures. Clerical duties may be assigned in accordance with the office procedures of individual establishments and may include a combination of answering telephones, bookkeeping, typing or word processing, stenography, office machine operation, and filing.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Office Machine Operators, Except Computer	Operate one or more of a variety of office machines, such as photocopying, photographic, and duplicating machines, or other office machines. Exclude "Computer Operators" (43-9011), "Mail Clerks and Mail Machine Operators" (43-9051) and "Billing and Posting Clerks and Machine Operators" (43-3021).
	Proofreaders and Copy Markers	Read transcript or proof type setup to detect and mark for correction any grammatical, typographical, or compositional errors. Exclude workers whose primary duty is editing copy. Include proofreaders of Braille.
	Statistical Assistants	Compile and compute data according to statistical formulas for use in statistical studies. May perform actuarial computations and compile charts and graphs for use by actuaries. Include actuarial clerks.
	Office and Administrative Support Workers, All Other	All office and administrative support workers not listed separately.
	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	Directly supervise and coordinate the activities of agricultural, forestry, aquacultural, and related workers. Exclude "First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers" (37-1012).
	Agricultural Inspectors	Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.
	Animal Breeders	Breed animals, including cattle, goats, horses, sheep, swine, poultry, dogs, cats, or pet birds. Select and breed animals according to their genealogy, characteristics, and offspring. May require a knowledge of artificial insemination techniques and equipment use. May involve keeping records on heats, birth intervals, or pedigree. Exclude "Nonfarm Animal Caretakers" (39-2021) who may occasionally breed animals as part of their other caretaking duties. Exclude "Animal Scientists" (19-1011) whose primary function is research.
	Farm Labor Contractors	Recruit, hire, furnish, and supervise seasonal or temporary agricultural laborers for a fee. May transport, house, and provide meals for workers.
	Graders and Sorters, Agricultural Products	Grade, sort, or classify unprocessed food and other agricultural products by size, weight, color, or condition. Exclude "Agricultural Inspectors" (45-2011).
	Agricultural Equipment Operators	Drive and control farm equipment to till soil and to plant, cultivate, and harvest crops. May perform tasks, such as crop baling or hay bucking. May operate stationary equipment to perform post-harvest tasks, such as husking, shelling, threshing, and ginning.
	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	Manually plant, cultivate, and harvest vegetables, fruits, nuts, horticultural specialties, and field crops. Use hand tools, such as shovels, trowels, hoes, tampers, pruning hooks, shears, and knives. Duties may include tilling soil and applying fertilizers; transplanting, weeding, thinning, or pruning crops; applying pesticides; cleaning, grading, sorting, packing and loading harvested products. May construct trellises, repair fences and farm buildings, or participate in irrigation activities. Exclude "Graders and Sorters, Agricultural Products" (45-2041). Exclude "Forest, Conservation, and Logging Workers" (45-4011 through 45-4029).
	Farmworkers, Farm and Ranch Animals	Attend to live farm, ranch, or aquacultural animals that may include cattle, sheep, swine, goats, horses and other equines, poultry, finfish, shellfish, and bees. Attend to animals produced for animal products, such as meat, fur, skins, feathers, eggs, milk, and honey. Duties may include feeding, watering, herding, grazing, castrating, branding, de-beaking, weighing, catching, and loading animals. May maintain records on animals; examine animals to detect diseases and injuries; assist in birth deliveries; and administer medications, vaccinations, or insecticides as appropriate. May clean and maintain animal housing areas. Include workers who shear wool from sheep, and collect eggs in hatcheries.
	Agricultural Workers, All Other	All agricultural workers not listed separately.
	Fishers and Related Fishing Workers	Use nets, fishing rods, traps, or other equipment to catch and gather fish or other aquatic animals from rivers, lakes, or oceans, for human consumption or other uses. May haul game onto ship. Include aquacultural laborers who work on fish farms with "Agricultural Workers, All Other" (45-2099).
	Hunters and Trappers	Hunt and trap wild animals for human consumption, fur, feed, bait, or other purposes.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Forest and Conservation Workers	Under supervision, perform manual labor necessary to develop, maintain, or protect forest, forested areas, and woodlands through such activities as raising and transporting tree seedlings; combating insects, pests, and diseases harmful to trees; and building erosion and water control structures and leaching of forest soil. Include forester aides, seedling pullers, and tree planters.
	Fallers	Use axes or chainsaws to fell trees using knowledge of tree characteristics and cutting techniques to control direction of fall and minimize tree damage.
	Logging Equipment Operators	Drive logging tractor or wheeled vehicle equipped with one or more accessories, such as bulldozer blade, frontal shear, grapple, logging arch, cable winches, hoisting rack, or crane boom, to fell tree; to skid, load, unload, or stack logs; or to pull stumps or clear brush.
	Log Graders and Scalers	Grade logs or estimate the marketable content or value of logs or pulpwood in sorting yards, millpond, log deck, or similar locations. Inspect logs for defects or measure logs to determine volume. Exclude "Purchasing Agents and Buyers, Farm Products" (13-1021).
	Logging Workers, All Other	All logging workers not listed separately.
	Farming, Fishing, and Forestry Workers, All Other	All farming, fishing, and forestry workers not listed separately.
	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Directly supervise and coordinate activities of construction or extraction workers.
	Boilermakers	Construct, assemble, maintain, and repair stationary steam boilers and boiler house auxiliaries. Align structures or plate sections to assemble boiler frame tanks or vats, following blueprints. Work involves use of hand and power tools, plumb bobs, levels, wedges, dogs, or turnbuckles. Assist in testing assembled vessels. Direct cleaning of boilers and boiler furnaces. Inspect and repair boiler fittings, such as safety valves, regulators, automatic-control mechanisms, water columns, and auxiliary machines.
	Brickmasons and Blockmasons	Lay and bind building materials, such as brick, structural tile, concrete block, cinder block, glass block, and terra-cotta block, with mortar and other substances to construct or repair walls, partitions, arches, sewers, and other structures. Exclude "Stonemasons" (47-2022). Classify installers of mortarless segmental concrete masonry wall units in "Landscaping and Groundskeeping Workers" (37-3011).
	Stonemasons	Build stone structures, such as piers, walls, and abutments. Lay walks, curbstones, or special types of masonry for vats, tanks, and floors.
	Carpenters	Construct, erect, install, or repair structures and fixtures made of wood, such as concrete forms; building frameworks, including partitions, joists, studding, and rafters; wood stairways, window and door frames, and hardwood floors. May also install cabinets, siding, drywall and batt or roll insulation. Include brattice builders who build doors or brattices (ventilation walls or partitions) in underground passageways to control the proper circulation of air through the passageways and to the working places.
	Carpet Installers	Lay and install carpet from rolls or blocks on floors. Install padding and trim flooring materials. Exclude "Floor Layers, Except Carpet, Wood, and Hard Tiles" (47-2042).
	Floor Layers, Except Carpet, Wood, and Hard Tiles	Apply blocks, strips, or sheets of shock-absorbing, sound-deadening, or decorative coverings to floors.
	Floor Sanders and Finishers	Scrape and sand wooden floors to smooth surfaces using floor scraper and floor sanding machine, and apply coats of finish.
	Tile and Marble Setters	Apply hard tile, marble, and wood tile to walls, floors, ceilings, and roof decks.
	Cement Masons and Concrete Finishers	Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, roads, or curbs using a variety of hand and power tools. Align forms for sidewalks, curbs, or gutters; patch voids; use saws to cut expansion joints. Classify installers of mortarless segmental concrete masonry wall units in "Landscaping and Groundskeeping Workers. (37-3011).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Terrazzo Workers and Finishers	Apply a mixture of cement, sand, pigment, or marble chips to floors, stairways, and cabinet fixtures to fashion durable and decorative surfaces.
	Construction Laborers	Perform tasks involving physical labor at building, highway, and heavy construction projects, tunnel and shaft excavations, and demolition sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments. May clean and prepare sites, dig trenches, set braces to support the sides of excavations, erect scaffolding, clean up rubble and debris, and remove asbestos, lead, and other hazardous waste materials. May assist other craft workers. Exclude construction laborers who primarily assist a particular craft worker, and classify them under "Helpers, Construction Trades" (47-3011 through 47-3016).
	Paving, Surfacing, and Tamping Equipment Operators	Operate equipment used for applying concrete, asphalt, or other materials to road beds, parking lots, or airport runways and taxiways, or equipment used for tamping gravel, dirt, or other materials. Include concrete and asphalt paving machine operators, form tampers, tamping machine operators, and stone spreader operators.
	Pile-Driver Operators	Operate pile drivers mounted on skids, barges, crawler treads, or locomotive cranes to drive pilings for retaining walls, bulkheads, and foundations of structures, such as buildings, bridges, and piers.
	Operating Engineers and Other Construction Equipment Operators	Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement. May repair and maintain equipment in addition to other duties. Exclude "Crane and Tower Operators" (53-7021) and equipment operators who work in extraction or other non-construction industries.
	Drywall and Ceiling Tile Installers	Apply plasterboard or other wallboard to ceilings or interior walls of buildings. Apply or mount acoustical tiles or blocks, strips, or sheets of shock-absorbing materials to ceilings and walls of buildings to reduce or reflect sound. Materials may be of decorative quality. Include lathers who fasten wooden, metal, or rockboard lath to walls, ceilings or partitions of buildings to provide support base for plaster, fire-proofing, or acoustical material. Exclude "Carpet Installers" (47-2041), "Carpenters" (47-2031), and "Tile and Marble Setters" (47-2044).
	Tapers	Seal joints between plasterboard or other wallboard to prepare wall surface for painting or papering.
	Electricians	Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems. Exclude "Security and Fire Alarm Systems Installers" (49-2098).
	Glaziers	Install glass in windows, skylights, store fronts, and display cases, or on surfaces, such as building fronts, interior walls, ceilings, and tabletops.
	Insulation Workers, Floor, Ceiling, and Wall	Line and cover structures with insulating materials. May work with batt, roll, or blown insulation materials.
	Insulation Workers, Mechanical	Apply insulating materials to pipes or ductwork, or other mechanical systems in order to help control and maintain temperature.
	Painters, Construction and Maintenance	Paint walls, equipment, buildings, bridges, and other structural surfaces, using brushes, rollers, and spray guns. May remove old paint to prepare surface prior to painting. May mix colors or oils to obtain desired color or consistency. Exclude "Paperhangers" (47-2142).
	Paperhangers	Cover interior walls and ceilings of rooms with decorative wallpaper or fabric, or attach advertising posters on surfaces, such as walls and billboards. Duties include removing old materials from surface to be papered.
	Pipelayers	Lay pipe for storm or sanitation sewers, drains, and water mains. Perform any combination of the following tasks: grade trenches or culverts, position pipe, or seal joints. Exclude "Welders, Cutters, Solderers, and Brazers" (51-4121).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Plumbers, Pipefitters, and Steamfitters	Assemble, install, alter, and repair pipelines or pipe systems that carry water, steam, air, or other liquids or gases. May install heating and cooling equipment and mechanical control systems.
	Plasterers and Stucco Masons	Apply interior or exterior plaster, cement, stucco, or similar materials. May also set ornamental plaster.
	Reinforcing Iron and Rebar Workers	Position and secure steel bars or mesh in concrete forms in order to reinforce concrete. Use a variety of fasteners, rod-bending machines, blowtorches, and hand tools. Include rod busters.
	Roofers	Cover roofs of structures with shingles, slate, asphalt, aluminum, wood, and related materials. May spray roofs, sidings, and walls with material to bind, seal, insulate, or soundproof sections of structures.
	Sheet Metal Workers	Fabricate, assemble, install, and repair sheet metal products and equipment, such as ducts, control boxes, drainpipes, and furnace casings. Work may involve any of the following: setting up and operating fabricating machines to cut, bend, and straighten sheet metal; shaping metal over anvils, blocks, or forms using hammer; operating soldering and welding equipment to join sheet metal parts; inspecting, assembling, and smoothing seams and joints of burred surfaces. Include sheet metal duct installers who install prefabricated sheet metal ducts used for heating, air conditioning, or other purposes.
	Structural Iron and Steel Workers	Raise, place, and unite iron or steel girders, columns, and other structural members to form completed structures or structural frameworks. May erect metal storage tanks and assemble prefabricated metal buildings. Exclude "Reinforcing Iron and Rebar Workers" (47-2171).
	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	Help brickmasons, blockmasons, stonemasons, or tile and marble setters by performing duties of lesser skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate skilled construction trade occupation (47-2011 through 47-2221). Exclude construction laborers who do not primarily assist brickmasons, blockmasons, and stonemasons or tile and marble setters, and classify them under "Construction Laborers" (47-2061).
	Helpers--Carpenters	Help carpenters by performing duties of lesser skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate skilled construction trade occupation (47-2011 through 47-2221). Exclude construction laborers who do not primarily assist carpenters, and classify them under "Construction Laborers" (47-2061).
	Helpers--Electricians	Help electricians by performing duties of lesser skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate skilled construction trade occupation (47-2011 through 47-2221). Exclude construction laborers who do not primarily assist electricians, and classify them under "Construction Laborers" (47-2061).
	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	Help painters, paperhangers, plasterers, or stucco masons by performing duties of lesser skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate skilled construction trade occupation (47-2011 through 47-2221). Exclude construction laborers who do not primarily assist painters, paperhangers, plasterers, or stucco masons, and classify them under "Construction Laborers" (47-2061).
	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	Help plumbers, pipefitters, steamfitters, or pipelayers by performing duties of lesser skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate skilled construction trade occupation (47-2011 through 47-2221). Exclude construction laborers who do not primarily assist plumbers, pipefitters, steamfitters, or pipelayers, and classify them under "Construction Laborers" (47-2061).
	Helpers--Roofers	Help roofers by performing duties of lesser skill. Duties include using, supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate skilled construction trade occupation (47-2011 through 47-2221). Exclude construction laborers who do not primarily assist roofers, and classify them under "Construction Laborers" (47-2061).
	Helpers, Construction Trades, All Other	All construction trades helpers not listed separately.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Construction and Building Inspectors	Inspect structures using engineering skills to determine structural soundness and compliance with specifications, building codes, and other regulations. Inspections may be general in nature or may be limited to a specific area, such as electrical systems or plumbing.
	Elevator Installers and Repairers	Assemble, install, repair, or maintain electric or hydraulic freight or passenger elevators, escalators, or dumbwaiters.
	Fence Erectors	Erect and repair metal and wooden fences and fence gates around highways, industrial establishments, residences, or farms, using hand and power tools.
	Hazardous Materials Removal Workers	Identify, remove, pack, transport, or dispose of hazardous materials, including asbestos, lead-based paint, waste oil, fuel, transmission fluid, radioactive materials, contaminated soil, etc. Specialized training and certification in hazardous materials handling or a confined entry permit are generally required. May operate earth-moving equipment or trucks.
	Highway Maintenance Workers	Maintain highways, municipal and rural roads, airport runways, and rights-of-way. Duties include patching broken or eroded pavement, repairing guard rails, highway markers, and snow fences. May also mow or clear brush from along road or plow snow from roadway. Exclude "Tree Trimmers and Pruners" (37-3013).
	Rail-Track Laying and Maintenance Equipment Operators	Lay, repair, and maintain track for standard or narrow-gauge railroad equipment used in regular railroad service or in plant yards, quarries, sand and gravel pits, and mines. Include ballast cleaning machine operators and road bed tamping machine operators.
	Septic Tank Servicers and Sewer Pipe Cleaners	Clean and repair septic tanks, sewer lines, or drains. May patch walls and partitions of tank, replace damaged drain tile, or repair breaks in underground piping.
	Construction and Related Workers, All Other	All construction and related workers not listed separately.
	Derrick Operators, Oil and Gas	Rig derrick equipment and operate pumps to circulate mud through drill hole.
	Rotary Drill Operators, Oil and Gas	Set up or operate a variety of drills to remove petroleum products from the earth and to find and remove core samples for testing during oil and gas exploration.
	Service Unit Operators, Oil, Gas, and Mining	Operate equipment to increase oil flow from producing wells or to remove stuck pipe, casing, tools, or other obstructions from drilling wells. May also perform similar services in mining exploration operations. Include fishing-tool technicians.
	Earth Drillers, Except Oil and Gas	Operate a variety of drills--such as rotary, churn, and pneumatic--to tap sub-surface water and salt deposits, to remove core samples during mineral exploration or soil testing, and to facilitate the use of explosives in mining or construction. May use explosives. Include horizontal and earth boring machine operators.
	Explosives Workers, Ordnance Handling Experts, and Blasters	Place and detonate explosives to demolish structures or to loosen, remove, or displace earth, rock, or other materials. May perform specialized handling, storage, and accounting procedures. Include seismograph shooters. Exclude "Earth Drillers, Except Oil and Gas" (47-5021) who may also work with explosives.
	Continuous Mining Machine Operators	Operate self-propelled mining machines that rip coal, metal and nonmetal ores, rock, stone, or sand from the face and load it onto conveyors or into shuttle cars in a continuous operation.
	Mine Cutting and Channeling Machine Operators	Operate machinery--such as longwall shears, plows, and cutting machines--to cut or channel along the face or seams of coal mines, stone quarries, or other mining surfaces to facilitate blasting, separating, or removing minerals or materials from mines or from the earth's surface. Include shale planers.
	Mining Machine Operators, All Other	All mining machine operators not listed separately.
	Rock Splitters, Quarry	Separate blocks of rough dimension stone from quarry mass using jackhammer and wedges.
	Roof Bolters, Mining	Operate machinery to install roof support bolts in underground mine.
	Roustabouts, Oil and Gas	Assemble or repair oil field equipment using hand and power tools. Perform other tasks as needed.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Helpers--Extraction Workers	Help extraction craft workers, such as earth drillers, blasters and explosives workers, derrick operators, and mining machine operators, by performing duties of lesser skill. Duties include supplying equipment or cleaning work area. Exclude apprentice workers and report them with the appropriate extraction trade occupation (47-5011 through 47-5099).
	Extraction Workers, All Other	All extraction workers not listed separately.
	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	Supervise and coordinate the activities of mechanics, installers, and repairers. Exclude team or work leaders.
	Computer, Automated Teller, and Office Machine Repairers	Repair, maintain, or install computers, word processing systems, automated teller machines, and electronic office machines, such as duplicating and fax machines.
	Radio Mechanics	Test or repair mobile or stationary radio transmitting and receiving equipment and two-way radio communications systems used in ship-to-shore communications and found in service and emergency vehicles.
	Telecommunications Equipment Installers and Repairers, Except Line Installers	Set-up, rearrange, or remove switching and dialing equipment used in central offices. Service or repair telephones and other communication equipment on customers' property. May install equipment in new locations or install wiring and telephone jacks in buildings under construction.
	Avionics Technicians	Install, inspect, test, adjust, or repair avionics equipment, such as radar, radio, navigation, and missile control systems in aircraft or space vehicles.
	Electric Motor, Power Tool, and Related Repairers	Repair, maintain, or install electric motors, wiring, or switches.
	Electrical and Electronics Installers and Repairers, Transportation Equipment	Install, adjust, or maintain mobile electronics communication equipment, including sound, sonar, security, navigation, and surveillance systems on trains, watercraft, or other mobile equipment. Exclude "Avionics Technicians" (49-2091) and "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096).
	Electrical and Electronics Repairers, Commercial and Industrial Equipment	Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas. Exclude "Avionics Technicians" (49-2091), "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096), and "Electrical and Electronics Installers and Repairers, Transportation Equipment" (49-2093).
	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	Inspect, test, repair, or maintain electrical equipment in generating stations, substations, and in-service relays.
	Electronic Equipment Installers and Repairers, Motor Vehicles	Install, diagnose, or repair communications, sound, security, or navigation equipment in motor vehicles.
	Electronic Home Entertainment Equipment Installers and Repairers	Repair, adjust, or install audio or television receivers, stereo systems, camcorders, video systems, or other electronic home entertainment equipment.
	Security and Fire Alarm Systems Installers	Install, program, maintain, and repair security and fire alarm wiring and equipment. Ensure that work is in accordance with relevant codes. Exclude "Electricians" (47-2111) who do a broad range of electrical wiring.
	Aircraft Mechanics and Service Technicians	Diagnose, adjust, repair, or overhaul aircraft engines and assemblies, such as hydraulic and pneumatic systems. Include helicopter and aircraft engine specialists. Exclude "Avionics Technician" (49-2091).
	Automotive Body and Related Repairers	Repair and refinish automotive vehicle bodies and straighten vehicle frames. Exclude "Painters, Transportation Equipment" (51-9122) and "Automotive Glass Installers and Repairers" (49-3022).
	Automotive Glass Installers and Repairers	Replace or repair broken windshields and window glass in motor vehicles.
	Automotive Service Technicians and Mechanics	Diagnose, adjust, repair, or overhaul automotive vehicles. Exclude "Automotive Body and Related Repairers" (49-3021), "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031), and "Electronic Equipment Installers and Repairers, Motor Vehicles" (49-2096).
	Bus and Truck Mechanics and Diesel Engine Specialists	Diagnose, adjust, repair, or overhaul trucks, buses, and all types of diesel engines. Include mechanics working primarily with automobile diesel engines.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Farm Equipment Mechanics	Diagnose, adjust, repair, or overhaul farm machinery and vehicles, such as tractors, harvesters, dairy equipment, and irrigation systems. Exclude "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).
	Mobile Heavy Equipment Mechanics, Except Engines	Diagnose, adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment, such as cranes, bulldozers, graders, and conveyors, used in construction, logging, and surface mining. Exclude "Rail Car Repairers" (49-3043) and "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).
	Rail Car Repairers	Diagnose, adjust, repair, or overhaul railroad rolling stock, mine cars, or mass transit rail cars. Exclude "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031).
	Motorboat Mechanics	Repairs and adjusts electrical and mechanical equipment of gasoline or diesel powered inboard or inboard-outboard boat engines. Exclude "Diesel Engine Specialists" (49-3031).
	Motorcycle Mechanics	Diagnose, adjust, repair, or overhaul motorcycles, scooters, mopeds, dirt bikes, or similar motorized vehicles.
	Outdoor Power Equipment and Other Small Engine Mechanics	Diagnose, adjust, repair, or overhaul small engines used to power lawn mowers, chain saws, and related equipment.
	Bicycle Repairers	Repair and service bicycles.
	Recreational Vehicle Service Technicians	Diagnose, inspect, adjust, repair, or overhaul recreational vehicles including travel trailers. May specialize in maintaining gas, electrical, hydraulic, plumbing, or chassis/towing systems as well as repairing generators, appliances, and interior components. Include workers who perform customized van conversions. Exclude "Automotive Service Technicians and Mechanics" (49-3023) and "Bus and Truck Mechanics and Diesel Engine Specialists" (49-3031) who also work on recreation vehicles.
	Tire Repairers and Changers	Repair and replace tires.
	Mechanical Door Repairers	Install, service, or repair opening and closing mechanisms of automatic doors and hydraulic door closers. Include garage door mechanics.
	Control and Valve Installers and Repairers, Except Mechanical Door	Install, repair, and maintain mechanical regulating and controlling devices, such as electric meters, gas regulators, thermostats, safety and flow valves, and other mechanical governors.
	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Install or repair heating, central air conditioning, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.
	Home Appliance Repairers	Repair, adjust, or install all types of electric or gas household appliances, such as refrigerators, washers, dryers, and ovens.
	Industrial Machinery Mechanics	Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems. Exclude "Millwrights" (49-9044), "Mobile Heavy Equipment Mechanics, Except Engines" (49-3042), and "Maintenance Workers, Machinery" (49-9043) who perform only routine tasks.
	Maintenance and Repair Workers, General	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs. Exclude "Maintenance Workers, Machinery" (49-9043).
	Maintenance Workers, Machinery	Lubricate machinery, change parts, or perform other routine machinery maintenance. Exclude "Maintenance and Repair Workers, General" (49-9042).
	Millwrights	Install, dismantle, or move machinery and heavy equipment according to layout plans, blueprints, or other drawings.
	Refractory Materials Repairers, Except Brickmasons	Build or repair furnaces, kilns, cupolas, boilers, converters, ladles, soaking pits, ovens, etc., using refractory materials.
	Electrical Power-Line Installers and Repairers	Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers. Exclude "Electrical and Electronics Repairers, Powerhouse, Substation, and Relay" (49-2095).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Telecommunications Line Installers and Repairers	String and repair telephone and television cable, including fiber optics and other equipment for transmitting messages or television programming.
	Camera and Photographic Equipment Repairers	Repair and adjust cameras and photographic equipment, including commercial video and motion picture camera equipment.
	Medical Equipment Repairers	Test, adjust, or repair biomedical or electromedical equipment.
	Musical Instrument Repairers and Tuners	Repair percussion, stringed, reed, or wind instruments. May specialize in one area, such as piano tuning. Exclude "Electronic Home Entertainment Equipment Installers and Repairers" (49-2097) who repair electrical and electronic musical instruments.
	Watch Repairers	Repair, clean, and adjust mechanisms of timing instruments, such as watches and clocks. Include watchmakers.
	Precision Instrument and Equipment Repairers, All Other	All precision instrument and equipment repairers not listed separately.
	Coin, Vending, and Amusement Machine Servicers and Repairers	Install, service, adjust, or repair coin, vending, or amusement machines including video games, juke boxes, pinball machines, or slot machines.
	Commercial Divers	Work below surface of water, using scuba gear to inspect, repair, remove, or install equipment and structures. May use a variety of power and hand tools, such as drills, sledgehammers, torches, and welding equipment. May conduct tests or experiments, rig explosives, or photograph structures or marine life. Exclude "Fishers and Related Fishing Workers" (45-3011), "Athletes and Sports Competitors" (27-2021), and "Police and Sheriff's Patrol Officers" (33-3051).
	Fabric Menders, Except Garment	Repair tears, holes, and other defects in fabrics, such as draperies, linens, parachutes, and tents.
	Locksmiths and Safe Repairers	Repair and open locks; make keys; change locks and safe combinations; and install and repair safes.
	Manufactured Building and Mobile Home Installers	Move or install mobile homes or prefabricated buildings.
	Riggers	Set up or repair rigging for construction projects, manufacturing plants, logging yards, ships and shipyards, or for the entertainment industry.
	Signal and Track Switch Repairers	Install, inspect, test, maintain, or repair electric gate crossings, signals, signal equipment, track switches, section lines, or intercommunications systems within a railroad system.
	Helpers--Installation, Maintenance, and Repair Workers	Help installation, maintenance, and repair workers in maintenance, parts replacement, and repair of vehicles, industrial machinery, and electrical and electronic equipment. Perform duties, such as furnishing tools, materials, and supplies to other workers; cleaning work area, machines, and tools; and holding materials or tools for other workers.
	Installation, Maintenance, and Repair Workers, All Other	All mechanical, installation, and repair workers and helpers not listed separately.
	First-Line Supervisors/Managers of Production and Operating Workers	Supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. Exclude team or work leaders.
	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	Assemble, fit, fasten, and install parts of airplanes, space vehicles, or missiles, such as tails, wings, fuselage, bulkheads, stabilizers, landing gear, rigging and control equipment, or heating and ventilating systems.
	Coil Winders, Tapers, and Finishers	Wind wire coils used in electrical components, such as resistors and transformers, and in electrical equipment and instruments, such as field cores, bobbins, armature cores, electrical motors, generators, and control equipment.
	Electrical and Electronic Equipment Assemblers	Assemble or modify electrical or electronic equipment, such as computers, test equipment telemetering systems, electric motors, and batteries.
	Electromechanical Equipment Assemblers	Assemble or modify electromechanical equipment or devices, such as servomechanisms, gyros, dynamometers, magnetic drums, tape drives, brakes, control linkage, actuators, and appliances.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Engine and Other Machine Assemblers	Construct, assemble, or rebuild machines, such as engines, turbines, and similar equipment used in such industries as construction, extraction, textiles, and paper manufacturing.
	Structural Metal Fabricators and Fitters	Fabricate, lay out, position, align, and fit parts of structural metal products.
	Fiberglass Laminators and Fabricators	Laminate layers of fiberglass on molds to form boat decks and hulls, bodies for golf carts, automobiles, or other products.
	Team Assemblers	Work as part of a team having responsibility for assembling an entire product or component of a product. Team assemblers can perform all tasks conducted by the team in the assembly process and rotate through all or most of them rather than being assigned to a specific task on a permanent basis. May participate in making management decisions affecting the work. Team leaders who work as part of the team should be included. Exclude assemblers (51-2011 through 51-2099) who continuously perform the same task.
	Timing Device Assemblers, Adjusters, and Calibrators	Perform precision assembling or adjusting, within narrow tolerances, of timing devices, such as watches, clocks, or chronometers. Exclude "Watch Repairers" (49-9064).
	Assemblers and Fabricators, All Other	All assemblers and fabricators not listed separately.
	Bakers	Mix and bake ingredients according to recipes to produce breads, rolls, cookies, cakes, pies, pastries, or other baked goods. Include pastry chefs in restaurants and hotels with "Chefs and Head Cooks" (35-1011).
	Butchers and Meat Cutters	Cut, trim, or prepare consumer-sized portions of meat for use or sale in retail establishments.
	Meat, Poultry, and Fish Cutters and Trimmers	Use hand tools to perform routine cutting and trimming of meat, poultry, and fish.
	Slaughterers and Meat Packers	Work in slaughtering, meat packing, or wholesale establishments performing precision functions involving the preparation of meat. Work may include specialized slaughtering tasks, cutting standard or premium cuts of meat for marketing, making sausage, or wrapping meats. Exclude "Meat, Poultry, and Fish Cutters and Trimmers" (51-3022) who perform routine, lower-skilled meat cutting.
	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	Operate or tend food or tobacco roasting, baking, or drying equipment, including hearth ovens, kiln driers, roasters, char kilns, and vacuum drying equipment.
	Food Batchmakers	Set up and operate equipment that mixes or blends ingredients used in the manufacturing of food products. Include candy makers and cheese makers.
	Food Cooking Machine Operators and Tenders	Operate or tend cooking equipment, such as steam cooking vats, deep fry cookers, pressure cookers, kettles, and boilers, to prepare food products. Exclude "Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders" (51-3091).
	Computer-Controlled Machine Tool Operators, Metal and Plastic	Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.
	Numerical Tool and Process Control Programmers	Develop programs to control machining or processing of parts by automatic machine tools, equipment, or systems.
	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend machines to extrude or draw thermoplastic or metal materials into tubes, rods, hoses, wire, bars, or structural shapes.
	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend forging machines to taper, shape, or form metal or plastic parts.
	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend machines to roll steel or plastic forming bends, beads, knurls, rolls, or plate or to flatten, temper, or reduce gauge of material.
	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend machines to saw, cut, shear, slit, punch, crimp, notch, bend, or straighten metal or plastic material.
	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend drilling machines to drill, bore, ream, mill, or countersink metal or plastic work pieces.
	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders,	Set up, operate, or tend grinding and related tools that remove excess material or burrs from surfaces, sharpen edges or corners, or buff, hone, or polish metal or plastic work pieces.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend lathe and turning machines to turn, bore, thread, form, or face metal or plastic materials, such as wire, rod, or bar stock.
	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend milling or planing machines to mill, plane, shape, groove, or profile metal or plastic work pieces.
	Machinists	Set up and operate a variety of machine tools to produce precision parts and instruments. Include precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, shop mathematics, metal properties, layout, and machining procedures.
	Metal-Refining Furnace Operators and Tenders	Operate or tend furnaces, such as gas, oil, coal, electric-arc or electric induction, open-hearth, or oxygen furnaces, to melt and refine metal before casting or to produce specified types of steel. Exclude "Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic" (51-4191).
	Pourers and Casters, Metal	Operate hand-controlled mechanisms to pour and regulate the flow of molten metal into molds to produce castings or ingots.
	Model Makers, Metal and Plastic	Set up and operate machines, such as lathes, milling and engraving machines, and jig borers to make working models of metal or plastic objects. Include template makers.
	Patternmakers, Metal and Plastic	Lay out, machine, fit, and assemble castings and parts to metal or plastic foundry patterns, core boxes, or match plates.
	Foundry Mold and Coremakers	Make or form wax or sand cores or molds used in the production of metal castings in foundries.
	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and	Set up, operate, or tend metal or plastic molding, casting, or coremaking machines to mold or cast metal or thermoplastic parts or products.
	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend more than one type of cutting or forming machine tool or robot.
	Tool and Die Makers	Analyze specifications, lay out metal stock, set up and operate machine tools, and fit and assemble parts to make and repair dies, cutting tools, jigs, fixtures, gauges, and machinists' hand tools.
	Welders, Cutters, Solderers, and Brazers	Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.
	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	Set up, operate, or tend welding, soldering, or brazing machines or robots that weld, braze, solder, or heat treat metal products, components, or assemblies. Include workers who operate laser cutters or laser-beam machines.
	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend heating equipment, such as heat-treating furnaces, flame-hardening machines, induction machines, soaking pits, or vacuum equipment to temper, harden, anneal, or heat-treat metal or plastic objects.
	Lay-Out Workers, Metal and Plastic	Lay out reference points and dimensions on metal or plastic stock or workpieces, such as sheets, plates, tubes, structural shapes, castings, or machine parts, for further processing. Include shipfitters.
	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	Set up, operate, or tend plating or coating machines to coat metal or plastic products with chromium, zinc, copper, cadmium, nickel, or other metal to protect or decorate surfaces. Include electrolytic processes.
	Tool Grinders, Filers, and Sharpeners	Perform precision smoothing, sharpening, polishing, or grinding of metal objects.
	Metalworkers and Plastic Workers, All Other	All metalworkers and plastic workers not listed separately.
	Bindery Workers	Set up or operate binding machines that produce books and other printed materials. Include hand bindery workers. Exclude "Bookbinders" (51-5012).
	Bookbinders	Perform highly skilled hand finishing operations, such as grooving and lettering to bind books.
	Job Printers	Set type according to copy; operate press to print job order; and read proof for errors and clarity of impression, and correct imperfections. Job printers are often found in small establishments where work combines several job skills.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Prepress Technicians and Workers	Set up and prepare material for printing presses. Include prepress functions, such as compositing, typesetting, layout, paste-up, camera operating, scanning, film stripping, and photoengraving.
	Printing Machine Operators	Set up or operate various types of printing machines, such as offset, letterset, intaglio, or gravure presses or screen printers to produce print on paper or other materials.
	Laundry and Dry-Cleaning Workers	Operate or tend washing or dry-cleaning machines to wash or dry-clean industrial or household articles, such as cloth garments, suede, leather, furs, blankets, draperies, fine linens, rugs, and carpets. Include spotters and dyers of these articles.
	Pressers, Textile, Garment, and Related Materials	Press or shape articles by hand or machine.
	Sewing Machine Operators	Operate or tend sewing machines to join, reinforce, decorate, or perform related sewing operations in the manufacture of garment or nongarment products.
	Shoe and Leather Workers and Repairers	Construct, decorate, or repair leather and leather-like products, such as luggage, shoes, and saddles.
	Shoe Machine Operators and Tenders	Operate or tend a variety of machines to join, decorate, reinforce, or finish shoes and shoe parts.
	Sewers, Hand	Sew, join, reinforce, or finish, usually with needle and thread, a variety of manufactured items. Include weavers and stitchers. Exclude "Fabric Menders, Except Garment" (49-9093).
	Tailors, Dressmakers, and Custom Sewers	Design, make, alter, repair, or fit garments.
	Textile Bleaching and Dyeing Machine Operators and Tenders	Operate or tend machines to bleach, shrink, wash, dye, or finish textiles or synthetic or glass fibers.
	Textile Cutting Machine Setters, Operators, and Tenders	Set up, operate, or tend machines that cut textiles.
	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	Set up, operate, or tend machines that knit, loop, weave, or draw in textiles. Exclude "Sewing Machine Operators" (51-6031).
	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	Set up, operate, or tend machines that wind or twist textiles; or draw out and combine sliver, such as wool, hemp, or synthetic fibers. Include slubber machine and drawing frame operators.
	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass	Set up, operate, or tend machines that extrude and form continuous filaments from synthetic materials, such as liquid polymer, rayon, and fiberglass.
	Fabric and Apparel Patternmakers	Draw and construct sets of precision master fabric patterns or layouts. May also mark and cut fabrics and apparel.
	Upholsterers	Make, repair, or replace upholstery for household furniture or transportation vehicles.
	Textile, Apparel, and Furnishings Workers, All Other	All textile, apparel, and furnishings workers not listed separately.
	Cabinetmakers and Bench Carpenters	Cut, shape, and assemble wooden articles or set up and operate a variety of woodworking machines, such as power saws, jointers, and mortisers to surface, cut, or shape lumber or to fabricate parts for wood products. Exclude "Woodworking Machine Setters, Operators, and Tenders" (51-7041 through 51-7042) who specialize in one or a limited number of machine phases.
	Furniture Finishers	Shape, finish, and refinish damaged, worn, or used furniture or new high-grade furniture to specified color or finish.
	Model Makers, Wood	Construct full-size and scale wooden precision models of products. Include wood jig builders and loft workers.
	Patternmakers, Wood	Plan, lay out, and construct wooden unit or sectional patterns used in forming sand molds for castings.
	Sawing Machine Setters, Operators, and Tenders, Wood	Set up, operate, or tend wood sawing machines. Include head sawyers.
	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	Set up, operate, or tend woodworking machines, such as drill presses, lathes, shapers, routers, sanders, planers, and wood nailing machines.
	Woodworkers, All Other	All woodworkers not listed separately.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Nuclear Power Reactor Operators	Control nuclear reactors.
	Power Distributors and Dispatchers	Coordinate, regulate, or distribute electricity or steam.
	Power Plant Operators	Control, operate, or maintain machinery to generate electric power. Include auxiliary equipment operators. Exclude "Nuclear Power Reactor Operators" (51-8011).
	Stationary Engineers and Boiler Operators	Operate or maintain stationary engines, boilers, or other mechanical equipment to provide utilities for buildings or industrial processes. Operate equipment, such as steam engines, generators, motors, turbines, and steam boilers.
	Water and Liquid Waste Treatment Plant and System Operators	Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or liquid waste.
	Chemical Plant and System Operators	Control or operate an entire chemical process or system of machines.
	Gas Plant Operators	Distribute or process gas for utility companies and others by controlling compressors to maintain specified pressures on main pipelines.
	Petroleum Pump System Operators, Refinery Operators, and Gaugers	Control the operation of petroleum refining or processing units. May specialize in controlling manifold and pumping systems, gauging or testing oil in storage tanks, or regulating the flow of oil into pipelines.
	Plant and System Operators, All Other	All plant and system operators not listed separately.
	Chemical Equipment Operators and Tenders	Operate or tend equipment to control chemical changes or reactions in the processing of industrial or consumer products. Equipment used includes devulcanizers, steam-jacketed kettles, and reactor vessels. Exclude "Chemical Plant and System Operators" (51-8091).
	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	Set up, operate, or tend continuous flow or vat-type equipment; filter presses; shaker screens; centrifuges; condenser tubes; precipitating, fermenting, or evaporating tanks; scrubbing towers; or batch stills. These machines extract, sort, or separate liquids, gases, or solids from other materials to recover a refined product. Include dairy processing equipment operators. Exclude "Chemical Equipment Operators and Tenders" (51-9011).
	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	Set up, operate, or tend machines to crush, grind, or polish materials, such as coal, glass, grain, stone, food, or rubber.
	Grinding and Polishing Workers, Hand	Grind, sand, or polish, using hand tools or hand-held power tools, a variety of metal, wood, stone, clay, plastic, or glass objects. Include chippers, buffers, and finishers.
	Mixing and Blending Machine Setters, Operators, and Tenders	Set up, operate, or tend machines to mix or blend materials, such as chemicals, tobacco, liquids, color pigments, or explosive ingredients. Exclude "Food Batchmakers" (51-3092).
	Cutters and Trimmers, Hand	Use hand tools or hand-held power tools to cut and trim a variety of manufactured items, such as carpet, fabric, stone, glass, or rubber.
	Cutting and Slicing Machine Setters, Operators, and Tenders	Set up, operate, or tend machines that cut or slice materials, such as glass, stone, cork, rubber, tobacco, food, paper, or insulating material. Exclude "Woodworking Machine Setters, Operators, and Tenders" (51-7041 through 51-7042), "Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic" (51-4031), and "Textile Cutting Machine Setters, Operators, and Tenders" (51-6062).
	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	Set up, operate, or tend machines, such as glass forming machines, plodder machines, and tuber machines, to shape and form products, such as glassware, food, rubber, soap, brick, tile, clay, wax, tobacco, or cosmetics. Exclude "Paper Goods Machine Setters, Operators, and Tenders" (51-9196) and "Shoe Machine Operators and Tenders" (51-6042).
	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	Operate or tend heating equipment other than basic metal, plastic, or food processing equipment. Includes activities, such as annealing glass, drying lumber, curing rubber, removing moisture from materials, or boiling soap.
	Inspectors, Testers, Sorters, Samplers, and Weighers	Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Jewelers and Precious Stone and Metal Workers	Design, fabricate, adjust, repair, or appraise jewelry, gold, silver, other precious metals, or gems. Include diamond polishers and gem cutters and persons who perform precision casting and modeling of molds, casting metal in molds, or setting precious and semi-precious stones for jewelry and related products.
	Dental Laboratory Technicians	Construct and repair full or partial dentures or dental appliances. Exclude "Dental Assistants" (31-9091).
	Medical Appliance Technicians	Construct, fit, maintain, or repair medical supportive devices, such as braces, artificial limbs, joints, arch supports, and other surgical and medical appliances.
	Ophthalmic Laboratory Technicians	Cut, grind, and polish eyeglasses, contact lenses, or other precision optical elements. Assemble and mount lenses into frames or process other optical elements. Include precision lens polishers or grinders, centerer-edgers, and lens mounters. Exclude "Opticians, Dispensing" (29-2081).
	Packaging and Filling Machine Operators and Tenders	Operate or tend machines to prepare industrial or consumer products for storage or shipment. Include cannery workers who pack food products.
	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	Set up, operate, or tend machines to coat or paint any of a wide variety of products including food, glassware, cloth, ceramics, metal, plastic, paper, or wood, with lacquer, silver, copper, rubber, varnish, glaze, enamel, oil, or rust-proofing materials. Exclude "Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic" (51-4193) and "Painters, Transportation Equipment" (51-9122).
	Painters, Transportation Equipment	Operate or tend painting machines to paint surfaces of transportation equipment, such as automobiles, buses, trucks, trains, boats, and airplanes. Include painters in auto body repair facilities.
	Painting, Coating, and Decorating Workers	Paint, coat, or decorate articles, such as furniture, glass, plateware, pottery, jewelry, cakes, toys, books, or leather. Exclude "Artists and Related Workers" (27-1011 through 27-1019), "Designers" (27-1021 through 27-1029), "Photographic Process Workers" (51-9131), and "Etchers and Engravers" (51-9194).
	Photographic Process Workers	Perform precision work involved in photographic processing, such as editing photographic negatives and prints, using photo-mechanical, chemical, or computerized methods.
	Photographic Processing Machine Operators	Operate photographic processing machines, such as photographic printing machines, film developing machines, and mounting presses.
	Semiconductor Processors	Perform any or all of the following functions in the manufacture of electronic semiconductors: load semiconductor material into furnace; saw formed ingots into segments; load individual segment into crystal growing chamber and monitor controls; locate crystal axis in ingot using x-ray equipment and saw ingots into wafers; clean, polish, and load wafers into series of special purpose furnaces, chemical baths, and equipment used to form circuitry and change conductive properties.
	Cementing and Gluing Machine Operators and Tenders	Operate or tend cementing and gluing machines to join items for further processing or to form a completed product. Processes include joining veneer sheets into plywood; gluing paper; joining rubber and rubberized fabric parts, plastic, simulated leather, or other materials. Exclude "Shoe Machine Operators and Tenders" (51-6042).
	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	Operate or tend machines to wash or clean products, such as barrels or kegs, glass items, tin plate, food, pulp, coal, plastic, or rubber, to remove impurities.
	Cooling and Freezing Equipment Operators and Tenders	Operate or tend equipment, such as cooling and freezing units, refrigerators, batch freezers, and freezing tunnels, to cool or freeze products, food, blood plasma, and chemicals.
	Etchers and Engravers	Engrave or etch metal, wood, rubber, or other materials for identification or decorative purposes. Include such workers as etcher-circuit processors, pantograph engravers, and silk screen etchers. Include photoengravers with "Prepress Technicians and Workers" (51-5022).
	Molders, Shapers, and Casters, Except Metal and Plastic	Mold, shape, form, cast, or carve products such as food products, figurines, tile, pipes, and candles consisting of clay, glass, plaster, concrete, stone, or combinations of materials.
	Paper Goods Machine Setters, Operators, and Tenders	Set up, operate, or tend paper goods machines that perform a variety of functions, such as converting, sawing, corrugating, banding, wrapping, boxing, stitching, forming, or sealing paper or paperboard sheets into products.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Tire Builders	Operate machines to build tires from rubber components.
	Helpers--Production Workers	Help production workers by performing duties of lesser skill. Duties include supplying or holding materials or tools, and cleaning work area and equipment. Exclude apprentice workers and report them with the appropriate production occupation (51-1011 through 51-9199).
	Production Workers, All Other	All production workers not listed separately.
	Aircraft Cargo Handling Supervisors	Direct ground crew in the loading, unloading, securing, and staging of aircraft cargo or baggage. Determine the quantity and orientation of cargo and compute aircraft center of gravity. May accompany aircraft as member of flight crew and monitor and handle cargo in flight, and assist and brief passengers on safety and emergency procedures. Include loadmasters.
	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	Supervise and coordinate the activities of helpers, laborers, or material movers.
	First-Line Supervisors/Managers of Transportation and Material-Moving Machine	Directly supervise and coordinate activities of transportation and material-moving machine and vehicle operators and helpers.
	Airline Pilots, Copilots, and Flight Engineers	Pilot and navigate the flight of multi-engine aircraft in regularly scheduled service for the transport of passengers and cargo. Requires Federal Air Transport rating and certification in specific aircraft type used. Include aircraft instructors with similar certification.
	Commercial Pilots	Pilot and navigate the flight of small fixed or rotary winged aircraft, primarily for the transport of cargo and passengers. Requires Commercial Rating. Include aircraft instructors with similar certification.
	Air Traffic Controllers	Control air traffic on and within vicinity of airport and movement of air traffic between altitude sectors and control centers according to established procedures and policies. Authorize, regulate, and control commercial airline flights according to government or company regulations to expedite and ensure flight safety.
	Airfield Operations Specialists	Ensure the safe takeoff and landing of commercial and military aircraft. Duties include coordination between air-traffic control and maintenance personnel; dispatching; using airfield landing and navigational aids; implementing airfield safety procedures; monitoring and maintaining flight records; and applying knowledge of weather information.
	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	Drive ambulance or assist ambulance driver in transporting sick, injured, or convalescent persons. Assist in lifting patients.
	Bus Drivers, Transit and Intercity	Drive bus or motor coach, including regular route operations, charters, and private carriage. May assist passengers with baggage. May collect fares or tickets.
	Bus Drivers, School	Transport students or special clients, such as the elderly or persons with disabilities. Ensure adherence to safety rules. May assist passengers in boarding or exiting.
	Driver/Sales Workers	Drive truck or other vehicle over established routes or within an established territory and sell goods, such as food products, including restaurant take-out items, or pick up and deliver items, such as laundry. May also take orders and collect payments. Include newspaper delivery drivers. Exclude "Truck Drivers, Light or Delivery Services" (53-3033) and "Coin, Vending, and Amusement Machine Servicers and Repairers" (49-9091).
	Truck Drivers, Heavy and Tractor-Trailer	Drive a tractor-trailer combination or a truck with a capacity of at least 26,000 GVW, to transport and deliver goods, livestock, or materials in liquid, loose, or packaged form. May be required to unload truck. May require use of automated routing equipment. Requires commercial drivers' license.
	Truck Drivers, Light or Delivery Services	Drive a truck or van with a capacity of under 26,000 GVW, primarily to deliver or pick up merchandise or to deliver packages within a specified area. May require use of automatic routing or location software. May load and unload truck. Exclude "Couriers and Messengers" (43-5021).

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Taxi Drivers and Chauffeurs	Drive automobiles, vans, or limousines to transport passengers. May occasionally carry cargo. Include hearse drivers. Exclude "Ambulance Drivers and Attendants, Except Emergency Medical Technicians" (53-3011) and "Bus Drivers" (53-3021 through 53-3022).
	Motor Vehicle Operators, All Other	All motor vehicle operators not listed separately.
	Locomotive Engineers	Drive electric, diesel-electric, steam, or gas-turbine-electric locomotives to transport passengers or freight. Interpret train orders, electronic or manual signals, and railroad rules and regulations.
	Locomotive Firers	Monitor locomotive instruments and watch for dragging equipment, obstacles on rights-of-way, and train signals during run. Watch for and relay traffic signals from yard workers to yard engineer in railroad yard.
	Rail Yard Engineers, Dinkey Operators, and Hostlers	Drive switching or other locomotive or dinkey engines within railroad yard, industrial plant, quarry, construction project, or similar location.
	Railroad Brake, Signal, and Switch Operators	Operate railroad track switches. Couple or uncouple rolling stock to make up or break up trains. Signal engineers by hand or flagging. May inspect couplings, air hoses, journal boxes, and hand brakes.
	Railroad Conductors and Yardmasters	Conductors coordinate activities of train crew on passenger or freight train. Coordinate activities of switch-engine crew within yard of railroad, industrial plant, or similar location. Yardmasters coordinate activities of workers engaged in railroad traffic operations, such as the makeup or breakup of trains, yard switching, and review train schedules and switching orders.
	Subway and Streetcar Operators	Operate subway or elevated suburban train with no separate locomotive, or electric-powered streetcar to transport passengers. May handle fares.
	Rail Transportation Workers, All Other	All rail transportation workers not listed separately.
	Sailors and Marine Oilers	Stand watch to look for obstructions in path of vessel, measure water depth, turn wheel on bridge, or use emergency equipment as directed by captain, mate, or pilot. Break out, rig, overhaul, and store cargo-handling gear, stationary rigging, and running gear. Perform a variety of maintenance tasks to preserve the painted surface of the ship and to maintain line and ship equipment. Must hold government-issued certification and tankerman certification when working aboard liquid-carrying vessels. Include able seamen and ordinary seamen.
	Captains, Mates, and Pilots of Water Vessels	Command or supervise operations of ships and water vessels, such as tugboats and ferryboats, that travel into and out of harbors, estuaries, straits, and sounds and on rivers, lakes, bays, and oceans. Required to hold license issued by U.S. Coast Guard. Exclude "Motorboat Operators" (53-5022).
	Motorboat Operators	Operate small motor-driven boats to carry passengers and freight between ships, or ship to shore. May patrol harbors and beach areas. May assist in navigational activities.
	Ship Engineers	Supervise and coordinate activities of crew engaged in operating and maintaining engines, boilers, deck machinery, and electrical, sanitary, and refrigeration equipment aboard ship.
	Bridge and Lock Tenders	Operate and tend bridges, canal locks, and lighthouses to permit marine passage on inland waterways, near shores, and at danger points in waterway passages. May supervise such operations. Include drawbridge operators, lock tenders and operators, and slip bridge operators.
	Parking Lot Attendants	Park automobiles or issue tickets for customers in a parking lot or garage. May collect fee.
	Service Station Attendants	Service automobiles, buses, trucks, boats, and other automotive or marine vehicles with fuel, lubricants, and accessories. Collect payment for services and supplies. May lubricate vehicle, change motor oil, install antifreeze, or replace lights or other accessories, such as windshield wiper blades or fan belts. May repair or replace tires.
	Traffic Technicians	Conduct field studies to determine traffic volume, speed, effectiveness of signals, adequacy of lighting, and other factors influencing traffic conditions, under direction of traffic engineer.

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

Classification*	Title	Definition
	Transportation Inspectors	Inspect equipment or goods in connection with the safe transport of cargo or people. Include rail transport inspectors, such as freight inspectors, car inspectors, rail inspectors, and other nonprecision inspectors of other types of transportation vehicles.
	Transportation Workers, All Other	All transportation workers not listed separately.
	Conveyor Operators and Tenders	Control or tend conveyors or conveyor systems that move materials or products to and from stockpiles, processing stations, departments, or vehicles. May control speed and routing of materials or products.
	Crane and Tower Operators	Operate mechanical boom and cable or tower and cable equipment to lift and move materials, machines, or products in many directions. Exclude "Excavating and Loading Machine and Dragline Operators" (53-7032).
	Dredge Operators	Operate dredge to remove sand, gravel, or other materials from lakes, rivers, or streams; and to excavate and maintain navigable channels in waterways.
	Excavating and Loading Machine and Dragline Operators	Operate or tend machinery equipped with scoops, shovels, or buckets, to excavate and load loose materials. Exclude "Dredge Operators" (53-7031).
	Loading Machine Operators, Underground Mining	Operate underground loading machine to load coal, ore, or rock into shuttle or mine car or onto conveyors. Loading equipment may include power shovels, hoisting engines equipped with cable-drawn scraper or scoop, or machines equipped with gathering arms and conveyor.
	Hoist and Winch Operators	Operate or tend hoists or winches to lift and pull loads using power-operated cable equipment. Exclude "Crane and Tower Operators" (53-7021).
	Industrial Truck and Tractor Operators	Operate industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, construction site, or similar location. Exclude "Logging Equipment Operators" (45-4022).
	Cleaners of Vehicles and Equipment	Wash or otherwise clean vehicles, machinery, and other equipment. Use such materials as water, cleaning agents, brushes, cloths, and hoses. Exclude "Janitors and Cleaners, Except Maids and Housekeeping Cleaners" (37-2011).
	Laborers and Freight, Stock, and Material Movers, Hand	Manually move freight, stock, or other materials or perform other unskilled general labor. Include all unskilled manual laborers not elsewhere classified. Exclude "Material Moving Workers" (53-7011 through 53-7199) who use power equipment. Exclude "Construction Laborers" (47-2061) and "Construction Trades Helpers" (47-3011 through 47-3019).
	Machine Feeders and Offbearers	Feed materials into or remove materials from machines or equipment that is automatic or tended by other workers.
	Packers and Packagers, Hand	Pack or package by hand a wide variety of products and materials.
	Gas Compressor and Gas Pumping Station Operators	Operate steam, gas, electric motor, or internal combustion engine driven compressors. Transmit, compress, or recover gases, such as butane, nitrogen, hydrogen, and natural gas.
	Pump Operators, Except Wellhead Pumpers	Tend, control, or operate power-driven, stationary, or portable pumps and manifold systems to transfer gases, oil, other liquids, slurries, or powdered materials to and from various vessels and processes.
	Wellhead Pumpers	Operate power pumps and auxiliary equipment to produce flow of oil or gas from wells in oil field.
	Refuse and Recyclable Material Collectors	Collect and dump refuse or recyclable materials from containers into truck. May drive truck.
	Shuttle Car Operators	Operate diesel or electric-powered shuttle car in underground mine to transport materials from working face to mine cars or conveyor.
	Tank Car, Truck, and Ship Loaders	Load and unload chemicals and bulk solids, such as coal, sand, and grain into or from tank cars, trucks, or ships using material moving equipment. May perform a variety of other tasks relating to shipment of products. May gauge or sample shipping tanks and test them for leaks.
	Material Moving Workers, All Other	All material moving workers not listed separately.
	Armed Military	

*Classification note: (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job.

APPENDIX B

COVER LETTER AND INSTRUCTIONS OF OCCUPATIONAL CLASSIFICATION

August 10, 2009

Consultant
Tallahassee, FL

Thank you for accepting our invitation to assist in conducting the study entitled "Employment, Ethnicity, and Crime and Delinquency of Working Youth: A Longitudinal Study of Youth Employment."

The Graduate School at Florida State University (FSU) and National Institute of Justice (NIJ) have sponsored this research project to investigate the impact of work on youth's antisocial behaviors. As the first step, the researchers have identified an exhaustive list of occupations that youth are possibly exposed to, as well as the definitions of these jobs. To further understand the nature of these occupational positions and classify them according to our conceptual framework in this research, we think that consulting with people who have extensive knowledge in this area is essential. This task of classifying occupations is part of that effort. The researchers invite you to provide your professional judgment in this regard because your knowledge will help us establish a consensus among experts. In other words, your assessment of occupational positions will greatly influence how the data will be analyzed and how the findings will be interpreted.

Attached please find the classification form and the instructions. Please read the instructions first and use the instruction to guide you finish the grouping task.

We will be enclosing a payment to express our appreciations with other documents (e.g., occupation classification form and instruction) as a way of saying thank you. It is also important to sign and date on the enclosed receipt that indicates you have received this payment. Please return the signed receipt to the researchers along with the regrouping form.

If you have any questions about how to do this task, I encourage you contact me via phone (850-339-2887), email (kwang@fsu.edu), or mail (634 W. Call St., Tallahassee, FL 32306, Florida State University).

Thank you very much for helping with this important study.

Sincerely,

Shun-Yung Kevin Wang
Ph.D. Candidate
College of Criminology and Criminal Justice

Florida State University

Gary Kleck, Ph.D.
Professor
College of Criminology and Criminal Justice
Florida State University

Instruction

The key concept in this study is the distinction between "ladder jobs" and other jobs. To differentiate a ladder job from a non-ladder job, you need to know about how the researchers have defined a ladder job. In addition, a list of jobs with detailed descriptions will be provided. In this instruction, you will firstly learn about the indicators of "ladder job" and secondly learn how to classify a list of occupational positions.

Ladder Jobs

A ladder job is conceptualized as a job with significant potential to be the start of an attractive career, with possible movement up a status ladder, especially when cumulative experiences are credited. A non-ladder job (a "dead-end job"), on the other hand, typically does not lead to a career path in which upward mobility is foreseeable or feasible, regardless of the employee's experience and training.

Another critical characteristic of a ladder job is "continuity." Continuity implies first of all that employees typically hold the job for a long time, or move on to a closely related job in the same field that is at least as attractive as the previous position. Continuity also implies that experience in the job is likely to yield an accumulation of skills that will be valued by later employers.

It should be emphasized that high pay is not necessarily a good indicator of some ladder jobs, at least at the front end of those career paths. However, a ladder job should promote occupational progress in a number of respects, such as skill levels, social status, fringe benefits, and/or schedule flexibility. In contrast, a non-ladder job by and large lacks the potential for meaningful increase of salary/wage or benefits, and minimal opportunity for advancing one's skills. For jobs that youth are usually exposed to, some non-ladder jobs may pay more in the short term than ladder jobs do.

Listed below are the indicators of a ladder job. It may have one or all of these characteristics:

1. The job offers a realistic potential for financial and non-financial advancement.
2. The payment (wages or salaries) grows with the employee's seniority.
3. The job requires entry level skills beyond high school education.
4. The job requires learning new skills, the continuation of training, or may involve employers' investment in the employee's human capita.
5. Positions at management level and above should always be coded as ladder jobs.

Classification Task

In the classification process, you have an exhaustive list of occupations classified by the U.S. Census Bureau. Each occupational position comes with a paragraph-length description/definition. Please use the description of "ladder jobs" stated above to reclassify these occupational positions into (1) ladder job; (2) somewhat ladder job; (3) somewhat non-ladder job; and (4) non-ladder job. You can either write your classification of each job on the paper form or type it into the Excel file. Please keep this in your mind: this list of position is relatively long, and you may need to go back to the above "ladder jobs" section a few times when the classification decision is not easily made. If you think a given job has changed between the late 1990s, when the surveys of youth we are analyzing were conducted, and today, please code the job as you think it was in the late 1990s.

APPENDIX C

IRB APPROVAL LETTER

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 Â· FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 12/11/2008

To: Gary Kleck [gkleck@mailer.fsu.edu]

Address: 634 W. Call St.
Dept.: CRIMINOLOGY AND CRIMINAL JUSTICE

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Employment, Ethnicity, and Crime and Delinquency of Working Youth: A Longitudinal Study of Youth Employment

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 12/10/2008. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 12/9/2009 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor

is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Gary Kleck, Advisor [gkleck@mailer.fsu.edu]
HSC No. 2008.2081

APPENDIX D

A LIST OF RECRUITED NATIONAL CERTIFIED CAREER COUNSELORS (NCCC)

- Ardith Weiss, M.S., NCCC, MCC, President of Career Success Consulting (Big Sandy, TX)
- Carla Hunter, M.S., NCCC, MCC, President of Career Span, Inc. (Lexington, KY)
- Catherine McGinnis, NCCC, Owner of CareerTamer (Lewisburg, PA)
- Christopher Cafone, NCCC, Career Counselors Consortium (Clifton, NJ)
- Debby Tang, Ph.D., NCCC, Licensed Clinical Professional Counselor (Naperville, ID)
- Dianne Fabii, M.S., NCCC, MCC, LPC, School Counselor at Marlton, NJ, Owner of Career and Lifeskills Management at Moorestown, NJ (Marlton, NJ)
- Edward Marks, NCCC, retired school psychologist from Trenton NJ Board of Education, adjunct professor at La Salle University, PA, and Bucks County, PA (Trenton, NJ)
- Garth Michaels, M.A., NCCC, Vocational Consulting Director at Career Solutions (Walnut Creek, CA)
- Joan O'Connell, NCCC (Saint Paul, MN)
- Kevin Brennfleck, M.A., NCCC, President of Christian Career Center (Howell, MI)
- Margaret King, M.S., NCCC, Career Counselor/Career Information Coordinator at Brentwood Public Library (Hungton Station, NY)
- Mary "Betty" McWillie, NCCC, MCC, LPC, Director of Career Center at Christian Brothers University (Memphis, TN)
- Patricia Joachim Kitzman, M.S., NCCC, Director of Career Center at Central College (Pella, IA)
- K. Richard Pyle, Ph.D., NCCC, Special Services Officer of Peace Corps (Washington, DC)
- Shannon Jordan, M.S., NCCC, MCC, Career Development Specialist of Qualcomm, Inc. (San Diego, CA)
- Susan Waters, NCCC, career coach/consultant (Broomfield, CO)
- Tanya Bodzin, M.S., NCCC, MCC, DCC, Career Counselor of TKB Career Consulting (Alexandria, VA)
- Terry L. Wynne, Ed.S., NCCC, MCC, MCDP, LPC, Owner of The Professional Edge (Decatur, GA)

Table 4.1: Cross-lag Model

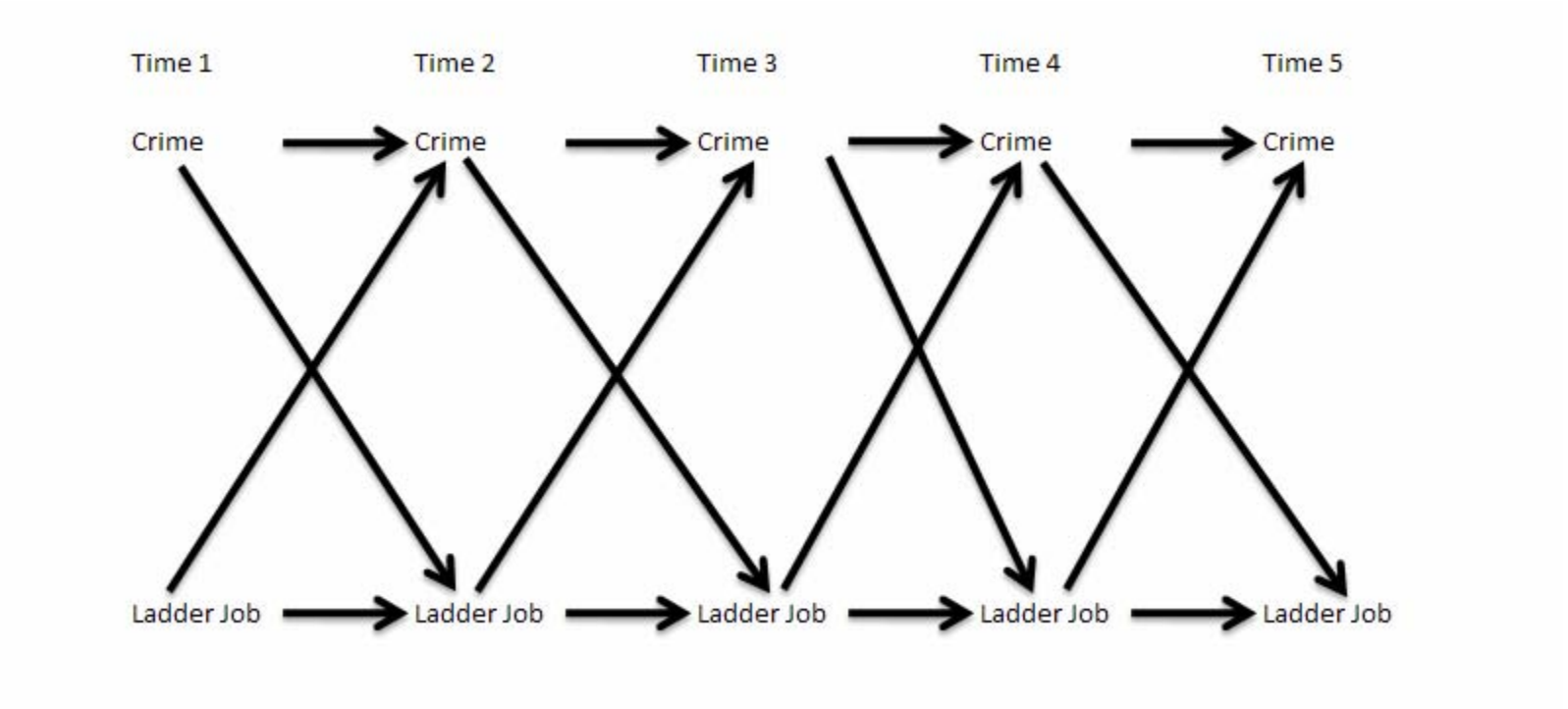


Table 4.2: Demographic Composition of National Longitudinal Survey of Youth 97

		Race_Ethnicity								
		White		Black		Hispanic		Others		Total
Gender	Age as of 12/31/1996	#	%	#	%	#	%	#	%	#
Male	12	458	50%	215	24%	199	22%	39	4%	911
	13	480	51%	230	25%	194	21%	30	3%	934
	14	464	49%	266	28%	191	20%	32	3%	953
	15	469	50%	246	26%	205	22%	27	3%	947
	16	415	49%	212	25%	188	22%	39	5%	854
	Sub Total	2,286	50%	1,169	25%	977	21%	167	4%	4,599
Female	12	410	48%	225	26%	189	22%	36	4%	860
	13	422	48%	233	27%	176	20%	42	5%	873
	14	440	50%	218	25%	206	23%	24	3%	888
	15	464	50%	225	24%	192	21%	46	5%	927
	16	391	47%	264	32%	159	19%	23	3%	837
	Sub Total	2,127	49%	1,165	27%	922	21%	171	4%	4,385
Total		4,413	49%	2,334	26%	1,899	21%	338	4%	8,984

Table 4.3: Waves of National Longitudinal Survey of Youth 97 Used to Test Hypotheses

Hypothesis	Wave of NLSY97						
	1	2	3	4	5	6	7
1: ladder job effect (dataset A)	√		√	√	√		
1: ladder job effect (dataset B)	√			√	√	√	
1: ladder job effect (dataset C)	√				√	√	√
2: job income mediates the impact of ladder jobs (dataset A)	√		√	√	√		
2: job income mediates the impact of ladder jobs (dataset B)	√			√	√	√	
2: job income mediates the impact of ladder jobs (dataset C)	√				√	√	√
3: job income mediates the impact of employment (dataset A)	√		√	√	√		
3: job income mediates the impact of employment (dataset B)	√			√	√	√	
3: job income mediates the impact of employment (dataset C)	√				√	√	√
4: job stability mediates the impact of ladder jobs (dataset A)	√		√	√	√		
4: job stability mediates the impact of ladder jobs (dataset B)	√			√	√	√	
4: job stability mediates the impact of ladder jobs (dataset C)	√				√	√	√
5: parental control mediates the impact of employment (live with both parents) (dataset D)	√		√	√	√		
5: parental control mediates the impact of employment (live with both parents) (dataset E)	√			√	√	√	
5: parental control mediates the impact of employment (live with a single parent) (dataset F)	√		√	√	√		
5: parental control mediates the impact of employment (live with a single parent) (dataset G)	√			√	√	√	

Table 4.4: Description of Occupation Classification Results

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Chief Executives
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	General and Operations Managers
1.333	0.8	1	78%	1	14	4	1	1.353	1	76%	Legislators
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Advertising and Promotions Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Marketing Managers
1.056	0.2	1	94%	1	17	2	1	1.059	1	94%	Sales Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Public Relations Managers
1.111	0.3	1	89%	1	16	2	2	1.118	1	88%	Administrative Services Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Computer and Information Systems Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Financial Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Compensation and Benefits Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Training and Development Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Human Resources Managers, All Other
1.111	0.3	1	89%	1	16	2	2	1.118	1	88%	Industrial Production Managers
1.167	0.4	1	83%	1	15	2	3	1.176	1	82%	Purchasing Managers
1.167	0.4	1	83%	1	15	2	3	1.176	1	82%	Transportation, Storage, and Distribution Managers
1.556	0.6	1	50%	1	9	3	1	1.529	1	53%	Farm, Ranch, and Other Agricultural Managers
2.611	1.0	2	39%	1	2	4	4	2.588	2	41%	Farmers and Ranchers
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Construction Managers
1.444	0.7	1	67%	1	12	3	2	1.471	1	65%	Education Administrators, Preschool and Child Care Center/Program
1.167	0.4	1	83%	1	15	2	3	1.176	1	82%	Education Administrators, Elementary and Secondary School
1.056	0.2	1	94%	1	17	2	1	1.059	1	94%	Education Administrators, Postsecondary
1.056	0.2	1	94%	1	17	2	1	1.059	1	94%	Education Administrators, All Other
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Engineering Managers
1.389	0.6	1	67%	1	12	3	1	1.412	1	65%	Food Service Managers
1.611	0.6	2	50%	1	8	3	1	1.647	2	53%	Funeral Directors
1.389	0.5	1	61%	1	11	2	7	1.412	1	59%	Gaming Managers and Gaming Department Heads
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Lodging Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Medical and Health Services Managers
1.000	0.0	1	100%	1	18	1	18	1.000	1	100%	Natural Sciences Managers
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Postmasters and Mail Superintendents
1.389	0.6	1	67%	1	12	3	1	1.412	1	65%	Property, Real Estate, and Community Association Managers
1.222	0.4	1	78%	1	14	2	4	1.235	1	76%	Social and Community Service Managers
1.222	0.4	1	78%	1	14	2	4	1.235	1	76%	Managers, All Other
1.444	0.5	1	56%	1	10	2	8	1.471	1	53%	Agents and Business Managers of Artists, Performers, and Athletes
1.889	0.7	2	56%	1	5	3	3	1.941	2	59%	Purchasing Agents and Buyers, Farm Products
1.611	0.6	2	50%	1	8	3	1	1.647	2	53%	Wholesale and Retail Buyers, Except Farm Products
1.667	0.7	1	44%	1	8	3	2	1.706	2	47%	Purchasing Agents, Except Wholesale, Retail, and Farm Products

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.000	0.8	2	44%	1	5	3	5	2.059	2	47%	Claims Adjusters, Examiners, and Investigators
2.222	0.9	3	39%	1	5	4	1	2.294	3	41%	Insurance Appraisers, Auto Damage
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation
2.000	0.7	2	56%	1	4	3	4	2.000	2	53%	Cost Estimators
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Employment, Recruitment, and Placement Specialists
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Compensation, Benefits, and Job Analysis Specialists
1.389	0.6	1	67%	1	12	3	1	1.412	1	65%	Training and Development Specialists
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Human Resources, Training, and Labor Relations Specialists, All Other
1.556	0.6	1	50%	1	9	3	1	1.588	2	47%	Logisticians
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Management Analysts
1.778	0.8	2	50%	1	7	4	1	1.824	2	53%	Meeting and Convention Planners
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Emergency Management Specialists
1.667	0.6	2	56%	1	7	3	1	1.706	2	59%	Business Operations Specialists, All Other
1.333	0.7	1	78%	1	14	3	2	1.353	1	76%	Accountants and Auditors
2.111	0.9	3	44%	1	6	3	8	2.176	3	47%	Appraisers and Assessors of Real Estate
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Budget Analysts
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Credit Analysts
1.389	0.7	1	72%	1	13	3	2	1.412	1	71%	Financial Analysts
1.556	0.9	1	61%	1	11	4	1	1.588	1	59%	Personal Financial Advisors
1.722	0.7	2	50%	1	7	3	2	1.765	2	53%	Insurance Underwriters
1.667	0.7	1	44%	1	8	3	2	1.706	2	47%	Financial Examiners
1.944	0.8	2	39%	1	6	3	5	2.000	2	41%	Loan Counselors
1.611	0.6	2	50%	1	8	3	1	1.647	2	53%	Loan Officers
1.778	0.6	2	56%	1	6	3	2	1.824	2	59%	Tax Examiners, Collectors, and Revenue Agents
2.222	0.8	2	50%	1	3	4	1	2.235	2	47%	Tax Preparers
1.833	0.8	1	39%	1	7	3	4	1.882	2	41%	Financial Specialists, All Other
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Computer and Information Scientists, Research
1.111	0.3	1	89%	1	16	2	2	1.118	1	88%	Computer Systems Analysts
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Computer Specialists, All Other
1.278	0.5	1	72%	1	13	2	5	1.294	1	71%	Computer Programmers
1.056	0.2	1	94%	1	17	2	1	1.059	1	94%	Computer Software Engineers, Applications
1.056	0.2	1	94%	1	17	2	1	1.059	1	94%	Computer Software Engineers, Systems Software
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Computer Support Specialists
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Database Administrators
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Network and Computer Systems Administrators
1.222	0.4	1	78%	1	14	2	4	1.235	1	76%	Network Systems and Data Communications Analysts
1.389	0.7	1	72%	1	13	3	2	1.412	1	71%	Actuaries
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Mathematicians

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Operations Research Analysts
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Statisticians
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Mathematical Scientists, All Other
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Mathematical Technicians
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Architects, Except Landscape and Naval
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Landscape Architects
1.611	0.7	1	50%	1	9	3	2	1.647	1	47%	Cartographers and Photogrammetrists
1.944	0.9	1	44%	1	8	3	7	2.000	3	41%	Surveyors
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Aerospace Engineers
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Agricultural Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Biomedical Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Chemical Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Civil Engineers
1.056	0.2	1	94%	1	17	2	1	1.059	1	94%	Computer Hardware Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Electrical Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Electronics Engineers, Except Computer
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Environmental Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Industrial Engineers
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Marine Engineers and Naval Architects
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Materials Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Mechanical Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Mining and Geological Engineers, Including Mining Safety Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Nuclear Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Petroleum Engineers
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Engineers, All Other
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Architectural and Civil Drafters
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Electrical and Electronics Drafters
1.833	0.8	1	39%	1	7	3	4	1.882	2	41%	Mechanical Drafters
1.944	0.9	1	39%	1	7	3	6	2.000	3	35%	Drafters, All Other
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Aerospace Engineering and Operations Technicians
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Civil Engineering Technicians
1.778	0.7	2	44%	1	7	3	3	1.824	2	47%	Electrical and Electronic Engineering Technicians
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Electro-mechanical Technicians
1.778	0.6	2	56%	1	6	3	2	1.824	2	59%	Environmental Engineering Technicians
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Industrial Engineering Technicians
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Mechanical Engineering Technicians
1.778	0.6	2	56%	1	6	3	2	1.824	2	59%	Engineering Technicians, Except Drafters, All Other

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.778	0.7	2	44%	1	7	3	3	1.824	2	47%	Surveying and Mapping Technicians
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Animal Scientists
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Food Scientists and Technologists
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Soil and Plant Scientists
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Biochemists and Biophysicists
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Microbiologists
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Zoologists and Wildlife Biologists
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Biological Scientists, All Other
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Conservation Scientists
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Foresters
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Epidemiologists
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Medical Scientists, Except Epidemiologists
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Astronomers
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Physicists
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Atmospheric and Space Scientists
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Chemists
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Materials Scientists
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Environmental Scientists and Specialists, Including Health
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Geoscientists, Except Hydrologists and Geographers
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Hydrologists
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Physical Scientists, All Other
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Economists
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Market Research Analysts
1.778	0.8	1	44%	1	8	3	4	1.824	1	41%	Survey Researchers
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Clinical, Counseling, and School Psychologists
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Industrial-Organizational Psychologists
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Psychologists, All Other
1.333	0.8	1	78%	1	14	4	1	1.353	1	76%	Sociologists
1.333	0.6	1	72%	1	13	3	1	1.353	1	71%	Urban and Regional Planners
1.389	0.8	1	78%	1	14	4	1	1.412	1	76%	Anthropologists and Archeologists
1.389	0.8	1	78%	1	14	4	1	1.412	1	76%	Geographers
1.500	0.9	1	67%	1	12	4	1	1.529	1	65%	Historians
1.444	0.9	1	72%	1	13	4	1	1.471	1	71%	Political Scientists
1.444	0.7	1	67%	1	12	3	2	1.471	1	65%	Social Scientists and Related Workers, All Other
1.833	0.8	1	39%	1	7	3	4	1.882	2	41%	Agricultural and Food Science Technicians
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Biological Technicians
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Chemical Technicians
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Geological and Petroleum Technicians

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Nuclear Technicians
1.889	0.7	2	56%	1	5	3	3	1.941	2	59%	Social Science Research Assistants
2.000	0.7	2	56%	1	4	3	4	2.059	2	59%	Environmental Science and Protection Technicians, Including Health
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Forensic Science Technicians
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Forest and Conservation Technicians
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Life, Physical, and Social Science Technicians, All Other
1.722	0.8	1	44%	1	8	3	3	1.765	2	41%	Substance Abuse and Behavioral Disorder Counselors
1.500	0.9	1	67%	1	12	4	1	1.529	1	65%	Educational, Vocational, and School Counselors
1.556	0.9	1	61%	1	11	4	1	1.588	1	59%	Marriage and Family Therapists
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	Mental Health Counselors
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	Rehabilitation Counselors
1.611	0.8	1	56%	1	10	4	1	1.647	1	53%	Counselors, All Other
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Child, Family, and School Social Workers
1.444	0.7	1	67%	1	12	3	2	1.471	1	65%	Medical and Public Health Social Workers
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Mental Health and Substance Abuse Social Workers
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Social Workers, All Other
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Health Educators
1.778	0.8	1	44%	1	8	3	4	1.824	1	41%	Probation Officers and Correctional Treatment Specialists
2.056	0.7	2	50%	1	4	3	5	2.118	2	53%	Social and Human Service Assistants
2.056	0.7	2	50%	1	4	3	5	2.118	2	53%	Community and Social Service Workers, All Other
1.944	0.8	2	39%	1	6	3	5	2.000	2	41%	Clergy
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	Directors, Religious Activities and Education
2.222	0.7	2	44%	1	3	3	7	2.294	2	47%	Religious Workers, All Other
1.111	0.5	1	94%	1	17	3	1	1.118	1	94%	Lawyers
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Administrative Law Judges, Adjuducators, and Hearing Officers
1.389	0.8	1	72%	1	13	4	1	1.412	1	71%	Arbitrators, Mediators, and Conciliators
1.167	0.5	1	89%	1	16	3	1	1.176	1	88%	Judges, Magistrate Judges, and Magistrates
1.833	0.9	1	44%	1	8	3	5	1.882	1	41%	Paralegals and Legal Assistants
2.222	1.0	2	33%	1	5	4	2	2.294	2	35%	Court Reporters
1.944	0.9	1	39%	1	7	4	1	2.000	2	35%	Law Clerks
2.222	0.8	3	44%	1	4	3	8	2.294	3	47%	Title Examiners, Abstractors, and Searchers
2.389	0.6	2	50%	1	1	3	8	2.471	2	53%	Legal Support Workers, All Other
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Business Teachers, Postsecondary
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Computer Science Teachers, Postsecondary
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Mathematical Science Teachers, Postsecondary
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	Architecture Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Engineering Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Agricultural Sciences Teachers, Postsecondary

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Biological Science Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Forestry and Conservation Science Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Chemistry Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Environmental Science Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Physics Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Anthropology and Archeology Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Area, Ethnic, and Cultural Studies Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Economics Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Geography Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Political Science Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Psychology Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Sociology Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Social Sciences Teachers, Postsecondary, All Other
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Health Specialties Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Nursing Instructors and Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Education Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Library Science Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Criminal Justice and Law Enforcement Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Law Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Social Work Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Art, Drama, and Music Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Communications Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	English Language and Literature Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Foreign Language and Literature Teachers, Postsecondary
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	History Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Philosophy and Religion Teachers, Postsecondary
2.000	1.0	2	44%	1	6	4	2	2.059	2	47%	Graduate Assistants, Teaching
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Home Economics Teachers, Postsecondary
1.611	0.8	1	56%	1	10	3	3	1.647	1	53%	Recreation and Fitness Studies Teachers, Postsecondary
1.611	0.7	1	50%	1	9	3	2	1.647	1	47%	Vocational Education Teachers, Postsecondary
1.556	0.7	1	56%	1	10	3	2	1.588	1	53%	Postsecondary Teachers, All Other
1.889	0.8	1	39%	1	7	3	5	1.941	2	35%	Preschool Teachers, Except Special Education
1.722	0.8	1	50%	1	9	3	4	1.765	1	47%	Kindergarten Teachers, Except Special Education
1.722	0.9	1	50%	1	9	4	1	1.765	1	47%	Elementary School Teachers, Except Special Education
1.722	0.9	1	50%	1	9	4	1	1.765	1	47%	Middle School Teachers, Except Special and Vocational Education
1.833	0.9	1	44%	1	8	4	1	1.882	1	41%	Middle School Vocational Education Teachers
1.611	0.8	1	50%	1	9	4	1	1.647	2	47%	Secondary School Teachers, Except Special and Vocational Education

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.722	0.8	1	44%	1	8	4	1	1.765	2	47%	Secondary School Vocational Education Teachers
1.611	0.8	1	56%	1	10	4	1	1.647	1	53%	Special Education Teachers, Preschool, Kindergarten, and Elementary School
1.611	0.8	1	56%	1	10	4	1	1.647	1	53%	Special Education Teachers, Middle School
1.611	0.8	1	56%	1	10	4	1	1.647	1	53%	Special Education Teachers, Secondary School
1.778	0.7	2	44%	1	7	3	3	1.824	2	47%	Adult Literacy, Remedial Education, and GED Teachers and Instructors
2.000	0.8	2	50%	1	5	4	1	2.059	2	53%	Self-Enrichment Education Teachers
1.722	0.8	1	44%	1	8	4	1	1.765	2	47%	Teachers and Instructors, All Other
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Archivists
1.444	0.9	1	72%	1	13	4	1	1.471	1	71%	Curators
2.000	0.9	1	39%	1	7	3	7	2.059	3	41%	Museum Technicians and Conservators
1.389	0.6	1	67%	1	12	3	1	1.412	1	65%	Librarians
2.167	0.8	2	39%	1	4	3	7	2.235	2	41%	Library Technicians
2.333	0.7	2	61%	1	1	4	1	2.412	2	65%	Teacher Assistants
2.056	0.8	2	39%	1	5	3	6	2.118	2	41%	Audio-Visual Collections Specialists
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Farm and Home Management Advisors
1.500	0.6	1	56%	1	10	3	1	1.529	1	53%	Instructional Coordinators
2.222	0.7	2	61%	1	2	4	1	2.294	2	65%	Education, Training, and Library Workers, All Other
1.278	0.6	1	78%	1	14	3	1	1.294	1	76%	Art Directors
2.444	1.0	2	39%	1	3	4	3	2.529	2	41%	Craft Artists
2.056	1.0	2	39%	1	6	4	2	2.118	2	41%	Fine Artists, Including Painters, Sculptors, and Illustrators
1.444	0.7	1	67%	1	12	3	2	1.471	1	65%	Multi-Media Artists and Animators
2.056	1.0	2	39%	1	6	4	2	2.118	2	41%	Artists and Related Workers, All Other
1.389	0.6	1	67%	1	12	3	1	1.412	1	65%	Commercial and Industrial Designers
1.556	0.6	1	50%	1	9	3	1	1.588	2	47%	Fashion Designers
2.444	1.0	3	44%	1	4	4	2	2.529	3	47%	Floral Designers
1.611	0.6	2	50%	1	8	3	1	1.647	2	53%	Graphic Designers
1.611	0.7	1	50%	1	9	3	2	1.647	1	47%	Interior Designers
2.833	0.9	3	44%	1	1	4	4	2.941	3	47%	Merchandise Displayers and Window Trimmers
2.278	0.8	3	44%	1	3	3	8	2.353	3	47%	Set and Exhibit Designers
2.278	0.7	2	50%	1	2	3	7	2.353	2	53%	Designers, All Other
2.222	0.8	2	50%	1	3	4	1	2.294	2	53%	Actors
1.611	0.7	1	50%	1	9	3	2	1.647	1	47%	Producers and Directors
2.222	0.8	2	50%	1	3	4	1	2.294	2	53%	Athletes and Sports Competitors
2.000	0.8	1	33%	1	6	3	6	2.059	2	35%	Coaches and Scouts
2.333	0.8	3	50%	1	3	3	9	2.412	3	53%	Umpires, Referees, and Other Sports Officials
2.389	0.8	2	44%	1	2	4	1	2.471	2	47%	Dancers
2.111	0.7	2	56%	1	3	3	5	2.176	2	59%	Choreographers
1.556	0.6	1	50%	1	9	3	1	1.588	1	47%	Music Directors and Composers

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.222	0.8	2	50%	1	3	4	1	2.294	2	53%	Musicians and Singers
2.278	0.7	2	50%	1	2	3	7	2.353	2	53%	Entertainers and Performers, Sports and Related Workers, All Other
2.000	0.8	2	44%	1	5	3	5	2.059	2	47%	Radio and Television Announcers
2.667	0.8	3	56%	1	2	4	2	2.765	3	59%	Public Address System and Other Announcers
1.556	0.6	1	50%	1	9	3	1	1.588	2	47%	Broadcast News Analysts
1.556	0.5	2	56%	1	8	2	10	1.588	2	59%	Reporters and Correspondents
1.444	0.5	1	56%	1	10	2	8	1.471	1	53%	Public Relations Specialists
1.444	0.5	1	56%	1	10	2	8	1.471	1	53%	Editors
1.500	0.5	1	50%	1	9	2	9	1.529	2	53%	Technical Writers
1.778	0.7	2	44%	1	7	3	3	1.824	2	47%	Writers and Authors
2.056	0.6	2	61%	1	3	3	4	2.118	2	65%	Interpreters and Translators
2.000	0.6	2	67%	1	3	3	3	2.059	2	71%	Media and Communication Workers, All Other
2.278	0.8	2	44%	1	3	4	1	2.353	2	47%	Audio and Video Equipment Technicians
2.222	0.8	2	50%	1	3	4	1	2.294	2	53%	Broadcast Technicians
2.556	0.8	3	56%	1	2	4	1	2.647	3	59%	Radio Operators
2.278	0.8	3	44%	1	3	3	8	2.353	3	47%	Sound Engineering Technicians
2.056	0.8	2	39%	1	5	3	6	2.118	2	41%	Photographers
2.167	0.7	2	50%	1	3	3	6	2.235	2	53%	Camera Operators, Television, Video, and Motion Picture
2.000	0.8	2	61%	1	4	4	1	2.059	2	65%	Film and Video Editors
2.333	0.6	2	56%	1	1	3	7	2.412	2	59%	Media and Communication Equipment Workers, All Other
1.333	0.8	1	78%	1	14	4	1	1.353	1	76%	Chiropractors
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Dentists, General
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Oral and Maxillofacial Surgeons
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Orthodontists
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Prosthodontists
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Dentists, All Other Specialists
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Dietitians and Nutritionists
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Optometrists
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Pharmacists
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Anesthesiologists
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Family and General Practitioners
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Internists, General
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Obstetricians and Gynecologists
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Pediatricians, General
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Psychiatrists
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Surgeons
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Physicians and Surgeons, All Other
1.500	0.8	1	61%	1	11	4	1	1.529	1	59%	Physician Assistants

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
1.278	0.8	1	83%	1	15	4	1	1.294	1	82%	Podiatrists
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Registered Nurses
1.444	0.8	1	67%	1	12	4	1	1.471	1	65%	Audiologists
1.500	0.8	1	61%	1	11	4	1	1.529	1	59%	Occupational Therapists
1.444	0.8	1	67%	1	12	4	1	1.471	1	65%	Physical Therapists
1.556	0.9	1	61%	1	11	4	1	1.588	1	59%	Radiation Therapists
1.722	0.9	1	50%	1	9	4	1	1.765	1	47%	Recreational Therapists
1.556	0.8	1	56%	1	10	4	1	1.588	1	53%	Respiratory Therapists
1.389	0.8	1	72%	1	13	4	1	1.412	1	71%	Speech-language Pathologists
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Therapists, All Other
1.222	0.7	1	89%	1	16	4	1	1.235	1	88%	Veterinarians
1.500	0.8	1	61%	1	11	4	1	1.529	1	59%	Health Diagnosing and Treating Practitioners, All Other
1.778	0.6	2	56%	1	6	3	2	1.824	2	59%	Medical and Clinical Laboratory Technologists
2.056	0.7	2	50%	1	4	3	5	2.118	2	53%	Medical and Clinical Laboratory Technicians
2.278	0.9	3	39%	1	4	4	1	2.353	3	41%	Dental Hygienists
1.944	0.8	2	56%	1	5	4	1	2.000	2	59%	Cardiovascular Technologists and Technicians
2.222	0.9	2	39%	1	4	4	1	2.294	2	41%	Diagnostic Medical Sonographers
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Nuclear Medicine Technologists
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Radiologic Technologists and Technicians
1.833	0.8	1	39%	1	7	3	4	1.882	2	41%	Emergency Medical Technicians and Paramedics
2.167	0.9	3	44%	1	5	3	8	2.235	3	47%	Dietetic Technicians
2.056	0.8	2	39%	1	5	3	6	2.118	2	41%	Pharmacy Technicians
2.167	0.9	3	33%	1	5	4	1	2.235	3	35%	Psychiatric Technicians
2.167	0.9	3	33%	1	5	4	1	2.235	3	35%	Respiratory Therapy Technicians
2.000	0.8	1	33%	1	6	3	6	2.059	3	35%	Surgical Technologists
2.222	0.7	2	44%	1	3	3	7	2.294	2	47%	Veterinary Technologists and Technicians
1.833	0.8	1	39%	1	7	3	4	1.882	2	41%	Licensed Practical and Licensed Vocational Nurses
2.222	0.8	2	50%	1	3	4	1	2.294	2	53%	Medical Records and Health Information Technicians
1.944	0.8	2	56%	1	5	4	1	2.000	2	59%	Opticians, Dispensing
1.833	0.9	2	44%	1	7	4	1	1.882	2	47%	Orthotists and Prosthetists
2.111	0.7	2	56%	1	3	3	5	2.176	2	59%	Health Technologists and Technicians, All Other
1.611	0.7	1	50%	1	9	3	2	1.647	1	47%	Occupational Health and Safety Specialists
2.000	0.8	2	44%	1	5	3	5	2.059	2	47%	Occupational Health and Safety Technicians
2.111	0.8	2	44%	1	4	3	6	2.176	2	47%	Athletic Trainers
2.111	0.6	2	67%	1	2	3	4	2.176	2	71%	Healthcare Practitioners and Technical Workers, All Other
3.000	0.9	3	39%	1	1	4	6	3.118	3	41%	Home Health Aides
3.000	1.0	3	44%	1	2	4	6	3.118	3	47%	Nursing Aides, Orderlies, and Attendants
2.889	1.0	3	33%	1	2	4	6	3.000	3	35%	Psychiatric Aides

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.389	0.9	2	39%	1	3	4	2	2.471	2	41%	Occupational Therapist Assistants
2.889	0.9	3	39%	1	1	4	5	3.000	3	41%	Occupational Therapist Aides
2.389	0.9	2	39%	1	3	4	2	2.471	2	41%	Physical Therapist Assistants
2.889	0.9	3	39%	1	1	4	5	3.000	3	41%	Physical Therapist Aides
2.556	0.9	2	39%	1	2	4	3	2.647	2	41%	Massage Therapists
2.444	1.0	2	39%	1	3	4	3	2.529	2	41%	Dental Assistants
2.389	1.0	3	39%	1	4	4	2	2.471	3	41%	Medical Assistants
2.944	1.1	4	39%	1	2	4	7	3.059	4	41%	Medical Equipment Preparers
2.611	0.9	3	56%	1	3	4	2	2.706	3	59%	Medical Transcriptionists
2.944	0.9	3	44%	1	1	4	5	3.059	3	47%	Pharmacy Aides
2.944	1.0	3	39%	1	2	4	6	3.059	3	41%	Veterinary Assistants and Laboratory Animal Caretakers
2.833	0.8	3	56%	1	1	4	3	2.941	3	59%	Healthcare Support Workers, All Other
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	First-Line Supervisors/Managers of Correctional Officers
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	First-Line Supervisors/Managers of Police and Detectives
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	First-Line Supervisors/Managers of Fire Fighting and Prevention Workers
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Supervisors, Protective Service Workers, All Other
2.222	0.8	2	50%	1	3	4	1	2.294	2	53%	Fire Fighters
1.722	0.7	2	50%	1	7	3	2	1.765	2	53%	Fire Inspectors and Investigators
1.778	0.6	2	56%	1	6	3	2	1.824	2	59%	Forest Fire Inspectors and Prevention Specialists
2.944	1.1	4	39%	1	2	4	7	3.059	4	41%	Bailiffs
2.778	0.9	3	44%	1	2	4	4	2.882	3	47%	Correctional Officers and Jailers
1.833	0.7	2	50%	1	6	3	3	1.882	2	53%	Detectives and Criminal Investigators
2.056	0.8	2	39%	1	5	3	6	2.118	2	41%	Fish and Game Wardens
3.278	0.7	3	50%	2	2	4	7	3.353	3	53%	Parking Enforcement Workers
2.000	0.8	2	44%	1	5	3	5	2.059	2	47%	Police and Sheriff's Patrol Officers
2.278	0.9	3	39%	1	4	4	1	2.353	3	41%	Transit and Railroad Police
2.778	0.9	3	56%	1	2	4	3	2.882	3	59%	Animal Control Workers
2.000	1.0	2	44%	1	6	4	2	2.059	2	47%	Private Detectives and Investigators
2.333	0.7	2	44%	1	2	3	8	2.412	2	47%	Gaming Surveillance Officers and Gaming Investigators
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Security Guards
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Crossing Guards
3.056	0.8	3	56%	1	1	4	5	3.176	3	59%	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers
2.722	0.8	3	44%	1	1	4	3	2.824	3	47%	Protective Service Workers, All Other
1.833	0.9	1	44%	1	8	3	5	1.882	1	41%	Chefs and Head Cooks
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	First-Line Supervisors/Managers of Food Preparation and Serving Workers
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Cooks, Fast Food
3.056	0.9	3	44%	1	1	4	6	3.176	3	47%	Cooks, Institution and Cafeteria
3.389	0.8	4	56%	2	3	4	10	3.471	4	59%	Cooks, Private Household

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.833	0.9	3	44%	1	1	4	4	2.941	3	47%	Cooks, Restaurant
3.167	0.8	3	56%	1	1	4	6	3.294	3	59%	Cooks, Short Order
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Food Preparation Workers
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Bartenders
3.500	0.8	4	61%	1	1	4	11	3.647	4	65%	Combined Food Preparation and Serving Workers, Including Fast Food
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Waiters and Waitresses
3.611	0.8	4	72%	1	1	4	13	3.765	4	76%	Food Servers, Nonrestaurant
3.611	0.8	4	72%	1	1	4	13	3.765	4	76%	Dining Room and Cafeteria Attendants and Bartender Helpers
3.833	0.5	4	89%	2	1	4	16	3.941	4	94%	Dishwashers
3.722	0.8	4	83%	1	1	4	15	3.882	4	88%	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Food Preparation and Serving Related Workers, All Other
1.889	1.2	1	56%	1	10	4	4	1.941	1	53%	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers
1.778	0.9	1	50%	1	9	4	1	1.824	1	47%	First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers
3.444	0.9	4	67%	1	1	4	12	3.588	4	71%	Janitors and Cleaners, Except Maids and Housekeeping Cleaners
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Building Cleaning Workers, All Other
3.722	0.7	4	83%	2	2	4	15	3.824	4	88%	Maids and Housekeeping Cleaners
3.278	0.8	3	44%	1	1	4	8	3.412	3	47%	Pest Control Workers
3.500	1.0	4	72%	1	2	4	13	3.647	4	76%	Landscaping and Groundskeeping Workers
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Pesticide Handlers, Sprayers, and Applicators, Vegetation
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Tree Trimmers and Pruners
3.556	0.7	4	67%	2	2	4	12	3.647	4	71%	Grounds Maintenance Workers, All Other
1.889	1.1	1	50%	1	9	4	2	1.941	1	47%	Gaming Supervisors
3.000	0.8	3	50%	1	1	4	5	3.118	3	53%	Slot Key Persons
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	First-Line Supervisors/Managers of Personal Service Workers
2.500	0.6	3	56%	1	1	3	10	2.588	3	59%	Animal Trainers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Nonfarm Animal Caretakers
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Gaming Dealers
3.389	0.8	4	56%	1	1	4	10	3.529	4	59%	Gaming and Sports Book Writers and Runners
3.389	0.8	4	50%	1	1	4	9	3.529	4	53%	Gaming Service Workers, All Other
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Motion Picture Projectionists
3.833	0.5	4	89%	2	1	4	16	3.941	4	94%	Ushers, Lobby Attendants, and Ticket Takers
3.833	0.5	4	89%	2	1	4	16	3.941	4	94%	Amusement and Recreation Attendants
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Costume Attendants
3.833	0.5	4	89%	2	1	4	16	3.941	4	94%	Locker Room, Coatroom, and Dressing Room Attendants
2.889	1.0	3	44%	1	2	4	5	3.000	3	47%	Embalmers
3.111	0.8	3	61%	1	1	4	5	3.235	3	65%	Funeral Attendants
3.111	0.8	3	50%	1	1	4	6	3.235	3	53%	Barbers

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.889	0.8	3	50%	1	1	4	4	3.000	3	53%	Hairdressers, Hairstylists, and Cosmetologists
2.611	0.8	3	44%	1	1	4	2	2.706	3	47%	Makeup Artists, Theatrical and Performance
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Manicurists and Pedicurists
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Shampooers
3.389	0.9	4	61%	1	1	4	11	3.529	4	65%	Skin Care Specialists
3.833	0.5	4	89%	2	1	4	16	3.941	4	94%	Baggage Porters and Bellhops
2.944	0.9	2	39%	2	7	4	6	3.000	2	35%	Concierges
3.056	0.8	3	56%	1	1	4	5	3.176	3	59%	Tour Guides and Escorts
2.500	0.9	3	56%	1	3	4	1	2.588	3	59%	Travel Guides
2.611	0.7	3	72%	1	2	3	13	2.706	3	76%	Flight Attendants
3.500	0.6	4	56%	2	1	4	10	3.588	4	59%	Transportation Attendants, Except Flight Attendants and Baggage Porters
3.389	0.8	4	56%	1	1	4	10	3.529	4	59%	Child Care Workers
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Personal and Home Care Aides
2.778	0.7	3	61%	1	1	4	2	2.882	3	65%	Fitness Trainers and Aerobics Instructors
2.722	0.8	3	56%	1	1	4	2	2.824	3	59%	Recreation Workers
2.722	0.8	3	56%	1	1	4	2	2.824	3	59%	Residential Advisors
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Personal Care and Service Workers, All Other
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	First-Line Supervisors/Managers of Retail Sales Workers
1.611	0.9	1	61%	1	11	4	1	1.647	1	59%	First-Line Supervisors/Managers of Non-Retail Sales Workers
3.222	0.9	4	50%	1	1	4	9	3.353	4	53%	Cashiers
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Gaming Change Persons and Booth Cashiers
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Counter and Rental Clerks
3.167	0.9	4	44%	1	1	4	8	3.294	4	47%	Parts Salespersons
3.167	0.9	4	44%	1	1	4	8	3.294	4	47%	Retail Salespersons
2.444	0.9	2	44%	1	2	4	2	2.529	2	47%	Advertising Sales Agents
2.278	0.8	2	44%	1	3	4	1	2.353	2	47%	Insurance Sales Agents
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Securities, Commodities, and Financial Services Sales Agents
2.444	0.7	3	56%	1	2	3	10	2.529	3	59%	Travel Agents
2.333	0.6	2	56%	1	1	3	7	2.412	2	59%	Sales Representatives, Services, All Other
1.944	0.7	2	50%	1	5	3	4	2.000	2	53%	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
2.000	0.7	2	56%	1	4	3	4	2.059	2	59%	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
3.278	0.8	4	44%	1	1	4	8	3.412	4	47%	Demonstrators and Product Promoters
3.333	0.8	4	50%	1	1	4	9	3.471	4	53%	Models
1.889	0.7	2	56%	1	5	3	3	1.941	2	59%	Real Estate Brokers
2.056	0.6	2	61%	1	3	3	4	2.118	2	65%	Real Estate Sales Agents
1.444	0.6	1	61%	1	11	3	1	1.471	1	59%	Sales Engineers
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Telemarketers
3.722	0.8	4	83%	1	1	4	15	3.882	4	88%	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.944	1.0	3	39%	1	2	4	6	3.059	3	41%	Sales and Related Workers, All Other
1.500	0.7	1	61%	1	11	3	2	1.529	1	59%	First-Line Supervisors/Managers of Office and Administrative Support Workers
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Switchboard Operators, Including Answering Service
3.333	0.8	4	50%	1	1	4	9	3.471	4	53%	Telephone Operators
3.000	0.8	3	50%	1	1	4	5	3.118	3	53%	Communications Equipment Operators, All Other
2.944	0.9	3	44%	1	1	4	5	3.059	3	47%	Bill and Account Collectors
3.111	0.9	4	39%	1	1	4	7	3.235	4	41%	Billing and Posting Clerks and Machine Operators
2.444	0.9	3	50%	1	3	4	1	2.529	3	53%	Bookkeeping, Accounting, and Auditing Clerks
3.278	0.8	4	44%	1	1	4	8	3.412	4	47%	Gaming Cage Workers
2.778	0.9	3	44%	1	2	4	4	2.882	3	47%	Payroll and Timekeeping Clerks
2.722	0.9	3	50%	1	2	4	3	2.824	3	53%	Procurement Clerks
2.611	0.8	3	50%	1	2	4	2	2.706	3	53%	Tellers
2.444	0.8	3	44%	1	2	4	1	2.529	3	47%	Brokerage Clerks
2.833	0.9	3	33%	1	1	4	5	2.941	3	35%	Correspondence Clerks
2.722	0.9	3	50%	1	2	4	3	2.824	3	53%	Court, Municipal, and License Clerks
2.778	0.8	3	50%	1	1	4	3	2.882	3	53%	Credit Authorizers, Checkers, and Clerks
2.722	0.9	3	50%	1	2	4	3	2.824	3	53%	Customer Service Representatives
2.667	0.8	3	50%	1	1	4	2	2.765	3	53%	Eligibility Interviewers, Government Programs
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	File Clerks
3.056	0.9	3	44%	1	1	4	6	3.176	3	47%	Hotel, Motel, and Resort Desk Clerks
3.056	0.9	3	44%	1	1	4	6	3.176	3	47%	Interviewers, Except Eligibility and Loan
3.056	0.8	3	56%	1	1	4	5	3.176	3	59%	Library Assistants, Clerical
2.833	0.7	3	67%	1	1	4	2	2.941	3	71%	Loan Interviewers and Clerks
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	New Accounts Clerks
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Order Clerks
2.611	0.6	3	67%	1	1	3	12	2.706	3	71%	Human Resources Assistants, Except Payroll and Timekeeping
3.167	0.8	3	56%	1	1	4	6	3.294	3	59%	Receptionists and Information Clerks
3.111	0.8	3	50%	1	1	4	6	3.235	3	53%	Reservation and Transportation Ticket Agents and Travel Clerks
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Information and Record Clerks, All Other
3.056	0.9	3	44%	1	1	4	6	3.176	3	47%	Cargo and Freight Agents
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Couriers and Messengers
2.833	0.9	3	50%	1	2	4	4	2.941	3	53%	Police, Fire, and Ambulance Dispatchers
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	Dispatchers, Except Police, Fire, and Ambulance
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Meter Readers, Utilities
3.278	1.0	4	56%	1	1	4	10	3.412	4	59%	Postal Service Clerks
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Postal Service Mail Carriers
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Postal Service Mail Sorters, Processors, and Processing Machine Operators
2.722	1.0	3	56%	1	3	4	3	2.824	3	59%	Production, Planning, and Expediting Clerks

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
3.056	1.0	3	39%	1	2	4	7	3.176	3	41%	Shipping, Receiving, and Traffic Clerks
3.333	0.8	4	50%	1	1	4	9	3.471	4	53%	Stock Clerks and Order Fillers
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Weighers, Measurers, Checkers, and Samplers, Recordkeeping
2.278	0.9	3	39%	1	4	4	1	2.353	3	41%	Executive Secretaries and Administrative Assistants
2.333	0.9	3	44%	1	4	4	1	2.412	3	47%	Secretaries, Legal
2.333	0.9	3	44%	1	4	4	1	2.412	3	47%	Secretaries, Medical
2.333	0.9	3	44%	1	4	4	1	2.412	3	47%	Computer Operators
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Data Entry Keyers
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Word Processors and Typists
2.333	0.8	3	50%	1	3	3	9	2.412	3	53%	Desktop Publishers
3.056	0.9	3	44%	1	1	4	6	3.176	3	47%	Insurance Claims and Policy Processing Clerks
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Mail Clerks and Mail Machine Operators, Except Postal Service
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Office Clerks, General
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Office Machine Operators, Except Computer
3.000	0.8	3	50%	1	1	4	5	3.118	3	53%	Proofreaders and Copy Markers
2.444	0.7	2	50%	1	1	4	1	2.529	2	53%	Statistical Assistants
2.833	0.7	3	67%	1	1	4	2	2.941	3	71%	Office and Administrative Support Workers, All Other
1.778	1.0	1	56%	1	10	4	1	1.824	1	53%	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers
2.944	0.9	3	61%	1	2	4	4	3.059	3	65%	Farm Labor Contractors
1.944	1.1	1	44%	1	8	4	2	2.000	1	41%	Agricultural Inspectors
2.722	1.0	3	56%	1	3	4	3	2.824	3	59%	Animal Breeders
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Graders and Sorters, Agricultural Products
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Agricultural Equipment Operators
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Farmworkers and Laborers, Crop, Nursery, and Greenhouse
3.556	0.9	4	72%	1	1	4	13	3.706	4	76%	Farmworkers, Farm and Ranch Animals
3.500	0.6	4	56%	2	1	4	10	3.588	4	59%	Agricultural Workers, All Other
3.500	0.6	4	56%	2	1	4	10	3.588	4	59%	Farming, Fishing, and Forestry Workers, All Other
3.556	0.9	4	72%	1	1	4	13	3.706	4	76%	Fishers and Related Fishing Workers
3.611	0.8	4	72%	1	1	4	13	3.765	4	76%	Hunters and Trappers
3.278	1.0	4	56%	1	2	4	10	3.412	4	59%	Forest and Conservation Workers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Fallers
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Logging Equipment Operators
3.389	0.8	4	50%	1	1	4	9	3.529	4	53%	Log Graders and Scalers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Logging Workers, All Other
1.556	0.8	1	61%	1	11	3	3	1.588	1	59%	First-Line Supervisors/Managers of Construction Trades and Extraction Workers
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	Boilermakers
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Brickmasons and Blockmasons
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Stonemasons

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.944	0.9	3	44%	1	1	4	5	3.059	3	47%	Carpenters
3.611	0.8	4	72%	1	1	4	13	3.765	4	76%	Carpet Installers
3.611	0.8	4	72%	1	1	4	13	3.765	4	76%	Floor Layers, Except Carpet, Wood, and Hard Tiles
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Floor Sanders and Finishers
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Tile and Marble Setters
3.278	0.8	3	56%	1	1	4	7	3.412	3	59%	Cement Masons and Concrete Finishers
3.278	0.8	3	56%	1	1	4	7	3.412	3	59%	Terrazzo Workers and Finishers
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Construction Laborers
3.389	0.8	4	56%	1	1	4	10	3.529	4	59%	Paving, Surfacing, and Tamping Equipment Operators
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Pile-Driver Operators
3.000	1.0	4	39%	1	2	4	7	3.118	4	41%	Operating Engineers and Other Construction Equipment Operators
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Drywall and Ceiling Tile Installers
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Tapers
2.611	1.0	3	44%	1	3	4	3	2.706	3	47%	Electricians
3.333	0.8	4	50%	2	3	4	9	3.412	4	53%	Glaziers
3.500	0.8	4	67%	2	3	4	12	3.588	4	71%	Insulation Workers, Floor, Ceiling, and Wall
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Insulation Workers, Mechanical
3.444	0.8	4	61%	2	3	4	11	3.529	4	65%	Painters, Construction and Maintenance
3.556	0.7	4	67%	2	2	4	12	3.647	4	71%	Paperhangers
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Pipelayers
2.833	1.0	3	39%	1	2	4	5	2.941	3	41%	Plumbers, Pipefitters, and Steamfitters
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Plasterers and Stucco Masons
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Reinforcing Iron and Rebar Workers
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Roofers
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Sheet Metal Workers
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Structural Iron and Steel Workers
3.667	0.8	4	78%	1	1	4	14	3.824	4	82%	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Helpers--Carpenters
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Helpers--Electricians
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Helpers--Roofers
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Helpers, Construction Trades, All Other
2.333	1.0	2	33%	1	4	4	2	2.412	2	35%	Construction and Building Inspectors
2.889	0.9	3	39%	1	1	4	5	3.000	3	41%	Elevator Installers and Repairers
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Fence Erectors
3.111	1.0	3	44%	1	2	4	7	3.235	3	47%	Hazardous Materials Removal Workers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Highway Maintenance Workers

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Rail-Track Laying and Maintenance Equipment Operators
3.389	0.8	4	56%	1	1	4	10	3.529	4	59%	Septic Tank Servicers and Sewer Pipe Cleaners
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Construction and Related Workers, All Other
3.111	0.9	3	39%	1	1	4	7	3.235	3	41%	Derrick Operators, Oil and Gas
3.056	0.9	3	44%	1	1	4	6	3.176	3	47%	Rotary Drill Operators, Oil and Gas
3.000	0.8	3	61%	1	1	4	4	3.118	3	65%	Service Unit Operators, Oil, Gas, and Mining
3.000	0.8	3	50%	1	1	4	5	3.118	3	53%	Earth Drillers, Except Oil and Gas
3.056	0.8	3	56%	1	1	4	5	3.176	3	59%	Explosives Workers, Ordnance Handling Experts, and Blasters
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Continuous Mining Machine Operators
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Mine Cutting and Channeling Machine Operators
3.278	0.8	3	56%	1	1	4	7	3.412	3	59%	Mining Machine Operators, All Other
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Roof Bolters, Mining
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Roustabouts, Oil and Gas
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Helpers--Extraction Workers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Rock Splitters, Quarry
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Extraction Workers, All Other
1.944	1.2	1	50%	1	9	4	3	2.000	1	47%	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
2.889	0.8	3	50%	1	1	4	4	3.000	3	53%	Computer, Automated Teller, and Office Machine Repairers
3.000	0.9	3	39%	1	1	4	6	3.118	3	41%	Radio Mechanics
2.889	0.8	3	50%	1	1	4	4	3.000	3	53%	Telecommunications Equipment Installers and Repairers, Except Line Installers
2.667	0.7	3	61%	1	1	4	1	2.765	3	65%	Avionics Technicians
3.000	0.8	3	50%	1	1	4	5	3.118	3	53%	Electric Motor, Power Tool, and Related Repairers
2.778	0.7	3	61%	1	1	4	2	2.882	3	65%	Electrical and Electronics Installers and Repairers, Transportation Equipment
2.722	0.8	3	56%	1	1	4	2	2.824	3	59%	Electrical and Electronics Repairers, Commercial and Industrial Equipment
2.722	0.8	3	56%	1	1	4	2	2.824	3	59%	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay
2.889	0.8	3	61%	1	1	4	3	3.000	3	65%	Electronic Equipment Installers and Repairers, Motor Vehicles
2.944	0.7	3	67%	1	1	4	3	3.059	3	71%	Electronic Home Entertainment Equipment Installers and Repairers
3.167	0.7	3	67%	1	1	4	5	3.294	3	71%	Security and Fire Alarm Systems Installers
2.722	0.8	3	44%	1	1	4	3	2.824	3	47%	Aircraft Mechanics and Service Technicians
3.000	0.8	3	61%	1	1	4	4	3.118	3	65%	Automotive Body and Related Repairers
3.167	0.9	4	44%	1	1	4	8	3.294	4	47%	Automotive Glass Installers and Repairers
2.778	0.8	3	50%	1	1	4	3	2.882	3	53%	Automotive Service Technicians and Mechanics
2.778	0.8	3	50%	1	1	4	3	2.882	3	53%	Bus and Truck Mechanics and Diesel Engine Specialists
2.833	0.8	3	56%	1	1	4	3	2.941	3	59%	Farm Equipment Mechanics
2.778	0.8	3	50%	1	1	4	3	2.882	3	53%	Mobile Heavy Equipment Mechanics, Except Engines
3.056	0.7	3	50%	2	4	4	5	3.118	3	53%	Rail Car Repairers
2.889	0.8	3	50%	1	1	4	4	3.000	3	53%	Motorboat Mechanics
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	Motorcycle Mechanics

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	Outdoor Power Equipment and Other Small Engine Mechanics
3.389	0.8	4	50%	1	1	4	9	3.529	4	53%	Bicycle Repairers
2.889	0.8	3	50%	1	1	4	4	3.000	3	53%	Recreational Vehicle Service Technicians
3.556	0.7	4	67%	2	2	4	12	3.647	4	71%	Tire Repairers and Changers
3.389	0.7	4	50%	2	2	4	9	3.471	4	53%	Mechanical Door Repairers
3.167	0.8	4	39%	2	4	4	7	3.235	4	41%	Control and Valve Installers and Repairers, Except Mechanical Door
3.056	0.7	3	50%	2	4	4	5	3.118	3	53%	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
3.056	0.7	3	50%	2	4	4	5	3.118	3	53%	Home Appliance Repairers
3.000	0.8	3	44%	2	5	4	5	3.059	3	47%	Industrial Machinery Mechanics
3.000	0.8	3	61%	1	1	4	4	3.118	3	65%	Refractory Materials Repairers, Except Brickmasons
3.056	0.7	3	50%	2	4	4	5	3.118	3	53%	Maintenance and Repair Workers, General
3.333	0.7	4	44%	2	2	4	8	3.412	4	47%	Maintenance Workers, Machinery
3.000	0.9	3	56%	1	2	4	5	3.118	3	59%	Millwrights
3.056	0.7	3	67%	1	1	4	4	3.176	3	71%	Electrical Power-Line Installers and Repairers
3.056	0.7	3	67%	1	1	4	4	3.176	3	71%	Telecommunications Line Installers and Repairers
3.056	0.7	3	67%	1	1	4	4	3.176	3	71%	Camera and Photographic Equipment Repairers
3.000	0.8	3	61%	1	1	4	4	3.118	3	65%	Medical Equipment Repairers
3.222	0.7	3	61%	1	1	4	6	3.353	3	65%	Musical Instrument Repairers and Tuners
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Watch Repairers
3.111	0.8	3	61%	1	1	4	5	3.235	3	65%	Precision Instrument and Equipment Repairers, All Other
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Coin, Vending, and Amusement Machine Servicers and Repairers
2.722	0.9	2	39%	1	1	4	4	2.824	2	41%	Commercial Divers
3.278	0.8	4	44%	1	1	4	8	3.412	4	47%	Locksmiths and Safe Repairers
3.278	0.8	4	44%	2	3	4	8	3.353	4	47%	Manufactured Building and Mobile Home Installers
3.278	0.8	4	50%	2	4	4	9	3.353	4	53%	Riggers
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Signal and Track Switch Repairers
3.667	0.8	4	78%	1	1	4	14	3.824	4	82%	Helpers--Installation, Maintenance, and Repair Workers
3.556	0.5	4	56%	3	8	4	10	3.588	4	59%	Fabric Menders, Except Garment
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Installation, Maintenance, and Repair Workers, All Other
1.611	0.8	1	56%	1	10	3	3	1.647	1	53%	First-Line Supervisors/Managers of Production and Operating Workers
3.111	0.9	3	39%	1	1	4	7	3.235	3	41%	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
3.500	0.8	4	61%	1	1	4	11	3.647	4	65%	Coil Winders, Tapers, and Finishers
3.278	0.8	4	44%	2	3	4	8	3.353	4	47%	Electrical and Electronic Equipment Assemblers
3.333	0.7	4	44%	2	2	4	8	3.412	4	47%	Electromechanical Equipment Assemblers
3.278	0.7	3	50%	2	2	4	7	3.353	3	53%	Engine and Other Machine Assemblers
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Structural Metal Fabricators and Fitters
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Fiberglass Laminators and Fabricators
2.944	1.0	4	39%	1	1	4	7	3.000	4	41%	Team Assemblers

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
3.278	0.7	3	50%	2	2	4	7	3.353	3	53%	Timing Device Assemblers, Adjusters, and Calibrators
3.333	0.7	4	44%	2	2	4	8	3.412	4	47%	Assemblers and Fabricators, All Other
3.111	1.0	4	44%	1	1	4	8	3.235	4	47%	Bakers
3.389	0.8	4	56%	1	1	4	10	3.529	4	59%	Butchers and Meat Cutters
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Meat, Poultry, and Fish Cutters and Trimmers
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Slaughterers and Meat Packers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders
3.778	0.5	4	83%	2	1	4	15	3.882	4	88%	Food Batchmakers
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Food Cooking Machine Operators and Tenders
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Computer-Controlled Machine Tool Operators, Metal and Plastic
2.778	0.9	3	44%	1	2	4	4	2.882	3	47%	Numerical Tool and Process Control Programmers
3.278	1.0	4	61%	1	1	4	11	3.412	4	65%	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Forging Machine Setters, Operators, and Tenders, Metal and Plastic
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
2.667	0.9	3	44%	1	2	4	3	2.765	3	47%	Machinists
3.500	0.8	4	61%	1	1	4	11	3.647	4	65%	Metal-Refining Furnace Operators and Tenders
3.611	0.8	4	72%	1	1	4	13	3.765	4	76%	Pourers and Casters, Metal
3.389	0.9	4	61%	1	1	4	11	3.529	4	65%	Model Makers, Metal and Plastic
3.389	0.9	4	61%	1	1	4	11	3.529	4	65%	Patternmakers, Metal and Plastic
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Foundry Mold and Coremakers
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
3.333	1.0	4	61%	1	1	4	11	3.471	4	65%	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic
3.111	1.1	4	50%	1	2	4	9	3.235	4	53%	Tool and Die Makers
3.333	0.8	4	50%	1	1	4	9	3.471	4	53%	Welders, Cutters, Solderers, and Brazers
3.333	0.8	4	50%	2	3	4	9	3.412	4	53%	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders
3.444	0.7	4	56%	2	2	4	10	3.529	4	59%	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic
3.444	0.7	4	56%	2	2	4	10	3.529	4	59%	Lay-Out Workers, Metal and Plastic
3.444	0.7	4	56%	2	2	4	10	3.529	4	59%	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic
3.444	0.7	4	56%	2	2	4	10	3.529	4	59%	Tool Grinders, Filers, and Sharpeners
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Metalworkers and Plastic Workers, All Other
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Bindery Workers
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Bookbinders
3.056	0.7	3	50%	2	4	4	5	3.118	3	53%	Job Printers

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
3.222	0.7	3	44%	2	3	4	7	3.294	3	47%	Prepress Technicians and Workers
3.167	0.9	4	44%	1	1	4	8	3.294	4	47%	Printing Machine Operators
3.722	0.5	4	72%	3	5	4	13	3.765	4	76%	Laundry and Dry-Cleaning Workers
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Pressers, Textile, Garment, and Related Materials
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Sewing Machine Operators
3.500	0.6	4	56%	2	1	4	10	3.588	4	59%	Shoe and Leather Workers and Repairers
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Shoe Machine Operators and Tenders
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Sewers, Hand
3.278	0.8	4	44%	2	3	4	8	3.353	4	47%	Tailors, Dressmakers, and Custom Sewers
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Textile Bleaching and Dyeing Machine Operators and Tenders
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Textile Cutting Machine Setters, Operators, and Tenders
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Textile Knitting and Weaving Machine Setters, Operators, and Tenders
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders
3.611	0.6	4	67%	2	1	4	12	3.706	4	71%	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers
3.500	0.8	4	67%	2	3	4	12	3.588	4	71%	Fabric and Apparel Patternmakers
3.500	0.7	4	61%	2	2	4	11	3.588	4	65%	Upholsterers
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Textile, Apparel, and Furnishings Workers, All Other
2.889	1.0	4	33%	1	2	4	6	3.000	4	35%	Cabinetmakers and Bench Carpenters
3.333	0.8	4	50%	2	3	4	9	3.412	4	53%	Furniture Finishers
3.056	0.8	3	39%	2	5	4	6	3.118	3	41%	Model Makers, Wood
3.278	0.7	3	50%	2	2	4	7	3.353	3	53%	Patternmakers, Wood
3.389	0.8	4	56%	2	3	4	10	3.471	4	59%	Sawing Machine Setters, Operators, and Tenders, Wood
3.389	0.7	4	50%	2	2	4	9	3.471	4	53%	Woodworking Machine Setters, Operators, and Tenders, Except Sawing
3.222	0.7	3	44%	2	3	4	7	3.294	3	47%	Woodworkers, All Other
2.556	0.9	3	61%	1	3	4	1	2.588	3	65%	Nuclear Power Reactor Operators
2.722	0.9	3	50%	1	2	4	3	2.765	3	53%	Power Distributors and Dispatchers
2.389	0.8	3	44%	1	3	4	1	2.471	3	47%	Power Plant Operators
2.667	1.0	3	39%	1	3	4	4	2.765	3	41%	Stationary Engineers and Boiler Operators
2.667	1.0	3	39%	1	3	4	4	2.765	3	41%	Water and Liquid Waste Treatment Plant and System Operators
2.500	1.0	3	50%	1	4	4	2	2.588	3	53%	Chemical Plant and System Operators
2.611	0.9	3	56%	1	3	4	2	2.706	3	59%	Gas Plant Operators
2.611	0.9	3	56%	1	3	4	2	2.706	3	59%	Petroleum Pump System Operators, Refinery Operators, and Gaugers
2.667	0.9	3	44%	1	2	4	3	2.765	3	47%	Plant and System Operators, All Other
2.778	0.9	3	56%	1	2	4	3	2.882	3	59%	Chemical Equipment Operators and Tenders
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders
3.278	0.8	4	44%	2	3	4	8	3.353	4	47%	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders
3.389	0.8	4	56%	2	3	4	10	3.471	4	59%	Grinding and Polishing Workers, Hand
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Mixing and Blending Machine Setters, Operators, and Tenders

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Cutters and Trimmers, Hand
3.500	0.8	4	67%	2	3	4	12	3.588	4	71%	Cutting and Slicing Machine Setters, Operators, and Tenders
3.444	0.9	4	67%	2	4	4	12	3.529	4	71%	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders
3.556	0.6	4	61%	2	1	4	11	3.647	4	65%	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders
3.111	0.9	4	39%	1	1	4	7	3.235	4	41%	Inspectors, Testers, Sorters, Samplers, and Weighers
2.944	0.9	3	44%	1	1	4	5	3.059	3	47%	Jewelers and Precious Stone and Metal Workers
2.889	0.9	3	39%	1	1	4	5	3.000	3	41%	Dental Laboratory Technicians
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	Medical Appliance Technicians
2.944	0.8	3	56%	1	1	4	4	3.059	3	59%	Ophthalmic Laboratory Technicians
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Packaging and Filling Machine Operators and Tenders
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Painters, Transportation Equipment
3.389	0.8	4	50%	1	1	4	9	3.529	4	53%	Painting, Coating, and Decorating Workers
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Photographic Process Workers
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Photographic Processing Machine Operators
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Semiconductor Processors
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Cementing and Gluing Machine Operators and Tenders
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Cooling and Freezing Equipment Operators and Tenders
3.278	0.8	3	56%	1	1	4	7	3.412	3	59%	Etchers and Engravers
3.278	0.8	3	44%	1	1	4	8	3.412	3	47%	Molders, Shapers, and Casters, Except Metal and Plastic
3.278	0.9	4	50%	1	1	4	9	3.412	4	53%	Paper Goods Machine Setters, Operators, and Tenders
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Tire Builders
3.667	0.8	4	78%	1	1	4	14	3.824	4	82%	Helpers--Production Workers
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Production Workers, All Other
2.056	1.0	2	39%	1	6	4	2	2.118	2	41%	Aircraft Cargo Handling Supervisors
1.667	0.8	1	56%	1	10	3	4	1.706	1	53%	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand
1.667	0.8	1	56%	1	10	3	4	1.706	1	53%	First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators
1.389	0.8	1	78%	1	14	3	3	1.412	1	76%	Airline Pilots, Copilots, and Flight Engineers
1.222	0.5	1	83%	1	15	3	1	1.235	1	82%	Commercial Pilots
1.667	0.8	1	50%	1	9	3	3	1.706	1	47%	Air Traffic Controllers
1.722	0.8	1	44%	1	8	3	3	1.765	2	41%	Airfield Operations Specialists
3.056	0.9	4	39%	1	1	4	7	3.176	4	41%	Ambulance Drivers and Attendants, Except Emergency Medical Technicians
3.222	0.8	3	50%	1	1	4	7	3.353	3	53%	Bus Drivers, Transit and Intercity
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Bus Drivers, School
3.111	0.9	4	39%	1	1	4	7	3.235	4	41%	Driver/Sales Workers
3.278	0.8	4	44%	1	1	4	8	3.412	4	47%	Truck Drivers, Heavy and Tractor-Trailer
3.333	0.8	3	50%	1	1	4	8	3.471	3	53%	Truck Drivers, Light or Delivery Services

Table 4.4 – continued

By 18 Coders								By 17 Coders			
Mean	Std.	Mode	%rate Mode	Min.	Count Min	Max.	Count Max	Mean	Mode	%rate Mode	Title
3.500	0.8	4	61%	1	1	4	11	3.647	4	65%	Taxi Drivers and Chauffeurs
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Motor Vehicle Operators, All Other
2.667	0.9	3	44%	1	2	4	3	2.765	3	47%	Locomotive Engineers
3.222	0.9	4	44%	1	1	4	8	3.353	4	47%	Locomotive Firers
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Rail Yard Engineers, Dinkey Operators, and Hostlers
3.278	0.8	3	44%	1	1	4	8	3.412	3	47%	Railroad Brake, Signal, and Switch Operators
2.944	0.9	3	50%	1	2	4	5	3.059	3	53%	Railroad Conductors and Yardmasters
3.333	0.9	4	56%	1	1	4	10	3.471	4	59%	Subway and Streetcar Operators
3.278	0.8	4	44%	1	1	4	8	3.412	4	47%	Rail Transportation Workers, All Other
2.833	0.9	3	44%	1	1	4	4	2.941	3	47%	Sailors and Marine Oilers
2.000	1.1	1	44%	1	8	4	2	2.059	1	41%	Captains, Mates, and Pilots of Water Vessels
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Motorboat Operators
1.889	0.8	2	44%	1	6	3	4	1.941	2	47%	Ship Engineers
3.000	0.8	3	50%	1	1	4	5	3.059	3	53%	Bridge and Lock Tenders
3.833	0.5	4	89%	2	1	4	16	3.941	4	94%	Parking Lot Attendants
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Service Station Attendants
2.611	0.8	3	50%	1	2	4	2	2.706	3	53%	Transportation Inspectors
2.889	0.9	3	39%	1	1	4	5	3.000	3	41%	Traffic Technicians
3.167	0.9	3	44%	1	1	4	7	3.294	3	47%	Transportation Workers, All Other
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Conveyor Operators and Tenders
3.444	0.9	4	67%	1	1	4	12	3.588	4	71%	Crane and Tower Operators
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Dredge Operators
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Excavating and Loading Machine and Dragline Operators
3.556	0.8	4	67%	1	1	4	12	3.706	4	71%	Loading Machine Operators, Underground Mining
3.500	0.9	4	67%	1	1	4	12	3.647	4	71%	Hoist and Winch Operators
3.444	0.9	4	61%	1	1	4	11	3.588	4	65%	Industrial Truck and Tractor Operators
3.722	0.8	4	83%	1	1	4	15	3.882	4	88%	Cleaners of Vehicles and Equipment
3.722	0.8	4	83%	1	1	4	15	3.882	4	88%	Laborers and Freight, Stock, and Material Movers, Hand
3.778	0.5	4	83%	2	1	4	15	3.882	4	88%	Machine Feeders and Offbearers
3.778	0.5	4	83%	2	1	4	15	3.882	4	88%	Packers and Packagers, Hand
3.389	0.8	4	50%	1	1	4	9	3.529	4	53%	Gas Compressor and Gas Pumping Station Operators
3.444	0.8	4	56%	1	1	4	10	3.588	4	59%	Pump Operators, Except Wellhead Pumpers
3.444	0.6	4	50%	2	1	4	9	3.529	4	53%	Wellhead Pumpers
3.778	0.5	4	83%	2	1	4	15	3.882	4	88%	Refuse and Recyclable Material Collectors
3.667	0.6	4	72%	2	1	4	13	3.765	4	76%	Shuttle Car Operators
3.667	0.7	4	78%	2	2	4	14	3.765	4	82%	Tank Car, Truck, and Ship Loaders
3.722	0.6	4	78%	2	1	4	14	3.824	4	82%	Material Moving Workers, All Other
2.167	0.8	3	39%	1	4	3	7	2.235	3	41%	Armed Military

Table 4.5: Ladder Job Scores of Occupational Positions

Ladder Job Score		Job Title
Mean	Standard Deviation	
4.000	0.00	Chief Executives
4.000	0.00	General and Operations Managers
3.647	0.79	Legislators
4.000	0.00	Advertising and Promotions Managers
4.000	0.00	Marketing Managers
3.941	0.24	Sales Managers
4.000	0.00	Public Relations Managers
3.882	0.33	Administrative Services Managers
4.000	0.00	Computer and Information Systems Managers
4.000	0.00	Financial Managers
4.000	0.00	Compensation and Benefits Managers
4.000	0.00	Training and Development Managers
4.000	0.00	Human Resources Managers, All Other
3.882	0.33	Industrial Production Managers
3.824	0.39	Purchasing Managers
3.824	0.39	Transportation, Storage, and Distribution Managers
3.471	0.62	Farm, Ranch, and Other Agricultural Managers
2.412	1.00	Farmers and Ranchers
3.706	0.59	Construction Managers
3.529	0.72	Education Administrators, Preschool and Child Care Center/Program
3.824	0.39	Education Administrators, Elementary and Secondary School
3.941	0.24	Education Administrators, Postsecondary
3.941	0.24	Education Administrators, All Other
4.000	0.00	Engineering Managers
3.588	0.62	Food Service Managers
3.353	0.61	Funeral Directors
3.588	0.51	Gaming Managers and Gaming Department Heads
3.471	0.62	Lodging Managers
4.000	0.00	Medical and Health Services Managers
4.000	0.00	Natural Sciences Managers
3.471	0.62	Postmasters and Mail Superintendents
3.588	0.62	Property, Real Estate, and Community Association Managers
3.765	0.44	Social and Community Service Managers
3.765	0.44	Managers, All Other
3.529	0.51	Agents and Business Managers of Artists, Performers, and Athletes
3.059	0.66	Purchasing Agents and Buyers, Farm Products
3.353	0.61	Wholesale and Retail Buyers, Except Farm Products
3.294	0.69	Purchasing Agents, Except Wholesale, Retail, and Farm Products
2.941	0.75	Claims Adjusters, Examiners, and Investigators
2.706	0.92	Insurance Appraisers, Auto Damage
3.059	0.75	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation
3.000	0.71	Cost Estimators
3.471	0.62	Employment, Recruitment, and Placement Specialists
3.471	0.62	Compensation, Benefits, and Job Analysis Specialists
3.588	0.62	Training and Development Specialists
3.529	0.62	Human Resources, Training, and Labor Relations Specialists, All Other
3.412	0.62	Logisticians
3.706	0.59	Management Analysts
3.176	0.81	Meeting and Convention Planners
3.471	0.62	Emergency Management Specialists
3.294	0.59	Business Operations Specialists, All Other
3.647	0.70	Accountants and Auditors
2.824	0.88	Appraisers and Assessors of Real Estate
3.412	0.71	Budget Analysts
3.294	0.77	Credit Analysts
3.588	0.71	Financial Analysts
3.412	0.87	Personal Financial Advisors

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
3.235	0.66	Insurance Underwriters
3.294	0.69	Financial Examiners
3.000	0.79	Loan Counselors
3.353	0.61	Loan Officers
3.176	0.64	Tax Examiners, Collectors, and Revenue Agents
2.765	0.83	Tax Preparers
3.118	0.78	Financial Specialists, All Other
3.765	0.56	Computer and Information Scientists, Research
3.882	0.33	Computer Systems Analysts
3.647	0.61	Computer Specialists, All Other
3.706	0.47	Computer Programmers
3.941	0.24	Computer Software Engineers, Applications
3.941	0.24	Computer Software Engineers, Systems Software
3.647	0.61	Computer Support Specialists
3.706	0.59	Database Administrators
3.824	0.53	Network and Computer Systems Administrators
3.765	0.44	Network Systems and Data Communications Analysts
3.588	0.71	Actuaries
3.706	0.59	Mathematicians
3.647	0.61	Operations Research Analysts
3.647	0.61	Statisticians
3.647	0.61	Mathematical Scientists, All Other
3.471	0.72	Mathematical Technicians
3.647	0.61	Architects, Except Landscape and Naval
3.471	0.72	Landscape Architects
3.353	0.70	Cartographers and Photogrammetrists
3.000	0.94	Surveyors
3.824	0.53	Aerospace Engineers
3.824	0.53	Agricultural Engineers
3.882	0.49	Biomedical Engineers
3.882	0.49	Chemical Engineers
3.882	0.49	Civil Engineers
3.941	0.24	Computer Hardware Engineers
3.882	0.49	Electrical Engineers
3.882	0.49	Electronics Engineers, Except Computer
3.882	0.49	Environmental Engineers
3.882	0.49	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
3.882	0.49	Industrial Engineers
3.824	0.53	Marine Engineers and Naval Architects
3.824	0.53	Materials Engineers
3.882	0.49	Mechanical Engineers
3.882	0.49	Mining and Geological Engineers, Including Mining Safety Engineers
3.882	0.49	Nuclear Engineers
3.882	0.49	Petroleum Engineers
3.882	0.49	Engineers, All Other
3.294	0.77	Architectural and Civil Drafters
3.059	0.75	Electrical and Electronics Drafters
3.118	0.78	Mechanical Drafters
3.000	0.87	Drafters, All Other
3.294	0.77	Aerospace Engineering and Operations Technicians
3.294	0.77	Civil Engineering Technicians
3.176	0.73	Electrical and Electronic Engineering Technicians
3.118	0.70	Electro-mechanical Technicians
3.176	0.64	Environmental Engineering Technicians
3.118	0.70	Industrial Engineering Technicians
3.118	0.70	Mechanical Engineering Technicians

Table 4.5 – continued

Ladder Job Score		Job Title
Mean	Standard Deviation	
3.176	0.64	Engineering Technicians, Except Drafters, All Other
3.176	0.73	Surveying and Mapping Technicians
3.706	0.59	Animal Scientists
3.765	0.56	Food Scientists and Technologists
3.765	0.56	Soil and Plant Scientists
3.882	0.49	Biochemists and Biophysicists
3.882	0.49	Microbiologists
3.824	0.53	Zoologists and Wildlife Biologists
3.824	0.53	Biological Scientists, All Other
3.824	0.53	Conservation Scientists
3.529	0.62	Foresters
3.882	0.49	Epidemiologists
3.882	0.49	Medical Scientists, Except Epidemiologists
3.765	0.56	Astronomers
3.765	0.56	Physicists
3.824	0.53	Atmospheric and Space Scientists
3.824	0.53	Chemists
3.824	0.53	Materials Scientists
3.765	0.56	Environmental Scientists and Specialists, Including Health
3.706	0.59	Geoscientists, Except Hydrologists and Geographers
3.647	0.61	Hydrologists
3.706	0.59	Physical Scientists, All Other
3.765	0.56	Economists
3.706	0.59	Market Research Analysts
3.176	0.81	Survey Researchers
3.706	0.77	Clinical, Counseling, and School Psychologists
3.706	0.77	Industrial-Organizational Psychologists
3.706	0.77	Psychologists, All Other
3.647	0.79	Sociologists
3.647	0.61	Urban and Regional Planners
3.588	0.87	Anthropologists and Archeologists
3.588	0.87	Geographers
3.471	0.87	Historians
3.529	0.87	Political Scientists
3.529	0.72	Social Scientists and Related Workers, All Other
3.118	0.78	Agricultural and Food Science Technicians
3.059	0.75	Biological Technicians
3.118	0.70	Chemical Technicians
3.118	0.70	Geological and Petroleum Technicians
3.118	0.70	Nuclear Technicians
3.059	0.66	Social Science Research Assistants
2.941	0.66	Environmental Science and Protection Technicians, Including Health
3.059	0.75	Forensic Science Technicians
3.059	0.75	Forest and Conservation Technicians
3.059	0.75	Life, Physical, and Social Science Technicians, All Other
3.235	0.75	Substance Abuse and Behavioral Disorder Counselors
3.471	0.87	Educational, Vocational, and School Counselors
3.412	0.87	Marriage and Family Therapists
3.353	0.93	Mental Health Counselors
3.353	0.93	Rehabilitation Counselors
3.353	0.86	Counselors, All Other
3.471	0.72	Child, Family, and School Social Workers
3.529	0.72	Medical and Public Health Social Workers
3.471	0.72	Mental Health and Substance Abuse Social Workers
3.471	0.72	Social Workers, All Other
3.471	0.72	Health Educators

Table 4.5 – continued

Ladder Job Score		Job Title
Mean	Standard Deviation	
3.176	0.81	Probation Officers and Correctional Treatment Specialists
2.882	0.70	Social and Human Service Assistants
2.882	0.70	Community and Social Service Workers, All Other
3.000	0.79	Clergy
3.353	0.93	Directors, Religious Activities and Education
2.706	0.69	Religious Workers, All Other
3.882	0.49	Lawyers
3.824	0.53	Administrative Law Judges, Adjuducators, and Hearing Officers
3.588	0.80	Arbitrators, Mediators, and Conciliators
3.824	0.53	Judges, Magistrate Judges, and Magistrates
3.118	0.86	Paralegals and Legal Assistants
2.706	0.99	Court Reporters
3.000	0.94	Law Clerks
2.706	0.77	Title Examiners, Abstractors, and Searchers
2.529	0.51	Legal Support Workers, All Other
3.529	0.62	Business Teachers, Postsecondary
3.529	0.62	Computer Science Teachers, Postsecondary
3.529	0.62	Mathematical Science Teachers, Postsecondary
3.471	0.72	Architecture Teachers, Postsecondary
3.471	0.62	Engineering Teachers, Postsecondary
3.412	0.71	Agricultural Sciences Teachers, Postsecondary
3.529	0.62	Biological Science Teachers, Postsecondary
3.412	0.71	Forestry and Conservation Science Teachers, Postsecondary
3.471	0.62	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
3.471	0.62	Chemistry Teachers, Postsecondary
3.471	0.62	Environmental Science Teachers, Postsecondary
3.471	0.62	Physics Teachers, Postsecondary
3.412	0.71	Anthropology and Archeology Teachers, Postsecondary
3.471	0.62	Area, Ethnic, and Cultural Studies Teachers, Postsecondary
3.471	0.62	Economics Teachers, Postsecondary
3.412	0.71	Geography Teachers, Postsecondary
3.471	0.62	Political Science Teachers, Postsecondary
3.471	0.62	Psychology Teachers, Postsecondary
3.412	0.71	Sociology Teachers, Postsecondary
3.412	0.71	Social Sciences Teachers, Postsecondary, All Other
3.529	0.62	Health Specialties Teachers, Postsecondary
3.471	0.62	Nursing Instructors and Teachers, Postsecondary
3.471	0.62	Education Teachers, Postsecondary
3.471	0.62	Library Science Teachers, Postsecondary
3.412	0.71	Criminal Justice and Law Enforcement Teachers, Postsecondary
3.471	0.62	Law Teachers, Postsecondary
3.471	0.62	Social Work Teachers, Postsecondary
3.412	0.71	Art, Drama, and Music Teachers, Postsecondary
3.471	0.62	Communications Teachers, Postsecondary
3.471	0.62	English Language and Literature Teachers, Postsecondary
3.471	0.62	Foreign Language and Literature Teachers, Postsecondary
3.471	0.62	History Teachers, Postsecondary
3.412	0.71	Philosophy and Religion Teachers, Postsecondary
2.941	0.97	Graduate Assistants, Teaching
3.412	0.71	Home Economics Teachers, Postsecondary
3.353	0.79	Recreation and Fitness Studies Teachers, Postsecondary
3.353	0.70	Vocational Education Teachers, Postsecondary
3.412	0.71	Postsecondary Teachers, All Other
3.059	0.83	Preschool Teachers, Except Special Education
3.235	0.83	Kindergarten Teachers, Except Special Education
3.235	0.90	Elementary School Teachers, Except Special Education

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
3.235	0.90	Middle School Teachers, Except Special and Vocational Education
3.118	0.93	Middle School Vocational Education Teachers
3.353	0.79	Secondary School Teachers, Except Special and Vocational Education
3.235	0.83	Secondary School Vocational Education Teachers
3.353	0.86	Special Education Teachers, Preschool, Kindergarten, and Elementary School
3.353	0.86	Special Education Teachers, Middle School
3.353	0.86	Special Education Teachers, Secondary School
3.176	0.73	Adult Literacy, Remedial Education, and GED Teachers and Instructors
2.941	0.83	Self-Enrichment Education Teachers
3.235	0.83	Teachers and Instructors, All Other
3.294	0.77	Archivists
3.529	0.87	Curators
2.941	0.90	Museum Technicians and Conservators
3.588	0.62	Librarians
2.765	0.75	Library Technicians
2.588	0.62	Teacher Assistants
2.882	0.78	Audio-Visual Collections Specialists
3.118	0.70	Farm and Home Management Advisors
3.471	0.62	Instructional Coordinators
2.706	0.69	Education, Training, and Library Workers, All Other
3.706	0.59	Art Directors
2.471	0.94	Craft Artists
2.882	0.99	Fine Artists, Including Painters, Sculptors, and Illustrators
3.529	0.72	Multi-Media Artists and Animators
2.882	0.99	Artists and Related Workers, All Other
3.588	0.62	Commercial and Industrial Designers
3.412	0.62	Fashion Designers
2.471	0.94	Floral Designers
3.353	0.61	Graphic Designers
3.353	0.70	Interior Designers
2.059	0.75	Merchandise Displayers and Window Trimmers
2.647	0.70	Set and Exhibit Designers
2.647	0.61	Designers, All Other
2.706	0.77	Actors
3.353	0.70	Producers and Directors
2.706	0.77	Athletes and Sports Competitors
2.941	0.83	Coaches and Scouts
2.588	0.71	Umpires, Referees, and Other Sports Officials
2.529	0.72	Dancers
2.824	0.64	Choreographers
3.412	0.62	Music Directors and Composers
2.706	0.77	Musicians and Singers
2.647	0.61	Entertainers and Performers, Sports and Related Workers, All Other
2.941	0.75	Radio and Television Announcers
2.235	0.75	Public Address System and Other Announcers
3.412	0.62	Broadcast News Analysts
3.412	0.51	Reporters and Correspondents
3.529	0.51	Public Relations Specialists
3.529	0.51	Editors
3.471	0.51	Technical Writers
3.176	0.73	Writers and Authors
2.882	0.60	Interpreters and Translators
2.941	0.56	Media and Communication Workers, All Other
2.647	0.79	Audio and Video Equipment Technicians
2.706	0.77	Broadcast Technicians
2.353	0.70	Radio Operators

Table 4.5 – continued

Ladder Job Score		Job Title
Mean	Standard Deviation	
2.647	0.70	Sound Engineering Technicians
2.882	0.78	Photographers
2.765	0.66	Camera Operators, Television, Video, and Motion Picture
2.941	0.75	Film and Video Editors
2.588	0.51	Media and Communication Equipment Workers, All Other
3.647	0.79	Chiropractors
3.706	0.77	Dentists, General
3.765	0.75	Oral and Maxillofacial Surgeons
3.765	0.75	Orthodontists
3.765	0.75	Prosthodontists
3.706	0.77	Dentists, All Other Specialists
3.765	0.56	Dietitians and Nutritionists
3.765	0.75	Optometrists
3.706	0.77	Pharmacists
3.765	0.75	Anesthesiologists
3.765	0.75	Family and General Practitioners
3.765	0.75	Internists, General
3.765	0.75	Obstetricians and Gynecologists
3.765	0.75	Pediatricians, General
3.765	0.75	Psychiatrists
3.765	0.75	Surgeons
3.765	0.75	Physicians and Surgeons, All Other
3.471	0.80	Physician Assistants
3.706	0.77	Podiatrists
3.765	0.56	Registered Nurses
3.529	0.80	Audiologists
3.471	0.80	Occupational Therapists
3.529	0.80	Physical Therapists
3.412	0.87	Radiation Therapists
3.235	0.90	Recreational Therapists
3.412	0.80	Respiratory Therapists
3.588	0.80	Speech-language Pathologists
3.529	0.62	Therapists, All Other
3.765	0.75	Veterinarians
3.471	0.80	Health Diagnosing and Treating Practitioners, All Other
3.176	0.64	Medical and Clinical Laboratory Technologists
2.882	0.70	Medical and Clinical Laboratory Technicians
2.647	0.86	Dental Hygienists
3.000	0.79	Cardiovascular Technologists and Technicians
2.706	0.85	Diagnostic Medical Sonographers
3.118	0.70	Nuclear Medicine Technologists
3.294	0.77	Radiologic Technologists and Technicians
3.118	0.78	Emergency Medical Technicians and Paramedics
2.765	0.83	Dietetic Technicians
2.882	0.78	Pharmacy Technicians
2.765	0.90	Psychiatric Technicians
2.765	0.90	Respiratory Therapy Technicians
2.941	0.83	Surgical Technologists
2.706	0.69	Veterinary Technologists and Technicians
3.118	0.78	Licensed Practical and Licensed Vocational Nurses
2.706	0.77	Medical Records and Health Information Technicians
3.000	0.79	Opticians, Dispensing
3.118	0.86	Orthotists and Prosthetists
2.824	0.64	Health Technologists and Technicians, All Other
3.353	0.70	Occupational Health and Safety Specialists
2.941	0.75	Occupational Health and Safety Technicians

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
2.824	0.73	Athletic Trainers
2.824	0.53	Healthcare Practitioners and Technical Workers, All Other
1.882	0.78	Home Health Aides
1.882	0.86	Nursing Aides, Orderlies, and Attendants
2.000	0.94	Psychiatric Aides
2.529	0.87	Occupational Therapist Assistants
2.000	0.79	Occupational Therapist Aides
2.529	0.87	Physical Therapist Assistants
2.000	0.79	Physical Therapist Aides
2.353	0.86	Massage Therapists
2.471	0.94	Dental Assistants
2.529	0.94	Medical Assistants
1.941	0.97	Medical Equipment Preparers
2.294	0.85	Medical Transcriptionists
1.941	0.75	Pharmacy Aides
1.941	0.90	Veterinary Assistants and Laboratory Animal Caretakers
2.059	0.66	Healthcare Support Workers, All Other
3.529	0.62	First-Line Supervisors/Managers of Correctional Officers
3.529	0.62	First-Line Supervisors/Managers of Police and Detectives
3.529	0.62	First-Line Supervisors/Managers of Fire Fighting and Prevention Workers
3.529	0.62	Supervisors, Protective Service Workers, All Other
2.706	0.77	Fire Fighters
3.235	0.66	Fire Inspectors and Investigators
3.176	0.64	Forest Fire Inspectors and Prevention Specialists
1.941	0.97	Bailiffs
2.118	0.86	Correctional Officers and Jailers
3.118	0.70	Detectives and Criminal Investigators
2.882	0.78	Fish and Game Wardens
1.647	0.61	Parking Enforcement Workers
2.941	0.75	Police and Sheriff's Patrol Officers
2.647	0.86	Transit and Railroad Police
2.118	0.78	Animal Control Workers
2.941	0.97	Private Detectives and Investigators
2.588	0.62	Gaming Surveillance Officers and Gaming Investigators
1.647	0.70	Security Guards
1.353	0.61	Crossing Guards
1.824	0.64	Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers
2.176	0.73	Protective Service Workers, All Other
3.118	0.86	Chefs and Head Cooks
3.353	0.93	First-Line Supervisors/Managers of Food Preparation and Serving Workers
1.588	0.71	Cooks, Fast Food
1.824	0.73	Cooks, Institution and Cafeteria
1.529	0.72	Cooks, Private Household
2.059	0.75	Cooks, Restaurant
1.706	0.59	Cooks, Short Order
1.235	0.44	Food Preparation Workers
1.412	0.51	Bartenders
1.353	0.49	Combined Food Preparation and Serving Workers, Including Fast Food
1.353	0.61	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop
1.294	0.47	Waiters and Waitresses
1.235	0.44	Food Servers, Nonrestaurant
1.235	0.44	Dining Room and Cafeteria Attendants and Bartender Helpers
1.059	0.24	Dishwashers
1.118	0.33	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop
1.294	0.47	Food Preparation and Serving Related Workers, All Other
3.059	1.25	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
3.176	0.95	First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers
1.412	0.71	Janitors and Cleaners, Except Maids and Housekeeping Cleaners
1.176	0.39	Building Cleaning Workers, All Other
1.176	0.53	Maids and Housekeeping Cleaners
1.588	0.62	Pest Control Workers
1.353	0.79	Landscaping and Groundskeeping Workers
1.647	0.70	Pesticide Handlers, Sprayers, and Applicators, Vegetation
1.412	0.62	Tree Trimmers and Pruners
1.353	0.61	Grounds Maintenance Workers, All Other
3.059	1.09	Gaming Supervisors
1.882	0.70	Slot Key Persons
3.353	0.93	First-Line Supervisors/Managers of Personal Service Workers
2.412	0.51	Animal Trainers
1.294	0.47	Nonfarm Animal Caretakers
1.529	0.72	Gaming Dealers
1.471	0.62	Gaming and Sports Book Writers and Runners
1.471	0.51	Gaming Service Workers, All Other
1.412	0.62	Motion Picture Projectionists
1.059	0.24	Ushers, Lobby Attendants, and Ticket Takers
1.059	0.24	Amusement and Recreation Attendants
1.235	0.44	Costume Attendants
1.059	0.24	Locker Room, Coatroom, and Dressing Room Attendants
2.000	0.87	Embalmers
1.765	0.56	Funeral Attendants
1.765	0.66	Barbers
2.000	0.71	Hairdressers, Hairstylists, and Cosmetologists
2.294	0.69	Makeup Artists, Theatrical and Performance
1.647	0.61	Manicurists and Pedicurists
1.176	0.39	Shampooers
1.471	0.72	Skin Care Specialists
1.059	0.24	Baggage Porters and Bellhops
2.000	0.87	Concierges
1.824	0.64	Tour Guides and Escorts
2.412	0.80	Travel Guides
2.294	0.59	Flight Attendants
1.412	0.51	Transportation Attendants, Except Flight Attendants and Baggage Porters
1.471	0.62	Child Care Workers
1.412	0.62	Personal and Home Care Aides
2.118	0.60	Fitness Trainers and Aerobics Instructors
2.176	0.64	Recreation Workers
2.176	0.64	Residential Advisors
1.706	0.69	Personal Care and Service Workers, All Other
3.353	0.93	First-Line Supervisors/Managers of Retail Sales Workers
3.353	0.93	First-Line Supervisors/Managers of Non-Retail Sales Workers
1.647	0.79	Cashiers
1.412	0.62	Gaming Change Persons and Booth Cashiers
1.412	0.51	Counter and Rental Clerks
1.706	0.77	Parts Salespersons
1.706	0.77	Retail Salespersons
2.471	0.80	Advertising Sales Agents
2.647	0.79	Insurance Sales Agents
3.059	0.75	Securities, Commodities, and Financial Services Sales Agents
2.471	0.62	Travel Agents
2.588	0.51	Sales Representatives, Services, All Other
3.000	0.71	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
2.941	0.66	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
1.588	0.62	Demonstrators and Product Promoters
1.529	0.62	Models
3.059	0.66	Real Estate Brokers
2.882	0.60	Real Estate Sales Agents
3.529	0.62	Sales Engineers
1.353	0.61	Telemarketers
1.118	0.33	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers
1.941	0.90	Sales and Related Workers, All Other
3.471	0.72	First-Line Supervisors/Managers of Office and Administrative Support Workers
1.294	0.47	Switchboard Operators, Including Answering Service
1.529	0.62	Telephone Operators
1.882	0.70	Communications Equipment Operators, All Other
1.941	0.75	Bill and Account Collectors
1.765	0.75	Billing and Posting Clerks and Machine Operators
2.471	0.80	Bookkeeping, Accounting, and Auditing Clerks
1.588	0.62	Gaming Cage Workers
2.118	0.86	Payroll and Timekeeping Clerks
2.176	0.81	Procurement Clerks
2.294	0.77	Tellers
2.471	0.72	Brokerage Clerks
2.059	0.83	Correspondence Clerks
2.176	0.81	Court, Municipal, and License Clerks
2.118	0.70	Credit Authorizers, Checkers, and Clerks
2.176	0.81	Customer Service Representatives
2.235	0.66	Eligibility Interviewers, Government Programs
1.412	0.51	File Clerks
1.824	0.73	Hotel, Motel, and Resort Desk Clerks
1.824	0.73	Interviewers, Except Eligibility and Loan
1.824	0.64	Library Assistants, Clerical
2.059	0.56	Loan Interviewers and Clerks
1.941	0.66	New Accounts Clerks
1.706	0.69	Order Clerks
2.294	0.47	Human Resources Assistants, Except Payroll and Timekeeping
1.706	0.59	Receptionists and Information Clerks
1.765	0.66	Reservation and Transportation Ticket Agents and Travel Clerks
1.647	0.61	Information and Record Clerks, All Other
1.824	0.73	Cargo and Freight Agents
1.176	0.39	Couriers and Messengers
2.059	0.83	Police, Fire, and Ambulance Dispatchers
1.941	0.66	Dispatchers, Except Police, Fire, and Ambulance
1.412	0.62	Meter Readers, Utilities
1.588	0.80	Postal Service Clerks
1.706	0.69	Postal Service Mail Carriers
1.706	0.69	Postal Service Mail Sorters, Processors, and Processing Machine Operators
2.176	0.88	Production, Planning, and Expediting Clerks
1.824	0.88	Shipping, Receiving, and Traffic Clerks
1.529	0.62	Stock Clerks and Order Fillers
1.588	0.71	Weighers, Measurers, Checkers, and Samplers, Recordkeeping
2.647	0.86	Executive Secretaries and Administrative Assistants
2.588	0.87	Secretaries, Legal
2.588	0.87	Secretaries, Medical
2.588	0.87	Computer Operators
1.529	0.72	Data Entry Keyers
1.588	0.71	Word Processors and Typists
2.588	0.71	Desktop Publishers
1.824	0.73	Insurance Claims and Policy Processing Clerks

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
1.412	0.51	Mail Clerks and Mail Machine Operators, Except Postal Service
1.647	0.61	Office Clerks, General
1.412	0.62	Office Machine Operators, Except Computer
1.882	0.70	Proofreaders and Copy Markers
2.471	0.62	Statistical Assistants
2.059	0.56	Office and Administrative Support Workers, All Other
3.176	1.01	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers
1.941	0.75	Farm Labor Contractors
3.000	1.06	Agricultural Inspectors
2.176	0.88	Animal Breeders
1.412	0.51	Graders and Sorters, Agricultural Products
1.412	0.62	Agricultural Equipment Operators
1.353	0.61	Farmworkers and Laborers, Crop, Nursery, and Greenhouse
1.294	0.59	Farmworkers, Farm and Ranch Animals
1.412	0.51	Agricultural Workers, All Other
1.412	0.51	Farming, Fishing, and Forestry Workers, All Other
1.294	0.59	Fishers and Related Fishing Workers
1.235	0.44	Hunters and Trappers
1.588	0.87	Forest and Conservation Workers
1.294	0.47	Fallers
1.412	0.51	Logging Equipment Operators
1.471	0.51	Log Graders and Scalers
1.294	0.47	Logging Workers, All Other
3.412	0.80	First-Line Supervisors/Managers of Construction Trades and Extraction Workers
1.941	0.66	Boilermakers
1.706	0.69	Brickmasons and Blockmasons
1.706	0.69	Stonemasons
1.941	0.75	Carpenters
1.235	0.44	Carpet Installers
1.235	0.44	Floor Layers, Except Carpet, Wood, and Hard Tiles
1.294	0.47	Floor Sanders and Finishers
1.471	0.51	Tile and Marble Setters
1.588	0.51	Cement Masons and Concrete Finishers
1.588	0.51	Terrazzo Workers and Finishers
1.176	0.39	Construction Laborers
1.471	0.62	Paving, Surfacing, and Tamping Equipment Operators
1.412	0.51	Pile-Driver Operators
1.882	0.93	Operating Engineers and Other Construction Equipment Operators
1.353	0.49	Drywall and Ceiling Tile Installers
1.235	0.44	Tapers
2.294	0.92	Electricians
1.588	0.71	Glaziers
1.412	0.71	Insulation Workers, Floor, Ceiling, and Wall
1.412	0.62	Insulation Workers, Mechanical
1.471	0.72	Painters, Construction and Maintenance
1.353	0.61	Paperhangers
1.529	0.72	Pipelayers
2.059	0.90	Plumbers, Pipefitters, and Steamfitters
1.529	0.72	Plasterers and Stucco Masons
1.588	0.71	Reinforcing Iron and Rebar Workers
1.353	0.49	Roofers
1.529	0.72	Sheet Metal Workers
1.588	0.71	Structural Iron and Steel Workers
1.176	0.39	Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters
1.176	0.39	Helpers--Carpenters
1.235	0.44	Helpers--Electricians

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
1.176	0.39	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons
1.176	0.39	Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters
1.176	0.39	Helpers--Roofers
1.176	0.39	Helpers, Construction Trades, All Other
2.588	0.94	Construction and Building Inspectors
2.000	0.79	Elevator Installers and Repairers
1.471	0.51	Fence Erectors
1.765	0.83	Hazardous Materials Removal Workers
1.294	0.47	Highway Maintenance Workers
1.529	0.72	Rail-Track Laying and Maintenance Equipment Operators
1.471	0.62	Septic Tank Servicers and Sewer Pipe Cleaners
1.647	0.70	Construction and Related Workers, All Other
1.765	0.75	Derrick Operators, Oil and Gas
1.824	0.73	Rotary Drill Operators, Oil and Gas
1.882	0.60	Service Unit Operators, Oil, Gas, and Mining
1.882	0.70	Earth Drillers, Except Oil and Gas
1.824	0.64	Explosives Workers, Ordnance Handling Experts, and Blasters
1.647	0.61	Continuous Mining Machine Operators
1.706	0.69	Mine Cutting and Channeling Machine Operators
1.588	0.51	Mining Machine Operators, All Other
1.294	0.47	Roof Bolters, Mining
1.412	0.51	Roustabouts, Oil and Gas
1.176	0.39	Helpers--Extraction Workers
1.294	0.47	Rock Splitters, Quarry
1.353	0.49	Extraction Workers, All Other
3.000	1.17	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
2.000	0.71	Computer, Automated Teller, and Office Machine Repairers
1.882	0.78	Radio Mechanics
2.000	0.71	Telecommunications Equipment Installers and Repairers, Except Line Installers
2.235	0.56	Avionics Technicians
1.882	0.70	Electric Motor, Power Tool, and Related Repairers
2.118	0.60	Electrical and Electronics Installers and Repairers, Transportation Equipment
2.176	0.64	Electrical and Electronics Repairers, Commercial and Industrial Equipment
2.176	0.64	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay
2.000	0.61	Electronic Equipment Installers and Repairers, Motor Vehicles
1.941	0.56	Electronic Home Entertainment Equipment Installers and Repairers
1.706	0.47	Security and Fire Alarm Systems Installers
2.176	0.73	Aircraft Mechanics and Service Technicians
1.882	0.60	Automotive Body and Related Repairers
1.706	0.77	Automotive Glass Installers and Repairers
2.118	0.70	Automotive Service Technicians and Mechanics
2.118	0.70	Bus and Truck Mechanics and Diesel Engine Specialists
2.059	0.66	Farm Equipment Mechanics
2.118	0.70	Mobile Heavy Equipment Mechanics, Except Engines
1.882	0.70	Rail Car Repairers
2.000	0.71	Motorboat Mechanics
1.941	0.66	Motorcycle Mechanics
1.941	0.66	Outdoor Power Equipment and Other Small Engine Mechanics
1.471	0.51	Bicycle Repairers
2.000	0.71	Recreational Vehicle Service Technicians
1.353	0.61	Tire Repairers and Changers
1.529	0.62	Mechanical Door Repairers
1.765	0.75	Control and Valve Installers and Repairers, Except Mechanical Door
1.882	0.70	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
1.882	0.70	Home Appliance Repairers
1.941	0.75	Industrial Machinery Mechanics

Table 4.5 – continued

Ladder Job Score		Job Title
Mean	Standard Deviation	
1.882	0.60	Refractory Materials Repairers, Except Brickmasons
1.882	0.70	Maintenance and Repair Workers, General
1.588	0.62	Maintenance Workers, Machinery
1.882	0.78	Millwrights
1.824	0.53	Electrical Power-Line Installers and Repairers
1.824	0.53	Telecommunications Line Installers and Repairers
1.824	0.53	Camera and Photographic Equipment Repairers
1.882	0.60	Medical Equipment Repairers
1.647	0.49	Musical Instrument Repairers and Tuners
1.647	0.61	Watch Repairers
1.765	0.56	Precision Instrument and Equipment Repairers, All Other
1.471	0.51	Coin, Vending, and Amusement Machine Servicers and Repairers
2.176	0.81	Commercial Divers
1.588	0.62	Locksmiths and Safe Repairers
1.647	0.70	Manufactured Building and Mobile Home Installers
1.647	0.79	Riggers
1.647	0.70	Signal and Track Switch Repairers
1.176	0.39	Helpers--Installation, Maintenance, and Repair Workers
1.412	0.51	Fabric Menders, Except Garment
1.412	0.51	Installation, Maintenance, and Repair Workers, All Other
3.353	0.79	First-Line Supervisors/Managers of Production and Operating Workers
1.765	0.75	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
1.353	0.49	Coil Winders, Tapers, and Finishers
1.647	0.70	Electrical and Electronic Equipment Assemblers
1.588	0.62	Electromechanical Equipment Assemblers
1.647	0.61	Engine and Other Machine Assemblers
1.471	0.51	Structural Metal Fabricators and Fitters
1.471	0.51	Fiberglass Laminators and Fabricators
2.000	1.00	Team Assemblers
1.647	0.61	Timing Device Assemblers, Adjusters, and Calibrators
1.588	0.62	Assemblers and Fabricators, All Other
1.765	0.83	Bakers
1.471	0.62	Butchers and Meat Cutters
1.412	0.62	Meat, Poultry, and Fish Cutters and Trimmers
1.235	0.44	Slaughterers and Meat Packers
1.294	0.47	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders
1.118	0.33	Food Batchmakers
1.235	0.44	Food Cooking Machine Operators and Tenders
1.647	0.61	Computer-Controlled Machine Tool Operators, Metal and Plastic
2.118	0.86	Numerical Tool and Process Control Programmers
1.588	0.87	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
1.412	0.62	Forging Machine Setters, Operators, and Tenders, Metal and Plastic
1.412	0.62	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic
1.412	0.62	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
1.353	0.49	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
1.353	0.49	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic
1.412	0.62	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
1.412	0.62	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
2.235	0.83	Machinists
1.353	0.49	Metal-Refining Furnace Operators and Tenders
1.235	0.44	Pourers and Casters, Metal
1.471	0.72	Model Makers, Metal and Plastic
1.471	0.72	Patternmakers, Metal and Plastic
1.412	0.62	Foundry Mold and Coremakers
1.412	0.62	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
1.529	0.80	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
1.765	0.97	Tool and Die Makers
1.529	0.62	Welders, Cutters, Solderers, and Brazers
1.588	0.71	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders
1.471	0.62	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic
1.471	0.62	Lay-Out Workers, Metal and Plastic
1.471	0.62	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic
1.471	0.62	Tool Grinders, Filers, and Sharpeners
1.471	0.51	Metalworkers and Plastic Workers, All Other
1.353	0.49	Bindery Workers
1.471	0.51	Bookbinders
1.882	0.70	Job Printers
1.706	0.69	Prepress Technicians and Workers
1.706	0.77	Printing Machine Operators
1.235	0.44	Laundry and Dry-Cleaning Workers
1.235	0.44	Pressers, Textile, Garment, and Related Materials
1.353	0.49	Sewing Machine Operators
1.412	0.51	Shoe and Leather Workers and Repairers
1.353	0.49	Shoe Machine Operators and Tenders
1.294	0.47	Sewers, Hand
1.647	0.70	Tailors, Dressmakers, and Custom Sewers
1.294	0.47	Textile Bleaching and Dyeing Machine Operators and Tenders
1.235	0.44	Textile Cutting Machine Setters, Operators, and Tenders
1.294	0.47	Textile Knitting and Weaving Machine Setters, Operators, and Tenders
1.294	0.47	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders
1.294	0.47	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers
1.412	0.71	Fabric and Apparel Patternmakers
1.412	0.62	Upholsterers
1.471	0.51	Textile, Apparel, and Furnishings Workers, All Other
2.000	0.94	Cabinetmakers and Bench Carpenters
1.588	0.71	Furniture Finishers
1.882	0.78	Model Makers, Wood
1.647	0.61	Patternmakers, Wood
1.529	0.72	Sawing Machine Setters, Operators, and Tenders, Wood
1.529	0.62	Woodworking Machine Setters, Operators, and Tenders, Except Sawing
1.706	0.69	Woodworkers, All Other
2.412	0.87	Nuclear Power Reactor Operators
2.235	0.90	Power Distributors and Dispatchers
2.529	0.80	Power Plant Operators
2.235	0.97	Stationary Engineers and Boiler Operators
2.235	0.97	Water and Liquid Waste Treatment Plant and System Operators
2.412	0.94	Chemical Plant and System Operators
2.294	0.85	Gas Plant Operators
2.294	0.85	Petroleum Pump System Operators, Refinery Operators, and Gaugers
2.235	0.83	Plant and System Operators, All Other
2.118	0.78	Chemical Equipment Operators and Tenders
1.647	0.70	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders
1.647	0.70	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders
1.529	0.72	Grinding and Polishing Workers, Hand
1.529	0.72	Mixing and Blending Machine Setters, Operators, and Tenders
1.353	0.49	Cutters and Trimmers, Hand
1.412	0.71	Cutting and Slicing Machine Setters, Operators, and Tenders
1.471	0.80	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders
1.353	0.49	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders
1.765	0.75	Inspectors, Testers, Sorters, Samplers, and Weighers
1.941	0.75	Jewelers and Precious Stone and Metal Workers
2.000	0.79	Dental Laboratory Technicians

Table 4.5 – continued

Ladder Job Score		
Mean	Standard Deviation	Job Title
1.941	0.66	Medical Appliance Technicians
1.941	0.66	Ophthalmic Laboratory Technicians
1.294	0.47	Packaging and Filling Machine Operators and Tenders
1.294	0.47	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders
1.412	0.51	Painters, Transportation Equipment
1.471	0.51	Painting, Coating, and Decorating Workers
1.588	0.71	Photographic Process Workers
1.412	0.51	Photographic Processing Machine Operators
1.647	0.70	Semiconductor Processors
1.412	0.51	Cementing and Gluing Machine Operators and Tenders
1.235	0.44	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders
1.294	0.47	Cooling and Freezing Equipment Operators and Tenders
1.588	0.51	Etchers and Engravers
1.588	0.62	Molders, Shapers, and Casters, Except Metal and Plastic
1.588	0.71	Paper Goods Machine Setters, Operators, and Tenders
1.412	0.51	Tire Builders
1.176	0.39	Helpers--Production Workers
1.294	0.47	Production Workers, All Other
2.882	0.99	Aircraft Cargo Handling Supervisors
3.294	0.85	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand
3.294	0.85	First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators
3.588	0.80	Airline Pilots, Copilots, and Flight Engineers
3.765	0.56	Commercial Pilots
3.294	0.77	Air Traffic Controllers
3.235	0.75	Airfield Operations Specialists
1.824	0.81	Ambulance Drivers and Attendants, Except Emergency Medical Technicians
1.647	0.61	Bus Drivers, Transit and Intercity
1.412	0.51	Bus Drivers, School
1.765	0.75	Driver/Sales Workers
1.588	0.62	Truck Drivers, Heavy and Tractor-Trailer
1.529	0.51	Truck Drivers, Light or Delivery Services
1.353	0.49	Taxi Drivers and Chauffeurs
1.412	0.51	Motor Vehicle Operators, All Other
2.235	0.83	Locomotive Engineers
1.647	0.70	Locomotive Firers
1.706	0.69	Rail Yard Engineers, Dinkey Operators, and Hostlers
1.588	0.62	Railroad Brake, Signal, and Switch Operators
1.941	0.83	Railroad Conductors and Yardmasters
1.529	0.72	Subway and Streetcar Operators
1.588	0.62	Rail Transportation Workers, All Other
2.059	0.75	Sailors and Marine Oilers
2.941	1.09	Captains, Mates, and Pilots of Water Vessels
1.706	0.69	Motorboat Operators
3.059	0.75	Ship Engineers
1.941	0.83	Bridge and Lock Tenders
1.059	0.24	Parking Lot Attendants
1.235	0.44	Service Station Attendants
2.294	0.77	Transportation Inspectors
2.000	0.79	Traffic Technicians
1.706	0.69	Transportation Workers, All Other
1.294	0.47	Conveyor Operators and Tenders
1.412	0.71	Crane and Tower Operators
1.353	0.61	Dredge Operators
1.353	0.61	Excavating and Loading Machine and Dragline Operators
1.294	0.47	Loading Machine Operators, Underground Mining
1.353	0.61	Hoist and Winch Operators

Table 4.5 – continued

Ladder Job Score		Job Title
Mean	Standard Deviation	
1.412	0.62	Industrial Truck and Tractor Operators
1.118	0.33	Cleaners of Vehicles and Equipment
1.118	0.33	Laborers and Freight, Stock, and Material Movers, Hand
1.118	0.33	Machine Feeders and Offbearers
1.118	0.33	Packers and Packagers, Hand
1.471	0.51	Gas Compressor and Gas Pumping Station Operators
1.412	0.51	Pump Operators, Except Wellhead Pumpers
1.471	0.51	Wellhead Pumpers
1.118	0.33	Refuse and Recyclable Material Collectors
1.235	0.44	Shuttle Car Operators
1.235	0.56	Tank Car, Truck, and Ship Loaders
1.176	0.39	Material Moving Workers, All Other
2.765	0.75	Armed Military

Table 5.1: Summary of Ladder Job Statistics and Datasets

		Dataset						
		A	**B**	**C**	**D**	**E**	**F**	**G**
Delinquency Measure at	**Wave**	5	6	7	5	6	5	6
	Wave	3	4	5	3	4	3	4
Employment	**% employed**	66%	80%	85%	54%	67%	52%	65%
	Wave	3	4	5	3	4	3	4
	Mean	1.042	1.313	1.423	0.830	1.031	0.767	0.964
Ladder Job Score	**Standard Deviation**	0.890	0.883	0.872	0.865	0.851	0.839	0.841
	Wave 3	6%			2%		3%	
	Wave 4	9%	9%		6%	5%	4%	4%
	Wave 5	11%	11%	11%	8%	7%	7%	5%
% with ladder job	**Wave 6**		13%	13%		9%		9%
(ladder job score>=2.5)	**Wave 7**			16%				

Table 5.2: Descriptive Statistics of Dataset A

Dataset A: Wave 3, 4, 5 (n=7,322)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W5	Variety score of criminal and delinquent behaviors between wave 4 and wave 5	1.69	1.68	1.41	2.77	0.00	11.00
Income_Jobs_W4	Youths' income from jobs in the year of wave 4	4,655.36	5,540.32	2.41	7.03	0.00	30,623.00
Income_Jobs_W4 (transformed)	Square root of variable "Income_Jobs_W4"	58.75	34.70	0.99	0.98	0.00	174.99
Income_Family_W4	Youth's monetary resources from family in the year of wave 4	586.20	3,886.60	18.10	360.74	0.00	95,488.00
Income_Family_W4 (transformed)	Square root of variable "Income_Family_W4"	11.23	21.45	5.61	56.55	0.00	309.01
Employment_W3	Whether youth was employed at wave 3 0 = not employed 1 = employed	0.66	0.47	-0.68	-1.53	0.00	1.00
Ladder Job Score_W3	Ladder job score of youth's primary job at wave 3 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	1.04	0.89	0.36	-0.20	0.00	3.97
Work Hours_W3	Number of hours youth worked in the year of wave 3	462.01	615.91	1.80	3.94	0.00	5,330.00
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.38	0.81	2.96	11.81	0.00	8.00
Age	Youth's age as of 12/31/1996	13.90	1.39	0.86	-1.26	12.00	16.00
Male	Whether youth is a male 0 = female 1 = male	0.50	0.50	-0.08	-2.00	0.00	1.00
Black	Whether youth is an African American 0 = non-black 1 = black	0.26	0.44	1.08	-0.83	0.00	1.00
Hispanic	Whether youth is a Latino origin 0 = non-Latino 1 = Latino	0.21	0.41	1.43	0.03	0.00	1.00

Table 5.2 – continued

Dataset A: Wave 3, 4, 5 (n=7,322)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Mother's Education	Education level of youth's mother 0 = none 1 = grades 1 to 8 2 = grades 9 to 11 3 = grades 12 4 = some college 5 = college degree 6 = some graduate school 7 = graduate/professional degree	2.48	1.42	0.54	0.37	1.00	7.00
Father's Education	Education level of youth's father 0 = none 1 = grades 1 to 8 2 = grades 9 to 11 3 = grades 12 4 = some college 5 = college degree 6 = some graduate school 7 = graduate/professional degree	2.54	1.65	0.80	0.36	1.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	35,522.39	39,520.00	2.32	9.67	0.00	443,000.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	152.85	110.27	0.21	-0.29	0.00	665.58

Table 5.3: Descriptive Statistics of Dataset B

Dataset B: Wave 4, 5, 6 (n=7,234)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W6	Variety score of criminal and delinquent behaviors between wave 5 and wave 6	1.67	1.53	1.31	2.63	0.00	11.00
Income_Jobs_W5	Youths' income from jobs in the year of wave 5	6,556.54	7,090.99	1.94	4.22	0.00	35,558.00
Income_Jobs_W5 (transformed)	Square root of variable "Income_Jobs_W5"	70.77	39.35	0.80	0.26	0.00	188.57
Income_Family_W5	Youth's monetary resources from family in the year of wave 5	586.29	1,852.23	8.01	95.50	0.00	41,500.00
Income_Family_W5 (transformed)	Square root of variable "Income_Family_W5"	12.69	20.63	2.52	9.25	0.00	203.72
Employment_W4	Whether youth was employed at wave 4 0 = not employed 1 = employed	0.80	0.40	-1.52	0.30	0.00	1.00
Ladder Job Score_W4	Ladder job score of youth's primary job at wave 4 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	1.31	0.88	0.23	0.26	0.00	4.00
Work Hours_W4	Number of hours youth worked in the year of wave 4	701.09	750.73	1.36	2.53	0.00	6,468.00
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.38	0.82	3.00	12.41	0.00	8.00
Age	Youth's age as of 12/31/1996	13.90	1.40	0.09	-1.26	12.00	16.00
Male	Whether youth is a male 0 = female 1 = male	0.50	0.50	0.00	-2.00	0.00	1.00
Black	Whether youth is an African American 0 = non-black 1 = black	0.26	0.44	1.07	-0.86	0.00	1.00
Hispanic	Whether youth is a Latino origin 0 = non-Latino 1 = Latino	0.21	0.41	1.43	0.05	0.00	1.00

Table 5.3 – continued

Dataset B: Wave 4, 5, 6 (n=7,234)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Mother's Education	Education level of youth's mother 0 = none 1 = grades 1 to 8 2 = grades 9 to 11 3 = grades 12 4 = some college 5 = college degree 6 = some graduate school 7 = graduate/professional degree	2.48	1.42	0.56	0.40	0.00	7.00
Father's Education	Education level of youth's father 0 = none 1 = grades 1 to 8 2 = grades 9 to 11 3 = grades 12 4 = some college 5 = college degree 6 = some graduate school 7 = graduate/professional degree	2.54	1.65	0.81	0.37	0.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	35,519.53	39,499.97	2.31	9.63	0.00	443,000.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	152.75	110.41	0.21	-0.30	0.00	665.58

Table 5.4: Descriptive Statistics of Dataset C

Dataset C: Wave 5, 6, 7 (n=7,114)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W7	Variety score of criminal and delinquent behaviors between wave 6 and wave 7	1.64	1.46	1.44	3.66	0.00	11.00
Income_Jobs_W6	Youths' income from jobs in the year of wave 6	6,225.79	8,047.56	1.94	4.38	0.00	42,458.00
Income_Jobs_W6 (transformed)	Square root of variable "Income_Jobs_W6"	82.06	41.80	0.67	-0.02	0.00	206.05
Income_Family_W6	Youth's monetary resources from family in the year of wave 6	676.24	2,126.78	7.87	96.02	0.00	49,179.00
Income_Family_W6 (transformed)	Square root of variable "Income_Family_W6"	13.65	22.14	2.52	9.10	0.00	221.76
Employment_W5	Whether youth was employed at wave 5 0 = not employed 1 = employed	0.85	0.36	-1.97	1.88	0.00	1.00
Ladder Job Score_W5	Ladder job score of youth's primary job at wave 5 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	1.42	0.87	0.20	0.40	0.00	4.00
Work Hours_W5	Number of hours youth worked in the year of wave 5	845.83	798.27	1.16	2.61	0.00	8,154.00
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.38	0.81	2.99	12.28	0.00	8.00
Age	Youth's age as of 12/31/1996	13.91	1.39	0.07	-1.26	12.00	16.00
Male	Whether youth is a male 0 = female 1 = male	0.50	0.50	0.01	-2.00	0.00	1.00
Black	Whether youth is an African American 0 = non-black 1 = black	0.27	0.44	1.06	-0.88	0.00	1.00
Hispanic	Whether youth is a Latino origin 0 = non-Latino 1 = Latino	0.21	0.41	1.43	0.06	0.00	1.00

Table 5.4 – continued

Dataset C: Wave 5, 6, 7 (n=7,114)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
	Education level of youth's mother						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Mother's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.48	1.42	0.57	0.43	0.00	7.00
	Education level of youth's father						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Father's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.54	1.65	0.82	0.38	0.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	35,403.49	39,411.64	2.32	9.73	0.00	443,000.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	152.40	110.36	0.21	-0.31	0.00	665.58

Table 5.5: Descriptive Statistics of Dataset D

Dataset D: Wave 3, 4, 5 (n=2,805)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W5	Variety score of criminal and delinquent behaviors between wave 4 and wave 5	1.60	1.72	1.47	2.82	0.00	11.00
Job Stability_W4	Index of job stability from wave 3 to wave 4	0.58	0.88	0.93	-1.06	0.00	2.00
Mother_KnowYourFriend_W4	Mother knows youth's close friends at wave 4 0 = No 1 = Yes	2.61	0.91	-0.60	0.22	0.00	1.00
Mother_KnowYourFriendParents_W4	Mother knows youth's close friends' parents at wave 4 0 = No 1 = Yes	1.97	1.06	-0.04	-0.65	0.00	1.00
Mother_KnowWhomYouWith_W4	Mother knows whom youth with when not at home at wave 4 0 = No 1 = Yes	2.68	1.08	-0.66	-0.24	0.00	1.00
Father_KnowYourFriend_W4	Father knows youth's close friends at wave 4 0 = No 1 = Yes	1.94	1.06	-0.04	-0.65	0.00	1.00
Father_KnowYourFriendParents_W4	Father knows youth's close friends' parents at wave 4 0 = No 1 = Yes	1.49	1.10	0.33	-0.71	0.00	1.00
Father_KnowWhomYouWith_W4	Father knows whom youth with when not at home at wave 4 0 = No 1 = Yes	2.04	1.21	-0.03	-0.95	0.00	1.00
Income_Jobs_W3	Youths' income from jobs in the year of wave 3	2,438.87	2,839.71	3.27	18.56	0.00	30,623.00
Income_Jobs_W3 (transformed)	Square root of variable "Income_Jobs_W3"	42.90	24.47	0.93	1.71	0.00	174.99
Income_Family_W3	Youth's monetary resources from family in the year of wave 3	332.01	1,918.87	31.18	1,238.26	0.00	82,375.00
Income_Family_W3 (transformed)	Square root of variable "Income_Family_W3"	8.91	15.90	4.26	44.97	0.00	287.01
Employment_W3	Whether youth was employed at wave 3 0 = not employed 1 = employed	0.54	0.50	-0.16	-1.98	0.00	1.00
Ladder Job Score_W3	Ladder job score of youth's primary job at wave 3 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	0.83	0.86	0.59	-0.32	0.00	3.94

Table 5.5 – continued

Dataset D: Wave 3, 4, 5 (n=2,805)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Work Hours_W3	Number of hours youth worked in the year of wave 3	249.34	409.95	2.72	11.89	0.00	4,500.00
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.39	0.82	2.86	10.21	0.00	7.00
Age	Youth's age as of 12/31/1996	12.93	0.81	0.13	-1.45	12.00	14.00
	Whether youth is a male						
Male	0 = female						
	1 = male	0.53	0.50	-0.13	-1.99	0.00	1.00
	Whether youth is an African American						
Black	0 = non-black						
	1 = black	0.17	0.38	1.74	1.02	0.00	1.00
	Whether youth is a Latino origin						
Hispanic	0 = non-Latino						
	1 = Latino	0.22	0.41	1.37	-0.12	0.00	1.00
	Education level of youth's mother						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Mother's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.60	1.46	0.45	0.20	0.00	7.00
	Education level of youth's father						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Father's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.68	1.70	0.70	0.10	0.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	45,056.03	43,189.19	2.17	8.85	0.00	443,000.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	181.20	110.57	-0.04	-0.01	0.00	665.58

Table 5.6: Descriptive Statistics of Dataset E

Dataset E: Wave 4, 5, 6 (n=1,768)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W6	Variety score of criminal and delinquent behaviors between wave 5 and wave 6	1.58	1.61	1.40	2.78	0.00	11.00
Job Stability_W5	Index of job stability from wave 4 to wave 5	0.73	0.93	0.56	-1.61	0.00	2.00
Mother_KnowYourFriend_W5	Mother knows youth's close friends at wave 5 0 = No 1 = Yes	2.67	0.90	-0.65	0.32	0.00	1.00
Mother_KnowYourFriendParents_W5	Mother knows youth's close friends' parents at wave 5 0 = No 1 = Yes	1.99	1.03	-0.09	-0.58	0.00	1.00
Mother_KnowWhomYouWith_W5	Mother knows whom youth with when not at home at wave 5 0 = No 1 = Yes	2.70	1.05	-0.70	-0.05	0.00	1.00
Father_KnowYourFriend_W5	Father knows youth's close friends at wave 5 0 = No 1 = Yes	2.04	1.08	-0.12	-0.66	0.00	1.00
Father_KnowYourFriendParents_W5	Father knows youth's close friends' parents at wave 5 0 = No 1 = Yes	1.59	1.12	0.27	-0.71	0.00	1.00
Father_KnowWhomYouWith_W5	Father knows whom youth with when not at home at wave 5 0 = No 1 = Yes	2.08	1.19	-0.13	-0.90	0.00	1.00
Income_Jobs_W4	Youths' income from jobs in the year of wave 4	2,951.55	3,269.81	3.10	16.07	0.00	35,558.00
Income_Jobs_W4 (transformed)	Square root of variable "Income_Jobs_W4"	47.99	25.49	0.98	1.82	0.00	188.57
Income_Family_W4	Youth's monetary resources from family in the year of wave 4	327.55	925.00	7.78	90.01	0.00	15,926.00
Income_Family_W4 (transformed)	Square root of variable "Income_Family_W4"	9.54	15.38	2.12	6.50	0.00	126.20
Employment_W4	Whether youth was employed at wave 4 0 = not employed 1 = employed	0.67	0.47	-0.74	-1.45	0.00	1.00
Ladder Job Score_W4	Ladder job score of youth's primary job at wave 4 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	1.03	0.85	0.24	-0.37	0.00	3.94

Table 5.6 – continued

Dataset E: Wave 4, 5, 6 (n=1,768)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Work Hours_W4	Number of hours youth worked in the year of wave 4	339.09	441.12	2.22	9.55	0.00	4,770.00
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.41	0.86	2.84	10.12	0.00	7.00
Age	Youth's age as of 12/31/1996	12.45	0.50	0.19	-1.97	12.00	13.00
	Whether youth is a male						
Male	0 = female						
	1 = male	0.54	0.50	-0.15	-1.98	0.00	1.00
	Whether youth is an African American						
Black	0 = non-black						
	1 = black	0.17	0.37	1.78	1.18	0.00	1.00
	Whether youth is a Latino origin						
Hispanic	0 = non-Latino						
	1 = Latino	0.23	0.42	1.29	-0.35	0.00	1.00
	Education level of youth's mother						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Mother's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.56	1.48	0.47	0.24	0.00	7.00
	Education level of youth's father						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Father's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.63	1.72	0.72	0.13	0.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	43,732.26	42,396.92	2.08	7.30	0.00	343,230.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	178.12	109.59	-0.01	-0.05	0.00	585.86

Table 5.7: Descriptive Statistics of Dataset F

Dataset F: Wave 3, 4, 5 (n=1,386)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W5	Variety score of criminal and delinquent behaviors between wave 4 and wave 5	1.75	1.87	1.50	2.76	0.00	11.00
Job Stability_W4	Index of job stability from wave 3 to wave 4	0.71	0.92	0.60	-1.55	0.00	2.00
Mother/Father_KnowYourFriend_W4	Mother/Father knows youth's close friends at wave 4 0 = No 1 = Yes	2.59	1.04	-0.59	-0.12	0.00	1.00
Mother/Father_KnowYourFriendParents_W4	Mother/Father knows youth's close friends' parents at wave 4 0 = No 1 = Yes	1.93	1.14	0.04	-0.79	0.00	1.00
Mother/Father_KnowWhomYouWith_W4	Mother/Father knows whom youth with when not at home at wave 4 0 = No 1 = Yes	2.63	1.17	-0.58	-0.55	0.00	1.00
Income_Jobs_W3	Youths' income from jobs in the year of wave 3	2,585.30	2,829.63	2.53	9.33	0.00	22,000.00
Income_Jobs_W3 (transformed)	Square root of variable "Income_Jobs_W3"	44.64	24.36	0.86	1.02	0.00	148.32
Income_Family_W3	Youth's monetary resources from family in the year of wave 3	304.23	945.03	7.97	83.70	0.00	14,833.00
Income_Family_W3 (transformed)	Square root of variable "Income_Family_W3"	9.12	14.87	2.43	8.85	0.00	121.79
Employment_W3	Whether youth was employed at wave 3 0 = not employed 1 = employed	0.52	0.50	-0.08	-2.00	0.00	1.00
Ladder Job Score_W3	Ladder job score of youth's primary job at wave 3 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	0.77	0.84	0.64	-0.29	0.00	3.97
Work Hours_W3	Number of hours youth worked in the year of wave 3	242.60	399.15	2.34	6.45	0.00	2,861.00

Table 5.7 – continued

Dataset F: Wave 3, 4, 5 (n=1,386)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.46	0.87	2.41	7.09	0.00	6.00
Age	Youth's age as of 12/31/1996	12.99	0.81	0.02	-1.49	12.00	14.00
	Whether youth is a male						
Male	0 = female						
	1 = male	0.49	0.50	0.06	-2.00	0.00	1.00
	Whether youth is an African American						
Black	0 = non-black						
	1 = black	0.40	0.49	0.42	-1.82	0.00	1.00
	Whether youth is a Latino origin						
Hispanic	0 = non-Latino						
	1 = Latino	0.20	0.40	1.51	0.29	0.00	1.00
	Education level of youth's mother						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Mother's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.41	1.36	0.63	0.60	0.00	7.00
	Education level of youth's father						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Father's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.50	1.58	0.80	0.56	0.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	19,808.10	24,869.98	2.08	6.46	0.00	193,711.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	106.92	91.56	0.42	-0.58	0.00	440.13

Table 5.8: Descriptive Statistics of Dataset G

Dataset G: Wave 4, 5, 6 (n=846)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Crime/Delinquency_W6	Variety score of criminal and delinquent behaviors between wave 5 and wave 6	1.68	1.73	1.37	2.16	0.00	10.00
Job Stability_W5	Index of job stability from wave 4 to wave 5	0.66	0.90	0.71	-1.40	0.00	2.00
Mother/Father_KnowYourFriend_W5	Mother/Father knows youth's close friends at wave 5 0 = No 1 = Yes	2.65	0.96	-0.56	0.03	0.00	4.00
Mother/Father_KnowYourFriendParents_W5	Mother/Father knows youth's close friends' parents at wave 5 0 = No 1 = Yes	1.96	1.11	0.01	-0.73	0.00	4.00
Mother/Father_KnowWhomYouWith_W5	Mother/Father knows whom youth with when not at home at wave 5 0 = No 1 = Yes	2.69	1.12	-0.62	-0.42	0.00	4.00
Income_Jobs_W4	Youths' income from jobs in the year of wave 4	3,102.23	3,750.76	3.61	19.69	0.00	35,558.00
Income_Jobs_W4 (transformed)	Square root of variable "Income_Jobs_W4"	48.58	27.27	1.14	2.69	0.00	188.57
Income_Family_W4	Youth's monetary resources from family in the year of wave 4	348.55	1,112.36	8.04	89.70	0.00	17,450.00
Income_Family_W4 (transformed)	Square root of variable "Income_Family_W4"	9.49	16.09	2.52	9.24	0.00	132.10
Employment_W4	Whether youth was employed at wave 4 0 = not employed 1 = employed	0.65	0.48	-0.61	-1.63	0.00	1.00
Ladder Job Score_W4	Ladder job score of youth's primary job at wave 4 1 = Non-ladder job 2 = somehow non-ladder job 3 = somehow ladder job 4 = ladder job	0.96	0.84	0.29	-0.36	0.00	3.81
Work Hours_W4	Number of hours youth worked in the year of wave 4	339.92	449.23	1.73	3.80	0.00	3,220.00
Delinquency Before Age 10	Variety score of criminal and delinquent behaviors before age 10	0.49	0.90	2.51	8.10	0.00	7.00

Table 5.8 – continued

Dataset G: Wave 4, 5, 6 (n=846)	Description	Mean	Std. Dev.	Skewness	Kurtosis	Min.	Max.
Age	Youth's age as of 12/31/1996	12.47	0.50	0.12	-1.99	12.00	13.00
	Whether youth is a male						
Male	0 = female						
	1 = male	0.48	0.50	0.06	-2.00	0.00	1.00
	Whether youth is an African American						
Black	0 = non-black						
	1 = black	0.39	0.49	1.54	0.38	0.00	1.00
	Whether youth is a Latino origin						
Hispanic	0 = non-Latino						
	1 = Latino	0.20	0.40	1.54	0.38	0.00	1.00
	Education level of youth's mother						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Mother's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.46	1.31	0.56	0.57	0.00	7.00
	Education level of youth's father						
	0 = none						
	1 = grades 1 to 8						
	2 = grades 9 to 11						
Father's Education	3 = grades 12						
	4 = some college						
	5 = college degree						
	6 = some graduate school						
	7 = graduate/professional degree	2.50	1.55	0.80	0.63	0.00	7.00
Parent(s) Income	Income of youth's parent(s) at wave 1	21,238.59	26,182.94	2.35	9.78	0.00	226,125.00
Parent(s) Income (transformed)	Square root of variable "Parent(s) Income"	112.51	92.69	0.38	-0.45	0.00	475.53

Table 5.9: Testing Hypothesis 1 by Using Datasets A, B, and C

Model	n	Employment (yes/no)			Ladder Job Scores			Magnitude Rate	Delinquency
		Wave	Beta	Sig.	Wave	Beta	Sig.		Wave
A1	7,322	3	0.107	***	3	-0.026		0.24	5
A2	7,322	4	0.114	***	4	-0.055	***	0.48	5
A3	7,322	5	0.067	***	5	-0.042	**	0.63	5
B1	7,234	4	0.072	***	4	-0.037	*	0.51	6
B2	7,234	5	0.060	***	5	-0.032	`	0.53	6
B3	7,234	6			6			n/a	6
C1	7,114	5	0.091	***	5	-0.042	**	0.46	7
C2	7,114	6			6			n/a	7
C3	7,114	7	0.081	***	7	-0.089	***	1.10	7

Note: Models B3 and C2 could not be estimated because of no variation of employment at wave 6.

Table 5.10: Testing Hypotheses 2 and 3 by Using Datasets A, B, and C

Model	n	Employment			Ladder Job Scores			Magnitude Rate	Job Income					Delinquency
		Wave	Beta	Sig.	Wave	Beta	Sig.		Wave	Beta	Sig.	by Employment	by Ladder Job	Wave
A11	7,322	3	0.095	***	3	-0.027		0.28	3	0.053	**	***	`	5
A12	7,322	3	0.096	***	3	-0.025		0.26	4	0.056	**	***		5
A21	7,322	4	0.109	***	4	-0.055	***	0.50	4	0.018		***		5
A22	7,322	4	0.105	***	4	-0.056	***	0.53	5	0.046	***	***		5
A31	7,322	5	0.057	***	5	-0.042	**	0.74	5	0.041	*	***		5
B11	7,234	4	0.067	***	4	-0.037	*	0.55	4	0.021		***		6
B12	7,234	4	0.058	**	4	-0.038	*	0.66	5	0.081	***	***		6
B21	7,234	5	0.043	**	5	-0.031	`	0.72	5	0.066	***	***		6
B22	7,234	5	0.058	***	5	-0.032	`	0.55	6	0.042	*	***		6
C11	7,114	5	0.075	***	5	-0.041	*	0.55	5	0.06	**	***		7
C12	7,114	5	0.088	***	5	-0.042	**	0.48	6	0.054	**	***		7
C31	7,114	7	0.078	***	7	-0.089	***	1.14	7	0.008		***		7

Table 5.11: Testing Hypothesis 4 by Using Datasets A, B, and C

Model	n	Employment			Ladder Job Scores			Magnitude Rate	Job Income					Job Stability				Delinquency
		Wave	Beta	Sig.	Wave	Beta	Sig.		Wave	Beta	Sig.	by Employment	by Ladder Job	Wave	Beta	Sig.	by Ladder Job	Wave
A111	7,322	3	0.105	***	3	-0.023		0.22	3	0.053	**	***	`	4	-0.031	*	***	5
A121	7,322	3	0.107	***	3	-0.021		0.20	4	0.063	**	***		4	-0.036	**	***	5
A211	7,322	4	0.124	***	4	-0.046	**	0.37	4	0.021		***		5	-0.058	***	***	5
A221	7,322	4	0.119	***	4	-0.046	**	0.39	5	0.061	***	***		5	-0.065	***	***	5
B111	7,234	4	0.075	***	4	-0.032	`	0.43	4	0.022		***		5	-0.029	*	***	6
B121	7,234	4	0.066	***	4	-0.032	`	0.48	5	0.089	***	***		5	-0.039	**	***	6
B211	7,234	5	0.043	**	5	-0.031	`	0.72	5	0.066	***	***		6	-0.001	**	**	6
B221	7,234	5	0.058	***	5	-0.032	`	0.55	6	0.042	*	***		6	-0.001	**	**	6
C111	7,114	5	0.075	***	5	-0.041	*	0.55	5	0.060	**	***		6	-0.001	***	***	7
C121	7,114	5	0.088	***	5	-0.042	**	0.48	6	0.054	**	***		6	-0.001	***	***	7

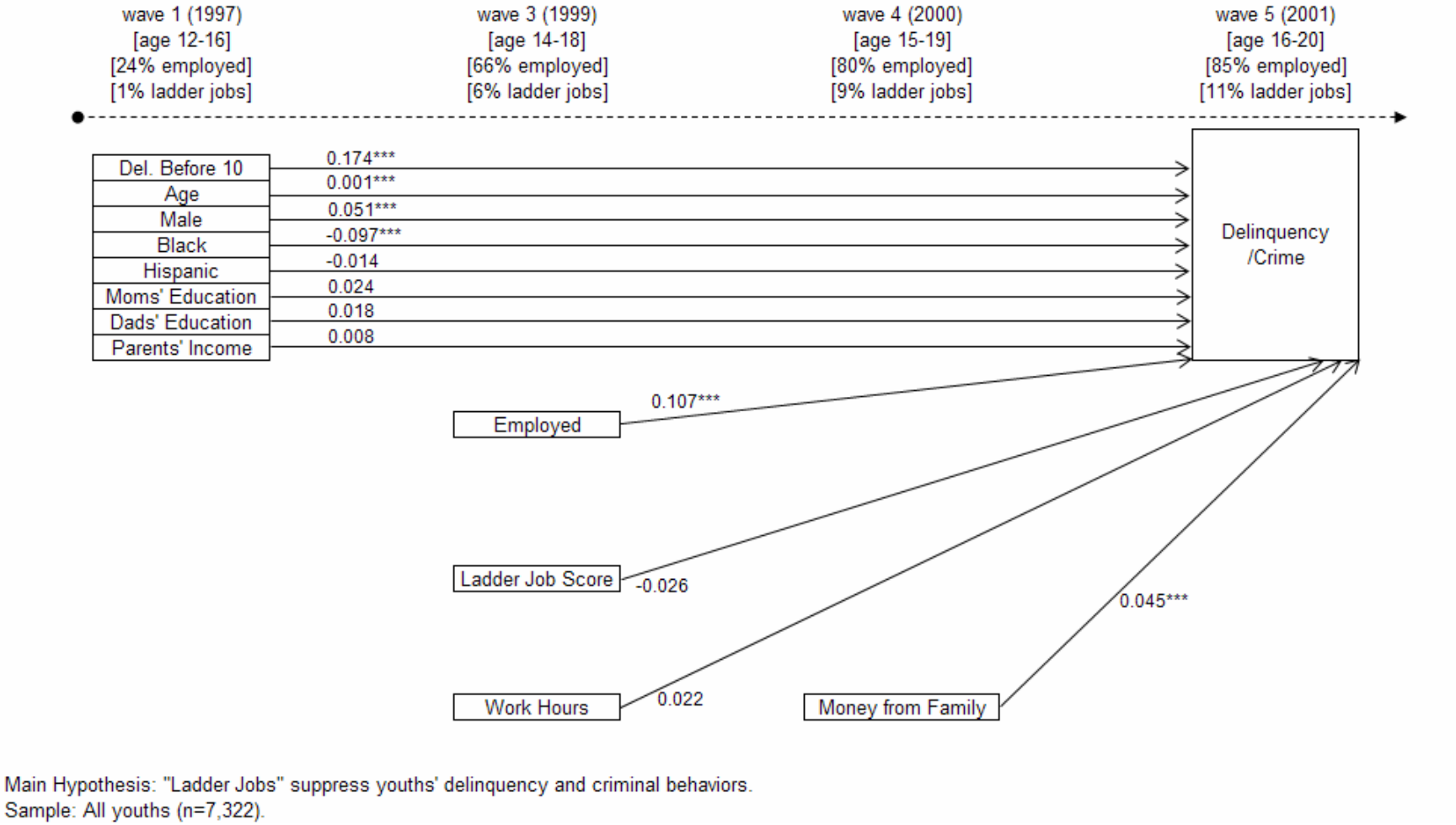
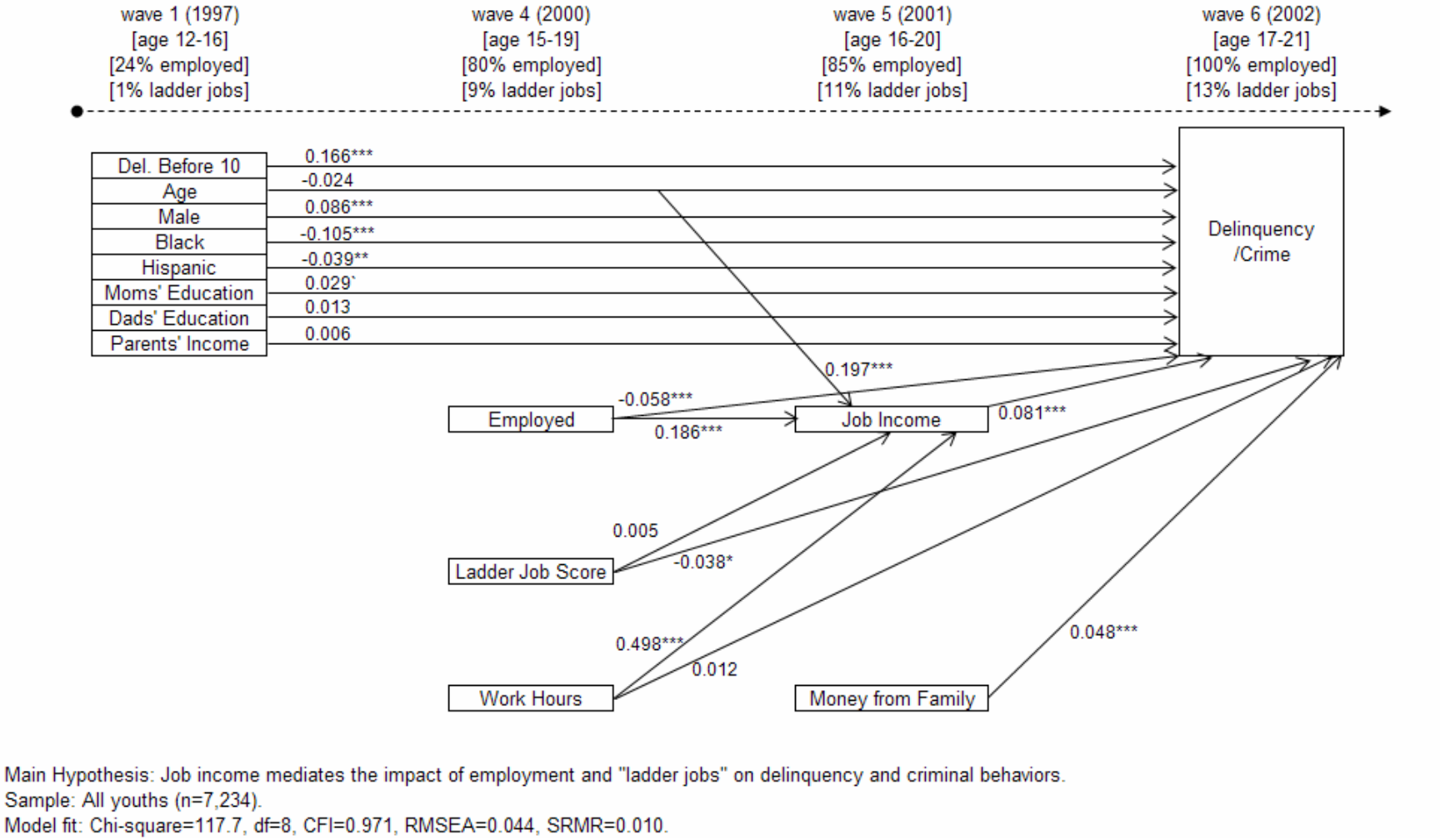
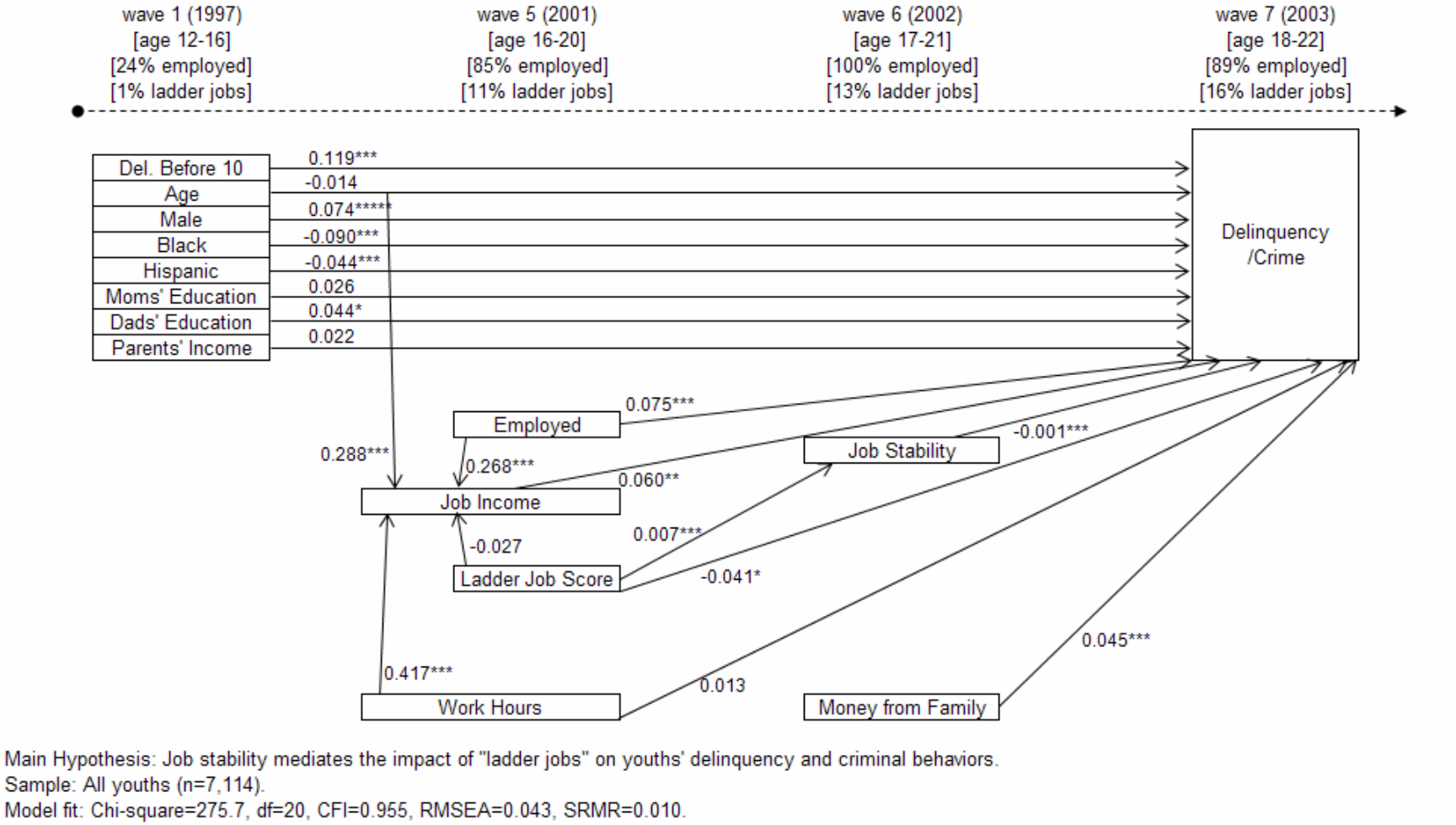


Figure 5.1: Testing Hypothesis 1: Structural Model with Standardized Coefficients by Using Dataset A



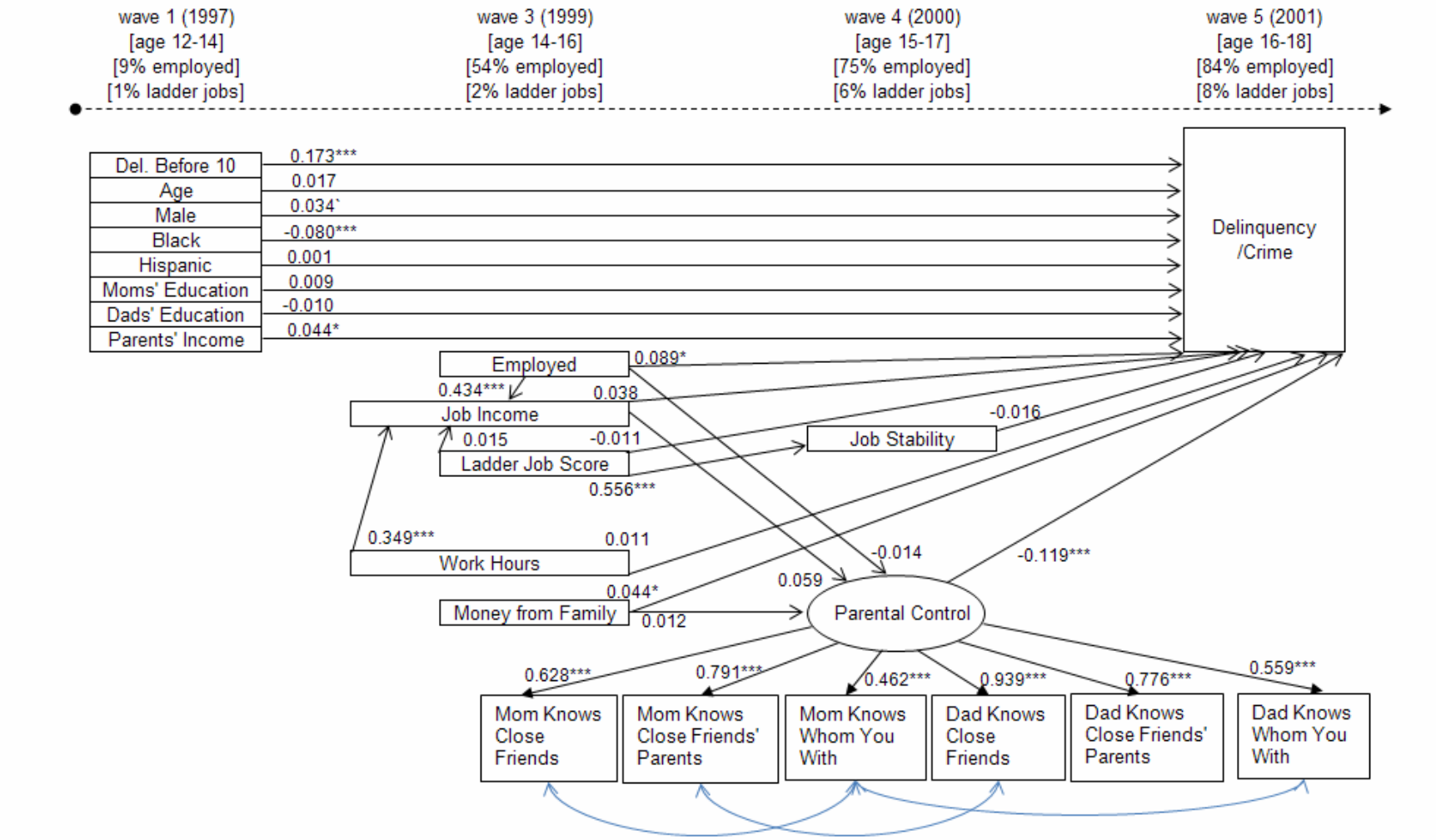
Main Hypothesis: Job income mediates the impact of employment and "ladder jobs" on delinquency and criminal behaviors.
Sample: All youths (n=7,234).
Model fit: Chi-square=117.7, df=8, CFI=0.971, RMSEA=0.044, SRMR=0.010.

Figure 5.2: Testing Hypothesis 2 & 3: Structural Model with Standardized Coefficients by Using Dataset B



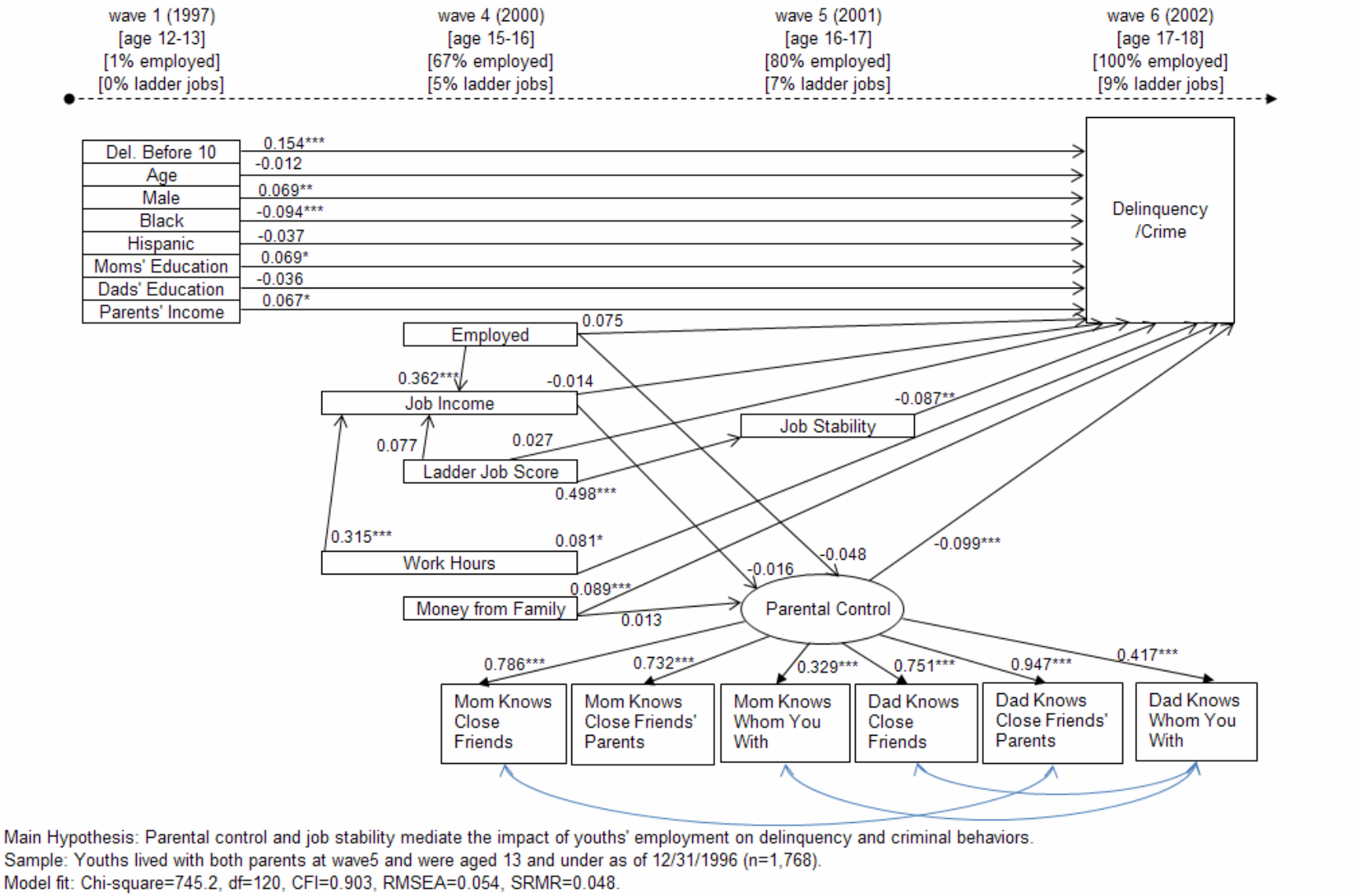
Main Hypothesis: Job stability mediates the impact of "ladder jobs" on youths' delinquency and criminal behaviors.
Sample: All youths (n=7,114).
Model fit: Chi-square=275.7, df=20, CFI=0.955, RMSEA=0.043, SRMR=0.010.

Figure 5.3: Testing Hypothesis 4: Structural Model with Standardized Coefficients by Using Dataset C



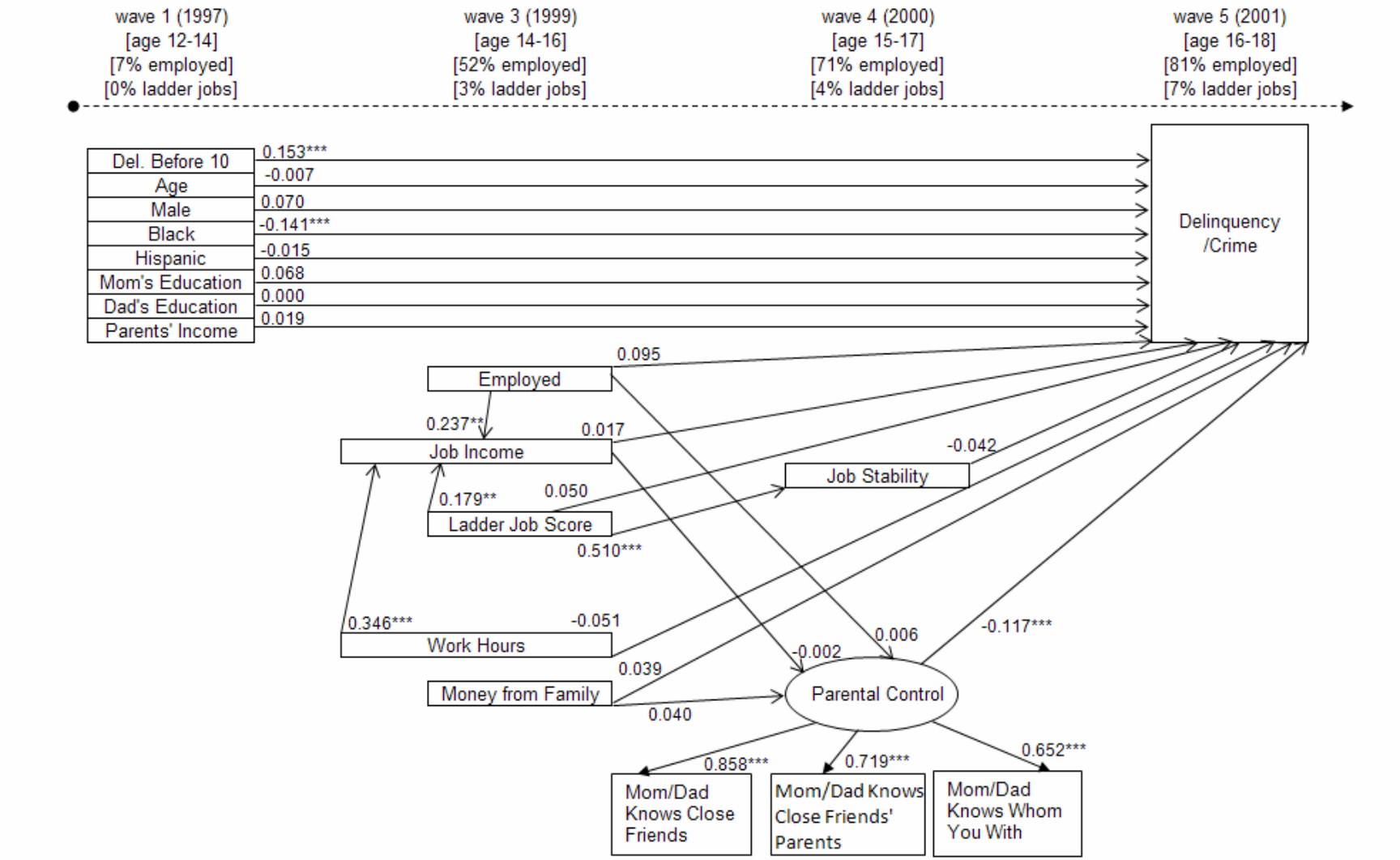
Main Hypothesis: Parental control and job stability mediate the impact of youths' employment on delinquency and criminal behaviors.
Sample: Youths lived with both parents at wave4 and were aged 14 and under as of 12/31/1996 (n=2,805).
Model fit: Chi-square=1196.7, df=119, CFI=0.907, RMSEA=0.057, SRMR=0.049.

Figure 5.4: Testing Hypothesis 5: Structural Model with Standardized Coefficients by Using Dataset D



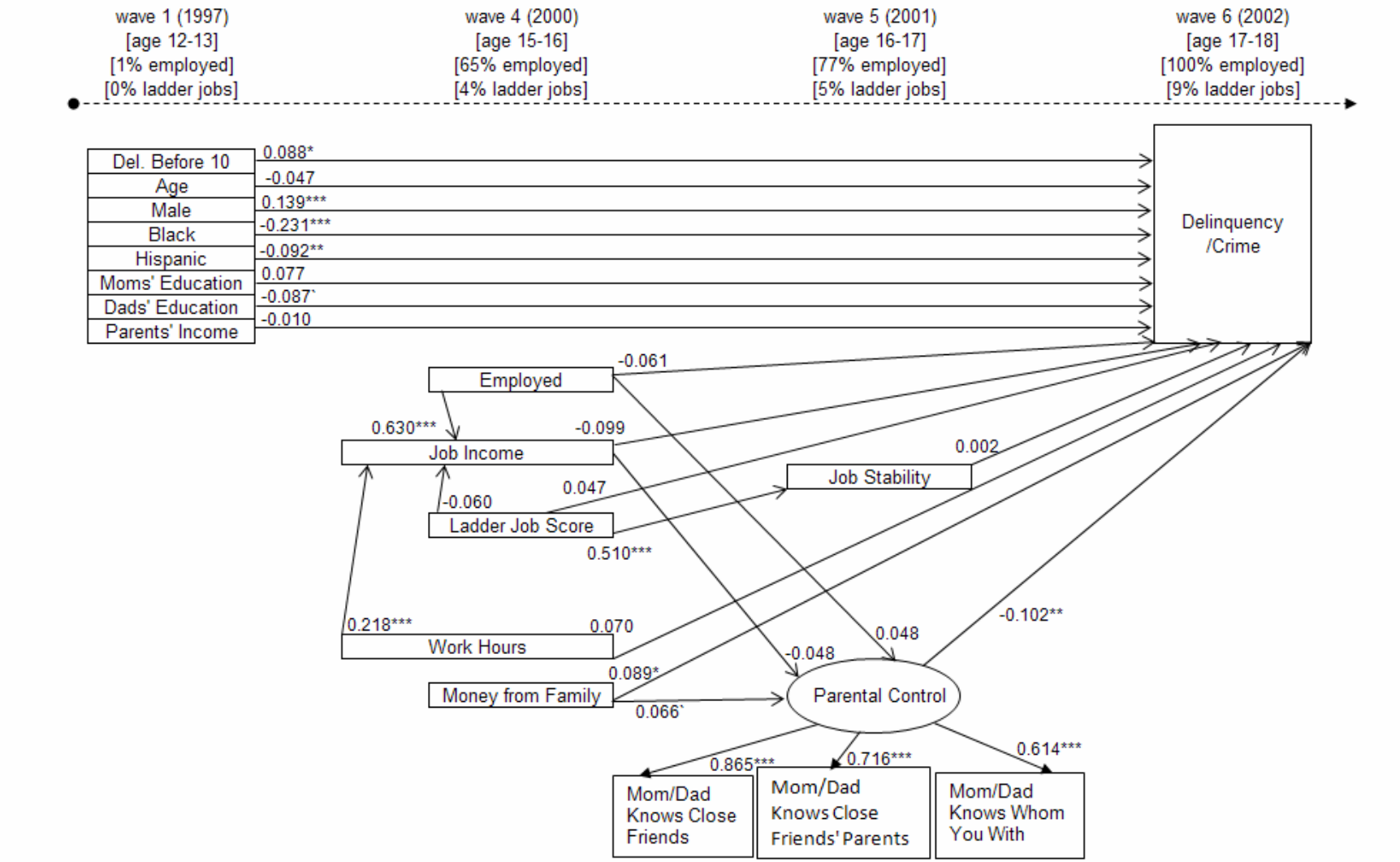
Main Hypothesis: Parental control and job stability mediate the impact of youths' employment on delinquency and criminal behaviors.
Sample: Youths lived with both parents at wave5 and were aged 13 and under as of 12/31/1996 (n=1,768).
Model fit: Chi-square=745.2, df=120, CFI=0.903, RMSEA=0.054, SRMR=0.048.

Figure 5.5: Testing Hypothesis 5: Structural Model with Standardized Coefficients by Using Dataset E



Main Hypothesis: Parental control and job stability mediate the impact of youths' employment on delinquency and criminal behaviors.
Sample: Youths lived with a single parent at wave4 and were aged 14 and under as of 12/31/1996 (n=1,386).
Model fit: Chi-square=261.4, df=67, CFI=0.923, RMSEA=0.046, SRMR=0.036.

Figure 5.6: Testing Hypothesis 5: Structural Model with Standardized Coefficients by Using Dataset F



Main Hypothesis: Parental control and job stability mediate the impact of youths' employment on delinquency and criminal behaviors.
Sample: Youths lived with a single parent at wave5 and were aged 13 and under as of 12/31/1996 (n=846).
Model fit: Chi-square=189.2, df=67, CFI=0.929, RMSEA=0.046, SRMR=0.039.

Figure 5.7: Testing Hypothesis 5: Structural Model with Standardized Coefficients by Using Dataset G

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