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Ishien Li

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ECOLOGICAL CONTEXTS OF DELINQUENCY: EXAMINATION OF AN ECOLOGICAL MODEL OF DELINQUENCY USING META-ANALYTICAL TECHNIQUES

By

Ishien Li

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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ABSTRACT

ECOLOGICAL CONTEXTS OF DELINQUENCY: EXAMINATION OF AN ECOLOGICAL MODEL OF DELINQUENCY USING META-ANALYTICAL TECHNIQUES

By

Ishien Li

This study is designed (1) to develop an explanatory model of adolescent delinquency, attending to a diversity of ecological contexts, by means of theory integration, and (2) to investigate the extent to which the existing research supports the relationships of the variables proposed in the theoretical model of delinquency.

The synthesis of the study results follow Becker and Schram's (1994) model-driven meta-analysis approach. Zero-order correlations among the predictors of delinquency and their relationships with delinquency are gathered from 50 independent studies. Based on the correlations, seven standard regressions are conducted to investigate the intervening mechanisms that protect adolescents from delinquent acts, or that translate socialenvironmental influences into individual delinquent behavior.

The ecological model of delinquency includes five exogenous variables, three intermediating variables, and the outcome of three types of

self-report juvenile delinquency -- index offenses, status offenses, and substance abuse. The background variables are family attachment, family control, parental conventionality, family socio-economic status (SES), and community trouble. The intermediating variables are the adolescents' educational commitment, self conventionality, and peers' conventionality.

Different combinations of significant predictors are found for different types of delinquent behaviors. All three intermediating variables and family attachment are significant predictors of status offenses. However, the significant predictors of index offenses are self conventionality and educational commitment; of substance abuse, peers' conventionality, self conventionality, and educational commitment.

Family attachment, on average, is an insignificant to barely significant predictor of different types of delinquent behavior. However, it has an indirect effect on delinquent behavior through adolescents' educational commitment, self conventionality, and peers' conventionality. Family SES, parental conventionality, community trouble, and family control are also found to have indirect effects on delinquency.

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CHAPTER 1

INTRODUCTION

About 7 million adolescents in the U.S. today (i.e., one fourth of the current population of 10- to 17-year-olds) have limited potential for becoming productive adults because they are at high risk of delinquency, substance abuse, school failure, and teen parenthood (Dryfoos, 1990). These problem behaviors often co-occur; most at-risk adolescents, to some extent, "do them all" (Dryfoos, 1990). Also, these adolescents tend to be intractable in treatment and have continued problem behaviors as adults (Lerman & Pottick, 1995). The large number of adolescents with multiple problems has become a major concern because societal costs, both monetary and in human capital are high.

Researchers attempt to explain the causes of delinquent behavior using factors from different ecological contexts, such as family, school, peer groups, and the local community. Some attribute the major cause of youth crime in the U.S. to the dysfunction of the family. Their argument is that all factors influencing delinquency are likely to be a consequence of parental behavior. Others believe that influences from deviant peers and community criminal subcultures are more important than influences from family factors;

family life is important only when there are delinquent patterns to copy. Few studies of delinquent etiology, however, have studied the differential contexts of influences simultaneously (Farrington, 1993). As a field, delinquency research today presents neither a coherent theoretical position nor consistent empirical evidence regarding what factors lead to delinquent behavior and how the factors relate to each other.

The confusion stems from several sources. First, investigators define delinquent behavior differently, often making distinctions between different forms of delinquent behavior. Some study index offenses (illegal behaviors that can be prosecuted whether conducted by adults or minors) and status offenses (behaviors defined as criminal only when committed by minors, including truancy, curfew violation, and running away) separately (e.g., Johnstone, 1978; Thornton, 1982). Others study different combinations of delinquent behavior (e.g., Larzelere & Patterson, 1990; Lipton & Smith, 1983). As a consequence, delinquency investigators have not effectively addressed the question of whether there are different explanations for different types of delinquent behavior.

Secondly, studies using official versus self-report data tend to generate different conclusions. When official data are used as a measure of delinquent

behavior, the individuals who engage in delinquent behavior but are undetected by law enforcement are not included. Also, some researchers consider the use of official data problematic due to administrative and procedural errors and police bias in the arrest decision-making process (Siegal & Senna, 1988). On the other hand, research using self-report data to measure delinquency addresses delinquent behavior prior to official actions; the focus is shifted from legal-judicial responses to the behaviors themselves (Tolan & Lorion, 1988).

Finally, a significant source of confusion is that studies tend to consider only one or two possible ecological contexts at a time. The historical trend of limiting research to one or two possible ecological contexts, in part, was the result of both the competition between different schools of thought on crime and delinquency and shortcomings and limitations in analytic design. However, research restricted to one or two possible ecological contexts are inadequate because the influences from other contexts need to be considered in order to address alternative explanations as well as to rule out possible confounding effects. As Wikstrom (1993) pointed out, a key issue in future studies of delinquent behavior is such an integration; simple identification of likely intervention targets or the relative merits of the targets in limited

ecological contexts is insufficient. More knowledge is needed about what the relative influences of the factors from different contexts are, and also how these influences are related to each other. In other words, we need to know how negative social-environmental influences induce delinquent behavior in individuals, as well as how the positive influences dissuade individuals from delinquent behavior.

The above mentioned issues provide a focus for the design of the proposed study as an examination of the relationships among the commonly studied factors on delinquency. Each factor of delinquent behavior will be put in a broad ecological context and the conceptualization of theoretical positions which underlay these factors will be specified. And the intervening processes for different forms of delinquent behavior (measured with selfreport, instead of official data) will be examined and compared. The essential goal of this study will be to investigate how family, peers, school, and community contexts influence adolescents' delinquent behavior.

Purpose of the Study

The purposes of this study are (1) to develop an explanatory model of delinquent behavior, attending to a diversity of ecological contexts, by means

of theory integration, and (2) to investigate the extent to which the primary studies support the relationships of the variables proposed in the theoretical model of delinquency. The test of the model will also focus on whether there are different systematic levels of explanations for different types of delinquent behavior.

The synthesis of the study results follow Becker and Schram's (1994) *model-driven meta-analysis* approach. A model-driven meta-analysis is an investigation of multiple relationships in a theoretical model, through a synthesis of primary study results. A path model that represents the theory can then be estimated from the synthesized results.

The model-driven meta-analysis approach suggested by Becker and Schram (1994) is an option, besides the traditional primary study, well suited to test the integrated theory. Theories or theoretical models help guide the conduct of primary studies, as well as research synthesis. For both primary studies and meta-analysis, simple identification of differences or relationships is rarely the sole research objective; it is insufficient to examine only differences or bivariate relationships. To accomplish the goals of this study, one can "piece together the existing studies" by synthesizing their statistical results (Becker, 1992). Even though none of the existing studies has

examined all the relationships of interest, the subsets of the studies examining different relationships often overlap to some extent and thus can be synthesized.

Besides focusing on the presumed contribution of an ecological perspective to our understanding in the social-environmental causes of delinquency, this study will also investigate gender differences. The necessity of a gender-specific theory of delinquency has been repeatedly emphasized by some feminist criminologists (e.g., Chesney-Lind, 1989; Chesney-Lind & Shelden, 1992; Figueira-McDonough, 1983; Leonard, 1982). However, other researchers believe a better approach would be to begin by testing the utility of contemporary theories separately for the two genders (Jang, 1992). To investigate this controversy, this study aims to answer the questions below. How are gender differences considered in the delinquency literature? Do the interrelations among the social-ecological factors, proposed in the ecological model of delinquency, differ by gender?

Theoretical Approach

In the theory integration, the focus is on Hirschi's social control theory and Sutherland's differential association theory, the two dominant social-

psychological theories of delinquent behavior (Krohn, 1986; Massey & Krohn, 1986). Hirschi's (1969) social control theory states that delinquent behaviors result when an individual's bonding to the society is weak or broken. Sutherland's (Sutherland & Cressey, 1978) differential association theory conceptualizes delinquent behavior as a result of socialization to prodelinquent values. Some researchers treat the two theories as irreconcilable (Jensen, 1972; Matsueda, 1982; Matsueda & Heimer, 1987). However, others view the two theories as complementary rather than competitive, emphasizing the close interrelationship between the two theories in facilitating theory integration (Conger, 1976; Elliott et al., 1985; Johnson et al., 1987; Marcos et al., 1986; Massey & Krohn, 1986).

As each theory is often found to be incomplete in explaining delinquency by itself, it is frequently proposed that the two theories would benefit through integration. For example, Hirschi's social control theory emphasizes that attachment to conventional others decreases the likelihood of delinquent behavior (Hirschi, 1969: 140-141), but the effect of attaching to delinquent others is left unexplained. Sutherland's differential association theory, on the other hand, argues that deviant behavior is learned from deviant others, and that attachment to deviant others increases the likelihood of

deviant behavior (Sutherland & Cressey, 1978). Researchers also find it economic to integrate the two theories because the foci of the two are overlapping to a great extent--differential association theory does not attend to settings other than the family, community, and peers, while the social control theory emphasizes the social bonding to family, peers, school, and community.

The major criticism the integrationists face, however, is the incompatibility in the basic assumptions of social control and differential association theory. For example, criminal motivation is assumed to be a constant for control theory, but as a variable for differential association theory. Social control theory assumes that every person has sufficient motivation to act delinquently and that differential vulnerability to deviance is determined by variation in the strength of social controls. As a result, social control theory focuses on the strength of the social bonds; an adolescent's bonding to family, school, community are the principle interest of social control theorists. In contrast, differential association theory does not make the assumption of an innate motivation to delinquent behavior, but rather views delinquent behavior as learned through pro-delinquent socialization.

Consequently, differential association theory focuses more on variations in pro-delinquent socialization.

Facing the concern of the incompatibilities in the above-mentioned assumptions of social control and differential association theory, several integrationists propose different solutions. The approach this study takes is to modify Hirschi' s assumption to be more similar to Sutherland's assumption about human nature. In this study, human nature is assumed to be neutral; goodness is not inherent, nor is badness. Also, it is assumed that one's values and attitudes are subject to the influences from the outside world.

After modifying Hirschi's theory's assumption, one can explore how the concepts and propositions of the two theories fit together, because not all concepts and propositions are tightly related to assumptions (Liska et al., 1989). Following the assumption modification, a middle range integration of the two theories will be conducted, that is, only some of the theoretical concepts will be selected in the attempt to integrate the two theories.

Regarding the selection of the theoretical concepts, the scope of the this study is ecological. The variables include (1) family attachment/bonding, (2) family control/supervision, (3) family socio-economic status (SES), (4) educational commitment, (5) parents', peers', and self's values toward

conventional activities and antisocial behavior, and (6) community trouble. However, it is important to emphasize that this ecological approach is somewhat different from Shaw and McKay's social disorganization theory (1942), the so-called ecological theory in criminology, which emphasizes the influences of community variables on aggregated measures of delinquency.

Shaw and McKay (1942) argued that certain community characteristics may influence adolescents' relationships with parents, adolescents' beliefs about right and wrong, and adolescents' peer association. These factors, in turn, are considered to influence involvement in delinquent behavior. To the degree that a community is considered to be socially disorganized, adolescents are expected to display attenuated social bonds, a greater level of association with delinquent peers, and a greater level of delinquent behavior themselves.

The position taken in Shaw and McKay's (1942) social disorganization theory is that characteristics of the community are the primary influence of the initiation of delinquent behavior, independent of individual and family factors. They referred to the process by which community characteristics affect individual behavior as "social disorganization." However, they did not make explicit their arguments linking the community level and individual level

elements. This problematic stance has plagued social disorganization research since its development by Shaw and McKay. Another reason for the scarcity of empirical work in the field of social disorganization is that research in this tradition is generally very labor intensive and time consuming.

In this study, the human ecological framework is used to address the relationships among the family, school, peers, and community factors in relation to adolescent delinquency. A human ecological approach emphasizes the interdependence between the individual, the family, and their environments (Bronfennbrenner, 1977, 1986, 1989, 1993, 1994; Bubolz & Sontag, 1993; Lerner, 1991). The environments, or the ecological contexts, include culture, socio-economic system, community, school, peers, family, and other institutions. The strength of the approach is its description and explanation of phenomena in the wholeness of interaction and interdependence.

Organization of the Study

In Chapter 2, the proposed ecological model of delinquency is developed based on the literature review. By means of human ecological concepts which focus on the interrelations of family, school, peers, and community environments and their influences on adolescent delinquent behavior, Hirschi's social control theory and Sutherland's differential association theory are integrated.

In Chapter 3, the principles and procedures of the research synthesis (i.e., meta-analysis) are described. The rationale for using multivariate and model driven meta-analysis is also provided. To investigate certain phenomena, primary studies often apply statistical procedures to data collected from subjects; with meta-analysis, this researcher studies phenomena through analyzing the statistical results of primary studies. In addition to gathering quantitative information about the zero-order correlations among the predictors of delinquency and their relations with delinquency, this study aims to investigate the intervening mechanisms that translate social-environmental influences into individual delinquent behavior, or the mechanisms that protect adolescents from conducting delinquent acts.

In Chapter 4, the results of the meta-analysis are presented, including: (1) study characteristics, (2) sample characteristics, (3) homogeneity test results, (4) common or average correlations, and (5) standardized regressions. In the first two sections, the characteristics of the sample studies used in this meta-analysis and of the subjects that are used in these sample studies are

summarized. Next, with the results of the homogeneity tests, a decision is made as to whether the relationships between the variables seem to differ in strength across the studies after chance variation is taken into account. Finally, results of the standardized regressions based on the estimated parameters are presented. Because the regression coefficients are standardized, different predictors' influences on different types of delinquent behavior will be compared. In addition, the comparisons of study results based on gender-specific samples will be made.

In Chapter 5, major findings and implications for practice as well as future research are discussed. The need for certain actions and continued research are suggested, based on this study's results. Comparisons are made between this integrated model of delinquency and other models that integrate social control and differential association theories. Strengths and limitations of this study are also provided.

CHAPTER 2

REVIEW OF RESEARCH

In this chapter, research is reviewed in the following areas: (1) the definitions and measurements of juvenile delinquency, (2) social control theory, (3) differential association theory, (4) delinquent values and behavior, and (5) selected ecological contexts of delinquency -- specifically, family, school, peers, and community. Also, an ecological model of delinquency will be proposed.

Juvenile Delinquency

Definition

Juvenile delinquency is typically defined as behavior committed by minors that violates the penal codes of the government. Definitions of "minor" vary among states, but normally the term refers to a person below 16 or 17 years of age. Generally, all delinquent behaviors share the common characteristic of being antisocial acts, with the potential to inflict harm on others or their property. In addition to the legal codes regulating both juveniles and adults, juveniles are also arrested for drinking, truancy, curfew violation, and runaway behavior. Such offenses are called status offenses, as they would not be defined as criminal if committed by adults (Bartollas, 1993).

Measurement

In the measurement of juvenile delinquency, one continuing debate concerns the relative merits of official versus self-report data. Various criticisms have been raised about the use of official records of arrests and convictions. Major concerns about official records are their susceptibility to class and race biases in rates of arrest, and their partial representation of committed crimes (Cohen, 1986; Siegal & Senna, 1988; Elliot et al., 1989; Huizinga & Elliott, 1987). When official records are used as a measure of delinquent behavior, the individuals who engage in delinquent behavior but are undetected by law enforcement are not included. Research using selfreport data to measure delinquency, on the other hand, studies delinquent behavior prior to or separate from official actions; the focus is shifted from legal-judicial responses to the behaviors themselves (Tolan & Lorion, 1988).

Self-report data are believed to represent a more complete picture of delinquent behaviors. However, there are also some possible drawbacks in using self-report data, for example, self-report data may over-represent minor offenses. Also, self-report data may incorporate systematic errors of measurement across samples of differential characteristics, such as race (Matsueda, 1982).

Social Control Theory

Hirschi is the preeminent spokesman of modern social control theory. He assumes that humans are inherently antisocial and that deviant behaviors are natural (Hirschi, 1969). The question for Hirschi is "Why don't they do it?" rather than "Why do they do it?" Specifically, why do most people stay out of trouble? Hirschi argues that humans are dissuaded, protected, or insulated from committing crime by strong bonding to the conventional society. And the elements of the social bond are attachment, commitment, involvement, and belief in the conventional moral order. However, there are no universally accepted precise meanings for these four elements; Hirschi's descriptions about the four elements are rather "sketchy" (Marcos et al., 1986).

Attachment, the first element of the social bond, refers to the ties of affection adolescents have to parents, teachers, and friends. The stronger the attachment to others, the more likely an individual will internalize norms, develop a conscience, and consider that a delinquent act might threaten, or break, their ties of affection. Attachment to parents is considered the most important variable insulating an adolescent against delinquent behavior. Hirschi (1969) argues that if an adolescent is alienated from the parent he or she will not develop an adequate conscience or superego; if a adolescent is attached to the parent he or she will be less likely to deviate from the norms of society.

Commitment to conventional activities and values is the second element of the social bond. Commitment refers to an individual's aspirations for and behavior consistent with conventional activities, such as educational or career goals. When a committed individual considers the cost of delinquent behavior, he or she uses common sense and thinks of the risk of losing the investment already made in conventional activities (Hirschi, 1969). Therefore, the more an individual is committed to academic achievement or has higher occupational expectations, the less likely he is to become involved in delinquent acts.

Involvement in conventional activities is another bonding element which protects an individual from conducting delinquent behavior; involvement in conventional activities leaves no time for delinquency.

Hirschi (1969) reasons that "The person involved in conventional activities is tied to appointments, deadlines, working hours, plans, and the like . . . so the opportunity to commit deviant acts rarely arises to the extent that he is engrossed in conventional activities."

Belief in the conventional social norms is the fourth element. The absence of effective beliefs that forbid socially unacceptable behavior leads to delinquency. According to Hirschi (1969), belief in "conventionality" is derived from intimate relationships with other persons, especially parents. In other words, there is a causal chain from parental attachment to belief in conventionality to delinquency.

Hirschi's concept of attachment is extremely broad and problematic. It includes attachment to parents, school, and peers. Parental attachment is considered as the most important attachment variable and is operationlized as a single construct. School attachment is not clearly differentiated from, and thus is overlapping and redundant with, the concepts of involvement and commitment. Marcos et al. (1986) suggest that a broader concept of educational influences, incorporating both attitudes and behavior related to education, appears to be a reasonable solution to this problem. In this study, this researcher will define a broad concept -- educational commitment -- which includes the emotional bonding to school, involvement in activities related to educational goals, and academic achievement.

Hirschi's concept of attachment to peers is another source of difficulty. This difficulty stems from his assumption of a single moral order in the society. However, given the existence of conflicting and competing norms in the modern society, Hirschi's assumption of a single conventional norm seems questionable. Also, empirical research shows that parental attachment decreases delinquency regardless of whether the values of the parent(s) are pro- or anti-delinquent (Johnson, 1976; Marcos et al., 1986). Nevertheless, the influence of peer attachment on delinquency depends on whether there is "an excess of definitions favorable to law-breaking" (Sutherland & Cressey, 1978). Also, peer attachment per se is not considered as important as other social bond variables (Marcos, Bahr, & Johnson, 1986). While Hirschi found that attachment to peers slightly reduced the probability of delinquent behavior, Hindelang (1973) found the opposite in his replication of Hirschi's study. In general, there is very little support that the level of peer attachment controls against delinquent acts, after holding peers values constant (Conger, 1976).

The interrelationships among the bonding elements are not clearly specified in the social control theory, except for the relationship between family attachment/bonding and the adolescent's conventional beliefs. Hirschi (1969) argues that intimate relationships with others, especially parents, lead to an adolescent's belief in conventional order. As for the interrelations in general, among attachment, commitment, involvement, and belief, he explains that the more closely a person is tied to conventional society in one way, the more closely he or she is likely to be tied in other ways.

To specify more fully the interrelationships among the reconceptualized attachment elements, which are family attachment/bonding, educational commitment, and conventional belief, this researcher propose to organize these elements in a chronological order of an adolescent's involvement in the socialization settings. Thus, it is supported that a causal chain goes from family attachment/bonding to adolescent's educational commitment, and then to strength of conventional beliefs. Another causal link exists between family attachment/bonding and the adolescent's conventional belief. Also, family attachment/bonding is directly linked with conventional belief as described by Hirschi (1969); to the degree that adolescents experience a warm family environment, they are expected to possess the

controls necessary to dissuade temptations toward committing delinquent behavior.

Differential Association Theory

Sutherland's differential association theory is basically a learning theory. In contrast to Hirschi's (1969) social control theory which assumes that humans are inherently deviant, Sutherland's theory does not posit any assumption about human nature, implying that humans are born neutral and not "good" nor "bad." It views tendencies towards delinquent behavior as learned in interaction with others, where the learning takes place within intimate personal groups (Sutherland & Cressey, 1978). The theory assumes that there are conflicting norms in the society, with pro-delinquent and antidelinquent values as the two extremes in a continuum, and that each of us is "programmed" by our significant others in both directions. In other words, we may learn both anti- and pro-delinquent values from the people around us.

The learning process of delinquent behavior is invariant, but the context of learning varies across people. The learning contexts, such as parents, peers, and communities, tend to vary. Different parents, different peers, different people living in the community may present different values

about the conventional moral order to the adolescent. Quality of home environment also affects the probability of an adolescent's association with anti-delinquent and pro-delinquent patterns outside the home. For example, an unpleasant experience or relationship at home may drive the adolescent from home and thus increase his or her association with delinquent patterns (Shaw & McKay, 1942; Sutherland & Cressey, 1978).

In sum, Sutherland's differential association theory assumes that modern societies contain conflicting norms, behavior patterns, and definitions of appropriate behavior, in contrast to Hirschi's assumption of a single conventional moral order. According to Sutherland, delinquency is rooted in normative conflicts; adolescents become delinquent because they experience an environment that "favors" law-breaking. The theory implies that (1) the values of parents, peers, and the community directly influence the adolescent's self conventionality, and (2) family attachment and family control affect self conventionality indirectly through peers' conventionality.

Delinquent Values and Behavior

Differential association in Sutherland's theory refers to association with law-breaking behavior patterns displayed by parents and peers whom are not

necessarily criminals. If parents or peers approve or fail to disapprove of criminal patterns, then the adolescent's contact with pro-delinquent values increases. There is also an increase in the *ratio* of the adolescent's definitions, of what appropriate behavior is, favorable to law violation over law abidance as well.

In clarifying the concepts in differential association theory, Cressey states that:

"If you are programmed to know only honesty is the best policy, then you will be honest. If you are programmed to know only that it is all right to steal, then you will steal. But the matter is not so simple because, starting when we are at our mothers' knees, we are programmed in both ways. What the theory says, then, is that whether you will steal or not depends on the *ratio* of these two kinds of behavior patterns that have been put in you" (Bartollas, 1993).

Differential association theory also emphasizes that most youth learn to act delinquently through association with delinquent peers (Sutherland & Cressey, 1978; Akers et al., 1979; Elliot et al., 1985). And it is an unpleasant relationship at home that drives the adolescent from home and thus increases the adolescent's association with delinquent patterns (Sutherland & Cressey, 1978; Shaw & McKay, 1942). In other words, differential association theory implies that parental attachment protects the adolescent from the probability
of association with delinquent peers and thereby prevents delinquency. Hirschi (1969), on the other hand, argues that parental attachment plays a role of psychological monitoring, therefore, adolescents who are strongly attached to their parents are less likely to deviate from the norms of society. This model implies that parental attachment has a direct impact on delinquency.

Association with delinquent peers, according to differential association theory, contributes to adolescents' acquisition of pro-delinquent values. Association with delinquent peers in the contexts of low parental and low school attachment drives the adolescent to acquire and refine more delinquent values and behavior. As a consequence, researchers have observed that association with delinquent peers is a powerful predictor of delinquent behavior. Specifically, studies show that compared to the effects of individual, family, and school factors, association with deviant peers is almost always the strongest predictor of delinquent behavior (Cashwell, 1994; Gardner & Shoemaker, 1989; Johnstone, 1978; Jensen, 1972; Thompson et al., 1984).

The Ecological Contexts

During adolescence, an individual can be simultaneously influenced by parents, peers, school, and the community context. However, few attempts have been made to study the combined influences and the interrelations among their effects in relation to adolescent delinquent behavior. The scarcity of cross-contextual ecological studies on delinquency may be due to two reasons: (1) cross-contextual studies are more complicated and time-consuming than studies focusing on a single context, and (2) the importance of studying different social contexts simultaneously was not recognized until Bronfenbrenner introduced the concept of ecological contexts (Bronfenbrenner 1986, 1989, 1993, 1994; Bronfenbrenner & Crouter, 1983).

Bronfenbrenner (1986) outlined four levels to his ecological system--microsystem, mesosystem, exosystem, and macrosystem -- which provide contexts for human-social interaction. The *microsystem* is an individual's immediate environment; an adolescent's microsystem includes the family, the school, and the peer group. Adolescents tend to spend time in more than one microsystem. The linkages or processes that occur between the settings are called the *mesosystem*. For example, the linkages between home and school as well as home and peers, have developmental significance for adolescents.

Settings or events that occur in a setting that do not include the adolescent but have influences on the adolescent are called the *exosystem*. The *macrosystem* is the broadest level of the environment -- the culture or subculture in which the adolescent and his or her family are living. The remainder of this chapter discusses the different levels of Brofenbrenner's ecological system and focuses on the ecological concepts relevant to the proposed delinquency model.

Family

Both Hirschi's (1969) social control theory and Sutherland's (Sutherland & Cressey, 1978) differential association theory emphasize the importance of family life in an adolescent's involvement with delinquent acts. Although Hirschi emphasized attachment more than supervision in his original version of social control theory, he considers parental management skills -supervision and nurturance -- as equally important in his more recent study (Hirschi, 1986). And in theory integration attempts, most theorists (Cernkovick & Giordano, 1987; Elliott et. al., 1979; Thornberry, 1987) rely heavily on both parental attachment and supervision to explain delinquency. Furthermore, the theoretical emphasis on the family process is supported by

consistent research findings that show that secure parent-adolescent attachment and wise parental supervision prevents delinquency.

According to Hirschi's (1969) social control theory, family attachment directly protects adolescents from delinquent acts; a direct link exits between family attachment/bonding and the adolescent's delinquent behavior. Adolescents who have warm and secure relationships with their parents are likely to consider their parents' reactions to the deviant act. This is the socalled "psychological monitoring." As Hirschi's theory assumes a single moral order in the society, parental reactions will always be negative and thus discourage delinquent acts. Additional research has also found that parental attachment decreases delinquency regardless of whether parents' values are anti- or pro-delinquent (Johnson, 1976).

Both Hirschi and Sutherland also consider the indirect effects of family attachment and control on adolescent delinquency. According to Hirschi's theory, the indirect influences of family attachment exist because family attachment may increase both the adolescent's educational commitment and belief in conventional order (self conventionality), which are negatively related to delinquent behavior. According to Sutherland's theory, the indirect effects of family factors include: (1) the influence parents' values have on adolescents' values which in turn have a direct impact on adolescent delinquency, and (2) the influence family attachment and family control have on adolescents' values toward and behaviors of delinquency, through changing the probabilities of adolescents' association with pro-delinquent and anti-delinquent peers.

Peers

In both neutral and antisocial situations, peer influences are important forces in adolescent development. Peer interactions contribute to the adolescent's acquisition of behavioral norms and moral values (Panella, Cooper & Henggeler, 1982). Also, the peer group is an important source of imitation. Association with delinquent peers tends to decrease an adolescent's belief in the conventional moral order and increase the likelihood of an adolescent's committing delinquent acts.

Adolescents' propensity to associate with pro-delinquent peers as opposed to anti-delinquent peers may be associated with (1) a lack of nurturant home environment and family attachment, (2) a lack of parental control and supervision, (3) a lack of educational commitment and (4) a lack of positive role models in the community.

As Sutherland's theory (Sutherland & Cressey, 1978) explains, family attachment and family control influence adolescents' differential association with a delinquent pattern in two ways. First, an unpleasant experience and relationship at home may drive the adolescent from home and thus increase his or her association with delinquent patterns. Second, a lack of parents' disapproval and wise control that prevents violation of family rules increases adolescents' association with delinquents as opposed to nondelinquents.

Besides the family factors, educational commitment and community trouble may influence adolescents' delinquent behavior through differential association with delinquent peers; association with delinquent peers has been considered as the most proximate cause of delinquent behavior, next to the effect of adolescents' own attitudes and beliefs.

School

The relationship between school experience and delinquency has typically been explained in two ways. Hirschi's social control theory explains the association as resulting from (1) a lack of attachment to significant others

(e.g., parents) who might encourage school related goals and (2) a shortage of attachment, involvement, and commitment to conventional goals, which causes students to be less controlled and thus more likely to engage in illegal activities. However, some researchers still hold to a "strain" explanation; their argument is that poor educational attachment, involvement, and commitment inhibit students from status and school-related opportunities, leading them to search for compensatory achievement through illegal activities (Figueira-McDonough, 1986).

Hirschi's (1969) discussion about education in relation to delinquent involvement includes: the adolescent's feelings about school and importance of good grades, time spent on school work, grades received, and educational expectations. Strong attachment to teachers helps the adolescent to internalize conventional norms. High levels of commitment to and investment in education decrease the likelihood of an adolescent's jeopardizing his or her investment by violating the law. Also, involvement in academic activities simply limits the time available to become involved with illegal activities.

A concept of educational influences, incorporating both attitudes and behaviors related to education, will be used in this study to represent the social bonding between the individual and school that plays the role of

protecting adolescents from delinquent acts. This concept will be called "educational commitment," which includes the adolescent's academic achievement, attachment to teachers, involvement in activities related to educational goals, and academic achievement.

The direct impact of adolescents' educational commitment on delinquency has received substantial empirical support; both cross-sectional and longitudinal studies show that low educational commitment is associated with delinquent behavior (for a review, see Henggeler, 1989). Also, school failure is a common risk predictor of the multiple problem behaviors of adolescents (Dryfoos, 1990). Dryfoos suggests that when school failure happens for at-risk youth, different types of delinquent behavior begin to arise.

Besides the direct effect of educational commitment on adolescent delinquent behavior, indirect effects may exist between educational commitment and delinquency, mediated by self conventionality and peers' conventionality. As for the mediation by self conventionality, Hirschi (1969) suggests that strong attachment to teachers, a component of educational commitment, helps the adolescent to internalize conventional norms. The indirect effect of adolescents' low educational commitment on delinquency through their association with delinquent peers is consistent with the generally accepted view that social bonding has an indirect relationship to delinquency, through association with delinquent peers (Cattarello, 1993); weakening or breaking of the bond will not directly cause one to commit delinquent behavior, but simply frees an adolescent to do so. An adolescent with weakened social bonding (for example, low educational commitment) is more likely to select or be recruited by deviant peers.

Community

Adolescents' attitudes toward unlawful behaviors and conventional activities may be subject to the influence of the subcultures that exist in the communities in which they live. According to differential association theory (Sutherland & Cressey, 1978), delinquency is rooted in normative conflicts, and some subcultures in modern industrial society demonstrate Sutherland's "excess of definitions favorable to law-violating." The normative conflict can be translated into group level criminal rates through differential social organization -- the extent to which a group is organized for or against lawviolating behaviors. Community subculture, specifically community trouble as it is considered in this study, represents a source of the environmental

pressure at the community level that influences an adolescent's conventionality.

Besides the direct effect of community subculture on adolescents, Sutherland's theory also considers the indirect community effect through peer association; because of the preponderance of delinquent peers in the troubled communities, adolescents living in these communities have more chance to be in contact with and socialized toward pro-delinquency values.

Family-Peer Mesosystem Relationships

Changes in family and peer relations mark the transition from childhood to adolescence. During adolescence, the increase in emotional autonomy from parents is accompanied by the increase of susceptibility to peer influences in both antisocial and neutral situations (Steinberg & Silverberg, 1986). The adolescent's susceptibility to negative peer influences depends on the family environment and parental management skills.

According to the differential association theory (Sutherland & Cressey, 1978), secure family attachment and wise parental control decreases adolescents' delinquent acts through decreasing their contact with prodelinquent definitions. The family variables -- lack of attachment and control

-- are related to delinquency through the processes described below.

The home may fail to train the adolescent to deal with outside world situations in a law-abiding manner. Delinquent patterns may not be present in the home, but the home may be neutral with respect to antisocial behaviors. Whether such a "neutral" adolescent becomes delinquent or not will depend on his or her association with delinquent and anti-delinquent patterns outside the home. Also, an adolescent may be driven from the home by unpleasant experiences or by the absence of pleasant experiences. Isolation from the family is likely to increase an adolescent's association with delinquent behavior patterns and to decrease his or her association with anti-delinquent behavior patterns.

Also, differential association theory argues that the lack of direct and indirect control by parents (i.e., attachment and supervision) is associated with delinquent behavior only when there are delinquent patterns to copy. In other words, the known relationship between quality of family life and delinquency is thought to be associated through peer context. If poor quality of family life makes the adolescent vulnerable to the influence of delinquent peers, then peer pressure becomes more influential and most likely anticonventional or pro-delinquent.

Family, Community, and School

Educational commitment has a direct impact on adolescents' delinquent behavior; low educational commitment can follow from particular family and community influences, specifically (1) insufficient parental support, (2) inadequate aspiration for education, and (3) lack of existence of role models in the surrounding community. Adolescents from families with low attachment, and low expectations for pursuing conventional goals such as education, and who are from communities where graduation from high school does not offer better occupational opportunities, are more likely to experience school failure which in turn is more likely to lead to delinquent acts (Huston, 1991).

Also, educational commitment is among the most documented correlates of both delinquency and family socio-economic status (SES) (Lipton & Smith, 1983; McGarvey et al., 1981). Studies show strong associations among family SES, family preparation for and attitude toward the adolescent's education, and the adolescent's educational experiences (Alexander et al., 1978; Lipton & Smith, 1983). Moreover, a strong and consistent relationship between educational commitment and non-delinquency has been well demonstrated as discussed previously. The question is now:

how do the three variables (i.e., family SES, educational commitment, and delinquency) link with each other?

Given the existing evidence that (1) the relationships are strong between educational commitment and family SES, and educational commitment and non-delinquency, and (2) the relation between family SES and delinquency is consistently low, the following interrelationship of the three variables is proposed: the links go from family SES (variable A) to educational commitment (variable B) and then from educational commitment to non-delinquency (variable C). In other words, delinquent behavior is caused in part by low educational commitment which is caused in part by the negative effect of low family SES. The low correlation between family SES and delinquency is thus explainable: as the causal chain flows from variable A to B, and then from B to C, the correlation between A and C tends to be low because it is the multiplication of the correlation of A and B by the correlation of B and C.

This hypothesis that family SES predicts educational commitment, which in turn precedes and predicts adolescent delinquent behavior, is supported in the literature, although a much debated issue remains in the criminology literature over whether family SES influences the emergence of

delinquent behavior. Some argue that low family SES predicts intellectual and emotional deprivation which motivates later illegal acts. Others suggest that regardless of family SES, intelligence is the chief determinant of criminal behavior. The view that family SES influences educational performance, which in turn precedes the development of criminal activity has been tested and supported (Lipton & Smith, 1983; McGravey et al., 1981).

In sum, low family SES, low parent-adolescent attachment, low parental aspiration for education, and low levels of collective well-being in the community (e.g., high crime, high unemployment rates, and widespread poverty) tend to increase the probability of delinquent acts by influencing adolescents' educational experiences.

Gender Differences in Delinquency

Since the start of time, males and females have been treated differently, partly because they are considered different in biological, social, and psychological characteristics. However, while a variety of contemporary sociological theories attempt to explain adolescents' delinquent behavior in general, our understanding of gender differences in this regard remains limited. The explanations of gender differences in delinquency have mainly relied on biological and psychological theories.

However, a controversy exists over the causal impact of biological differences in delinquent behavior. Some criminologists challenge the appropriateness of using biological factors to explain gender differences in delinquent behavior. For instance, hormonal explanations of gender differences in aggression for adults cannot be applied to the explanation of gender differences in aggression of prepubescent boys and girls (Anderson, 1988).

The question of whether gender-specific sociological theories of delinquency are necessary also requires further consideration. While some feminist criminologists advocate a construction of completely new theories of delinquency relating to the unique experiences of women, others prefer to first test the usefulness of contemporary theories to explain female delinquency (Jang, 1992).

Although the sociological theories of delinquency do not totally exclude females from their theory consideration (e.g., Sutherland & Cressey, 1978), their theoretical development often relies heavily on male subjects (e.g., Hirschi, 1969). Also, in most empirical research on delinquency, though

both males and females tend to be included in study samples, gender is normally treated as an independent variable, leaving investigations of possible gender effects on relationships between variables (e.g., interaction effects) unattended. As a consequence, previous studies have consistently found greater involvement in delinquency among males than females, but the theoretical explanations of gender differences remain unexplored. Moreover, existing research tend to focus on just one or two social contexts, without attending to the full range of social contexts (e.g., peers, family, school, and community) that are important to both male and female adolescents' everyday lives (Canter, 1982; Cernkovich & Giordano, 1987, 1992; Figueira-McDonough, 1983, 1986; Giordano et al., 1986; Tolan, 1988).

Prevalence and Incidence of Delinquency

Are there more male delinquents than female delinquents? Do males commit delinquent acts more frequently than females? Answers to these questions seem to depend on the type of delinquent behavior under consideration.

In general, male prevalence rate is higher than female prevalence rate, especially when seriousness of offenses was taken into consideration (Canter,

1982; Cernkovich & Giordano, 1979; Deschenes et al., 1990; Gold, 1970). Males are more likely to engage in property and violent crimes. However, females are more likely to engage in status offenses such as runaway, defying parents' authority, and prostitution. In addition, it seems that there are few gender differences in the prevalence rate of substance abuse. For instance, Canter (1982) found that the only significant gender difference was in rate of alcohol abuse; rates of use of marijuana and hard drugs were similar between males and females.

As is the case with prevalence rates of delinquency, consistent research findings show higher incidence rates of male delinquency (Canter, 1982; Cernkovich & Giordano, 1979; Deschenes et al., 1990; Friedman & Rosenbaum, 1988; Gold, 1970; Hindelang, 1979). Although self-report data seem to show smaller gender differences than official data, significant gender differences in incidence rate exist, no matter which type of data are used (Datesman & Scarpitti, 1980; Hindelang, 1971).

Patterns of Changes

Besides the above mentioned issues of gender differences, patterns of changes in gender differences in delinquency over time are also intriguing.

Changes in both historical patterns and developmental patterns are the two mostly studied topics.

The so-called "emancipation hypothesis" or "liberation hypothesis" is the central focus of the studies investigating changes in the historical pattern. It is hypothesized that since the modernization and the movement of women's liberation have made socialization patterns increasingly similar for males and females, and have brought women more opportunities to commit delinquent acts than before, the magnitude of gender differences in both prevalence rate and incidence rate of delinquency are expected to increase over time.

The emancipation thesis has generated a series of heated debates among researchers. Research findings in this area are mixed. While a considerable amount of studies finds increase in arrest rates of females, especially for larceny (e.g., Alder, 1975; Simon, 1975; Streffensmeier & Streffensmeier, 1980) and for substance abuse (e.g., Canter, 1982; Gold & Reimer, 1975), controversies exist as to whether the women's movement is responsible for the increase in female crime.

In the explanation of increased arrest rates of females, Simon's (1975) and Adler's (1975, 1980) works are the most often cited, concerning the gender convergence. Simon (1975) argues that the liberation increases

females' likelihood to engage in the types of crimes, for which their works outside the home provide them with increased opportunities, such as larceny. Adler (1975), on the other hand, proposes that the gap between male and female delinquency has been narrowed in both type and frequency of delinquent acts due to increasing unisex role expectations and socializations.

In response to the liberation argument of Simon (1975) and Adler (1975), a series of studies were generated that provided only limited support for the notion that the women's movement is responsible for the increase in female crime (e.g., Giordano & Cernkovich, 1979; Thornton, 1982). Insignificant associations (accompanying a mixed findings of positive and negative relationships) between female liberated attitudes and self-reported delinquency involvement were reported. Some attribute the insignificant findings to (1) possible oversimplification of the notion of liberation of women (i.e., viewing liberalization as masculinization), (2) multidimensionality of the concept of gender roles, and (3) differential meaning of gender roles for individuals of different race or social classes (Giordano & Cernkovich, 1979).

Similarly, in response to Simon's (1975) hypothesis, Figueira-McDonough (1984) argues that the influence of the women's movement on

delinquent acts is "far more complex, less linear, and much more tenuous" than suggested by Simon. Leonard (1982) argues that Alder's attribution of gender convergence in delinquency is problematic; she stresses that Alder's assumption of equality among males and females is exaggerated, and criticizes Alder's equating of liberation with masculinization. Still other investigators attribute the increased rates of female delinquency to the influence of the women's movement on the treatment of women by criminal justice authorities (Datesman et al., 1975; Moulds, 1980) or to a greater willingness and improved methods to detect less serious offenses such as shop-lifting (Steffensmeier & Steffensmeier, 1980).

Developmental changes in gender differences in delinquency is another interesting research topic. While there are some discussions on changes in developmental patterns of gender differences (e.g., Farnworth, 1984), existing research tends to focus on the influence of age, rather than developmental stage, on delinquent behavior itself or gender differences in this issue. In addition, controversies exist concerning whether male and female delinquent involvements will diverge or converge over time.

Although adolescents tend to enjoy greater freedom from family control over, and intervention into, their lives as they grow older (McCarthy

& Hagan, 1987), some studies show this process takes place only for males and the opposite in the case with females (Chesney-Lind & Shelden, 1992). If such differential treatment exists for males and females, gender differences in delinquent involvement would diverge. However, Farnworth (1984) argues that male and female delinquency will converge, not diverge, as socialization and social relationships grow increasingly gender-neutral. A quantitative review to investigate these two conflicting hypotheses is not possible at this time, due to the insufficient amount of primary studies addressing this issue.

The Proposed Ecological Model of Delinquency

In light of the above review of juvenile delinquency variables and their contextual nature in families, schools, and communities, an ecological model of delinquency is proposed as a promising strategy for addressing this complexity. The ecological model of delinquency (Figure 1) assumes: (1) human beings are born neutral in terms of values which in turn are subject to influences from the environment, (2) conflicting norms and definitions about appropriate behavior exist in the U. S. society, and thus (3) criminal motivation is a variable and not a constant.

The model has three groups of variables -- four background variables, four intervening variables selected from Sutherland's differential association and Hirschi's social control theories, and one outcome variable of different types of self-reported delinquent behavior. The four background variables are family SES, community trouble, family attachment/bonding, and family control/supervision. The four intervening variables are educational commitment and the values toward antisocial behavior (conventionality) of parents, peers, and adolescents. The outcome variable, delinquency, is categorized into (1) official criminal offenses (i.e., index offenses) -- crimes against property and people, (2) status offenses, (3) substance abuse, and (4) general delinquency, which is a combination of the different types of delinquent behavior.

One important issue is the arrangement of the variables. Because the proposed model is primarily an integration of Sutherland's (Sutherland & Cressey, 1978) and Hirschi's (1969) theories, the arrangement of the variables is set to reflect the propositions of the theories. When both theories are not explicit about the relationships, the arrangement will be based on the chronological order of an adolescent's involvement in the socialization settings; for example, family is considered the first socialization setting,

school the second, and then the peer group factor comes in to compete with family and school influences. Also, the human ecological perspective, specifically the interrelations between family, school, peer groups, and community, provides a special focus for the construction of the model.

Hirschi's four elements of social bonding (i.e., attachment, commitment, involvement, and belief) are reconceptualized into three categories--family attachment/bonding, educational commitment, and the adolescent's belief in the conventional moral order. The interrelations among these three categories of social bonding and their relationships to delinquency may be summarized by the following research questions: (1) does family attachment have a direct impact on adolescent delinquency? (2) does educational commitment have a direct influence on adolescent delinquency? (3) does adolescents' self conventionality have a direct effect on adolescent delinquency? (4) is there a direct path flowing from family attachment to educational commitment? (5) is there a direct link between family attachment and self conventionality? (6) is there a direct link going from educational commitment to self conventionality?

Based on Sutherland's differential association theory, the following research questions are generated: (1) is there a direct relationship between

peers' conventionality and adolescent delinquency? (2) is there a direct relationship between adolescent's self conventionality and adolescent delinquency? (3) do family factors (including family attachment and family control) directly influence the likelihood of the adolescent's association with delinquent peers? (4) does community trouble have a direct effect on peers' conventionality? (5) does parental conventionality have a direct influence on the adolescent's self conventionality, (6) is there a direct relationship between peers' conventionality and the adolescent's self conventionality?

The research literature reviewed suggests that this model should propose that adolescents' differential association with delinquent peers is affected by educational commitment, although differential association theory states that differential association is determined solely by family and peer factors. In addition, adolescents' educational commitment are suggested to be influenced by community trouble, family SES, parental conventionality (parents' adherence to values of education is a component of this measure), besides by family attachment which is proposed by Hirschi (1969).



Note: ______ Links derived from Sutherland's differential association theory Links derived from Hirschi's social control theory Links added based on human ecological theory

CHAPTER 3

METHODOLOGY

This chapter describes the meta-analysis conducted to investigate the conceptual model derived from a review of existing research and presented in Figure 1. It provides details regarding the literature search, the criteria used for inclusion and exclusion of the relevant studies, the information recorded from the studies, study and sample characteristics, missing data, and procedures used to examine the proposed social-ecological model of delinquency. The descriptions of research variables and hypotheses derived from the conceptual model are also presented.

Literature Search

This study's literature search employed the approaches suggested by Cooper (1989). The search targeted studies examining relationships between measures of delinquent behavior and social-ecological causes such as family management skills, parents' and peers' attitudes toward the conventional moral order, school environments, and community subcultures. The population of interest consisted of all U.S. adolescents.

Ninety-eight reports were located from on-line or manual searches of a number of indices: Criminal Justice Abstract, Criminal Justice Publication Index, Dissertation Abstract Index, ERIC (Educational Resource Information Center), NCJRS (National Criminal Justice Resource Services), PsycInfo, SocioFiles, and Social Science Citation Index. The first groups of key words used were: aggression, alcohol use, alcoholism, antisocial behavior, cigarette smoking, delinquency, delinquent behavior, deviance, deviant behavior, drinking, drug abuse, drug use, externalizing disorder, juvenile delinguency, violent behavior, problem behavior, violence, substance use, and substance abuse. The search results were further narrowed down, by intersecting the above set of references, with the following key words, one at a time: family, parent, peer, school, education, community, SES, and social class.

Thirty-six candidate reports were added by skimming through the references of the reports discovered by the computerized search. Fifteen more relevant reports were found by investigating studies that cited the same reference(s) as did the first 98 studies found. Finally, 9 additional references were provided through discussion with Rolf Loeber, a professor at the University of Pittsburgh, who has carried out several meta-analyses on the relation of family factors to delinquency (e.g., Loeber & Dishion, 1983;

Loeber & Stouthamer-Loeber, 1986). Thus, these procedures retrieved a total of 158 initial sources that seemed to be relevant. Each report found was then tested against a variety of criteria.

Inclusion and Exclusion Criteria

Before its results were entered into the analysis, a report needed to meet the following criteria: (1) the report was made between 1970 and 1995, (2) the report concentrated on relationships among socio-ecological factors (as opposed to biological or psychological factors) and delinquent outcomes, (3) delinquency was measured as a continuous variable, (4) enough information was provided about the definitions or measurements of the variables of interest so that construct validity could be examined, (5) zeroorder correlation coefficients of the interrelationships among the variables of interest were either available or accessible, (6) samples were drawn from the average U.S. adolescent population, i.e., the study did not employ clinical samples or samples for comparison purposes (e.g., delinquent vs. nondelinquent group), and (7) the delinquency measure was based on self-report data rather than official reports.

The first two criteria were employed for the following reasons. First, restricting the collection of studies to the past 25 years eliminated studies

that may no longer be relevant to understanding modern-day delinquency. Second, this meta-analysis focused on the social-ecological causes of delinquency because biological studies of delinquency have not provided enough information, especially in terms of quantity, for research synthesis, and current theories have not attended to the simultaneous considerations of biological, psychological, and social-environmental factors. Limiting the focus of this meta-analysis to the social-ecological causes does not deny the importance of biological and psychological factors in explaining delinquent behavior.

The third and fourth criteria enhanced the compatibility of the studies for synthesis. Special care is needed in combining studies that use different designs or measurements to answer the same research question. It is not appropriate to combine data that measure delinquent behavior as dichotomous with data that measure delinquent behavior as continuous. Also, it is not appropriate to use broad categories that subsume numerous causes and outcomes of delinquent behavior. More information about the operational definitions used in this meta-analysis is presented later in the Research Variables section, in this chapter.

The fifth criterion was necessary because zero-order correlations are the indices of study outcome in this research synthesis. In order to be

included into this meta-analysis, the sample studies need to provide the correlation coefficients or other information (e.g., a variance-covariance matrix) that can be converted to correlation coefficients. Techniques that utilize less information, such as *p*-value syntheses (see, e.g., Becker & Schram, 1994) would be able to utilize more studies, as the inclusion criteria would be less strict. However, this would preclude multivariate analyses or the estimation of effect magnitudes.

The last two criteria were used to ensure the validity of this metaanalysis. Many studies were excluded from this meta-analysis due to their use of comparison samples instead of average U.S. adolescent samples: some compared delinquents with non-delinquents, and some compared clinical adolescents with non-clinical adolescents. Inclusion of studies that use comparison samples would be problematic because the purpose of this metaanalysis is to generate and test models that predict delinquent behavior in the overall population of adolescents. While the use of comparison samples is appropriate in explicating a set of variables relating to delinquent and nondelinquent populations, it is not appropriate for predicting delinquent behavior.

Other studies were excluded because they used official data rather than self-report data as measures of delinquency. The validity of official data is

questionable due to administrative and procedural errors and police bias in arrest decision-making (Siegal & Senna, 1988). Also, the use of official data excludes adolescents whose unlawful acts are not detected.

Using the above mentioned criteria to screen the 158 reports, 36 research reports (containing 50 separate studies) remained for further analyses and syntheses. A bibliography of these reports is available in Appendix A.

Coding

Information of interest was extracted from the collection of 36 selected research reports. An initial version of the coding form was pilot-tested with the first ten reports obtained. The coding form was then modified to eliminate the problems encountered in the pilot-test and to facilitate subsequent computer entry and data analysis. Appendix B contains the coding form used in recording the information found in the 36 research reports.

The information coded included: (1) name(s) of the author(s), title and source of the report, and year of publication/report, (2) sampling procedures used in the report and characteristics of the sample(s), (3) the conceptualization and measurement methods of the variables of interest, (4) reliability of the measurements, and (5) zero-order correlations (r's) among the variables of interest.

Sample characteristics of interest were the distributions of gender, age, ethnicity, and geographic location of the residences of the participants in the studies. As the examination of gender differences was of particular interest in this study, when the *r*s reported were calculated based on mixed gender samples, the author(s) of the report were requested to provide a breakdown of the correlations by gender. Five out of 21 breakdown requests were provided.

The coding was completed by two persons -- Meng-Li Yang, a Ph. D. candidate in Measurement and Quantitative Methods (MQM) Program at Michigan State University, and this researcher. The coding reliability (i.e., percent agreement between coders) ranged from 75% to 100%. All discrepancies in coding were resolved.

Unit of Analysis and Synthesis

The 423 correlation coefficients (the data points) used in the present meta-analysis were collected from 50 separate studies using independent samples in 36 research reports. A report refers to a written description of research, while a study refers to an element of the report based on an independent sample. Some reports used more than one independent sample and thus contain more than one study. For example, a research report might provide correlation coefficients separately for boys and girls or for blacks and nonblacks, and thus would equal two studies.

Study Characteristics

Years of report of the studies are summarized in Table 1. The studies were reported during a time span of 25 years. The majority (40%) of the studies were reported between 1986 and 1990. Over half of the studies had appeared in last 10 years.

Tuoto I: Tell of report of the Studies in the Synthesis							
	Year of report	Number of studies	Percentage				
	1991-1995	11	22				
	1986-1990	20	40				
	1981-1985	13	26				
	1976-1980	4	8				
	1971-1975	2	4				
	Total	50	100				

Table 1. Year of report of the studies in the synthesis.

Numbers of studies and of subjects are summarized by gender and by sample size distribution in Table 2 and Table 3. Of the 50 studies, 22 (44%) studied mixed samples of boys and girls, while 17 (34%) studied boys and 11 (22%) studied girls separately. Eighteen studies (36%) used sample sizes larger than 900, five studies (10%) had sample sizes between 601 and 900, twelve studies (24%) had sample sizes between 301 and 600, and fifteen studies (30%) had sample sizes less than 300.

 Table 2. Numbers of studie	s by gender	and sample	e size aisu	nounon
 Sample size distribution	All girls	All boys	Mixed	Total
 < 300	5	7	3	15
310-600	3	5	4	12
601-900	2	0	3	5
> 900	1	5	12	18
 Total	11	17	22	50

Table 2. Numbers of studies by gender and sample size distribution

Table 3. Number of subjects by gender and sample size distribution

-			A		
	Sample size distribution	All girls	All boys	Mixed	Total
-	< 300	1,026	1,231	337	2,594
	310-600	1,024	2,012	1,683	4,719
	601-900	1,702	0	2,046	3,748
	> 900	1,374	5,708	50,074	57,156
	Total	5,126	8,951	54,140	68,217

Sample Characteristics

A total of 68,217 U.S. adolescents were included in the 50 studies.

About one-fourth of the adolescents were from national representative samples; one-half were selected as state representative samples; and the rest were sampled from specific rural, urban, and suburban areas across the U. S.. The ages of the adolescents ranged from 10 to 20 years, with the majority in the range of 11 to 17 years. Based on the information provided in the sample studies, about 77% of the total sample was Caucasian American and 53% was male.

Research Variables

Research variable used in this research synthesis are often broad categories that could have more than one measures. When multiple measures are used in the primary studies, the correlations of each measure with another variable had to be statistically combined before being entered into the metaanalytical procedure. To obtain a composite correlation, the Olkin & Siotani (1976) formula was first used to compute the covariance among the individual subcategorical (component) correlations, then the weights for combining the component correlations were generated using the procedures described by Gleser & Olkin (1994). The more the component correlation correlates with other component correlations, the higher the weight it receives. A summary of how the variables are conceptualized in this study is presented below.

Family bonding/attachment (variable 1) is a measure of the social bonding between the adolescents and their parents; measurements under this construct include the adolescents' response to questions asking about the levels of (1) time spent with their parents, (2) caring and support from their parents (e.g., parents understand and listen to them), and (3) affection ties (or rejection) between themselves and their parents.

Family control/supervision (variable 2) is a measure of discipline and monitoring from parents toward the adolescents; this variable includes the measures of parents' (1) awareness of the adolescents' whereabouts and daily plans, (2) setting of rules (e.g., of curfew, manner, appearance) and follow-up of threatened punishments, and (3) letting their adolescents get away with misbehavior.

Educational commitment (variable 3) is a measure incorporating both attitudes and behaviors of adolescents toward education. Specifically, this variable reflects adolescents' educational aspiration, emotional bonding to school, involvement in activities related to educational goals, and academic achievement. The questions asked include: (1) how important the adolescents think education is, (2) how much the adolescents like or enjoy their schools and teachers, (3) how much time the adolescents spend in doing homework and activities related to educational goals, and (4) how well do they do in school academically (e.g., GPA).

Community troubles (variable 4) are measures of the community subcultures that focus on the types of resources, role models, and cultural norms existing in the community; these factors imply the aspirations and
expectations of the community. Community characteristics measured to reflect community troubles include (1) low group socio-economic level and (2) the extent to which people in the community "get into trouble" (e.g., selling drugs, police arrests).

The measure of adolescents' conventionality (variable 5) focuses on their belief in conventional morality, such as their willingness to respect others, obey the law, follow the rules, and stay out of trouble. Parental conventionality (variable 6) is a measure of the parents' adherence to such values as hard work, deferred gratification, and formal education. Peers' conventionality (variable 7) is a measure of peers' attitudes toward delinquent behavior in general, which ranges from the merely troublesome to the illegal.

General delinquency (variable 8) is a measure which combines different types of delinquent behavior, including substance abuse, index offenses (illegal behavior whether conducted by adults or minors), and status offenses (behavior that is illegal only when conducted by minors). Although some researchers consider index offenses, status offenses, and substance abuse as distinct types of delinquent behavior, others tend to combine the subcategories, often giving more weight to both more serious and more frequent behavior, while they study delinquency. Variable 9, 10, and 11 measure the frequency of adolescents' involvement in index offenses, status offenses, and substance abuse respectively.

The combination of parents' educational level and class position is used to measure the family's socio-economic status (variable 12). Parents' educational level and occupation are considered as more accurate measures of social class than family income, because most parents seldom discuss salary matters with their adolescents.

Missing Data

In order to have optimal results of model-driven meta-analysis (to "piece together the existing studies" by synthesizing their statistical results and to evaluate a theoretical model with the synthesized results), one needs the relationships, being analyzed in the existing studies, to overlap as much as possible. Existence of "missing" data, depending on the amount and the nature of missing, often results in the inability to fully consider the multivariate relationships or to investigate the interaction effects. Specifically, the problem of "missing" data forces this model-driven meta-analysis (1) to take a random-effects model approach, instead of using a fixed-effects model approach to investigate the moderator effects, and (2) to look at gender differences on limited numbers of relationships between the social-ecological variables of delinquency and delinquent outcomes, rather than to evaluate the whole model for both gender separately.

This meta-analysis studied 12 variables and their 66 possible intercorrelations. With the 50 studies used in this meta-analysis, the total number of correlation coefficients possible is 3300. However, none of the 50 studies contain information about all of the 66 relationships. A considerable amount of "missing" data exist; this meta-analysis gathered only 12.8% of the possible number of correlation coefficients (423 out of 3300).

A summary of number of studies by the number of intercorrelations provided in each study is presented in Table 4. The majority (40%) of the studies individually contributed only one to three correlation coefficients to this meta-analysis. Only three studies (6%) provided more than 15 correlation coefficients.

Number of Correlations Provided in each Study	Number of Studies
1 to 3	20
4 to 6	10
7 to 9	6
10 to 12	5
13 to 15	6
more than 15	3
Total	50

Table 4. Number of studies by number of correlation coefficients provided in each study.

 Table 5. Relationships investigated with multiple male- and female-only samples by number of studies

Relationships	# of Studies: for Females	# of Studies: for Males
Var. 1 & 2	6	10
Var. 1 & 8	9	11
Var. 1 & 10	4	6
Var. 1 & 11	4	4
Var. 2 & 8	6	7
Var. 2 & 9	2	4
Var. 2 & 10	3	5
Var. 5 & 8	2	5
Var. 8 & 12	2	6

- Note: Var. 1 = Family Attachment
 - Var. 2 = Family Control
 - Var. 5 = Self Conventionality
 - Var. 8 = General Delinquency
 - Var. 9 = Index Offenses
 - Var. 10 = Status Offenses
 - Var. 11 = Substance Abuse
 - Var. 12 = Family SES

Table 6. The most and least studied relationships.

# of studies	Relationships studied (# of studies)
More than 10	Family attachment and general delinquency (20 studies)
	Family attachment and family control (16 studies)
	Family control and general delinquency (15 studies)
	Family attachment and status offenses (14 studies)
	Family attachment and substance abuse (11 studies)
1 to 2	Family control and educational commitment (2 studies)
	Family control and community trouble (2 studies)
	Family control and self conventionality (2 studies)
	Community trouble and index offenses (2 studies)
	Self conventionality and index offenses (2 studies)
	General delinquency and status offenses (2 studies)
	Parental conventionality and family SES (1 study)
	General delinquency and index offenses (1 study)
	Substance abuse and family SES (1 study)
Missing	Family control and parental conventionality (0 studies)
-	Community trouble and parental conventionality (0 studies)

Limited number of studies looked at the relationships between variables separately for the two genders (see, Table 5). Only 9 out of 66 relationships were investigated with multiple male- and female-only samples. And the focus of the investigation seemed to restrict on the relationships between family factors and delinquent outcomes.

Most and Least Frequently Studied Relationships

A summary of the most and least studied relationships is provided in Table 6. For detailed information regarding the extent to which the 50 studies addressed the 66 possible relationships among the 12 variables used in the proposed conceptual model, see Table 7.

Meta-Analytical Procedures

Overview

The correlations (rs) collected from the 50 studies were analyzed using methods proposed by Becker (1992) and refined by Becker and Fahrbach (1994). Before conducting further analyses, the rs were first transformed into Fisher zs (Fisher, 1928). The purpose of this transformation was to normalize the distribution of the correlations, as well as simplify their variance. Statistical analyses that rely on assumptions of normality can then be safely applied. After analyses were completed, estimates were transformed back into the r-metric to provide interpretability.

In all analyses, each study was weighted depending on its sample size; studies using larger sample sizes are presumably more precise in the estimations of relationships, and thus deserve more weight in research syntheses than studies using smaller sample sizes.

Both univariate and multivariate homogeneity tests were then conducted to investigate whether the sample correlations seemed to derive from a single homogeneous population. Multiple univariate homogeneity tests were conducted on the samples of bivariate correlations, while one multivariate homogeneity test was used to consider all the correlations simultaneously. Finally, based on the results of the homogeneity tests, a decision was made to use either a fixed- or random-effects model for examination of the proposed social-ecological model of delinquency.

The population correlations between delinquency measures and their social-ecological predictors (i.e., the estimation of central tendency) were then estimated. The test of homogeneity of the correlations helped determine whether population variation needs to be considered a factor in the consideration of the relationship. Finally, the estimated population correlations and their variances were used to examine the proposed conceptual model of delinquency.

Homogeneity Tests

A homogeneity test was used to decide if the observed variance in the sample correlations can be fully explained by sampling error; in other words, to test whether it seemed plausible that the variation observed in the sample observations was due to chance alone (Hedges & Olkin, 1985).

If the expected sampling error variance and the observed variance are similar, it is safe to conclude that the relation between the pair of variables is constant across different samples (with differences in gender, race, social class, geographic locations, and other unmeasured characteristics). In other words, a series of sample correlations are said to be homogeneous (i.e., to share a common population correlation) if the variance in the sample correlations can be explained by the sampling error. It is important to note that this inference of homogeneity of population correlations only applies to the types of variation in study characteristics that were observed in the synthesis.

Two models exist for explaining why the distribution of population correlations seems to be heterogeneous. The first is a fixed-effects model that relies on moderator analysis to explain the extra variation. Population correlations are thought to differ <u>systematically</u> depending on study or sample characteristics. In contrast, the second model, the random-effects model, does

not attempt to explain away the variation by relying on sample or study characteristics. Instead, the simple random-effects model assumes that the population correlations have a normal distribution. For detailed discussions of the fixed- and random-effects models, see Hedges (1994) and Raudenbush (1994).

In this study, missing data problems forced the use of a random-effects model to explain the surplus variation that is not explained by sampling error. When the studies are considered random, two approaches are available for the estimation of the parameters: the "method of moments" and the "interative maximum likelihood" approaches. The "method of moments" approach was employed in this study for the estimation of the population parameters and further estimation of the linear models.

Estimation of the Linear Models

The estimated population correlations and their variances were then used to examine the proposed social-ecological model of delinquency (see, Figure 1) by using methods proposed by Becker (1992) and Becker & Schram (1994). The method for estimating linear models outlined by Becker (1992) was used to conduct the 7 standardized regressions with which the multiple relationships among the social-environmental factors and delinquent

behaviors, proposed in Figure 1, were specified. Using model-guided metaanalysis, this study aimed to generate an empirical social-environmental model of delinquency that fits the data in the existing research.

Using models in research synthesis allows the simultaneous examination of multiple relationships (Becker & Schram, 1994). Primary studies tend to focus on only one or several paths in a model. Like the blind man's description of the elephant, the primary studies may provide many conclusions, but little understanding of the big picture under study (Eccles et al., 1983). In order to piece together the information in the primary studies to provide a more complete explanation of the phenomenon, one needs to employ the approach of model-driven meta-analysis.

The above mentioned model-driven meta-analysis procedures are programmed in SAS IML (Statistical Analysis System, Interactive Matrix Language) by Kyle Fahrbach, a Ph.D. candidate in the Measurement and Quantitative Methods program at Michigan State University.

Hypotheses

Given the review of research (which culminated in a proposed model of delinquency and a set of related research questions -- see Chapter 2) as well as the above discussion of the samples, the variables under consideration, and the meta-analytical procedures, the proposed ecological model of delinquency presented in Figure 1 (Chapter 2) can be tested. The test of the proposed ecological model of delinquency will involve seven standardized regressions which reflect the following hypotheses:

Hypothesis 1: Educational commitment is predicted by family

bonding/attachment, community trouble, parental conventionality, and family SES.

- Hypothesis 2: Adolescent's self conventionality is predicted by family bonding/attachment, educational commitment, community trouble, parental conventionality, and peers' conventionality.
- Hypothesis 3: Peers' conventionality is predicted by family bonding/attachment, family control/supervision, and educational commitment.
- Hypothesis 4: General delinquency is predicted by family bonding/attachment, educational commitment, self-conventionality, and peers' conventionality.

- Hypothesis 5: Index offenses are predicted by family bonding/attachment, educational commitment, self-conventionality, and peers' conventionality.
- Hypothesis 6: Status offenses are predicted by family bonding/attachment, educational commitment, self-conventionality, and peers' conventionality.
- Hypothesis 7: Substance abuse is predicted by family bonding/attachment, educational commitment, self-conventionality, and peers' conventionality.

Because an insufficient number of studies existed to evaluate the proposed model separately for males and females, gender differences will be addressed only through the comparison of study results based on genderspecific samples. For every relationship between variables that allows for an investigation of gender differences, a general hypothesis is stated as:

Hypothesis 8: The average correlation, representing the relationship between variables in the model (e.g., between family attachment and status offenses), is not significantly different between males and females.

CHAPTER 4

RESULTS

This meta-analysis analyzes 50 studies, extracted from 26 published and 10 unpublished research reports. The total number of correlation coefficients under synthesis is 423. The total sample includes 68,217 U.S. adolescents. The results presented here include: (1) homogeneity tests, (2) average correlations, (3) standardized regressions, and (4) the revised models of delinquent behavior based on the integration of the results of the standardized regressions.

Homogeneity Test Results

Both multivariate and univariate homogeneity tests were used to investigate whether the sample correlations collected from the 50 studies were derived from a homogeneous population. There was only one multivariate homogeneity test, which considered whether the study correlations taken together as 12×12 correlation matrices seemed to share an underlying population correlation matrix. This was a test of the fit of the fixed-effects model. There were 66 possible univariate tests (i.e., the first test was conducted on $r_{1, 1\circ 2}, \ldots, r_{50, 1\circ 2}$, the second on $r_{2, 1\circ 3}, \ldots, r_{50, 1\circ 3}$, up until the 66th on $r_{1, 11 \cdot 12}$, ..., $r_{50, 11 \cdot 12}$; where $r_{k, m \cdot n}$ is the correlation between variables m and n in the kth study). However, as none of the 50 studies studied the relationship between *parental conventionality* and *family control* or between *parental conventionality* and *community trouble*, only 64 univariate tests of homogeneity were conducted. Each test was conducted to determine if the sample correlations, for each relationship, shared an underlying population correlation.

The multivariate homogeneity test statistic (Q_E) has approximately a chi-square distribution with degrees of freedom (df) equal to $[(k-1) \times p^*] - #$ of missing correlations, where k is the number of studies under synthesis and p^* refers to the number of possible relationships within a study. This metaanalysis analyzed 50 studies and 66 possible relationships. So, the Q_E value for the multivariate test of homogeneity was compared to the critical value of the chi-square distribution, at the 5% significance level with df = 357. For these data, the multivariate Q_E value was 4915.19 (p < 0.001) indicating that it was unlikely that the sample correlations contributed by the 50 studies shared a common population correlation matrix. The rejection of the multivariate null hypothesis suggested that the fixed-effects model did not fit the data. The univariate Q_E 's, which test individual cells' homogeneity, have approximate chi-square distributions with degrees of freedom equal to the number of studies that contained a sample correlation for the cell in question minus one. Ten of the univariate homogenous test results were not significant at the 0.05 significance level (see, Table 7).

Relationships	QE	p-value of Q_E	df	
Family attachment & general delinquency	26.10	0.13	19	
Family control & status offenses	11.37	0.12	7	
Family control & substance abuse	3.59	0.46	4	
Family control & family SES	5.92	0.20	4	
Educational commitment & index offenses	5.27	0.07	2	
Community trouble & index offenses	0.62	0.43	1	
Self conventionality & family SES	4.13	0.53	5	
Peers' conventionality & status offenses	6.62	0.36	6	
General delinquency & substance abuse	1.10	0.29	1	
Substance abuse & family SES	2.85	0.24	2	

Table 7. The relationships with insignificant homogeneity test results^a

Note: a = at 0.05 significance level, the sample correlations of each of these relationships seem to share a homogeneous underlying population correlation.

Average Correlations

Because the homogeneity tests showed that a random-effects model,

assuming variations in the population correlations, fits the data better than a

fixed-effects model, further analyses were based on the random-effects

model. When the null hypotheses of homogeneity are rejected, one might still prefer to use a fixed-effects model, to assume a single population parameter, and to seek explanation for the variation with sample and study characteristics. However, as a substantial amount of missing data exists in this meta-analysis, it seemed that a random-effects model was the only option. Unfortunately, because there was a considerable amount of missing data, there were not enough degrees of freedom to estimate the covariances well. Thus, the random-effects model utilized considers only the variances among the population correlations. In other words, for statistical reasons, a fully multivariate random effects analysis could not be conducted; all random effects analysis presented later on are univariate in nature.

Table 8 shows (1) the mean correlations, (2) the estimated 95% confidence interval for each mean correlation, and (3) a z test for whether the mean correlation was significantly different from zero.

Variables	Lower	Mean	Upper	Z score	Z p-	Number	Number
	Limit	Value	Limit		value	of	of Total
						Sample	Subjects
						<i>r</i> 's	
Var. 1 & 2	0.17	0.25	0.32	6.00	0.00	16	7247
Var. 1 & 3	0.23	0.29	0.35	9.09	0.00	4	35437
Var. 1 & 4	-0.20	-0.10	-0.01	-2.09	0.04	4	4559
Var. 1 & 5	0.26	0.34	0.40	8.65	0.00	10	35549
Var. 1 & 6	0.23	0.31	0.39	6.90	0.00	4	5040
Var. 1 & 7	0.22	0.27	0.31	11.01	0.00	10	8801
Var. 1 & 8	-0.28	-0.26	-0.24	-27.82	0.00	20	10865
Var. 1 & 9	-0.30	-0.21	-0.12	-4.58	0.00	7	7053
Var. 1 & 10	-0.31	-0.28	-0.24	-16.75	0.00	14	34255
Var. 1 & 11	-0.26	-0.23	-0.21	-19.30	0.00	11	34920
Var. 1 & 12	-0.05	0.005	0.14	0.99	0.32 ^a	6	3477
Var. 2 & 3	0.20	0.22	0.24	23.29	0.00	2	10852
Var. 2 & 4	-0.23	-0.13	-0.03	-2.61	0.01	2	2589
Var. 2 & 5	0.03	0.18	0.32	2.31	0.02	2	2589
Var. 2 & 6	missing	missing	missing	missing	missing	0	0
Var. 2 & 7	0.22	0.32	0.41	6.12	0.00	5	4382
Var. 2 & 8	-0.24	-0.19	-0.14	-6.83	0.00	15	9692
Var. 2 & 9	-0.21	-0.12	-0.04	-2.83	0.01	6	2641
Var. 2 & 10	-0.29	-0.25	-0.22	-13.38	0.00	8	2751
Var. 2 & 11	-0.34	-0.30	-0.26	-13.29	0.00	5	1920
Var. 2 & 12	-0.06	-0.01	0.03	-0.66	0.51 ^a	5	3788
Var. 3 & 4	-0.28	-0.09	-0.09	-0.99	0.32 ^a	3	2218
Var. 3 & 5	0.16	0.28	0.40	4.38	0.00	9	35486
Var. 3 & 6	0.10	0.26	0.40	3.19	0.00	4	4863
Var. 3 & 7	0.24	0.34	0.44	6.04	0.00	6	5186
Var. 3 & 8	-0.38	-0.27	-0.15	-4.41	0.00	6	6342
Var. 3 & 9	-0.28	-0.26	-0.23	-17.38	0.00	3	4351
Var. 3 & 10	-0.38	-0.31	-0.24	-8.31	0.00	9	33486
Var. 3 & 11	-0.27	-0.25	-0.23	-22.27	0.00	10	12803
Var. 3 & 12	0.07	0.27	0.48	2.27	0.02	4	5459
Var. 4 & 5	-0.20	-0.12	-0.04	-2.88	0.00	3	4077
Var. 4 & 6	missing	missing	missing	missing	missing	0	0
Var. 4 & 7	-0.24	-0.15	-0.05	-3.04	0.00	6	6044
Var. 4 & 8	-0.03	0.12	0.26	1.56	0.12 ^a	3	3142
Var. 4 & 9	0.05	0.10	0.14	4.14	0.00	2	1790
Var. 4 & 10	-0.36	-0.15	0.07	-1.31	0.19 ^a	4	2285
Var. 4 & 11	-0.28	-0.11	0.07	-1.18	0.24 ^a	4	3896

Table 8. The random-effects results: Correlations, Z-tests, number of sample correlations, and number of subjects.

Var. 4 & 12	-0.44	-0.22	0.03	-1.70	0.09*	4	2387
Var. 5 & 6	0.33	0.36	0.38	25.91	0.00	3	4863
Var. 5 & 7	0.22	0.39	0.54	4.19	0.00	8	7293
Var. 5 & 8	-0.42	-0.33	-0.24	-6.84	0.00	10	8791
Var. 5 & 9	-0.54	-0.36	-0.15	-3.28	0.00	2	3798
Var. 5 & 10	-0.46	-0.34	-0.21	-4.89	0.00	5	30684
Var. 5 & 11	-0.40	-0.37	-0.33	-20.22	0.00	5	31781
Var. 5 & 12	-0.59	-0.04	-0.01	-2.84	0.00	6	7036
Var. 6 & 7	0.32	0.36	0.40	16.61	0.00	3	1419
Var. 6 & 8	-0.40	-0.32	-0.26	-8.41	0.00	3	2458
Var. 6 & 9	-0.30	-0.22	-0.14	-5.23	0.00	4	5523
Var. 6 & 10	-0.36	-0.30	-0.24	-8.96	0.00	7	5700
Var. 6 & 11	-0.32	-0.25	-0.18	-6.62	0.00	4	3936
Var. 6 & 12	0.28	0.22	0.16	7.29	0.00	1	1065
Var. 7 & 8	-0.59	-0.49	-0.38	-7.91	0.00	10	5802
Var. 7 & 9	-0.38	-0.27	-0.15	-4.39	0.00	5	3146
Var. 7 & 10	-0.44	-0.42	-0.39	-27.22	0.00	7	3641
Var. 7 & 11	-0.49	-0.42	-0.33	-9.06	0.00	6	5499
Var. 7 & 12	-0.12	-0.02	0.08	-0.48	0.63ª	4	2855
Var. 8 & 9	0.71	0.75	0.78	22.82	0.00	1	553
Var. 8 & 10	0.61	0.76	0.85	6.88	0.00	2	110
Var. 8 & 11	0.78	0.84	0.90	12.50	0.00	4	864
Var. 8 & 12	-0.12	-0.07	-0.02	-2.91	000	10	6715
Var. 9 & 10	0.28	0.38	0.47	6.90	0.00	3	2593
Var. 9 & 11	0.28	0.39	0.48	6.61	0.00	3	1970
Var. 9 & 12	-0.16	-0.06	0.03	-1.26	0.21ª	3	1790
Var. 10 & 11	0.46	0.51	0.54	19.61	0.00	6	4341
Var. 10 & 12	-0.12	-0.06	-0.00	-2.11	0.04	1	1237
Var. 11 & 12	-0.05	-0.00	0.04	-0.15	0.88ª	3	1859

Note: a = correlations not different from zero at 1% significance level.

Var. 1 = Family Attachment.

Var. 2 = Family Control

Var. 3 = Educational Commitment

Var. 4 = Community Trouble

- Var. 5 =Self Conventionality
- Var. 6 = Parental Conventionality
- Var. 7 = Peers' Conventionality
- Var. 8 = General Delinquency
- Var. 9 = Index Offense
- Var. 10 = Status Offense
- Var. 11 = Substance Abuse

Var. 12 = Family SES

Standardized Regressions

Using the average correlations, which take into account both sampling error and population variation, the social-environmental model of delinquency was examined by conducting seven standardized regressions discussed in Chapter 3. The independent-dependent relations specified in these regression models were derived from Sutherland's differential association, Hirschi's social control theories, and the delinquency literature reviewed in Chapter II. The results of the standardized regressions are presented in Figures 2 to 8.

Because none of the 50 studies examined the relationship between family control (var. 2) and parental conventionality (var. 6), or community trouble (var. 4) and parental conventionality (var. 6), values needed to be imputed for the two estimates of the population correlation coefficients (i.e., ρ_{26} and ρ_{46}), as well as for their population variances. The following describes how the values were determined. An examination of the relationships between variables 2, 6, and all other variables implied that it seemed likely that $\rho_{26} \ge 0$. For example, \overline{r}_{12} 's 95% confidence interval is [0.17, 0.32], and \overline{r}_{16} 's 95% confidence interval is [0.22, 0.39]. It seemed reasonable to assume that if the relationship between variables 2 and 6 was positive, it was only moderately strong. Thus, it was decided to impute two different values -- 0.00 and 0.30, for the estimated correlation between parental control and community trouble. For the relationship between variable 4 and variable 6 (i.e., community trouble and parental conventionality), the same procedure was followed, leading to trial values of 0.00 and -0.30 for \overline{r}_{46} .

Realistic values of population variances for ρ_{26} and ρ_{46} also needed to be picked. The smaller the number, the higher the precision of estimation is assumed. Arbitrarily, 0.005 and 0.09 were selected to represent two different conditions -- precise and not so precise. The variance of 0.005 gives a population standard deviation of 0.07, and 0.09 gives 0.3.

Experimentation with different combinations of the estimated population correlations and their population variances for ρ_{26} and ρ_{46} across the seven regression models led to very similar results. Generally, the estimations of the standardized betas were within 0.04 of each other.

Because the results of the standardized regressions were so similar, only one set of numbers is presented. For the presented model, the correlation between family control and parental conventionality is assumed to be zero ($\rho_{26}=0$), the correlation between community trouble and parental conventionality is also assumed to be zero ($\rho_{46}=0$), and the population variances for these two correlations are assumed to be 0.09.

The first regression model (Figure 2) predicts *educational commitment* with *family attachment, community trouble, parental conventionality*, and *family SES. Educational commitment* is best predicted by *family SES* ($\hat{\beta} = 0.33$, SD($\hat{\beta}$) = 0.06), followed by *parental conventionality* ($\hat{\beta} = 0.27$, SD($\hat{\beta}$) = 0.06), and *family attachment* ($\hat{\beta} = 0.20$, SD($\hat{\beta}$) = 0.06). For *community trouble* predicting *educational commitment* ($\hat{\beta} = 0.00$, SD($\hat{\beta}$) = 0.11), the 95% confidence interval of the regression coefficient $\hat{\beta}$ was 0.00 ± 0.22. This last estimate implies that the relationship between *community trouble* and *educational commitment* is generally negligible when the effects of *family attachment*, *parental conventionality*, and *family SES* were taken into account.

The second regression model (Figure 3) predicts *self conventionality* with *family attachment, educational commitment, community trouble, parental conventionality*, and *peers' conventionality*. The three significant predictors of self conventionality were: *peers' conventionality* ($\hat{\beta} = 0.25$, $SD(\hat{\beta}) = 0.05$), *parental conventionality* ($\hat{\beta} = 0.19$, $SD(\hat{\beta}) = 0.07$), and *family attachment* ($\beta = 0.18$, $SD(\hat{\beta}) = 0.05$). The effects of *educational commitment* and *community trouble* were not significant, with the 95% confidence intervals of $\hat{\beta} = 0.09 \pm 0.18$ and $\hat{\beta} = -0.05 \pm 0.10$ respectively.

The third regression model (Figure 4) is with *peers' conventionality* predicted by *family attachment, family control, educational commitment,* and *community trouble.* All four predictors turn out to be significant; *educational commitment* was the most important predictor ($\hat{\beta} = 0.26$, SD($\hat{\beta}$) = 0.06), *family control* was the second ($\hat{\beta} = 0.22$, SD($\hat{\beta}$) = .05) and *family attachment* was the third ($\hat{\beta}$ = 0.13, SD ($\hat{\beta}$) = .05), while *community trouble* has a small but statistically significant relationship with *peers' conventionality*. Adding the predictor *community trouble* increased the explanatory power of the model (R²) from 13.1% to 21.3%.

The fourth, fifth, sixth, and seventh regression models (Figures 5, 6, & 7) were with *family attachment, educational commitment, self* conventionality, and peers' conventionality predicting, respectively, general delinquency, index offense, status offense, and substance abuse. It was found that general delinquency, status offense, and substance abuse were better explained than was index offense. The amount of variation explained in these models by the four predictors were, respectively, 31.8%, 26.5%, 25.2%, and 18.0%.

Adolescents' *self conventionality* toward moral values was a significant predictor for every type of delinquent measure. Among the different types of delinquent behavior, *self conventionality* had the highest impact on *index offense*; the 95% confidence interval of the $\hat{\beta}$ coefficient is [-0.36, -0.20]. With *self conventionality* predicting *general delinquency*, *status offense*, and *substance abuse*, the $\hat{\beta}$ coefficients' 95% confidence intervals were [-0.21, -0.01], [-0.24, -0.08], and [-0.30, -0.14] respectively.

Peers' conventionality had significant impacts on all types of delinquent behavior, except for *index offense*. The 95% confidence interval of the regression coefficients, for *peers' conventionality* predicting *general delinquency, status offense, and substance abuse*, were [-0.49, -0.41], [-0.36, -0.24], and [-0.36, -0.26] respectively.

Educational commitment had moderate but statistically significant influence on *index offense*, *status offense*, and *substance abuse* (95% confidence intervals of the regression coefficients were [-.25, -.01], [-.28, -.02], and [-.31, -.05] respectively), while its influence on *general delinquency* was not significant.

Also, family attachment had a small but significant effect on status offenses only, after holding adolescents' educational commitment, self

conventionality, and peer conventionality constant. However, family attachment did not have significant influence on other types of delinquent behavior.



Figure 2. Prediction of Educational Commitment, $R^2 = 21.1\%$. Note: 1. Statistically insignificant path coefficient (p < 0.05). 2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.



- Figure 3. Prediction of Self Conventionality, $R^2 = 29.6\%$.
- Note: 1. Statistically insignificant path coefficient (p < 0.05).

2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.

Educational Commitment	.26 ± .12	
Family Control	.22 ± .10	\rightarrow
Family Attachment	.13 ± .10	Peers' Conventionality
Community Trouble	08 ± .06	

Figure 4. Prediction of Peers' Conventionality, $R^2 = 21.3\%$. Note: $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.



- Figure 5. Prediction of General Delinquency, $R^2 = 31.8\%$.
- Note: 1. Statistically insignificant path coefficient (p < 0.05).

2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.



Figure 6. Prediction of Index Offenses, $R^2 = 18.0\%$. Note: 1. Statistically insignificant path coefficient (p < 0.05). 2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.



Figure 7. Prediction of Status Offenses, $R^2 = 26.5\%$. Note: $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.



Figure 8. Prediction of Substance Abuse, $R^2 = 25.2\%$.

- Note: 1. Statistically insignificant path coefficient (p < 0.05).
 - 2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.



Figure 9. Revised Ecological Model of Index Offenses.

- Note: 1. Educational Commitment and Self Conventionality each has a statistically significant direct impact on Index Offenses (p < 0.05).
 - 2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.
 - 3. Statistically insignificant paths are not shown in this path model.



Figure 10. Revised Ecological Model of Status Offenses.

- Note: 1. Educational Commitment, Family Attachment, Self Conventionality, and Peers' Conventionality each has a statistically significant direct impact on Index Offenses (p < 0.05).
 - 2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.
 - 3. Statistically insignificant paths are not shown in this path model.



Figure 11. Revised Ecological Model of Substance Abuse.

- Note: 1. Educational Commitment, Self Conventionality, and Peers' Conventionality each has a statistically significant direct impacts on Index Offenses (p < 0.05). 2. $\beta \pm 2^*$ SD(β) represents the 95% confidence interval of a path coefficient.
 - 3. Statistically insignificant paths are not shown in this path model.



Figure 12. Revised Ecological Model of Delinquency

Note: ______ Links derived from Sutherland's differential association theory

Links derived from Hirschi's social control theory

Links added based on human ecological theory

(1) a significant path for status offenses only

(2) a significant path for status offenses and substance abuse

(3) a significant path for index offenses and status offenses (barely significant)

(4) for index offenses, status offenses, and substance abuse

Revised Structural Model

Figures 9, 10, and 11, the revised models from the original model (Figure 1), represent the intervening mechanisms that translate socioecological factors into *index offenses*, *status offenses*, and *substance abuse* respectively. The model revisions are based on the integration of the results of the standardized regressions (presented in Figures 2 through 8); paths that are statistically insignificant are excluded. These revised ecological models of different types of adolescent delinquency are summarized in Figure 12.

Gender Differences in Average Correlations

For the investigation of gender differences, the original intention was to test the proposed model separately for both genders, first using a sample of female-only studies, and then a sample of male-only studies. Unfortunately, since an insufficient number of studies existed to do either of these analyses, *t*-tests were used on all relationships that contained at least 2 male- and 2 female-only studies. Only samples for 9 relationships met these criteria. On average, none of the relationships under investigation were significantly different by gender (see, Table 9) In conducting the *t*-tests, transformations for the standard errors and degrees of freedoms were necessary because a typical *t*-test assumes equal variances in small samples. However, the estimated variances for males and females among the studies were unequal. The transformations in this analysis used procedures described in Hays (1973).

Variables	Fema	ale	Mal	e		Gend	nder Differences		
	Mean r	Number of studies	Mean r	Number of studies	Standard error	t	df*	р	
Var. 1 & 2	0.216	6	0.223	10	0.100	0.150	7	0.885	
Var. 1 & 8	-0.250	9	-0.254	11	0.020	-0.166	14	0.871	
Var. 1 & 10	-0.236	4	-0.254	6	0.040	-0.445	5	0.675	
Var. 1 & 11	-0.159	4	-0.113	4	0.072	0.633	1	0.641	
Var. 2 & 8	-0.187	6	-0.145	7	0.076	0.559	8	0.592	
Var. 2 & 9	-0.077	2	-0.145	4	0.071	-0.992	2	0.426	
Var. 2 & 10	-0.236	3	-0.224	5	0.052	0.228	4	0.831	
Var. 5 & 8	-0.238	2	-0.259	5	0.064	-0.328	2	0.774	
Var. 8 & 12	-0.153	2	-0.169	6	0.047	-0.333	3	0.761	

Table 9. The random-effect results: Gender differences in average correlations (for the relationships that allow for gender comparisons only).

Note: $df^* =$ adjusted degrees of freedom

Var. 1 = Family Attachment

Var. 2 = Family Control

Var. 5 = Self Conventionality

Var. 8 = General Delinquency

Var. 9 = Index Offenses

Var. 10 = Status Offenses

Var. 11 = Substance Abuse

Var. 12 = Family SES

CHAPTER 5

CONCLUSION, DISCUSSION, AND IMPLICATIONS

Through an examination of several theoretical and empirical works, an integrative model of delinquency was developed. The integrated model combined propositions of Hirschi's control theory, Sutherland's differential association theory, and Bronfenbrenner's human ecological theory. The proposed interrelations, based on the theories, were tested by analyzing statistical results from the delinquency literature. This chapter presents (1) a summary of the principles of the integrated theories and the proposed hypotheses, (2) a discussion of major findings, and (3) implications for practice and future research.

Hirschi's theory emphasizes that adolescents are dissuaded, protected, and insulated from committing delinquent acts through bonding to conventional society. In contrast to Hirschi's assumption of single conventional moral order, Sutherland's theory argues that because modern societies contain conflicting norms, definitions, and patterns of "appropriate" behavior, an adolescent becomes delinquent because he or she experiences an environment that "favors" law-breaking. Bronfenbrenner, a developmentalist,

stresses that (1) human behavior is a result of the interplay between an individual and the key environments in which he or she is embedded, and (2) the links between the key environments have developmental significance for the individuals. Limited by the nature of the data, this study did not analyze the nonrecursive relationship between adolescent behavior and ecological contexts. Instead, the focus of this study is on the links between the key environments of the adolescents (i.e., the intervening mechanisms) that translate social-environmental influences into individual behaviors, including adolescents' commitment to educational goals, association with delinquent peers, and involvement in delinquent acts.

This integrated model proposes that adolescent delinquency is largely the product of attenuated bonding to conventional individuals, activities, and values. Besides adolescents' attitudes toward the conventional moral order, their family attachment, educational commitment, and peers' conventionality are viewed as social-environmental factors that have direct impacts on preventing or encouraging delinquent behavior.

The statistically significant links between key social-environmental factors that influence adolescent's *educational commitment*, *peers' conventionality*, and *self conventionality* are summarized below. First, adolescents' *educational commitment* is influenced by *family SES*, *family*
attachment, and parental conventionality. Second, self conventionality is influenced by family attachment, parental conventionality, peers' conventionality, and educational commitment. And finally, peers' conventionality is influenced by family attachment, family control, educational commitment, and community trouble. Family attachment, family control, parental conventionality, family SES and community trouble are considered as an exogenous (background) variables that are not subject to prediction in this model.

Discussion of Major Findings

Overall, the results of the meta-analysis provide more support for Sutherland's differential association theory than for Hirschi's social control theory. It was found that *family attachment* and *educational commitment* (i.e., the components of social bonding) have insignificant to barely significant relationships with delinquency. In general, the influences of *family attachment* and *educational commitment* are mainly mediated by the differential learning of definitions favorable to law breaking through socialization with pro-delinquent peers. This finding is consistent with previous research results supporting Sutherland's theory rather than Hirschi's (Thompson et al., 1984; Matsueda & Heimer, 1987). Specifically, Sutherland's argument that family life is relevant to delinquency only when "delinquent patterns" are available to copy is partially supported; *family attachment* itself is not a significant predictor for different measures of adolescent delinquent behavior (except for a barely significant relationship between *family attachment* and *status offenses*), while significant indirect links exist between *family attachment* and adolescent delinquency (except for *index offenses*) through *peer conventionality*.

Although Sutherland's theory is better supported, this study finds support for both theories when considering the impact of adolescents' *self conventionality* (belief about the conventional moral order) on adolescent delinquency. *Self conventionality* is the second most important predictor for *status offenses*, and *substance abuse*, and first importance in predicting *index offenses*.

Another finding of this study is that the zero-order correlations and standardized regressions offer different answers in the explanation of delinquency. The correlations between the four predictors of adolescent delinquency (i.e., *family attachment, educational commitment, self conventionality*, and *peers' conventionality*) and different measures of delinquent behavior (i.e., *general delinquency, index offenses, status offenses*, and *substance abuse*) are all significantly different from zero. The

zero-order correlations support (1) Hirschi's observation that adolescents with stronger attachment to the conventional society are more likely to be dissuaded, protected, and insulated from committing delinquent acts, and (2) Sutherland's argument that adolescents' attitude toward the conventional moral order (i.e., *self conventionality*) and their *peers' conventionality* are related to the adolescents' delinquent behavior.

However, when the standardized regressions are considered, it seems that Hirschi's suggestion that *family attachment* and *educational commitment*, the major components of social bonding, may directly dissuade adolescents from delinquent acts does not always hold true. On average, *family attachment* does not have significant direct impact on delinquent behavior of any type (except for a barely significant influence on *status offenses*). Educational commitment is not a significant predictor of general delinquency and substance abuse and only a marginal significant predictor of index offenses and status offenses, when other variables are held constant, as proposed by Hirschi.

Sutherland's theory, on the other hand, is better supported; adolescents' attitude toward the conventional moral order (i.e., *self conventionality*) and their *peers' conventionality* are the strongest predictors of all types of delinquent behavior with only one exception -- *peers'*

conventionality is not a significant predictor for index offenses, after adolescents' self conventionality and educational commitment are taken into account.

This implies that for adolescents with equal levels of *self conventionality* and *educational commitment*, their *peers' conventionality* has significant direct effects on *general delinquency, status offenses*, and *substance abuse*, but NOT on *index offenses*. Perhaps because of the seriousness of *index offenses*, adolescents with high *educational commitment* and high *self conventionality* do not choose to commit this type of crime even when they are pressured to do so by their peers.

Prediction of Educational Commitment

The strongest predictor for *educational commitment* is *family SES*, followed by *parental conventionality* and *family attachment*; *community trouble* is not a significant predictor of *educational commitment*. Given that *parental conventionality* is a measure of parents' attitudes toward hard work, <u>education</u>, and unlawful acts, the following interpretation is reached: for adolescents with similar levels of *family attachment* and *parental conventionality*, *family SES* has positive effects on their *educational commitment*. In other words, this study shows that low *family SES* has a significant negative influence on adolescent's *educational commitment*, holding constant *family attachment* and *parental conventionality* (a measure including parents' adherence to such values as hard work and education).

The finding of this influence is as expected; an extensive literature suggests that there is a strong association between the two: the lower the adolescent's *family SES*, the less likely he or she is to succeed or even want to succeed in school (Lipton & Smith, 1983; Huston, 1991). However, the results of the standardized regressions seem to disagree with some researchers' argument that this relationship is due to the association between *family SES* and parents' attitudes toward education (a component measured in *parental conventionality*).

Although there is a positive relationship between *family SES* and *parental conventionality* ($\mathbf{r} = 0.22$, SD(\mathbf{r}) = 0.03), after the effect of *parental conventionality* is controlled for, the relationship between *family SES* and adolescents' *educational commitment* still exists. This study did not directly examine family aspiration and preparation for education and thus cannot rule out the influence of family aspiration and preparation on the relationship between *family SES* and *educational commitment*. However, from a human ecological perspective, it is important for future research to consider the mediating effect between *family SES* and adolescents' *educational*

adolescents' *educational commitment* still exists. This study did not directly examine family aspiration and preparation for education and thus cannot rule out the influence of family aspiration and preparation on the relationship between *family SES* and *educational commitment*. However, from a human ecological perspective, it is important for future research to consider the mediating effect between *family SES* and adolescents' *educational commitment* within a broader context; besides family aspiration and preparation, factors such as teacher expectation, communication between family and school, and peer influence need to be taken into account simultaneously.

Prediction of Peers' Conventionality

The strongest predictor of *peers' conventionality* is *educational commitment*, followed by *family control, family attachment* and *community trouble*, and all the regression coefficients are statistically significant. The regression coefficients of *educational commitment* ($\hat{\beta} = 0.26$, SD($\hat{\beta}$) = 0.06), *family control* ($\hat{\beta} = 0.22$, SD($\hat{\beta}$) = 0.05), *family attachment* ($\hat{\beta} = 0.13$, SD($\hat{\beta}$) = .05, and *community trouble* ($\hat{\beta} = -0.08$, SD($\hat{\beta}$) = 0.03) are significantly different from zero ($\alpha = 0.05$). Given that the strength of the direct relationship between *family attachment* and *delinquency* ranges from nonexistent to barely significant, this finding of an indirect effect of *family attachment* and *control* on *delinquency* (through *peers' conventionality*), support Sutherland's argument that family life is important only when there are "delinquent patterns" to copy.

Prediction of Self Conventionality

Peers' conventionality, parental conventionality, and family attachment are significant predictors of adolescents' self conventionality (i.e., belief about the conventional moral order). Educational commitment and community trouble, on the other hand, are not significant predictors. This finding supports Sutherland's view that the values and attitudes of intimate personal groups influence adolescent definitions about what "appropriate" behavior is.

Besides *peers' conventionality* and *parental conventionality, family attachment* is a significant predictor of adolescents' attitudes toward conventional moral order (i.e., *self conventionality*). One explanation is that secure *family attachment* increases the likelihood of adolescent internalization of the conventional definitions. This is consistent with Hirschi's theory stating that the stronger the adolescent's attachment to Hirschi's theory stating that the stronger the adolescent's attachment to others, especially parents, the more likely he or she will internalize conventional social norms.

Overall, this regression model suggests that regardless of the level of *community trouble* and the level of adolescents' *educational commitment*, an appeal to *family attachment* and influence from intimate group (i.e., *parental* and *peers' conventionality*) can socialize adolescents toward the direction of conventional norms.

Prediction of General Delinquency

Perhaps because researchers use more items inquiring about general delinquency than about specific delinquent acts such as *index offense*, *status offense*, or *substance abuse*, the proposed model explains general delinquency better than specific delinquent behaviors. Theoretically, the more frequently the items are asked, the lower the measurement error is. However, as this study finds that different delinquent behaviors have different predictors, combining different types of delinquent behavior together is questionable.

Prediction of Index Offenses

Index offenses are best predicted by adolescents' levels of educational commitment and self conventionality (belief toward conventional moral order). Different from other types of delinquent behavior, index offenses are not predicted by peers' conventionality; when the effects of adolescents' educational commitment and self conventionality are taken into account, differential association with peers who provide definitions favorable to law breaking does not increase adolescents' involvement in index offenses.

In other words, for adolescents with equal amounts of *self conventionality* and *educational commitment*, *peers' conventionality* affects their *status offenses*, and *substance abuse*, but not their *index offenses*. Perhaps because of the seriousness of *index offenses*, adolescents' *educational commitment* and *self conventionality* prevent adolescents' involvement in this type of crime even when they are pressured to do so by peers. Note, though, that although *peer conventionality* is not important enough to have a direct impact on *index offenses*, it still has an indirect effect through *self conventionality*.

Prediction of Status Offenses

All predictors of *status offenses* in this model are significant. *Family attachment* is a direct predictor of *status offenses*, but not of other types of adolescent delinquency. However, its significance is marginal, and β is small (-0.10).

The influence of *peers' conventionality* on *status offenses* is stronger than that of the social bonding factors -- *family attachment, educational commitment,* and *self-conventionality,* after the influences of these social bonding factors are taken into account. In other words, when adolescents' *family attachment, educational commitment,* and *self-conventionality* are held constant, *peers' conventionality* still has a strong negative effect on *status offenses.*

Prediction of Substance Abuse

The literature has long demonstrated a relationship between differential association and adolescent *substance abuse*. Consistent with previous research (e.g., Marcos et al. 1986), this study finds that *peers*' *conventionality* is the strongest predictor of adolescent *substance abuse*, holding constant other variables. Besides *peers*' *conventionality*, adolescents' *self conventionality* is a significant determinant of *substance abuse*. Family

attachment and educational commitment, on the other hand are not significant predictors. This result implies adolescents' self conventionality is more strongly and directly related to substance abuse than family attachment and educational commitment.

Indirect Effects of Family Attachment

Family attachment, on average, is not a significant predictor of delinquent behavior of any type, except for status offenses (the 95% confidence interval for the regression coefficient is [-0.15, .05] for index offenses, [-0.19, -.01] for status offenses, and [-0.16, .04] for substance abuse). However, one should not conclude that family attachment has no influence on adolescent delinquency. The importance of the indirect effect of family attachment on delinquency needs to be emphasized; family attachment is a significant predictor of adolescents' educational commitment, self conventionality, and peers' conventionality -- the three variables that have significant direct impacts on delinquency. If an adolescent has higher *family* attachment, he or she is more likely to have higher educational commitment, to associate with conventional peers, and to adhere to conventional values, and thus is less likely to be delinquent.

The following discussion about the predictions of the three variables -educational commitment, self conventionality, and peers' conventionality -that have significant impacts on delinquency is organized around the results of the three standardized regressions (see Figures 2, 3, & 4). The first regression predicted educational commitment with family attachment, community trouble, parental conventionality, and family SES. The second regression predicted self conventionality with family attachment, educational commitment, parental conventionality, and peers' conventionality. The third regression predicted peers' conventionality with family attachment, family control, educational commitment, and community trouble.

Indirect Effects of Family SES

The role of adolescents' *educational commitment* as an intervening variable between *family SES* and *delinquency* is also supported by this study. A positive path coefficient exists between *family SES* and adolescents' *educational commitment*, which is negatively associated with both *index* and *status offenses*. As (1) the relationship between *family SES* (var A) and adolescents' *educational commitment* (var B) is significant and moderate (2) the relationship between *educational commitment* (var. B) and *delinquency* (var. C) is significant, although small ($\hat{\beta} = -0.13$ for *index offenses*, -0.14 for *status offenses*; SD($\hat{\beta}$) = 0.12 for both).

The low interrelationship between *family SES* and *delinquency*, extensively observed in the literature, is explainable. As the path goes from variable A, to B, then to C, and no direct relationship between A and C, the zero-order correlation between A and C is theoretically the product of the correlation between A and B and the correlation between B and C; in other words, $r_{AC} = r_{AB} * r_{BC}$. The actual r_{AC} (using *substance abuse* for example), empirically measured in the range between -0.05 to 0.04, is close to the theoretical computation: $r_{AC} = r_{AB} * r_{BC} = (0.27 \pm 0.21) * (-0.25 \pm 0.02)$, which is in the range between -0.13 and 0.00.

Therefore, the small relationship between *family SES* and *delinquency* should not be considered as an error or a source of confusion as generally viewed in the literature. As Tittle et al. (1979) describe in their work,

...there does seem to be an empirical relationship between class origin and academic performance in high school. There also seems to be a consistent and strong association between academic performance and delinquency... Therefore, it should follow that there would be a strong class origin/delinquency association, but of course, our paper shows that in general such relationship has not been demonstrated. Either the origin/performance or the performance/delinquency association is in error... (p. 670) The weak association between *family SES* and *delinquency* is found in this study and in many other studies. Traditional narrative reviews have stated that a considerable amount of studies have found a slight negative to nonexistent relationship between SES and delinquency (e.g., Tittle et al., 1979; Larzelere & Patterson, 1990). In a meta-analysis (bivariate), Loeber and Dishion (1983) found that SES is the weakest predictor compared to the other predictors of delinquency.

Findings of a weak association between *family SES* and *delinquency*, however, are not in error. Instead, they suggest the existence of a third variable serving as a link between the two. As adolescents' *educational commitment* is related to both *family SES* and *delinquency*, it seemed logical to treat *educational commitment* as the mediating link between *family SES* and *delinquency*.

Co-occurance of Delinquent Behaviors

Significant and strong to modest zero-order correlations were found between status offenses and substance abuse (r = 0.50, SD(r) = 0.02), between index offenses and substance abuse (r = 0.39, SD(r) = 0.05), and between status offenses and index offenses (r = 0.37, SD(r) = 0.05). These study results show a significant association between different types of delinquent behavior, commonly found in the literature, suggesting that a similar explanation exists to account for the varied behaviors (Dryfoos, 1990; Lerman & Pottick, 1995). However, as mentioned previously, this study shows that similar but not identical predictors exist for different types of delinquent behaviors.

Gender Differences

Most studies included in this meta-analysis that addressed female delinquency focused primarily on family factors and ignored possible peer, school, and community influences. The primacy of the family context in explaining female delinquency is perhaps due to the traditional view that females are more likely than males to be influenced by family factors such as attachment and control.

Although only a limited number of bivariate relationships could be investigated, the null hypotheses that there would be no differences in the strengths of the relationships that depended on gender were not rejected. One possible explanation for this finding is that the *t*-tests conducted had fairly low power because there was population variation within the male and female samples, and the sample sizes (i.e., the numbers of studies that looked at males and females separately) were often small. However, an examination of the mean correlations of the male and female samples indicate that differences between the genders on these relationships were substantively small.

In conclusion, because not enough studies had looked at males and females separately, testing the utility of the proposed model separately for the two genders was not possible at this time. Whether specific theories of delinquency with respect to gender, ethnicity, social status, and geographic residence are needed may well be a subject for future research.

Strengths and Limitations of the Study

The strengths of this study include the combination of theory integration, quantitative research synthesis, and multiple regression approach. First, unlike studies which focus on only one theory (e.g., Gardner & Shoemaker, 1989), this study compared, contrasted, and finally integrated the major theories of delinquency. Second, this integrated model was tested using meta-analytical techniques. These techniques allow for both specific quantitative estimates of relationships and tests of whether the strength of the relationships differ across the diversity of ecological contexts the primary studies tend to focus on separately.

Finally, unlike previous meta-analyses (e.g., Loeber & Dishion, 1983), this study did not address only the bivariate relationships. The standardized regression approach which was used allowed partial relationships to be estimated. For example, while the mean bivariate correlation between *family* attachment and different types of delinquency was about 0.25, it was found in the specific path model tested that the direct partial effect of *family* attachment on delinquent behaviors was generally not substantially different from 0. Therefore, unlike the previous meta-analyses, the results of this study indicate that, while *family attachment* has significant and substantial relationships with factors that have causal influences on delinguency, the direct relationships between *family attachment* and various measures of delinquent behavior seem to be nearly 0. Thus this approach allows for testing of both direct and indirect effects while holding important variables constant. This methodological strategy is unique to this study, differentiating it from other investigations which address delinquency.

However, this meta-analysis has three major limitations. First, while measurement error exists in the primary studies (i.e., many of the instruments had imperfect reliability), few studies reported the reliability of the instruments they used. Thus, measurement error could not be accounted for statistically. Second, specific cross-population model comparisons could not

be made due to "missing data." For instance, the conceptual model could not be estimated separately for boys and girls; instead, only differences in the strength of certain bivariate relationships could be compared. Third, the vast amount of "missing data" led to an inability to employ fixed-effects models which could investigate moderator variable effects. The only option remaining was to attribute surplus variance (i.e., variance over and above that expected due to sampling error) to variation in the population correlations.

This study synthesized the statistical results of primary studies that rely on the self-reports of adolescent respondents, and thus depends on adolescents' willingness to share their experiences regarding environments, social relations, and delinquent behaviors. Not all adolescents might have wanted to share this information, due to desires for privacy, or fears of disclosure. When self reports are less than accurate, potential for measurement errors and biases exist. To control statistically for such bias, one needs the information about reliability of the measurement scales. Because only a small proportion of the primary studies included in this meta-analysis reported this information, the results of this meta-analysis are subject to the influence of measurement errors.

Specific model comparisons across sub-populations are not available. If there were enough studies (more than 2) that focused on a specific

adolescent sub-population (e.g., boys or girls, whites or nonwhites) for each of the possible intercorrelations studied in this meta-analysis, then it would be possible to test whether the proposed model fits the data for different subpopulations, or to compare the magnitude of the intercorrelations and path coefficients across the sub-populations. Unfortunately, sufficient data on all correlations within each sub-populations were not available. Partial comparisons were done based on the data available; only gender differences in some relationships between family factors and delinquency can be examined, because family factors seem to be the only variables commonly focused on in the primary studies examining female delinquency.

As the hypotheses of homogeneity were rejected, suggesting the existence of variation in the population correlations in the studies subject to synthesis, one might elect to employ the fixed-effects model to use sample or study characteristics, as moderators, to explain the variation. However, because not enough studies had studied the relationships using samples from sub-populations (e.g., males vs. females, whites vs. non-whites, rural vs. urban), this meta-analysis necessarily employed a random-effects model instead, which assumed a normal distribution of population parameters in order to explain surplus variation.

Implications

Implications for Practice

According to Henggeler and Borduin (1990), adolescent delinquency prevention and treatment programs based on broad human ecological perspectives are more appropriate and effective than most existing programs, which focus only on the individual adolescent in one context. In order to make the existing programs more effective, practitioners who work with adolescents at risk should consider simultaneously the effects of family, peers, school, and community.

In general, current etiologic theories of delinquency fail to consider a diversity of causes of adolescent delinquency. As a consequence, the theories fail to drive the prevention and treatment programs effectively. Most prevention and treatment programs have been influenced by the narrower perspective of non-ecological theories; trained in reduction, those who work clinically with delinquents tend to dismiss too quickly diverse, multiple factors.

Reported by Kotlowitz (1991), the following case study illustrates the importance of using a human ecological approach to understand the needs of adolescents at risk.

Two boys, Pharoah and Lafayette, and their mother live in an inner-city ghetto, struggling for a better life. There are no banks, hospitals, or public libraries where they live. The newborn morality rate is higher than that of the third world. There are frequent gun shootings, and adults as well as children are very uncertain about their future.

The boys' mother believed that education would offer some promise of a better future and decided to spend more time with her two youngest children in order to give them support and advice. She felt she had made mistakes with her older children, and vowed not to repeat these mistakes of being too busy to supervise her children's progress in school and their whereabouts after school. Her older children had ended up in jail, for which she blames herself.

Pharoah and Lafayette each had strong ties to their mother. They depended on her; she was responsible for them. She was a caring mother and a soft-spoken person known for her warmth and generosity not only to her children, but also to her children's friends, because she knew that most families were facing the same problems. Pharoah and Lafayette's father, however, had let them down. Drugs had ruined his life and destroyed his relationship with his wife and sons. If they had had his full income and personal support, they would have moved out of the community.

The community had become a ghetto of poor families, mothers and children without fathers. An estimated 85 percent of the households were headed by women. The decay of the community was attributed to the structural changes in the economy, the loss of manufacturing jobs, and the transient population. Most people's lives in this community were influenced by drugs and drug-related violence. Gangs seemed to control the community and rival drug gangs frequently had shoot outs. These gangs also recruited young children to work for them. Many children in the community joined gangs, sold drugs, and were sometimes involved in homicides.

The fact that their mother valued education helped Lafayette and especially Pharoah do well in school. Pharoah studied very hard and placed near the top of his class. His teacher liked him very much and he appreciated the rewards of school. Lafayette, on the other hand, did not like school as much as Pharoah did, although he was also a smart adolescent. Later, a good relationship with a new teacher helped him take school more seriously, but he had already been held back one year because of a D average, had a poor attendance record, and secretly wished his mother would push him more.

As a strategy to prevent being pulled into gangs, Lafayette decided to have as few friends as possible. However, as he grew older he started to change, and began hanging out with delinquent peers.

Lafayette's mother felt he was slipping away, but she did not know what to do. One day, Lafayette broke the law because of his delinquent peers' insistence. Had someone looked at Lafayette's relationships with his parents, teachers, and friends somehow, and supported his initial efforts against delinquent peer pressure and the community's criminal subcultures, Lafayette might not have broken the law. Had the school system provided more opportunities for the development of commitment to conventional goals, instead of focusing on his poor grades, Lafayette might have liked school more and not played truant as much.

Perhaps, Lafayette's developmental trajectory would have been toward a healthier direction, if he had taken school more seriously either because his mother had pushed him harder or his relationships with school teachers had improved earlier . . . if his father had not been addicted to drugs and given more attention to his family helping them to move out of the ghetto . . . if the families in the community had joined together to counter the criminal forces . . . if these poor families had not been ghettoized . . . if . . .

Recommendations

The results of this present study suggest the need for certain actions and continued research. Below are some suggestions for practitioners, based on the findings of this study based on an overall 68,217 cases.

First, the family, as a source of social bonding and differential socialization, should not be ignored as an important component of effective prevention and treatment program. This suggestion is generated by the findings that family factors (including *family attachment, family control*, and *parental conventionality*) affect (1) the likelihood of an adolescent's association with delinquent peers (*peers' conventionality*), which then has a direct impact on delinquency and (2) an adolescent's attitudes toward conventional moral order (*self conventionality*). Both paths have the tendency of socializing an adolescent towards pro- or anti-delinquent behaviors.

Second, adolescent delinquency prevention and treatment programs need to be more actively involved in enhancing the community's potential power to influence its adolescents to reject delinquency. Although *community trouble* does not have a direct effect on an adolescent's behavior, it increases adolescent delinquent behavior by increasing the likelihood of association with delinquent peers (*peers' conventionality*). In other words, certain

community characteristics (e.g., availability of drugs and acceptance of delinquent behaviors) may influence adolescents' peer association.

Third, to assist adolescents to reject delinquent behavior, family and school need to work together to make sure adolescents have many opportunities to develop commitment to conventional goals (e.g., *educational commitment*). Perhaps a broader definition of success in school, instead of the narrow focus on academic performance, may help adolescents to build their social bonds to the conventional society. The connection between family and school is important, because this study shows that *family attachment* influences adolescent delinquent behavior indirectly through its impact on adolescents' *educational commitment*.

Finally, this study's results suggest (based on the prediction of *self conventionality*) that regardless of the level of community trouble and the level of adolescents' educational commitment, an appeal to the importance of *family attachment* and influence from intimate groups (i.e., *parents' and peer's conventionality*) can socialize adolescents toward the direction of conventional norms. This finding lends credence to the most recent trend of intervention programs in schools, which target the student body as a whole rather than particular subsets of students (e.g., drug-using students).

Implications for Future Research

The integration of social control and differential association theories has taken different forms; several models have been generated, with different interpretations of the two theories. In general, these models agree that: (1) association with delinquent peers is a proximate cause of delinquency, and (2) the formation of social bonding (e.g., family attachment and educational commitment) is generally "set" temporally prior to differential association with peers. Controversy exists, however, regarding whether social bonding, an element crucial to social control theories, has direct impacts on adolescent delinquency.

Some assert that social bonding has only an indirect impact on delinquency through association with delinquent peers (Elliott et al., 1985); weakening or breaking the social bonds does not cause adolescents to commit delinquent acts, but simply makes them more vulnerable, or susceptible to the influence of delinquent peers. With a national probability sample of 1,725 adolescents, Elliott and his colleagues found empirical support for their model; the bonding constructs (family and school involvement) had only indirect effects on delinquency, through association with delinquent peers, as they had hypothesized. However, unlike Elliott et al. (1985), Massey and Krohn (1986) found lack of educational commitment to be a direct predictor of delinquency, in addition to previous delinquent behavior and association with delinquent peers, when they used panel data from 1065 adolescents to test a variant of Elliott and associates' (1985) model. Massey and Krohn (1986) thus claimed that their finding confirmed Hirschi's argument that the impact of the social bond is not fully mediated by differential association.

Partially consistent with the previous models (e.g., Elliott et al., 1985; Massey & Krohn, 1986), this study confirmed both direct and indirect effects of social bonding on adolescent delinquency. Educational commitment had a direct impact on index offenses, status offenses, and substance abuse. Also, self conventionality prevented all of these three types of adolescent delinquent behavior directly. Family attachment, on the other hand, dissuaded adolescents from delinquent behaviors mostly by helping them internalize conventional social norms, reject influences of delinquent peers, and build educational commitment; the indirect impact of *family attachment* on delinguency was mediated by self conventionality, peers' conventionality, and educational commitment. Educational commitment also prevented adolescents' delinquent behaviors indirectly, by influencing their association with delinquent peers (peers' conventionality).

However, the ecological model of delinquency proposed in this study differs from other models in several ways. First, adolescents' belief in conventional moral order (i.e., *self conventionality*), considered as a bonding construct in the social control theory, is shown to be a proximate prevention of delinquency. Second, differential association theory is not confirmed for *index offenses*; association with delinquent peers does not have direct impact on *index offenses*. In this model, the two proximate predictors of *index offenses* are adolescents' belief in the conventional moral order and their commitment to conventional goals -- that is, education.

One of the biggest differences between the model studied here and others is that "past delinquent behavior" was not a predictor of interest. The focus of this model is on the social-environmental influences on adolescent delinquency. The goal is to find out why some adolescents become delinquents while others don't, rather than to confirm that they are delinquents because they were delinquents in the past. Also, different studies define "past" differently and thus prohibit the synthesis of their results regarding this variable.

Not using adolescents' past delinquent behavior as a predictor in this model is not to disagree with the argument of continuity in individual behavior, but using past delinquent behavior as a predictor requires a more

sophisticated study design. Elliott and associates' (Elliott et al., 1985) and Massey and Krohn's (1986) models included adolescents' past delinquent behavior as a predictor and thus brought their models more explanatory power. However, their designs suffered from a serious logical flaw: delinquency at time one (i.e., past history of delinquent acts) was proposed to be independent of every other variable in their models, including the social factors measured at time one that are proposed to predict delinquent behavior at time two. Their assumption of the independence between the social factors and delinquency in time one is problematic, and thus the accuracy of their model is in question, even though the inclusion of past delinquency in their model is a sound idea.

Recommendations

Based on this study's results, some suggestions are generated for future empirical work on delinquency. Potential benefits exist for both primary studies and meta-analysis, if the following points are taken into consideration.

First, the human ecological perspective is necessary. Influences from different ecological contexts need to be considered in order to rule out possible confounding effects. Simple identification of the influences of factors in limited ecological contexts is insufficient; factors from different contexts are related to each other and their interrelationships and translation mechanisms have important implications for intervention programs of delinquency.

Second, scale reliability needs to be measured and reported. Interrelations and path coefficients tend to be attenuated by measurement errors, and to correct for attenuation, one needs the information about reliabilities of the measurement scales (Hunter & Schmidt, 1990). It also cannot be assumed that there are no differences in reliability across subgroups of the subjects (e.g., gender, race, age); separate reliability information needs to be generated for each sample studied.

Third, to make future efforts in research synthesis more efficient, researchers of primary studies need to report zero-order correlations between the variables measured. Preferably, delinquency will be measured as a continuous variable. Also, the conceptualization of different constructs needs to be explicit. As this study shows, model driven meta-analysis is another option, besides traditional primary studies, for studying social phenomena. However, the success of meta-analysis depends on the thorough reporting of the statistical results of the primary studies (e.g., reliability information, zeroorder correlations for full sample, and for sub-groups as well if sub-group differences exist.) Fourth, this study's results suggest that different explanations exist for different types of delinquent behavior. Thus, future efforts in understanding the etiology of delinquency need to measure and examine different types of delinquency separately. Researchers thus need to come to a general consensus on how to differentiate different types of delinquent behavior, so that their empirical results may lend themselves to meta-analyses.

Finally, cross-cultural examination of the usefulness of this socialenvironmental model of delinquency is desirable. Adolescents living in another culture might have different socialization patterns and different value systems. Adolescents in Taiwan for example, are socialized differently from adolescents in the U.S. and are subject to influences of a different set of social-environmental factors. Cross-cultural tests of this social-environmental model might contribute to confirmation of the model's universality or provide contradictions that might be used to develop a more sophisticated model of delinquency. **APPENDICES**

APPENDIX A

Appendix A

Studies Included in this Meta-Analysis

Published Reports:

- Astone, N. M. & McLanahan, S. S. (1991). Family structure, parental practices and high school completion. *American Sociological Review*, 56, 309-320.
- Canter, R. J. (1982). Family correlates of male and female delinquency. *Criminology*, 20, 149-167.
- Cernkovich, S. (1978). Evaluating two models of delinquency causation: Structural theory and control theory. *Criminology*, 16, 335-352
- Cernkovich, S. & Giordano, P. C. (1987). Family relationships and delinquency. *Criminology*, 25, 295-319.
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- Simcha-Fagan, O. & Schwartz, J. E. (1986). Neighborhood and delinquency: An assessment of contextual effects. *Criminology*, 24, 667-703.

- Simons, R. L., Robertson, J. F., & Downs, W. R. (1989). The nature of the association between parental rejection and delinquent behavior. Journal of Youth & Adolescence, 18, 297-310.
- Steinberg, L., Lamborn, S. D., Darling, N., Mounts, N. S., & Dornbush, S. M. (1994). Over-time changes in adjustment and competence among adolescents from authoritative, authoritarian, indulgent, & neglectful families. *Child Development*, 65, 754-770.
- Thompson, W. E., Mitchell, J., & Dodder, R. A. (1984) An empirical test of Hirschi's control theory of delinquency. *Deviant Behavior*, 5, 11-22.
- Thornton, W. E. (1982). Gender traits and delinquency involvement of boys and girls. *Adolescence*, 17, 749-768.
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- Marcos, A. C. (1985). Causal models of adolescent drug use in Arizona and Utah. Unpublished doctoral dissertation, Brigham Young University.
- Peeples, F. (1991). Working against the odds: Parents, neighborhoods, and juvenile delinquency. Unpublished doctoral dissertation, University of Pittsburgh.
- Vazsonyi, A. T. (1993). Interpersonal and intrapersonal variables predicting early adolescent substance use: A risk factor model. Unpublished doctoral dissertation, The University of Arizona.
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- Walls, C. H. (1994). Explaining adolescent alcohol use: An empirical test of social control and labeling theory. Unpublished masters thesis, Mississippi State University.

APPENDIX B

Appendix B Coding Frame

Study ID: Author: Source: Data Entry Decision: Reason for Rejection: Sample Characteristics: Sample size: Sampling procedure: Age of respondents: Gender: Mixed gender? Number of males: Number of females: Ethnicity: Geographic area: Country for sample: Correlation coefficient information:

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