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# ARE THERE MULTIPLE PATHS TO DELINQUENCY?\*

## DENVER YOUTH SURVEY\*\*

DAVID HUIZINGA  
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### ABSTRACT

Criminological research and theory generally proceed with the orientation, if not the assumption, that delinquency is the result of some series of events common to all delinquents. While some attention has been given to the concepts of typologies, multiple pathways, and different developmental sequences leading to different outcomes, rarely have these concepts been pursued empirically. This paper uses

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a typological approach to make a preliminary examination of the existence of multiple paths leading to delinquency. Data from the first two annual surveys of the Denver Youth Survey provide the basis for the analyses. The results support the notion that there is typological diversity in the backgrounds of youth who become delinquent, a diversity which, perhaps, should not be ignored.

## I. INTRODUCTION

The idea that there are multiple pathways to delinquency is not new. Many researchers have expressed the notion that the underlying causes leading to participation in delinquent behavior may be different for different individuals or for different types of individuals. Gibbons,<sup>1</sup> for example, referred to the existence of separate etiological accounts for different offenders and, perhaps, for different types of offenses. Loeber and Le Blanc<sup>2</sup> described different developmental sequences leading to delinquency, and Elliott, Ageton, and Canter,<sup>3</sup> in their theoretical formulation, used the terminology of multiple etiologies or multiple paths. Similarly, Farrington, Ohlin, and Wilson<sup>4</sup> discussed the role of different causal patterns and individual differences leading to delinquency. More akin to the approach used in this paper, Huizinga<sup>5</sup> and Brennan and Huizinga<sup>6</sup> relied upon dynamic typologies to describe the relationship across time between kinds of individuals, patterns of delinquent behavior and patterns of theoretically postulated causal variables. To some extent, the notions that the causes of any one behavioral act are complex and that no one theoretical orientation is likely to explain the delinquent acts of all individuals underlie the concept of multiple paths. On the other hand, the belief remains that these acts are not so dependent on such unique factors and situations that generalizations to certain groups or types of individuals are impossible. Some youth, for example, run away from home because of a poor family environment, some run away because they are pushed out from their homes, others run away for fun and excitement, and still

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<sup>1</sup> Gibbons, *The Assumption of the Efficacy of Middle-Range Explanations: Typologies*, in *THEORETICAL METHODS IN CRIMINOLOGY* 151 (R. Meier ed. 1985).

<sup>2</sup> Loeber & Le Blanc, *Toward a Developmental Criminology*, in 12 *CRIME & JUST.: A REVIEW OF RES.* 375 (M. Tonry & N. Morris eds. 1990).

<sup>3</sup> Elliott, Ageton & Canter, *An Integrated Theoretical Perspective on Delinquent Behavior*, 16 *J. RES. IN CRIME & DELINQ.* 27 (1979).

<sup>4</sup> D. FARRINGTON, L. OHLIN & J. WILSON, *UNDERSTANDING AND CONTROLLING CRIME: TOWARDS A NEW RESEARCH STRATEGY* (1986).

<sup>5</sup> D. Huizinga, *Dynamic Typologies: A Means of Exploring Multivariate Data* (1979) (paper presented at the Classification Society Meetings, Gainesville, FL).

<sup>6</sup> Brennan & Huizinga, *The Social Psychology of Runaways*, 3 *CLASSIFICATION SOC'Y BULL.* (1976).

others run away because they are "over-bonded" and over-protected at home.<sup>7</sup> Similarly, one might anticipate that some youth steal for different reasons, that some youth engage in violent behavior for different reasons, and that some youth use drugs for different reasons.

Recent empirical research indicates the potential importance of examining multiple paths. For example, research reviewed by Loeber<sup>8</sup> suggests that there may be different developmental sequences leading to delinquency among different age groups. Hill and Crawford<sup>9</sup> reported evidence of the importance of different variables in predicting involvement in criminal behavior among black and white women. Seydlitz<sup>10</sup> found that there may be an age and gender interaction in the relationship between parental attachment and delinquency. Similarly, Bailey and Hubbard<sup>11</sup> found evidence that factors influencing the initiation of marijuana use may vary by age. Finally, Elliott, Huizinga, and Ageton<sup>12</sup> discussed the finding that a non-linear interaction exists in pro-social and delinquent bonding leading to delinquency.

Although criminologists historically have been interested in the notion of multiple pathways leading to delinquency, little major theoretical or empirical work exploring this possibility has been undertaken. In addition, where researchers have tested for multiple pathways, the pathways usually are not well specified or are limited to a few variables. This lack of empirical attention to potential multiple pathways raises both theoretical and methodological issues.

Most theoretical presentations, including those integrated models that expand the conceptual base to include a wider range of theoretically important variables in a single model, seem to suggest that the effects of the causal variables work more or less the same for everyone. These presentations of omnibus models rarely attempt to consider the possibility that there may be multiple types of offenders with different patterns of offending and different developmental se-

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<sup>7</sup> T. BRENNAN, D. HUIZINGA & D. ELLIOTT, *THE SOCIAL PSYCHOLOGY OF RUNAWAYS* (1978) [hereinafter T. BRENNAN, *RUNAWAYS*]; D. FINKELHOR, G. HOTALING & A. SEDLAK, *MISSING, ABDUCTED, RUNAWAY, AND THROWN AWAY CHILDREN IN AMERICA* (monograph prepared for Office of Juvenile Justice and Delinquency Prevention, 1990).

<sup>8</sup> Loeber, *Development and Risk Factors of Juvenile Antisocial Behavior and Delinquency*, 10 *CLINICAL PSYCHOLOGY REV.* 1 (1990).

<sup>9</sup> Hill & Crawford, *Women, Race, and Crime*, 28 *CRIMINOLOGY* 601 (1990).

<sup>10</sup> Seydlitz, *The Effects of Gender, Age, and Parental Attachment on Delinquency: A Test for Interactions*, 10 *SOC. SPECTRUM* 209 (1990).

<sup>11</sup> Bailey & Hubbard, *Developmental Variation in the Context of Marijuana Initiation among Adolescents*, 31 *J. HEALTH & SOC. BEHAV.* 58 (1990).

<sup>12</sup> D. ELLIOTT, D. HUIZINGA & S. AGETON, *EXPLAINING DELINQUENCY AND DRUG USE* (1985) [hereinafter D. ELLIOTT, *EXPLAINING DELINQUENCY*].

quences associated with the onset, maintenance, or termination of involvement in delinquent behavior. It must be recognized, however, that the development of sound theoretical statements is no simple task; it requires a great deal of effort and innovative thought. The addition of multiple types or pathways increases the order of complexity of the theoretical models. However, if multiple pathways do exist, our explanation of delinquent behavior is incomplete if they are not taken into account. An important theoretical concern thus arises. Is there one underlying constellation of variables leading to delinquency that works more or less the same for everybody, or are there subsets of individuals, each subset having a common background and experience, for which the variables work differently? That is, are there different pathways to delinquent behavior?

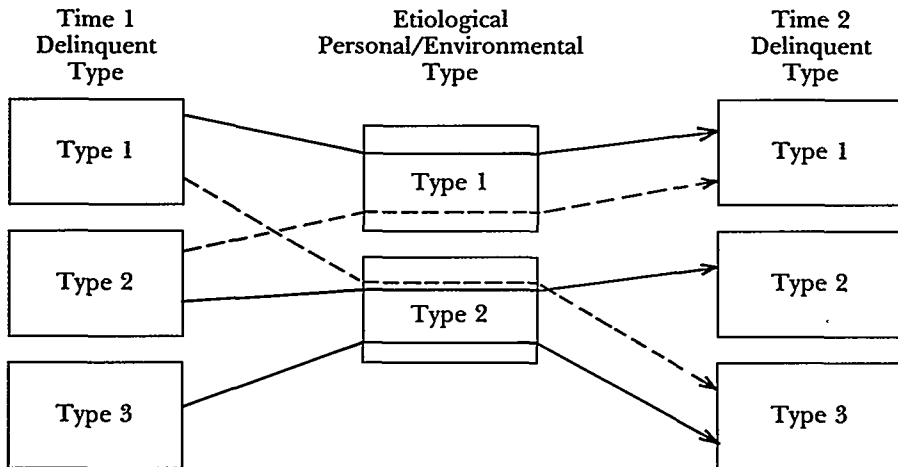
One methodological issue raised by the notion of multiple pathways is how such pathways are to be identified (presuming that they exist) using empirical data. Most of the current data analysis strategies used in examining theories of delinquency are designed to consider either all individuals as responding to theoretical variables in much the same way or all members of *pre-specified* subgroups as responding in the same way. That is, current analytic procedures are not designed to search for and identify types of individuals with different pathways to delinquency, or to identify the different covariance matrices involving non-linear interactions for different unspecified and unknown subgroups. Thus, it is unclear what "off-the-shelf" or "canned" analytical procedure can be used. While it conceivably might be possible to identify all the various pathways potentially specified in a theory, in practice, allowing for even a few bisected theoretical variables at a few points in time results in a plethora of types of individuals and raises other analytic issues as well.

Given these observations, the goal of the current paper is to provide a preliminary examination of the existence of multiple pathways to delinquency. Our approach is largely empirical. While we are somewhat favorably disposed to the idea of multiple pathways, whether there is one constellation of variables working more or less the same for everyone (*i.e.*, one general syndrome), or whether there are multiple syndromes with multiple etiological paths leading to delinquent behavior is an empirical issue. Although we rely on numerical taxonomy or cluster analytic methods, our orientation is not atheoretical. Our search is structured in data reflecting a general developmental model. On the other hand, given the current state of knowledge about multiple pathways, we believe an emphasis on taxonomic description is in itself valuable and consistent with Cattell's

dictum that “nosology precedes etiology.”<sup>13</sup>

The data used in this paper come from the Denver Youth Survey, an ongoing longitudinal study of the development of problem behavior among children and youth. The survey is a part of the Office of Juvenile Justice and Delinquency Prevention’s Program of Research on the Causes and Correlates of Delinquency. The taxonomic approach used employs a typology of children and youth based on their delinquent behavior at time 1, a typology of these individuals based on a set of theoretical factors that include both personal and environmental characteristics, and a final typology based on delinquent behavior at time 2. A simplified illustration is provided in Figure 1. This approach allows examination of potentially complex non-linear interactions in etiological variables as influences on the onset of delinquency as well as on increases or decreases in delinquent behavior. We seek to determine whether relatively distinct types of etiological environments exist that lead to initiation or changes in delinquent involvement. Although this examination uses a path that is “only one step long,” given the current state of knowledge about multiple paths, it seems reasonable at this stage to keep things relatively simple.

**FIGURE 1**  
**ILLUSTRATION OF A TAXONOMIC APPROACH TO MULTIPLE PATHS**



<sup>13</sup> Cattell, *Factor Analysis: An Introduction to the Essentials*, 21 *BIOMETRICS* 405 (1965).

## II. THE DENVER YOUTH SURVEY

### A. GENERAL DEVELOPMENTAL MODEL

The primary objective of The Denver Youth Survey (DYS) is to identify those social conditions, personal characteristics, social interactions, and developmental processes which are causally linked to the initiation, maintenance, and termination of delinquent behavior, drug use, and other problem behavior. The research is directed by a multidisciplinary theoretical paradigm which integrates variables typically employed by different academic disciplines. The explanatory model includes measures reflecting physiological, psychological, and social development; personal attributes and personality; primary socialization contexts such as the family and peer groups; social roles and role transitions; and the culture and social structure of larger social systems such as schools, neighborhoods, and communities. The measures of delinquency and crime, the primary dependent measures for the study, include both self-reported criminal behavior and arrests.

The scope of this study exceeds the limits of existing conceptual models concerning the etiology of crime and delinquency. To our knowledge, no existing general paradigm incorporates the full range of variables included in this study into a coherent explanation of delinquent behavior. A major thrust of theoretical work over the past decade has been toward the integration and synthesis of smaller-range theories. Some of this integration has already been accomplished and the integrated models are well supported.<sup>14</sup> Our

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<sup>14</sup> R. AKERS, *DEVIAN'T BEHAVIOR: A SOCIAL LEARNING PERSPECTIVE* (1977); D. ELLIOTT, *EXPLAINING DELINQUENCY*, *supra* note 12; R. JESSOR & S. JESSOR, *PROBLEM BEHAVIOR AND PSYCHOSOCIAL DEVELOPMENT: A LONGITUDINAL STUDY OF YOUTH* (1977); R. JOHNSON, *JUVENILE DELINQUENCY AND ITS ORIGINS* (1979); Cernkovich, *Evaluating Two Models of Delinquency Causation: Structural Theory and Control Theory*, 16 *CRIMINOLOGY* 335 (1978); Conger, *Juvenile Delinquency: Behavior Restraint or Behavior Facilitation?*, in *UNDERSTANDING CRIME: CURRENT THEORY AND RESEARCH* 131 (T. Hirschi & M. Gottfredson eds. 1980); Conger, *From Social Learning to Criminal Behavior*, in *CRIME, LAW AND SANCTIONS: THEORETICAL PERSPECTIVES* 91 (M. Krohn & R. Akers eds. 1978); Conger, *Social Control and Social Learning Models of Delinquent Behavior: A Synthesis*, 14 *CRIMINOLOGY* 17 (1976); Elliott, *The Assumption that Theories Can be Combined With Increased Explanatory Power: Theoretical Integrations*, in *THEORETICAL METHODS IN CRIMINOLOGY* (R. Meier ed. 1985); Hepburn, *Testing Alternative Models of Delinquency Causation*, 67 *J. CRIM. L. & CRIMINOLOGY* 450 (1977); Linden & Hackler, *Affective Ties and Delinquency*, 16 *PAC. SOC. REV.* 27 (1973); Meade & Marsden, *An Integration of Classic Theories of Delinquency*, in *YOUTH AND SOCIETY: STUDIES OF ADOLESCENT DEVIANCE* (A.C. Meade ed. 1981); Mednick, Pollock, Volauka & Gabrielli, Jr., *Biology and Violence*, in *CRIMINAL VIOLENCE* 85 (M. Wolfgang & N. Weiner eds. 1982); Patterson, Chamberlain & Reid, *A Comparative Evaluation of a Parent-Training Program*, 13 *BEHAV. THERAPY* 638 (1982); Thompson, Smith-Dijulio & Matthews, *Social Control Theory: Evaluating a Model for the Study of Adolescent Alcohol and Drug Use*, 13 *YOUTH & SOC'Y* 303 (1982).

own prior work (proposing a paradigm which integrates strain, social control, and learning perspectives) falls within this line of theoretical development. Elliott *et al.* tested this model in a longitudinal study of a national youth panel.<sup>15</sup> The current project builds upon this integrated social-psychological model by incorporating a social disorganization perspective that includes neighborhood characteristics identified as contributing to the etiology of crime and delinquency and by including biological variables that have been suggested as precursors to deviant behavior. By integrating the social psychological model with social disorganization theory and biological determinants, we created a general developmental model of the etiology of crime and delinquency. A focus of the study is to identify the combination of biological, economic, social, and psychological factors that explain why some youth initiate and continue involvement in serious delinquent behavior while other apparently similar youth do not.

The overall design of the research project is based on a prospective longitudinal survey. The longitudinal survey involves annual personal interviews with a probability sample of five different birth cohorts and their parents selected from areas of Denver, Colorado that have high risk for delinquency. The subjects consisted of 802 boys and 728 girls. At point of the first annual survey covering the 1987 period, the subjects were 7, 9, 11, 13 and 15 years of age. Of the 1,530 Year-1 respondents, slightly over 92% completed interviews in year 2.

The sampling procedure was designed to ensure that the sample included a sufficient number of serious chronic offenders for an analysis of their developmental patterns; at the same time, the sample procedure provided data on normal developmental processes and patterns. Both kinds of data are necessary to distinguish between normal and criminal developmental patterns and to determine the prevalence of various developmental patterns (particularly those which carry a high risk of violent or sustained criminal behavior).

Selection of survey respondents entailed a three stage process. First, we selected neighborhoods based upon their "high risk" status. Risk was determined by a social ecology analysis that identified "socially disorganized" areas, and by official crime rates. Second, all households in these communities were enumerated. Finally, interviewers were sent in person to a random sample of these addresses. This last stage required interviewers to speak with

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<sup>15</sup> D. ELLIOTT, EXPLAINING DELINQUENCY, *supra* note 12.



an adult and determine the ages of household members in approximately 20,000 households.<sup>16</sup>

All households with an appropriately aged child were eligible to participate in the study, and interviewers proceeded to interview the parent/guardian and all eligible youth in these households. The inclusion of all eligible children provided us with the ability to study families in general, and siblings more specifically. As a result of the sampling procedure, a large number of Black and Hispanic youth were included in the study; this will allow a careful examination of the relationship between race/ethnicity, social status, family background, and delinquency. The sample also included both "in-school" and "drop-out" youth.

#### B. MEASURES AND METHODS

The etiological or personal environment measures used to examine the existence of multiple pathways to delinquency were selected to represent some of the main constructs of the general developmental model. Because the measurement space of the DYS is wide ranging, even within theoretical constructs, we selected variables not only on the basis of their theoretical relevance but also on their empirical relationship to various forms of delinquent behavior. Although this selection process eliminated some potentially important variables (*e.g.*, social disorganization and secondary controls), it provided a reasonable collection of measures to use in this preliminary examination of multiple pathways. Once particular scales or variables were selected, we arranged them by theoretical construct. A second order factor analysis indicated that some of the measures within constructs could be combined into higher order measures and thus simplify the measurement space to be used. An outline of these higher order measures is provided in Figure 2, and the items included in the various scales are described in the Appendix. As demonstrated by Figure 2, a construct of a positive home is indicated by a combined measure of positive parenting and parental attachment, as perceived by a youth or child respondent. Although both parent and youth/child measures of these variables were available, based on our own previous work and that of our companion project in Albany,<sup>17</sup> we selected the youth/child measures because

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<sup>16</sup> For a more detailed description of the sample and ecological analysis, see Esbensen & Huizinga, *Community Structure and Drug Use: From a Social Disorganization Perspective*, 7 *Just. Q.* 691 (1990).

<sup>17</sup> M. Krohn, S. Stern, T. Thornberry & S. Jang, *Family Processes and Initiation of Delinquency and Drug Use: The Impact of Parent and Adolescent Perceptions* (1989) (unpublished manuscript).

**FIGURE 2**  
**VARIABLES USED IN PERSONAL ENVIRONMENT AND**  
**DELINQUENCY TYPOLOGIES**

Personal Environment Measures				
Positive Conventional Home	Parental Attitudes to Child Deviance	Youth Attitudes/ Beliefs	Youth Impulsive/ Hyperactive	Delinquent/ Conventional Behavior of Peers
Positive Parenting	Attitudes to Delinquency	Neutralization	Impulsive	Delinquent Behavior
Parental Attachment	Alcohol use  Drug use	Normlessness  Attitudes to Delinquency	Hyperactive	Conventional Behavior
Guilt Feelings				
Delinquency Measures				
Theft Offenses (Minor, Serious, Burglary)				
Assault Offenses (Minor, Serious)				
Status and Public Disorder Offenses (Curfew, Runaway, Unruly, Drunk, <i>etc.</i> )				
Other Offenses				

of their greater relevance in predicting delinquency.

A second parental construct involving parental attitudes toward delinquency and drug use was also selected. This construct included measures of the extent to which parents think it is wrong for their children to engage in delinquency and drug use. We selected this measure over other parenting measures because of its somewhat higher empirical correlation with several delinquency measures.

A third construct involves youth/child beliefs and attitudes. This composite construct included measures of neutralization (willingness to invoke reasons or excuses for delinquent behavior), normlessness (the feeling that rules must be violated to achieve desired goals), attitudes toward delinquent behavior (how wrong it is to engage in delinquent behavior), and feelings of guilt associated with performing delinquent acts.

An indication of impulsivity and/or hyperactivity is provided by a fourth construct. This measure is based on parent reports of their child's behavior. Finally, the delinquent and conventional orientations of peers is measured by a composite involving youth/child reports about the delinquent and conventional behaviors of their

friends, reflecting gender delinquency and less conventional behavior by friends.

We also based the selection of self-reported measures of delinquency used in the analysis of multiple pathways on a second-order factoring of a set of relatively homogeneous delinquency scales. A listing of the scales included in each of the higher order delinquency measures is outlined in Figure 2, and a listing of items included in each of the scales is included in the Appendix. Although similar in content, somewhat different items are employed in child (ages 7-9) and youth (age 11-15) delinquency scales, reflecting the differences in comprehension and experience of these different age groups. As indicated in Figure 2, delinquent offenses have been divided into theft offenses, assault offenses, status and public disorder offenses, and a collection of other offenses. The existence of some empirical justification for these higher order offense categories was fortuitous, since this simplification helped to decrease the complexity of the classification space.

The variables used in the analyses were also selected to reflect an appropriate temporal order. That is, Time 1 delinquency refers to the 1987 period, Time 2 delinquency refers to the 1988 period, and all of the etiological or personal environment variables either precede or are contemporaneous with Time 2 delinquency. In particular, all of the etiological variables, except the delinquency and conventionality of friends, reflect influences early in 1988. The measures of friends behavior involve the entire calendar year, and we have used the measure contemporaneous with Time 2 delinquency, believing that current friends may have a greater influence on behavior than do friends of the year just passed.

To search for the multiple types or pathways anticipated in the delinquent and etiological typologies, a K-means cluster analysis procedure was used. This procedure is an adaptation and modification of the method described by Sparks<sup>18</sup> that includes "collapsing of clusters" and the automatic identification of outliers. Because almost all cluster analysis routines will return a set of clusters, even when none are present, an evaluation of each clustering was conducted to examine the compactness, density, and separation of the derived clusters using methods described by Huizinga.<sup>19</sup>

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<sup>18</sup> Sparks, *Euclidean Cluster Analysis*, 22 APPLIED STATISTICS 126 (1973).

<sup>19</sup> For a description of the methods, see D. Huizinga, *Are There Any Clusters?* (1978) (paper presented at the Classification Society Meetings, Clemson, SC).

## C. RESULTS

1. *Etiological Typologies*

Analyses of standardized personal environment variables from the child sample (ages 7-9) with the K-means clustering algorithms suggested the existence of six clusters. Evaluation of the six cluster K-means partition, together with a separate K-means analysis using different initial starting points, indicated that the clustering was relatively stable. The evaluation also indicated that although the boundaries of the cluster were not well-separated in space, in each cluster the points were grouped around the cluster centroid. This suggests that the typology does not reflect isolated clusters in space, but rather groupings of relatively homogeneous points representing the differential density of points in the multivariate space. In a sense, the partition might be considered a "multivariate histogram" that locates swarms of points in the measurement space.

Examination of the standardized explanatory data from the youth sample (ages 11-15) with the K-means algorithms suggested the existence of five clusters. Evaluation of the five cluster partition from the K-means procedure indicated that they were very stable or robust. The evaluation also indicated that the cluster boundaries were not well separated and that the majority of points in each cluster were gathered about the cluster centroid. Thus, as in the child typology, this clustering does not represent isolated clusters but does reflect the differential density occurring in the data.

The profiles of the centroids of the clusters from the child and youth typologies are contained in Figures 3 and 4. Numerical tables describing the clusters are contained in the Appendix.

As Figure 3 illustrates, the first cluster in the child typology is a large cluster (N=263) containing children who have an average or positive home environment, who have parents with slightly higher than average attitudes about the wrongness of children's deviant behavior, who have personal beliefs or attitudes that are not supportive of delinquent behavior, who display less than average impulsivity/hyperactivity, and who report less than average delinquent/conventional behavior by their friends. The second cluster contains children characterized as having parents who do not believe that deviant behavior of children is as wrong as do other parents, but who are roughly average on the other variables. Children in the third cluster are characterized as having a less positive home than other children, and as having parents whose beliefs about the wrongness of deviant behavior is quite below that of other parents. These are children who have generally "pro-delinquent attitudes or

**FIGURE 3**  
**PROFILES OF CHILD PERSONAL ENVIRONMENTAL CLUSTERS**

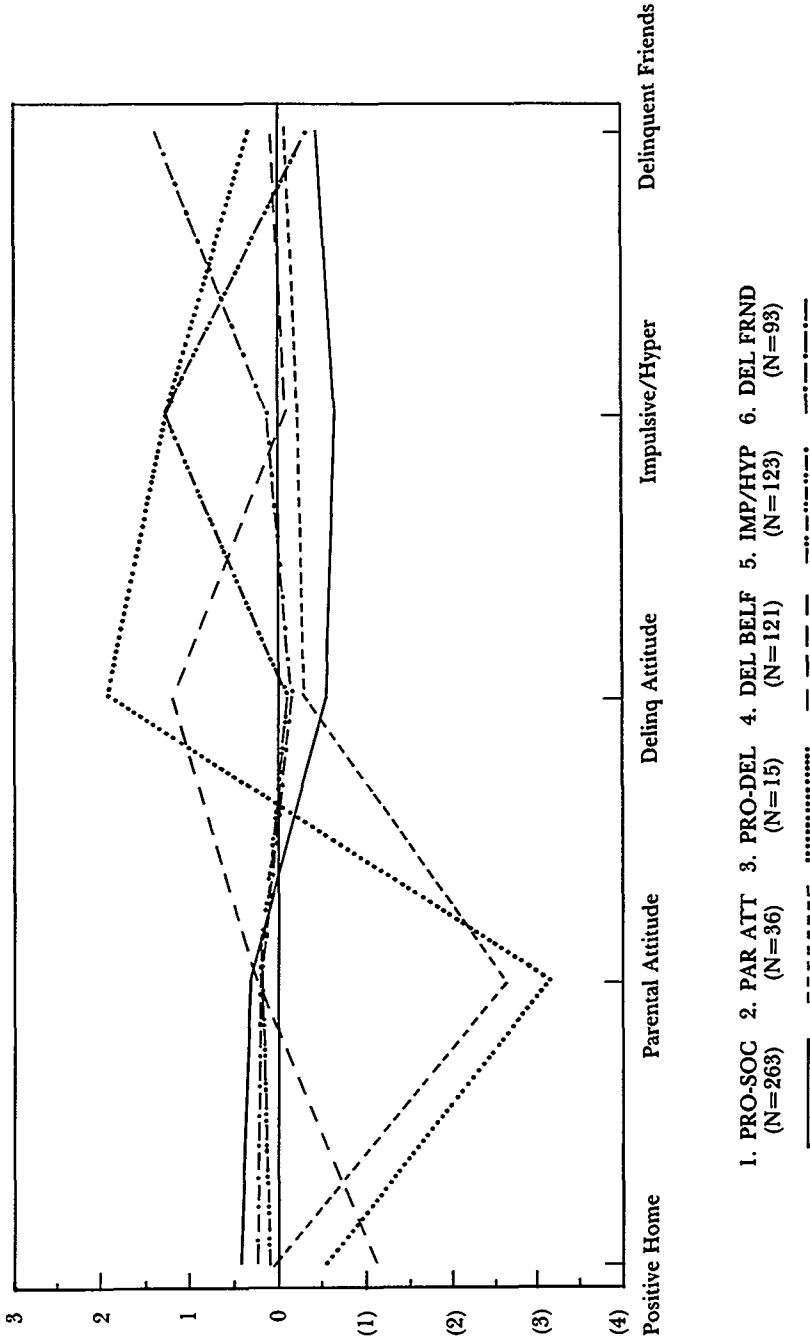
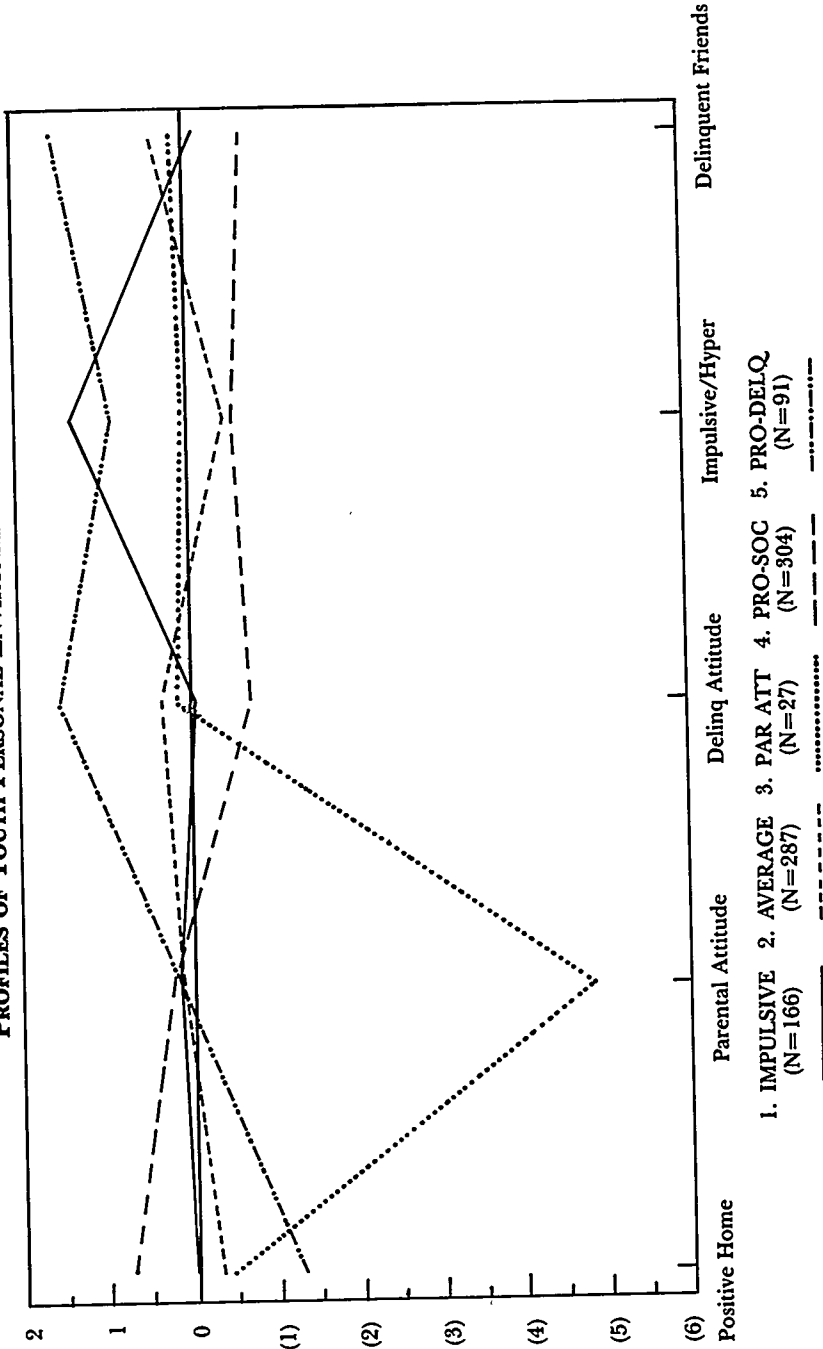


FIGURE 4  
PROFILES OF YOUTH PERSONAL ENVIRONMENTAL CLUSTERS



beliefs" and who are seen as being above average in impulsivity/hyperactivity. At the same time, these children report a slightly above average rate of delinquent/conventional behavior by their friends. The fourth cluster also contains children that have a less positive home and have pro-delinquent beliefs, but who are close to average in impulsivity and the delinquent behavior of their friends. The fifth cluster is essentially average, with the exception that these children are more impulsive and hyperactive than other children. Finally, the sixth cluster contains children who are generally average with the exception that they report a greater involvement in the delinquent behavior of their friends.

To provide some nomenclature, the clusters have been titled: Cluster One — Pro-Social; Cluster Two — Parent Attitudes; Cluster Three — Pro-Delinquent; Cluster Four — Delinquent Beliefs; Cluster Five — Impulsive/Hyperactive; Cluster Six — Delinquent Friends. As these clusters and their titles suggest, there appear to be differences in the "personal environments" of these children which may affect their delinquent behavior, an issue that will be examined later.

Several of the clusters encountered in the child typology are replicated in the youth typology. As illustrated in Figure 4, Cluster Four is similar to the Pro-Social Child Cluster; Cluster Three is similar to the Parent Attitudes Cluster; Cluster Five is similar to the Pro-Delinquent Cluster but additionally reflects involvement with delinquent friends; and Cluster One is similar to the Impulsive/Hyperactive Cluster. In addition, one youth cluster is essentially average on all variables, although it is slightly below average in impulsivity. This cluster has been entitled "Average." The youth typology also reflects differences in the personal environments of these youth that might be anticipated to affect their delinquent behavior.

## 2. *Delinquency Typologies*

We created delinquency typologies for both children and youth samples for the period covered by the first annual survey (1987) and for the period covered by the second annual survey (1988). Preliminary examination of the child delinquency data suggested a ten-cluster partition that was reasonably stable and robust, and in which most clusters were quite homogeneous. Two large clusters emerged. The first, a "non-delinquent" cluster (N=279), and the second, a "low-level" cluster (N=229), contained children reporting on the average less than one theft, about 3.5 assaults, and less than one status/public disorder and other offenses. In addition to

these two clusters, there were a number of smaller clusters that reflected different patterns of greater involvement in delinquent behavior. These clusters had substantially higher than average involvement in one or more of the types of delinquency measured. Although there might be merit in maintaining each of these clusters in further analyses, we combined them into one large group entitled "Higher Level Delinquents."

Essentially the same kinds of clusters were found for the youth sample. Specifically, we discovered a non-delinquent cluster (N=313) and a low level delinquency cluster (N=347) that contained youths who committed on the average less than one theft, one assault, three status/public disorder offenses, and one other offense. A number of other, smaller clusters representing different patterns of frequency of involvement in the different types of offenses were also found. Given the smaller cluster sizes, we also collapsed these into one higher level delinquency group.

Quite similar clusters were found for both year 1 and year 2 for the child and youth delinquency typologies.

### 3. *Transitions In Types*

The transition matrices between delinquent types at Time 1 and delinquent types at Time 2 for both child and youth samples is provided in Table 1. As that table demonstrates, a good deal of movement occurred between the types from year to year. For the child sample, approximately two-thirds of the non-delinquents remained non-delinquents, while approximately one-third initiated or "re-initiated" delinquent behavior. As might be anticipated, the majority of these entered the low-level delinquent category. Among child low-level delinquents, slightly less than one-half stayed in that category in the next year, while one-quarter moved to the higher delinquency category, and slightly less than one-third reported engaging in no delinquencies in the following year. Among children in the higher delinquency category, 43% remained in that category, 34% moved to the low-level delinquent category, and 24% moved to the non-delinquent category.

For the youth sample, 64% of the non-delinquents remained in that category the following year and 36% initiated or "re-initiated" delinquent behavior, with most entering the low-level delinquent category. These rates are very similar to the child sample. Among low-level delinquents, 59% remained in that category, 22% returned to a non-delinquent status, and 19% entered the higher-level delinquency class. Of the higher-level delinquents, 52% remained



**TABLE 1**  
**TRANSITION MATRICES**  
**DELINQUENCY TYPES TIME 1 TO DELINQUENCY TYPES TIME 2**

Child Sample		Delinquency Types Time 2			Row Total
		0	1	2	
Delinquency Types Time 1	Count				
	Row Pct				
	Col Pct				
	0	165 63.0% 63.5%	71 27.1% 33.5%	26 9.9% 19.3%	262
	1	63 29.9% 24.2%	96 45.5% 45.3%	52 24.6% 38.5%	211
	2	32 23.9% 12.3%	45 33.6% 21.2%	57 42.5% 42.2%	134
Column Total	260 42.8%	212 34.9%	135 22.2%	607 100.0%	

Youth Sample		Delinquency Types Time 2			Row Total
		0	1	2	
Delinquency Types Time 2	Count				
	Row Pct				
	Col Pct				
	0	185 64.0% 67.0%	88 30.4% 25.4%	16 5.5% 8.9%	289
	1	68 21.5% 24.6%	187 59.2% 53.9%	61 19.3% 33.9%	316
	2	23 11.6% 8.3%	72 36.4% 20.7%	103 52.0% 57.2%	198
Column Total	276 34.4%	347 43.2%	180 22.4%	803 100.0%	

## Legend

0 - Non-Delinquent    1 - Low Level Delinquent    2 - Higher Level Delinquent

in that category, and 48% moved to the lower-delinquent or non-delinquent types.

These transition matrices illustrate that regardless of age or delinquent type, the most prevalent transition from one year to the next is to remain in that same type. However, there is substantial movement to higher and lower levels of delinquency involvement, with the majority of movement being to an adjacent category.

Given these various transitions, two questions are raised in this paper: first, do the personal environments of these children and youth help explain these transitions?; and second, are there multiple environments leading to involvement, increases, or decreases in delinquent behavior? Before examining these issues, however, it should be noted that a relationship exists between the personal environment typology and the delinquency level typologies for both years and for both child and youth samples (Chi square was significant at the 0.01 level for all but year one for the child sample). That is, the proportion of children or youth classified as low or high level delinquent was higher for some types of personal environments than for others. Because the variables upon which the personal environment typology is based were selected as variables relevant to the explanation of delinquency, the relationship between the personal and delinquent typologies is not too surprising.

It is interesting, however, that in both the child and youth samples, the cluster reflecting a more positive home and a pro-social orientation of the child or youth is responsible for much of the relationship. These clusters were more likely to contain non-delinquents and less likely to contain higher level delinquents. In contrast, in the child sample, the cluster reflecting delinquent or less conventional friends, and in the youth sample, the clusters reflecting a negative home, a delinquent orientation, and delinquent or less conventional friends, disproportionately overlapped the higher delinquent type and were less likely to contain non-delinquents.

Although a relationship exists between the personal and delinquency typologies, it is important to note that a substantial number of children and youth in each personal environment type were classified as non-delinquent, low-level delinquent, and as higher-level delinquent. Delinquent involvement is not unique to any one personal environment type. Also, it should be noted that the "influence" of the Year-1 personal typology on delinquent behavior is not in the correct temporal order. Most personal environment variables are measured after the Time-1 delinquency period. Conceivably, the children's personal environment could be relatively stable over time or they may result, in part, from previous delinquent behavior,

but the data used in this paper do not allow this issue to be addressed.

To examine further the role of the personal environments in explaining the transitions between delinquency types, we constructed a transition matrix of the cross-classification of the Time-1 delinquency types by the personal environment types to the Time-2 delinquency types. These transition matrices represent the probability that a child or youth with a given delinquent behavior pattern at Time 1 and having a particular personal environment will display a particular delinquent behavior pattern at Time 2. Thus, consistency and change in delinquent behavior as filtered through the personal environments can be examined. The transition matrices are presented for the child and youth samples in Tables 2 and 3, respectively. The first column of figures in these tables provides the size and percentage of each personal environment within the respective Time-1 delinquency types. The next three columns provide the number and percent of these delinquency/personal environment types that are classified into the Time-2 delinquency types. For example, in the child table, the pro-social type makes up 42% of the Time-1 non-delinquents. Of this group, 70% remained non-delinquents, while 22% and 8% moved to the low-level and higher-level Time-2 delinquency types. Because some cross-classifications result in very small groups, transition probabilities are likely to be unstable and therefore are not provided for groups of less than ten.

Examination of differences in transitions for the child sample suggests that the personal environments may provide some protective as well as some risk factors. For example, among non-delinquents, having a personal environment that includes delinquent or less conventional friends appears to be strongly related to initiation or "re-initiation" of delinquency. Similarly, being in the cluster of impulsive/hyperactive also appears related to initiation. In these non-delinquent groups at Time 1, 63% of those with delinquent friends and 43% of those in the impulsive group initiated delinquent behavior in the following year, compared to 33% or less for the other groups. Among higher level delinquents, having a personal environment that includes a positive home and conventional attitudes appears to reduce delinquency involvement, while being in the three groups described as impulsive, having delinquent friends, or having parents with weak attitudes about child deviance appear to sustain the higher level involvement.

Examination of differences in transition probabilities for the youth sample also reveals differences in transition rates among dif-

**TABLE 2**  
**CHILD TRANSITIONS**

Delinquency Time 1 → Personal Environment → Delinquency 2			Delinquency Type Time 2			
Delinquency Type Time 1	Personal Environment Type	N %		Non-Delinq	Low-Level Delinq	Higher-Level Delinq
NON DELINQUENT	Pro-social	110 42	N %	77 70	24 22	9 8
	Parent Attitude	14 5	N %	11 79	1 7	2 4
	Pro-delinquent	5 2	N %	3	2	0
	Delinquent Beliefs	52 20	N %	35 67	11 21	6 12
	Impulsive/Hyperactive	44 17	N %	25 57	18 41	1 2
	Delinquent Friends	35 14	N %	13 37	14 40	8 23
N=260				Chi Sq 24.6	10df	Sig .006
LOW LEVEL	Pro-social	91 43	N %	24 26	45 50	22 24
	Parent Attitude	9 4	N %	5	2	2
	Pro-delinquent	5 2	N %	2	3	0
	Delinquent Beliefs	35 17	N %	8 23	19 54	8 23
	Impulsive/Hyperactive	39 19	N %	16 41	12 31	11 28
	Delinquent Friends	32 15	N %	8 25	15 47	9 28
N=211				Chi Sq 10.7	10df	Sig .38
HIGHER LEVEL	Pro-social	38 28	N %	10 26	18 47	10 26
	Parent Attitude	11 8	N %	1 9	3 27	7 64
	Pro-delinquent	5 4	N %	2	1	2
	Delinquent Beliefs	24 18	N %	6 25	9 37	9 37
	Impulsive/Hyperactive	30 22	N %	11 37	4 13	15 50
	Delinquent Friends	26 19	N %	2 7	10 39	14 54
N=134				Chi Sq 17.9	10df	Sig .06

**TABLE 3**  
**YOUTH TRANSITIONS**

Delinquency Time 1 → Personal Environment → Delinquency 2			Delinquency Type Time 2		
Delinquency Type Time 1	Personal Environment Type	N %	Delinquency Type Time 2		
			Non- Delinq	Low- Level Delinq	Higher- Level Delinq
N O N  D E L I N Q U E N T	Impulsive	51	N 29	17	5
		18	% 57	33	10
	Average	67	N 39	21	7
		23	% 58	31	10
	Parent Attitude	7	N 6	1	0
		2	%		
	Positive Pro-social	157	N 107	47	3
		54	% 69	30	2
	Pro-delinquent	7	N 4	2	1
		2	%		
N=289			Chi Sq 12.2	8df	Sig .14
L O W	Impulsive	65	N 16	37	12
		21	% 25	57	18
	Average	120	N 22	72	26
		38	% 18	60	22
	Parent Attitude	10	N 4	5	1
		3	% 40	50	10
	Positive Pro-social	102	N 20	66	16
		32	% 20	65	16
	Pro-delinquent	19	N 6	7	6
		6	% 32	37	32
N=316			Chi Sq 11.0	8df	Sig .19
L E V E L	Impulsive	39	N 4	19	16
		20	% 10	49	41
	Average	78	N 7	27	44
		40	% 9	35	56
	Parent Attitude	4	N 0	3	1
		2	%		
	Positive Pro-social	19	N 4	8	7
		10	% 21	42	37
	Pro-delinquent	57	N 8	15	34
		29	% 14	26	60
N=198			Chi Sq 11.4	8df	Sig .18

ferent initial delinquent types and personal environment types, although none of the differences are sufficiently large to result in a significant chi-square. Among non-delinquents, being in a pro-delinquent personal environment appears to increase the probability of moving to a higher involvement in delinquency in the following year. Among higher level delinquents, those with a positive home and conventional orientation were more likely to decrease their delinquent involvement than were other types, while those with a negative home and pro-delinquent orientation were more likely to maintain their classification as higher-level delinquents.

Although there are a number of differences in transition probabilities between groups of different initial delinquency levels and personal environments, it is also important to note that each of the Time-2 delinquency types contain a substantial number of individuals from most of the Time-1 "delinquency by personal environment" types. These results clearly demonstrate that multiple paths leading to increased delinquency involvement do exist, and, given the observed differences in transition probabilities, that there may be different explanations for different paths.<sup>20</sup>

To examine potential differences by sex in the child and youth samples, the above sequence of analyses was replicated separately for girls and boys. Although there are some differences, as noted below, the same general pattern of findings held for both sexes. At best, differences might be described as "variations on a theme." As might be anticipated, in the delinquency clusters girls are somewhat over-represented in the non-delinquent clusters and under-represented in the higher-involvement clusters. Using the Time 2 Delinquency Typology as an example, the child sample is 52% male and 48% female, but the higher delinquency cluster is 57% male and 43% female. Similarly, the youth sample is 53% male and 47% female, but the higher delinquency cluster is 61% male and 39% female. As these percentages suggest, substantial numbers of both males and females are contained in each delinquency cluster.

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<sup>20</sup> We initially anticipated that differences in covariance matrices between Time 1 Delinquency - Personal environment types could be demonstrated with simple linear regressions. However, the restriction of range brought about by the cluster analyses in both the dependent and independent variables did not allow this to occur in a meaningful or insightful way. For example, in the youth sample, the pro-delinquent cluster had an essentially zero regression coefficient for the influence of delinquent friends, while it was positive and of moderate size for the other clusters. The conclusion is not that delinquent friends do not influence the members of a pro-delinquent cluster but rather that all members of this cluster have high scores on the delinquency of friends variable. Thus this variable was not important in predicting the frequency of delinquency among members of the pro-delinquent group.

The personal environment typology also shows some relationship to sex; however, for the child sample, the association is not statistically significant at even the 0.10 level. In both samples, boys are somewhat more likely to be classified as impulsive/hyperactive and girls are somewhat more likely to be classified as having a positive home and a conventional orientation, but none of these differences is significant.

The delinquency Time-1 — Personal Environment — Delinquency Time-2 transition matrices are also generally similar for both sexes. Although some transition probabilities vary between the sexes, the same general patterns observed for the total child and youth samples are the same for both sexes. Given this overall similarity of findings, separate tables for each sex are not provided.

We also performed a separate sequence of analyses using a finer grained delinquency typology (non-delinquent, low-level delinquency, moderate delinquency, and high-level delinquency) to determine if one or more of the prior delinquency and personal environment types would account for a high-level delinquency group. The findings, however, were similar to the three group partition presented above. Even the high delinquency child and youth clusters contained individuals from most of the personal environment types.

### III. CONCLUSION

Given these various findings, what conclusions seem warranted? First, typological diversity does appear among the child and youth samples in the etiological or explanatory variables, and there is some indication of a differential relationship between these types and involvement in delinquent behavior. Second, those classified as delinquent, even those classified as very high delinquents, included individuals from most of the different personal environment types. We believe that other variables not included in these preliminary analyses may account for the tendency of some of the children and youth in particular types, such as those in generally pro-social environments with conventional orientations, to engage in delinquency. However, it seems clear that individuals in quite different personal environments and prior levels of delinquency are classified as delinquent. That is, multiple paths to delinquency do appear to exist.

But what does this mean in practice? The findings suggest that in both theory and analyses, it may be appropriate, and, perhaps, necessary to pay greater attention to the possibility of typological diversity. Also, it may be that it will prove useful to examine the

developmental changes in personal environments that lead to increases and sustained involvement in delinquent behavior. As more waves of the Denver Youth Survey become available, such an examination will become possible.



## APPENDIX

## TABLE A-1

SCALE COMPOSITION OF VARIABLES USED IN ETIOLOGICAL AND  
DELINQUENCY TYPOLOGIES.

## POSITIVE HOME

## Positive Parenting

When you do something your parents approve of how often do they . . .

1. give you a wink or smile?
2. say something nice about it?
3. give you a hug?
4. give you a reward?
5. mention it to someone else?

## Parental Attachment

How much do you agree or disagree that . . .

1. you enjoy talking things over with your parents.
2. you confide in your parents.
3. your parents don't understand your problems (reverse).
4. your parents make you feel trusted.
5. your parents are always picking on you (reverse).
6. you can go to your parents for advise and guidance.
7. your parents praise you when you do something well.
8. you would like to be the kind of person your mother is.

Youth Alpha=.76

Child Alpha=.65

## PARENTAL ATTITUDES TOWARD DEVIANCE

## Parental Attitude Toward Delinquency

How wrong do you think it is for someone your child's age to . . .

1. skip school without an excuse?
2. lie, disobey, or talk back to adults?
3. purposely damage or destroy others property?
4. steal something less than \$5?
5. steal something worth \$50?
6. steal something worth \$100?
7. go into building to steal?
8. go joyriding?
9. hit someone with the idea of hurting them?
10. attack someone with a weapon?
11. use force to get money or things?
12. sell drugs?

Alpha for Youth Sample=.86

Alpha for Child Sample=.87

## Parental Attitude Toward Alcohol Use

How wrong do you think it is for someone your child's age to . . .

1. use alcohol?

## Parental Attitude Toward Drug Use

How wrong do you think it is for someone your child's age to . . .

1. use marijuana?
2. use hard drugs such as heroin, cocaine, or LSD?

Alpha for Youth Sample=.64

Alpha for Child Sample=.68

## YOUTH ATTITUDES TOWARD DELINQUENCY

## Normlessness

1. Sometimes it's necessary to lie to teachers.
2. You can make it in school without having to cheat on tests (reverse).
3. It's important to do your own work (reverse).

TABLE A-1 (Continued)

4. It's sometimes necessary to play dirty to win.
5. Making a good impression is more important than telling truth to teachers.
6. Making a good impression is more important than telling truth to friends.
7. It's okay to break the rules to be popular.
8. To gain respect, it's sometimes necessary to beat up on others.
9. It's okay to lie to protect friends.
10. Making a good impression is more important than telling truth to parents.
11. You should always be honest with your parents.
12. It's sometimes necessary to lie to keep your parents' trust.
13. It may be necessary to break parents' rules to keep their trust.

Youth Alpha=.75

Child Alpha=.66

## Neutralization

1. It's okay to skip school if you missed the bus.
2. It's okay to skip school if your family needs you.
3. It's okay to skip school if your teachers don't make school fun.
4. It's okay to tell a small lie if it doesn't hurt anyone.
5. It's okay to lie if it will keep friends out of trouble.
6. It's okay to lie if it will keep you out of trouble.
7. It's okay to steal from the rich.
8. It's okay to take little things from stores.
9. It's okay to steal if that's the only way you will ever have it.
10. It's okay to fight if they hit first.
11. It's okay to fight to protect your rights.
12. It's okay to fight if your family is threatened.

Youth Alpha=.77

Child Alpha=.69

## Attitudes Towards Delinquency

How wrong is it to . . .

1. skip school without an excuse?
2. lie, disobey, or talk back to adults?
3. purposely damage or destroy others property?
4. steal something less than \$5?
5. steal something worth \$50?
6. steal something worth \$100?
7. go into building to steal?
8. go joyriding?
9. hit someone with the idea of hurting them?
10. attack someone with a weapon?
11. use force to get money or things?
12. sell drugs?

Youth Alpha=.89

Child Alpha=.88

## Guilt

How guilty would you feel if you . . .

1. skipped school without an excuse?
2. lied?
3. cheated on a school test?
4. stole something worth \$5?
5. stole something worth \$50?
6. beat someone up to steal?
7. attacked someone with the idea of hurting them?

Youth Alpha=.81

Child Alpha=.86

TABLE A-1 (Continued)

## IMPULSIVE/HYPERACTIVE

## Impulsive

Do you agree or disagree that your child . . .

1. is impulsive?
2. demands things immediately?
3. is easily frustrated?
4. is impatient?

Alpha for Youth Sample=.78

Alpha for Child Sample=.73

## Hyperactive

Do you agree or disagree that your child . . .

1. can't concentrate?
2. is restless, can't sit still or hyperactive?
3. fidgets?
4. has explosive or unpredictable behavior?
5. is disruptive in school?
6. is inattentive, easily distracted?

Alpha for Youth Sample=.80

Alpha for Child Sample=.76

## DELINQUENT FRIENDS

## Friends' Delinquent Activities

During the past year how many of your friends . . .

1. skipped school without an excuse?
2. lied, disobeyed, or talked back to adults?
3. purposely damaged or destroyed others property?
4. stole something less than \$5?
5. stole something worth \$50?
6. stole something worth \$100?
7. went into building to steal?
8. went joyriding?
9. hit someone with the idea of hurting them?
10. attacked someone with a weapon?
11. used force to get money or things?
12. sold drugs?

## Friends' Conventional Activities

During the past year how many of your friends . . .

1. have been involved in school activities?
2. have been involved in school athletics?
3. got along well with teacher and adults at school?
4. were good students?
5. have been involved in community activities?
6. have been involved in religious activities?
7. were considered good citizens?
8. took part in family activities?
9. never got into trouble at home?
10. never got into trouble at school?
11. were honest?
12. obeyed school rules?

## SELF-REPORTED DELINQUENCY SCALES AND ITEMS

## Theft

1. Stolen or tried to steal money or things worth less than \$5.
2. Stolen or tried to steal money or things worth between \$5 and \$50.
3. Stolen or tried to steal money or something worth more than \$50 but less than \$100.
4. Stolen or tried to steal money or something worth \$100 or more.

TABLE A-1 (Continued)

5. Gone joyriding, that is, taken a motor vehicle such as a car for a ride or drive without the owner's permission.
  6. Stolen or tried to steal a motor vehicle such as a car or motorcycle.
  7. Gone into or tried to go into a building to steal something.
- Assault
1. Attacked someone with a weapon or with the idea of seriously hurting or killing them.
  2. Hit someone with the idea of hurting them.
  3. Thrown objects such as rocks or bottles at people.
  4. Been involved in gang fights.
  5. Physically hurt or threatened to hurt someone to get them to have sex with you.
  6. Had or tried to have sexual relations with someone against their will.
- Public Disorder
1. Run away from home.
  2. Skipped classes without an excuse.
  3. Broken city curfew laws.
  4. Hitchhiked where it was illegal to do so.
  5. Been loud, rowdy, or unruly in a public place so that people complained about it or you got in trouble.
  6. Begged for money or things from strangers.
  7. Made obscene telephone calls such as calling someone and saying dirty things.
  8. Been drunk in a public place.
  9. Been paid for having sexual relations with someone.
- Other
1. Lied about your age to get into someplace or to buy something, for example, lying about your age to get into a movie or to buy alcohol.
  2. Used checks illegally or used a slug or fake money to pay for something.
  3. Used or tried to use credit or bank cards without the owner's permission.
  4. Tried to cheat someone by selling them something that was worthless or not what you said it was.
  5. Avoided paying for things such as movies, bus or subway rides, food, or computer services.
  6. Purposely damaged or destroyed property that did not belong to you.
  7. Purposely set fire to a house, building, car, or other property or tried to do so.
  8. Used a weapon, force, or strongarm methods to get money or things from people.
  9. Snatched someone's purse or wallet or picked someone's pocket.
  10. Sold marijuana or hashish.
  11. Sold hard drugs such as heroin, cocaine, and LSD.

Note: The scales listed are for the youth. The child scales are comprised of a smaller domain of the behaviors listed above.

**TABLE A-2**  
**CHILD PERSONAL ENVIRONMENT TYPOLOGY**

Cluster Number 1						
264 Elements with Average Squared Deviation						1.688
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Pos Home	0.424	0.812	4.184	0.434	3.957	0.535
Par Att	0.306	0.174	11.953	0.126	11.732	0.723
Att Del	-0.542	0.559	-3.227	0.561	-2.683	1.005
Imp/Hyp	-0.639	0.480	2.465	0.384	2.977	0.800
Del Frnd	-0.418	0.680	-0.906	0.310	-0.716	0.456
Cluster Number 2						
36 Elements with Average Squared Deviation						4.261
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Pos Home	0.017	0.852	3.966	0.456	3.957	0.535
Par Att	-2.634	1.092	9.826	0.790	11.732	0.723
Att Del	-0.289	0.640	-2.974	0.644	-2.683	1.005
Imp/Hyp	-0.222	0.774	2.799	0.619	2.977	0.800
Del Frnd	-0.062	0.952	-0.744	0.434	-0.716	0.456
Cluster Number 3						
15 Elements with Average Squared Deviation						13.400
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Pos Home	-0.558	1.034	3.659	0.552	3.957	0.535
Par Att	-3.131	0.863	9.467	0.624	11.732	0.723
Att Del	1.924	1.211	-0.749	1.217	-2.683	1.005
Imp/Hyp	1.256	1.017	3.981	0.814	2.977	0.800
Del Frnd	0.330	1.069	-0.565	0.487	-0.716	0.456
Cluster Number 4						
121 Elements with Average Squared Deviation						1.830
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Pos Home	-1.119	0.887	3.359	0.474	3.957	0.535
Par Att	0.242	0.295	11.907	0.214	11.732	0.723
Att Del	1.185	0.954	-1.492	0.959	-2.683	1.005
Imp/Hyp	-0.079	0.796	2.913	0.637	2.977	0.800
Del Frnd	0.089	0.886	-0.675	0.404	-0.716	0.456
Cluster Number 5						
123 Elements with Average Squared Deviation						2.318
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Pos Home	0.091	0.838	4.006	0.448	3.957	0.535
Par Att	0.210	0.407	11.884	0.295	11.732	0.723
Att Del	-0.098	0.643	-2.781	0.646	-2.683	1.005
Imp/Hyp	1.285	0.806	4.005	0.645	2.977	0.800
Del Frnd	-0.315	0.703	-0.859	0.321	-0.716	0.456

TABLE A-2 (Continued)

	Cluster Number 6					
	93 Elements with Average Squared Deviation					
	Stand	Stand	Raw	Raw	Total	Total
	Cluster	Cluster	Cluster	Cluster	Mean	SD
	Mean	SD	Mean	SD		
Pos Home	0.229	0.726	4.080	0.388	3.957	0.535
Par Att	0.175	0.380	11.859	0.275	11.732	0.723
Att Del	-0.129	0.760	-2.813	0.764	-2.683	1.005
Hyper	0.124	0.813	3.076	0.651	2.977	0.800
Del Frnd	1.404	0.820	-0.076	0.374	-0.716	0.456

**TABLE A-3**  
**YOUTH PERSONAL ENVIRONMENT TYPOLOGY**

Cluster Number 1						
166 Elements with Average Squared Deviation						
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
Pos Home	0.013	0.927	6.133	0.794	6.122	0.857
Par Att	0.129	0.534	11.576	0.810	11.381	1.518
Del Att	-0.089	0.685	-1.267	1.020	-1.135	1.490
Imp/Hyp	1.330	0.767	4.114	0.663	2.965	0.864
Del Frnd	-0.160	0.627	-1.375	0.632	-1.213	1.009
Cluster Number 2						
287 Elements with Average Squared Deviation						
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
Pos Home	-0.309	0.708	5.857	0.607	6.122	0.857
Par Att	0.102	0.564	11.536	0.856	11.381	1.518
Del Att	0.322	0.744	-0.655	1.109	-1.135	1.490
Imp/Hyp	-0.459	0.486	2.568	0.420	2.965	0.864
Del Frnd	0.352	0.746	-0.858	0.753	-1.213	1.009
Cluster Number 3						
27 Elements with Average Squared Deviation						
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
Pos Home	-0.441	0.866	5.744	0.742	6.122	0.857
Par Att	-4.836	0.392	4.037	0.596	11.381	1.518
Del Att	0.142	0.780	-0.923	1.161	-1.135	1.490
Imp/Hyp	0.040	0.167	3.000	0.144	2.965	0.864
Del Frnd	0.100	0.894	-1.112	0.902	-1.213	1.009
Cluster Number 4						
304 Elements with Average Squared Deviation						
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
Pos Home	0.718	0.647	6.737	0.555	6.122	0.857
Par Att	0.226	0.408	11.724	0.619	11.381	1.518
Del Att	-0.737	0.657	-2.232	0.978	-1.135	1.490
Imp/Hyp	-0.567	0.500	2.476	0.432	2.965	0.864
Del Frnd	-0.722	0.647	-1.941	0.653	-1.213	1.009
Cluster Number 5						
91 Elements with Average Squared Deviation						
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
Pos Home	-1.285	1.028	5.021	0.881	6.122	0.857
Par Att	0.117	0.562	11.559	0.854	11.381	1.518
Del Att	1.517	0.864	1.125	1.287	-1.135	1.490
Imp/Hyp	0.866	1.063	3.713	0.918	2.965	0.864
Del Frnd	1.510	0.911	0.311	0.919	-1.213	1.009

**TABLE A-4**  
**CHILD DELINQUENCY TYPOLOGY TIME 1**

Cluster Number 0						
279 Elements with Average Squared Deviation						0.000
Cluster Number 1						
28 Elements with Average Squared Deviation						0.893
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	0.481	0.525	2.256	1.814	0.595	3.453
Assault	0.685	0.513	9.536	5.267	2.498	10.277
St/Dis	0.902	0.447	2.679	1.219	0.216	2.728
Other	0.344	0.433	1.990	1.987	0.413	4.584
Cluster Number 2						
9 Elements with Average Squared Deviation						2.129
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	2.691	0.987	9.889	3.408	0.595	3.453
Assault	0.308	0.872	5.667	8.958	2.498	10.277
St/Dis	0.124	0.372	0.556	1.014	0.216	2.728
Other	0.670	0.723	3.486	3.315	0.413	4.584
Cluster Number 3						
229 Elements with Average Squared Deviation						0.241
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	-0.053	0.243	0.413	0.838	0.595	3.453
Assault	0.101	0.359	3.540	3.692	2.498	10.277
St/Dis	-0.004	0.174	0.205	0.475	0.216	2.728
Other	-0.016	0.156	0.339	0.714	0.413	4.584
Cluster Number 4						
12 Elements with Average Squared Deviation						1.265
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	0.127	0.446	1.033	1.542	0.595	3.453
Assault	1.225	0.939	15.083	9.653	2.498	10.277
St/Dis	0.165	0.451	0.667	1.231	0.216	2.728
Other	2.981	0.765	14.077	3.506	0.413	4.584
Cluster Number 5						
4 Elements with Average Squared Deviation						5.143
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	1.035	1.493	4.168	5.155	0.595	3.453
Assault	2.287	0.778	26.000	8.000	2.498	10.277
St/Dis	3.586	2.095	10.000	5.715	0.216	2.728
Other	4.538	1.685	21.215	7.726	0.413	4.584



TABLE A-4 (Continued)

Cluster Number 6						
4 Elements with Average Squared Deviation						7.547
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	6.271	2.427	22.250	8.382	0.595	3.453
Assault	2.019	0.652	23.250	6.702	2.498	10.277
St/Dis	0.745	0.964	2.250	2.630	0.216	2.728
Other	2.386	1.386	11.350	6.353	0.413	4.584
Cluster Number 7						
40 Elements with Average Squared Deviation						0.920
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	-0.025	0.323	0.510	1.116	0.595	3.453
Assault	2.304	0.531	26.175	5.453	2.498	10.277
St/Dis	-0.061	0.116	0.050	0.316	0.216	2.728
Other	0.234	0.472	1.485	2.163	0.413	4.584
Cluster Number 8						
32 Elements with Average Squared Deviation						0.498
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	0.036	0.287	0.719	0.991	0.595	3.453
Assault	0.104	0.376	3.563	3.868	2.498	10.277
St/Dis	0.081	0.383	0.438	1.045	0.216	2.728
Other	1.303	0.468	6.385	2.145	0.413	4.584
Cluster Number 9						
10 Elements with Average Squared Deviation						1.866
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	-0.172	0.000	0.000	0.000	0.595	3.453
Assault	0.312	0.629	5.700	6.464	2.498	10.277
St/Dis	2.340	0.757	6.600	2.066	0.216	2.728
Other	-0.025	0.105	0.300	0.483	0.413	4.584

**TABLE A-5**  
**YOUTH DELINQUENCY TYPOLOGY TIME 1**

Cluster Number 0						
279 Elements with Average Squared Deviation						0.000
Cluster Number 1						
14 Elements with Average Squared Deviation						2.508
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Theft	2.980	0.749	12.429	2.954	0.679	3.942
Assault	0.614	0.665	4.143	3.676	0.751	5.527
St/Dis	1.851	0.863	22.714	9.691	1.924	11.231
Other	1.471	0.976	10.262	6.420	0.582	6.578
Cluster Number 2						
16 Elements with Average Squared Deviation						3.076
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Theft	0.303	0.785	1.875	3.096	0.679	3.942
Assault	0.633	0.818	4.250	4.524	0.751	5.527
St/Dis	1.943	0.938	23.750	10.529	1.924	11.231
Other	3.474	1.056	23.438	6.947	0.582	6.578
Cluster Number 3						
61 Elements with Average Squared Deviation						0.541
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Theft	0.007	0.287	0.705	1.131	0.679	3.942
Assault	0.092	0.373	1.259	2.064	0.751	5.527
St/Dis	2.071	0.477	25.180	5.353	1.924	11.231
Other	0.166	0.319	1.675	2.096	0.582	6.578
Cluster Number 4						
32 Elements with Average Squared Deviation						0.727
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Theft	-0.085	0.178	0.344	0.701	0.679	3.942
Assault	0.056	0.251	1.063	1.390	0.751	5.527
St/Dis	0.368	0.480	6.063	5.394	1.924	11.231
Other	1.276	0.652	8.976	4.289	0.582	6.578
Cluster Number 5						
347 Elements with Average Squared Deviation						0.142
	Stand Cluster	Stand Cluster	Raw Cluster	Raw Cluster	Total Mean	Total SD
	Mean	SD	Mean	SD		
Theft	-0.119	0.132	0.211	0.522	0.679	3.942
Assault	-0.048	0.187	0.488	1.035	0.751	5.527
St/Dis	0.074	0.257	2.755	2.887	1.924	11.231
Other	-0.002	0.149	0.571	0.981	0.582	6.578

TABLE A-5 (Continued)

Cluster Number 6						
27 Elements with Average Squared Deviation						
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	0.072	0.302	0.963	1.192	0.679	3.942
Assault	1.622	0.542	9.719	2.995	0.751	5.527
St/Dis	0.455	0.536	7.037	6.016	1.924	11.231
Other	0.329	0.483	2.749	3.177	0.582	6.578
Cluster Number 7						
40 Elements with Average Squared Deviation						
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	1.063	0.486	4.869	1.917	0.679	3.942
Assault	0.113	0.317	1.375	1.750	0.751	5.527
St/Dis	0.503	0.519	7.575	5.826	1.826	11.231
Other	0.202	0.340	1.913	2.236	0.582	6.578
Cluster Number 8						
12 Elements with Average Squared Deviation						
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	-0.003	0.293	0.667	1.155	0.679	3.942
Assault	4.221	0.943	24.083	5.213	0.751	5.527
St/Dis	0.867	1.240	11.667	13.924	1.924	11.231
Other	0.545	0.583	4.167	3.834	0.582	6.578
Cluster Number 9						
7 Elements with Average Squared Deviation						
	Stand Cluster Mean	Stand Cluster SD	Raw Cluster Mean	Raw Cluster SD	Total Mean	Total SD
Theft	0.661	1.205	3.286	4.751	0.679	3.942
Assault	4.852	0.692	27.571	3.823	0.751	5.527
St/Dis	1.991	1.010	24.286	11.339	1.924	11.231
Other	4.472	0.000	30.000	0.000	0.582	6.578

**TABLE A-6**  
**CROSSTABS OF PERSONAL ENVIRONMENT CLUSTER**  
**BY DELINQUENCY CLUSTERS TIME 2**  
**CHILD SAMPLE**

		Delinquency Types Time 2			
Personal Environment Clusters	Count Row Pct Col Pct	Non	Low	High	Row Total
	Pro-Social	111 103.1 46.1% 42.5%	89 84.5 36.9% 41.6%	41 53.3 17.0% 30.4%	241 39.5%
Par Att	17 14.5 50.0% 6.5%	6 11.9 17.6% 2.8%	11 7.5 32.4% 8.1%	34 5.6%	
Pro-Del	7 6.4 46.7% 2.7%	6 5.3 40.0% 2.8%	2 3.3 13.3% 1.5%	15 2.5%	
Del-Bel	49 47.9 43.8% 18.8%	40 39.3 35.7% 18.7%	23 24.8 20.5% 17.0%	112 18.4%	
Imp/Hyp	54 49.2 47.0% 20.7%	34 40.3 29.6% 15.9%	27 25.5 23.5% 20.0%	115 18.9%	
Del Frnd	23 39.8 24.7% 8.8%	39 32.6 41.9% 18.2%	31 20.6 33.3% 23.0%	93	
Column Total	261 42.8%	214 35.1%	135 22.1%	610 100.0%	
Chi-Square		Value	DF	Significance	
Pearson		24.66545	10	.00602	
Likelihood Ratio		25.95420	10	.00380	
Mantel-Haenszel test for linear association		8.71348	1	.00316	

**TABLE A-7**  
**CROSSTABS OF PERSONAL ENVIRONMENT CLUSTERS**  
**BY DELINQUENCY TYPES TIME 2**  
**YOUTH SAMPLE**

	Count Row Pct Col Pct				Row Total
		Non	Low	High	
Personal Environment Clusters	Impulsive	49 31.6% 17.8%	73 47.1% 21.0%	33 21.3% 18.4%	155
	Average	68 25.7% 24.6%	120 45.3% 34.5%	77 29.1% 43.0%	265
	Par Att	10 47.6% 3.6%	9 42.9% 2.6%	2 9.5% 1.1%	21
	Pro-Soc	131 47.1% 47.5%	121 43.5% 34.8%	26 9.4% 14.5%	278
	Pro-Del	18 21.4% 6.5%	25 29.8% 7.2%	41 48.8% 22.9%	84
	Column Total	276 34.4%	348 43.3%	179 22.3%	803 100.0%
	<u>Chi-Square</u>	<u>Value</u>	<u>DF</u>	<u>Significance</u>	
	Pearson	83.24622	8	.00000	
	Likelihood Ratio	82.45677	8	.00000	
	Mantel-Haenszel test for linear association	1.84437	1	.17444	