Person-Environment Interaction, Psychological Strain and Delinquency: A Longitudinal Test of the Theory

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PERSON-ENVIRONMENT INTERACTION PSYCHOLOGICAL STRAIN AND DELINQUENCY: A LONGITUDINAL TEST OF THE THEORY

by

Mahmood Gazi-Tabatabaie

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY in

Sociology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah
1936
ACKNOWLEDGEMENTS

I would like to acknowledge the contribution of my lovely wife, companion, and friend Afseneh. Without her this work could never have been completed. I thank her for all of her love, support, sacrifice, and patience that she has shown to me.

I also thank my father, Mr. Mahmad Hossein Gazi-Tabatabaie, and my mother Fati, for the opportunity that they provided for me, so I could accomplish this task.

Mahmood Gazi-Tabatabaie
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ABSTRACT

Person-Environment Interaction, Psychological Strain and Delinquency: A Longitudinal Test of the Theory

by

Mahmood Gazi-Tabatabaie, Doctor of Philosophy

Utah State University, 1986

Major Professor and Dissertation Co-chairman: Dr. Brian L. Pitcher
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Department: Sociology, Social Work and Anthropology

Utilizing longitudinal panel data from Youth In Transition Project, the Person-Environment fit (P-E Fit) theory and its specific application to the area of delinquency and aggression was investigated longitudinally. Analysis of Covariance Structure Technique (LISREL) was used to address the issues of multi-dimensionality, stability, measurement of total P-E fit and to test the proposed delinquency model. The relationships between P-E fit, psychological strain, and delinquency were tested both cross-sectionally and longitudinally. The student sub-group (those respondents who stayed in school after high school) and the working sub-group (those who went to work after high school) were tested separately. P-E fit had significant negative effect on both psychological strain and delinquency in most of the cross-sectional models. Similar results were obtained in three of the longitudinal models also. The evidence from longitudinal models tended to support the idea that the causal flow of the relationship between P-E fit, psychological strain and delinquency to be from P-E fit to both psychological strain and delinquency. The longitudinal and cross-
sectional relationship between P-E fit, psychological strain, and delinquency were more pronounced among the working sub-group than the student sub-group of the sample population. P-E fit tended to be quite stable during the high school years and subject to noticeable change when the transition was made to work or college environments.
CHAPTER I

INTRODUCTION

The past half century of sociological, psychological, and social psychological research on the causes of delinquency has led to the development of many major theoretical orientations such as social control theory (Hirschi, 1969), strain theory (Merton, 1957; Cohen, 1955), social learning theory (Akers, 1977), opportunity theory (Cloward and Ohlin, 1960), and differential association theory (Sutherland and Cressy, 1974). However, the tendency has been to set up each theoretical orientation against the others, rather than synthesizing them to create a coherent and integrated explanatory paradigm about the causes of delinquency.

The recent works of Johnson (1979), Elliott, Ageton, and Canter (1979), Conger (1976, 1978, 1980), Akers (1977), and Kulka, Mann, and Klingel (1980), on the other hand, represent the emergence of a new avenue of theoretical and empirical research in the area of delinquency. All of these theorists have investigated an integrated theoretical framework to explain the causes of delinquency. Following his study of several hundred students in Seattle, Washington, Johnson (1979) concludes that a combination of a class-free sub-culture theory (i.e. social learning theory) and social control theory seems to be the best approach to explain delinquency (1979: 140).

Conger (1980), after reviewing the points of convergence and divergence between social control theories and social learning theories, concludes that these two theories are complimentary. He asserts that social control theory and social learning theory
both predict the same relationship between "ties to conformity" and delinquency. However, the social learning theory helps to explain how the tie between the adolescent and social order develops. In other words, while the less abstract nature of social control theory helps to pinpoint the important theoretical constructs concerning delinquency, the social learning theory helps to explain the mechanisms involved in the development of such constructs.

Elliott and his colleagues (1979) propose an integrated social psychological theory of delinquency which expands and synthesizes strain theory, social learning theory, and social control perspectives into a single explanatory paradigm. Kulka, Klingel and Mann (1980) propose and test yet another social psychological theory which not only has the potential of integrating the theoretical and empirical findings of many major theoretical orientations in the area of delinquency, it also introduces a new way of conceptualizing delinquent behavior. This theory is the application of the general theory of Person-Environment congruence into the area of delinquency. It tends to view delinquent behavior as an outcome of lack of congruence or fit between personal characteristics of the individual and the relevant characteristics of the environment in which he or she is located.

The present dissertation is further evaluation, extension, and refinement of Person-Environment fit theory of delinquency, as it has been proposed and tested by Kulka, Mann, Klingel (1980). More specifically, this research attempts to overcome some of the existing methodological and conceptual problems in person-environment fit theory of delinquency and tests the accuracy of suggested causal models, utilizing longitudinal panel data from Youth In Transition
Project (Bachman, et. al, 1967). The Youth In Transition Project is the longitudinal panel study of a nationally representative sample of high school students in the United States between 1966 to 1974.

**Background of the Problem**

Using French, Rodgers and Cobb's (1974) quantitative model of Person-Environment fit theory (from now on P-E fit theory), Kulka, Mann, and Klingel (1980), propose a theory of delinquent behavior, in which the lack of fit or congruence between two dimensions of P-E fit, the abilities vs. demands and motives vs. opportunities are seen as primary causes of a variety of psychological discomforts and strains which in turn are the major causes of various reactive and delinquent behavior by the individual (Figure 1.1). The abilities vs. demands dimension P-E fit refers to the extent to which the person's abilities and skills (such as physical abilities, education, ability to socialize or get along with people), match the demands and requirements of the environment in which he or she acts (such as role requirements, role expectation, or the expectations of friends and peers). The motives vs. opportunities dimension of P-E fit on the other hand refers to the extent to which the existing environmental opportunities and supplies (such as the opportunity to be promoted at work, availability of good friends, or availability of good jobs) are able to gratify the needs and expectations of the individual. Kulka, Mann, and Klingel (1980), assert that any incongruence of either kind causes various forms of psychological strains, such as low self-esteem, anxiety, anomie, depression, and alienation which in turn cause a variety of reactive and delinquent behaviors.
Figure 1.1: Graphic Representation of P-E Fit Theory of Delinquency

The extent of misfit between person's abilities and the environmental demands and requirements.

The extent of misfit between person's expectations and demands and existing environmental opportunities to gratify them.

P-E Fit → Psychological Strain → Behavioral Response

- Low self-esteem
- Anomie
- Anxiety
- Alienation
- Depression

Behavioral Response:
- Passive Compliance
- Active Evasion
- Delinquency
The major strength and advantage of Kulka, Mann, and Klingel's (1980), P-E fit model of delinquency is its capacity to integrate diverse theoretical and empirical findings of many major orientations in the delinquency literature. These include:

1. A variety of theoretical and empirical findings, including strain theories, which consider insufficient social and environmental opportunities as an important determinant of delinquent behavior. These theories imply an incongruence of motives vs. opportunities, in which the existing environmental opportunities and supplies, fail to gratify important needs and demands of the individual. For example, unemployment and poor educational opportunities are considered to be major causes of delinquency by Burgess (1952). Unavailability of legitimate opportunities to achieve success is considered to be an important cause of delinquency by strain theorists, including Merton (1957), Cloward and Ohlin (1960), and Elliott (1962). Many frustration aggression theories such as Berkowitz (1969), and Jenkins (1974), also consider lack of environmental opportunities as an important predictor of aggressive behavior.

2. A variety of theoretical and empirical findings which emphasize various psychological and intellectual short-comings as an important predictor of delinquent behavior. These theories imply an incongruence of abilities vs. demands in which personal abilities and skills of the individual are not sufficient to meet the role appropriate expectations and requirements of the environment. For example, deficits in intellectual and cognitive abilities are found to be related to delinquency by Singer (1976),
and Silberberg and Silberberg (1971). Elliott and Voss (1974) also assert that low-academic ability is an important element leading to delinquent behavior.

3. A variety of theories, including social control theory Hirschi (1969), which argue that delinquent behavior is a result of loose social bonds (lack of attachment to others and their expectations, lack of commitment to conventional behavior, and lack of involvement in conventional activities). These theories also lend indirect support to P-E fit theory since they imply a rejection of societal expectations for performance, resulting in decreased motivation and capability to meet such demands, and thereby increasing abilities vs. demands misfit.

While the predictions and assumptions of P-E fit theory of delinquency are supported by the various theoretical and empirical findings discussed above, the only explicit test and empirical support of the theory comes from Kulka, Klingel, and Mann's (1980) application of the theory to school related delinquency and misbehavior. Using the data collected by self-administered questionnaires from a random cross-sectional sample of 2,023 high school students in grades 10-12 at two high schools in suburban Detroit, Kulka, Klingel, and Mann (1980), demonstrate that there is a significant relationship between all three measures of delinquency (school crime, school avoidance, and class misbehavior) and the abilities vs. demands dimension of P-E fit. The analysis also shows a significant relationship between the motives vs. opportunities dimension of P-E fit with class misbehavior.
Statement of the Problem

Kulka, Klingel, and Mann's (1980) test of the P-E fit theory of delinquency establishes some direct evidence concerning the validity and reliability of the theory. However, due to a number of conceptual, theoretical, methodological, and design limitations, this study falls short of providing sufficient empirical evidence about the validity, accuracy, and generalizability of the P-E fit theory of delinquency. The most obvious of these problems is the fact that while the theory asserts that the relationship between P-E fit and delinquency is mediated by various forms of psychological strains (as it is illustrated in Figure 1.1), Kulka, Klingel, and Mann's (1980) test of the theory fails to include any independent measures of psychological strain in the model. This failure makes the results of such tests suspicious, since one can effectively argue that the observed relationship between P-E fit and delinquency are both results of variations in psychological strains.

Closely related to this criticism is the question of the causal order of the independent, mediating, and dependent variables. The cross-sectional nature of the study prevents strong and reliable causal interpretation of the relationship between P-E fit measures and delinquency. Using the argument from the labeling perspective, one might effectively argue that the observed variation in P-E fit measures are consequences of the individual's delinquency (or any other behavior) which through various kinds of labeling processes limits the person's abilities vs. demands or motives vs. opportunities dimensions of P-E fit. Even if it could be assumed that the model is correct, and
the causal order of the variables specified in the model are correct, the failure of the investigators to include the mediating variable of psychological strain in the analysis still poses another problem. While the theory predicts an indirect effect of P-E fit on delinquency, and a non-linear relationship between psychological strain and P-E fit, the analysis reports the direct effects of P-E fit, and tests for non-linearity of relationship between P-E fit measures and delinquency, rather than psychological strain. Treated this way, it seems that Kulka, Klingel, and Mann (1980) consider delinquency as simply another form of psychological strain rather than the consequence of it. Finally, the authors use a cumulative index of P-E misfit, to measure the total P-E fit in two dimensions of abilities vs. demands and motives vs. opportunities. The problem with the use of such measures is that a large misfit in one constituent part might be interpreted as total misfit, or for mathematical or substantive reasons, various constituent parts of a dimension might cancel each other out and consequently, a significant relationship be overlooked.

A longitudinal panel study of the relationship between three complex variables of P-E fit, psychological strain, and delinquency can overcome many of the above problems, and provide strong evidence from which the causal order of these variables can be inferred. The problem associated with measurement of the total fit can also be avoided by use of the statistical techniques of confirmatory factor analysis and the analysis of covariance structure, known as LISREL (Joreskog and Sorbom, 1981). This approach not only enables the investigator to assess the effects of the complex variable of total P-E fit on psychological
strain and delinquency, but it also allows the assessment of the relative importance of each of the constituent parts in the total measure of P-E fit and the overall effect of each part on the same dependent variables, without having to introduce any of the possible problems or biases associated with the approach used by Kulka, Klingel, and Mann (1980).

**Purpose of the Study**

This dissertation is an attempt to refine, extend, and further test the P-E fit theory of delinquency as it has been proposed and tested by Kulka, Klingel and Mann (1980) and Kulka, Mann and Klingel (1980). The study attempts to overcome a number of conceptual, methodological, and design problems in the existing literature concerning P-E fit theory of delinquency by using longitudinal panel data from a national sample of high school males. It also employs the statistical technique of analysis of covariance structure (LISREL) to analyze the data, both of which have not previously been applied to the analysis and testing of this theory. More specifically, the study has the following objectives: 1) to identify the major dimensions of the theoretical construct of P-E fit and to determine how each dimension loads on the theoretical construct of total P-E fit, 2) to include a composite measure of psychological strain (measuring anxiety, depression, anome, and alienation) in the analysis, and to analyze its relationship with two composite measures of P-E fit and delinquency, 3) to include a composite measure of parental socio-economic status and education as background variables in the model and assess the role of such variables on both delinquency and P-E fit, and 4) to test and
compare the original and revised causal models longitudinally to determine the causal order of the theoretical constructs to find the best-fitting causal model.

**Significance of the Study**

Extension, refinement, and further test of the P-E fit theory of delinquency may be justified on several grounds. First, the theory, if supported by sufficient empirical evidence, offers a theoretical framework which has the capacity to integrate a vast number of diverse theoretical and empirical findings on delinquency, aggression, and school misbehavior, into a single explanatory paradigm. Second, with the exception of social learning theories (Akers, 1977; Elliott et al., 1982), the field of delinquency research is dominated by either strictly sociological or strictly psychological theories. Sociological theories of delinquency, such as strain theories, deviant sub-culture theories, and social-control theories emphasize the importance of the social structure and social organizations as the sole determinant of deviant behavior. These theories usually overlook the role of individual characteristics and differences in determining the person's engagement in delinquent acts. Psychological explanations of delinquent behavior, such as the frustration aggression theory or the psychoanalytic theory on the other hand, emphasize the individual's psychological characteristics as the sole determinant of delinquent behavior, and tend to overlook the role of social structure and environmental conditions in determining such behavior.

Development, refinement, and extension of a social psychological theory (P-E fit theory, based on principles other than those proposed
by social learning theory) which tends to view deviant behavior as an outcome of interaction between characteristics of the individuals and characteristics of the environment would be a valuable contribution to the enrichment of theory and research in the field of delinquency. Third, while the P-E fit theory of delinquency is constructed on sound theoretical ground, little empirical work has been done to verify the theory and assess its explanatory power and utility in various contexts. In fact, the only explicit test and empirical support of the theory comes from Kulka's (1975) dissertation research and Kulka, Klingel and Mann's (1980) application of the theory to school-related delinquency and misbehavior. Both of these studies are based on a limited sample of high school students and the data in both cases are analyzed cross-sectionally, which limits the generalizability of the results and falls short of providing sufficient empirical evidence to verify the accuracy of the causal model suggested by the theory. A longitudinal test of the theory based on a national sample of high school students can be a decisive step toward verification, modification or rejection of the theory. Finally, the existing empirical tests of the P-E theory in general, and P-E fit theory of delinquency in particular, suffer from a series of conceptual and methodological inadequacies, which have to be addressed.

Organization of the Study

In Chapter Two, the P-E fit theory and its application to delinquent behavior is reviewed. The review includes a thorough evaluation of the current literature on aggression and delinquency which directly or indirectly support the assumptions of P-E fit theory.
of delinquency. The data, measurement instruments, specific hypothesis and predictions, and the method of analysis to be used in the analysis are discussed in the third chapter. The analysis of data and the results are presented in Chapter Four. Chapter Five presents the conclusions of the study and suggests some possibilities for future research.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The following review of literature is divided into five sections. The first section is a brief general examination of historical and theoretical basis of P-E fit theory and research. The application of P-E fit theory to delinquency research is discussed in the second section. This includes a thorough examination of the tenability and compatibility of assumptions and predictions of P-E fit theory of delinquency with the assumptions and empirical findings of other major theoretical orientations in the area of delinquency. A thorough critical evaluation of P-E fit theory of delinquency and research is given in the third section. This not only includes a discussion of some of the theoretical, conceptual, methodological, and empirical shortcomings of the existing P-E fit theory of delinquency, but it also includes some of the problems concerning the P-E fit theory in general. The theoretical, empirical, and methodological rationale for an extended and revised version of P-E fit theory of delinquency is given in the fourth section. This includes a discussion of the specific assumptions, hypothesis, and theoretical basis of the revised model. The fifth section discusses LISREL as the method of choice for the test of the revised theory and gives a brief introduction to LISREL, as it is used in the analysis of longitudinal panel data.
Theoretical, Conceptual, and Historical Bases of P-E Fit Theory

Sociologists and psychologists often stand on opposite sides of a continuum when it comes to their explanation of human behavior. Sociologists tend to overlook inter-individual differences and emphasize social structure and social organization as major determinants of human behavior. Psychologists, on the other hand, tend to overlook the importance of social structure and social context and emphasize the inner characteristics of the individual or his/her immediate environment as the major determinants of human behavior. However, an increasing number of social scientists within both disciplines are objecting to such conceptions of the determinants of human behavior and argue that human behavior should be understood in terms of a reciprocal and continuous interaction between the characteristics of the individual and characteristics of his or her environment. Based on principles derived from Kurt Lewin's (1951) field theory, the symbolic interactionist perspective of Cooley (1902), Mead (1934), and Blumer (1969), social psychologists within both disciplines are increasingly developing theoretical constructs and explanatory paradigms in which the principle of interdependency between individual and the environment in determining human behavior, superordinates any sociological or psychological causation. Situated identity theory (Alexander and Lauderdale, 1977), balance theory (Heider, 1946), cognitive consistency theory (Festinger, 1957), and attribution theory; (Kelley, 1972) are some of the most popular examples of theoretical and empirical work in this tradition.

One of the latest additions to this list is "person-environment
fit" or "person-environment congruency" theory (French et al., 1974; Feather, 1975; Harrison, 1978; House, 1972; Getzels, 1969; Kahana, 1978; and Kulka, Klingel, and Mann, 1980). Relying heavily on Lewin's (1951) description of motivational processes involved in interaction of the person and environment, P-E fit theory asserts that the congruence or fit between various aspects of the environment and the relevant characteristics of the individual is an important determinant of the person's behavior and his or her mental and physical health. Two kinds of fit or congruence between the individual and the environment are identified by the theory. One kind of fit is the extent to which the person's skills and abilities match the demands and requirements of the environment (role-requirements, role expectations, and societal expectations). Another kind of fit is the extent to which the existing environmental opportunities and supplies (such as the opportunity to be promoted at work, or the need to socialize with friend and so forth) are able to gratify the needs and expectations of the individual. The theory asserts that any misfit or incongruence of either kind will threaten the individual's well-being and a variety of psychological and physical problems will likely result (Harrison, 1978).

P-E fit theory was developed and elaborated by the Social Environment and Mental Health research program of Institute for Social Research, at the University of Michigan, during 1960s and 1970s. The theory has been applied to explain a variety of psychological dysfunctions and maladaptive behaviors in a variety of social and environmental situations, including stress at work (Harrison, 1978; Caplan, Cobb, French, Harrison, and Pinneau 1980; Caplan, 1972; House,
1972 and French et al., 1982), social gerontology and adaptation to aging (Carp, 1968; Kahana, 1978, 1982), marital adjustment (Hawkins and Johnson, 1969; Veroff and Feld, 1970), adaptation and coping at school environment (Kelly, 1979; Feather, 1975; and Kulka, 1975), and class misbehavior, problem behavior and delinquency (Kulka, Mann, and Klingel, 1980; Kulka, Klingel, and Mann 1980). In consequence, the theory is stated in various forms and with different terminologies. However, one particular formulation developed by French, Rodgers, and Cobb (1974) has received particular attention primarily because it is flexible enough to incorporate the main features of the other formulations and comprehensive enough to account for a variety of research findings and settings (Kulka, 1979).

French, Rodgers, and Cobb's (1974) formulation of P-E fit theory is stated in terms of the relationship between four elements of person-environment interaction:

1. The objective environment \( (E_0) \): the physical, environmental, and social attributes and properties which exist independent of the person and his or her perceptions (such as material and non-material resources and opportunities in the environment, or limitations, roles, expectations and organizational constraints).
2. The subjective environment \( (E_s) \): the person's perceptions and cognition of the relevant aspects of the objective environment.
3. The objective person \( (P_0) \): the individual's objective and demonstrative characteristics which exist independent of the individual's perception, such as a person's need for love and affection, his or her physical, mental, intellectual and other relatively enduring abilities and attributes as they are
measured independent of the person's perceptions.

4. The subjective person ($P_s$): the individual's perception or cognition of his or her objective characteristics, needs and abilities.

These four elements constitute two types of P-E fit, the subjective P-E fit ($F_s$) and the objective P-E fit ($F_o$). The fit is defined as objective when the extent of congruence between objective person ($P_o$) and objective environment ($E_o$) is measured. In other words:

$$F_o = P_o - E_o$$

The fit is defined as subjective when the extent of congruence between subjective person ($P_s$) and subjective environment is measured ($E_s$). In other words:

$$F_s = P_s - E_s$$

Both subjective and objective P-E fit, in turn, have two subtypes which are described in terms of two sorts of demands and two sorts of corresponding supplies to meet these demands. Organizational roles, and societal expectations place a set of demands on the individual to which his or her abilities and skills (supplies) may or may not be suited. On the other hand, the individual places a variety of objective and subjective demands (motives, needs, aspiration, and values) on the environment to be gratified, to which the existing environmental supplies (material or non-material resources, and opportunities) may or may not be enough (either objectively or subjectively). So strain may result from any misfit between: a) environmental demands and the individual's abilities to meet them, the ability-demand dimension, and b) the individual's needs or values and environmental resources to gratify these motives, the motive-opportunity dimension.
French, Rodgers, and Cobb (1974), assert that to quantify P-E fit as discrepancies between demands and supplies, these demands and supplies have to be conceptualized in commensurate dimensions. That is, they have to be measurable on the same scale. For example, to measure P-E fit in the motive-opportunity dimension we have to ask two commensurate questions, such as "How much environmental supplies does the person need to completely gratify a particular motive?" and "How much of this supply is available in his or her environment?" The answer to both questions are located on the same scale, and the quantitative measure of ability-demand dimension of P-E fit can be derived by subtracting the demand from supply.

What is the basis for the relationship between P-E fit and psychological strain? Following the leads of Lewin's (1951) field theory and Murray's (1938) need-press theory, P-E fit theorists rely on motive arousal as the mediating factor between P-E fit and psychological strain (Mason, 1975; Feather, 1975; Lazarus, 1966). Following Lewin's (1951) classical formula of $B = f(P,E)$ and Murray's (1938) need-press model, motivational theories maintain that, at any given moment in time, a person's behavior is a joint function of his or her desires (goals and abilities) and his or her perception of the existing pressures and constraints in the environment. These desires and goals include requirements for the individual's continued subsistence as well as objectives the individual has learned to value through socialization. The attainment of these goals and desires is associated with the maintenance and enhancement of the well-being of the individual. The extent to which the goals and desires are not attained, the well-being of the individual is limited or impaired.
The notion of P-E fit is implicit in motivational theories which relate motivational forces within the individual to specific goals concerning the environment (Harrison, 1978). Some authors have used P-E fit measures as indicators of psychological and physical strain (Porter, 1961, Slocum and Strawser, 1973), but most P-E fit theorists, such as Moss (1973) and Kulka (1975) maintain that P-E fit and strain are conceptually distinct, and poor P-E fit causes strain rather than represents it (Harrison, 1978). French, Rodgers, and Cobb (1974) also emphasize the theoretical necessity of the causal link between P-E fit and strain. However, the exact content of and process of that causal link is not clear, (Harrison, 1978).

P-E fit theory predicts three basic forms of relationship between the measures of P-E fit and psychological strain, which graphically are shown in Figure 2.1.

**Figure 2.1:** Hypothesized Relationship Between P-E Fit and Psychological Strain as Adapted from French, Rodgers, and Cobb (1974).
Curve A represents the situation in which the magnitude of psychological strain decreases as the magnitude of P-E fit decreases only up to the point of perfect fit and stabilizes from then on. In other words, the individual reaches a point of satiation where further environmental opportunities or personal abilities do not affect the level of psychological strain. Curve B represents the situation in which psychological strain decreases with the decrease in magnitude of P-E fit, until the point of perfect fit and then increases with excess of personal abilities and environmental supplies. This curve describes the situations in which having more than what a person needs, results in an increase in his or her psychological strain (probably because of boredom, apathy and so forth). Curve C represents the situation in which psychological strain decreases with increasing magnitude of P-E fit. This represents the situation in which personal abilities and environmental supplies continue to compensate each other and result in further reduction of psychological strain. Caplan and others (1975), Harrison (1978), Kulka (1975), French, Caplan and Harrison (1982), and Kulka, Klingel, and Mann (1980) have reported solid empirical support for each of the above hypothesized functions.

**P-E Fit Theory of Delinquency**

Using French, Rodgers, and Cobb's (1974) quantitative model of P-E fit theory, Kulka, Mann and Klingel (1980) proposed a P-E fit theory of delinquency in which school-related delinquency (as a sub-set of delinquent behavior in general) is seen as a behavioral response to strains caused by lack of fit in any of the two-dimensions of P-E fit. More specifically, the authors asserted that psychological strains of
"self-denigration and anxiety resulting from failure to meet school-related demands" and dissatisfaction and alienation which result from the persistent frustration of students' needs or values" (Kulka, Mann, and Klingel, 1980: 53) are an important predictor of school-related delinquency (Figure 2.2).

Figure 2.2: Model of Relationship Between P-E Fit and School Crime. Adapted from Kulka, Mann, and Klingel (1980: 53).

![Figure 2.2: Model of Relationship Between P-E Fit and School Crime.](image)

Given the two major categories of abilities vs. demands and motive vs. opportunities, the theory identifies three major categories of environmental demands in school environment to which the adolescent has to respond. These are the academic demands, the bureaucratic demands, and the informal or social demands. The salience of the norm, that academic achievement is an important step to the future success (delegated through the socialization of parents and larger society), presents itself as an environmental demand to which the adolescent has to respond. However, the adolescent's response to such demand is determined by his or her innate and acquired abilities regarding academic performance. The bureaucratic demands are the institutional
rules and regulations which are imposed on the individual by the school environment and administration (such as class schedule, number of credits to graduate and so forth). To meet these demands, the individual has to develop certain skills and strategies to cope with such requirements. The informal or social demands refers to the set of informal and societal expectations which are placed on the individual by his or friends, parents, peers, and larger society (such as how to deal with friends, how to dress up, and so forth) to which he or she has to respond by his or her learned social skills and strategies.

The theory also identifies three major categories of demands for resources and opportunities which the individual places on the environment to be gratified. These are, the demands for opportunities for personal development, the demands for opportunities to develop and maintain relationships and the demands for opportunities to participate and have an impact on the environment (system maintenance and change).

There is nothing in the P-E theory literature which can predict the exact kind of P-E misfit leading to a specific type of psychological strain (Harrison, 1978). This is also true of the P-E fit theory of delinquency. There is no particular principle derived from the P-E fit theory which specifies the exact type of psychological strains which might intervene between the P-E fit and delinquency. However, as Kulka, Mann, and Klingel (1980) point out, previous theory and research suggest that psychological strains, such as alienation, anxiety depression, resentment, anomie, and low self-esteem, are most likely to cause delinquency (Gold and Mann, 1972; Hirschi, 1969; Sarata, 1976).
As is evident from Figure 2.2, P-E fit theory does not consider delinquency to be an inevitable consequence of poor P-E fit and psychological strain. Kulka, Klingel, and Mann (1980) considered this to be the strength of their theory, and along with Yinger (1965), believed that a good theory must be able to recognize the "principle of multiple possibilities". They asserted that:

delinquent behavior is clearly not the inevitable consequence of person-environment incongruence in general or of any form of psychological strain. Individuals react to strain in a number of ways -some of them conforming, some not (Kulka, Klingel, and Mann, 1980: 154).

Following Rhodes and Reiss (1969), the authors asserted that psychological strain resulting from poor P-E fit might lead to any of three behavioral responses: 1) passive compliance (that is, resigned acceptance of the situation); 2) active evasion (truancy or dropping out); and 3) delinquent, rebellious, or disruptive behavior.

As it was mentioned earlier, the major strength of the P-E fit theory of delinquency is its capacity to integrate diverse theoretical orientations in the areas of delinquency and aggression research. The following section reviews many of such theories and how they can be restated in terms of the incongruence between personal abilities and environmental demands or personal motives and environmental opportunities.

A. Theories Emphasizing Insufficient Social and Environmental Opportunities as the Cause of Delinquency and Aggression:

A variety of theoretical and empirical findings emphasize insufficient social and environmental opportunities as the major cause of
delinquent behavior. These include Burgess (1952) and Shaw and McKay (1942) who cited poverty, unemployment, and poor educational opportunities as the cause of crime. A variety of frustration-aggression theories which considered frustration in general (Berkowitz, 1969), or frustration of specific needs (Bandura and Walters, 1959; Jenkins, 1974; and Sorrentino, 1975) as the major cause of delinquency and aggressive behavior. Other theories emphasized that delinquency is more likely in the presence of particular needs (Quay, 1965). In addition, studies like Dececco and Richard (1975) or Fish (1970) viewed delinquent behavior and school crime as a result of the failure of schools to meet the students' legitimate needs for achievement, competence, status, and recognition. However, the most important of these theories which see delinquency as an outcome of insufficient social and environmental opportunities is strain theory (Merton, 1957; Cloward and Ohlin, 1960; Elliott and Voss, 1974). These theories all imply an incongruence of motives vs. opportunities kind, in which the existing environmental opportunities and supplies fail to gratify important needs and the demands of the individual.

The key to the strain explanation of delinquency is the proposition that individuals become delinquent in response to the frustrations resulting from the incongruency between socially induced aspirations and socially approved ways of achieving these aspirations. Elaborating on Durkheim's (1951) state of normlessness or anomie, Merton (1957) argued that anomie arises from the incongruence between the importance of attaining culturally valued goals and the availability of legitimate, institutionalized means to reach these goals. These conditions are most likely to exist among the disadvantaged
segments of society (e.g. the poor, or certain racial-ethnic minorities). This particular segment of society, as part of the larger society, is constantly socialized into valuing American goals, like monetary success and material rewards, while their daily experiences tell them that the legitimate means for achieving these goals are relatively unavailable to them. According to Merton (1980), the dominant culture in the American society places incompatible demands upon the individual in lower reaches of society. On the one hand, they are asked to orient themselves toward prospects of large wealth. On the other hand, they are asked to achieve it with the existing institutional opportunities which are largely unavailable to them. The consequence of such structural inconsistency is a progressive emphasis on attaining a prestige-laden end by illegitimate means.

A high frequency of deviant behavior is not generated merely by lack of opportunity, or by this exaggerated pecuniary emphasis. A comparatively rigidified class structure, a caste order, may limit opportunities far beyond the point which obtains in the American society today. It is when a system of cultural values extols, virtually above all else, certain common success-goals for the population at large while the social structure rigorously restricts or completely closes access to approved modes of reaching these goals for a considerable part of the same population, that deviant behavior ensues on a large scale. Otherwise said, our egalitarian ideology denies by implication the existence of non-competing individuals and groups in the pursuit of pecuniary success. Instead, the same body of success-symbols is held to apply for all. Goals are held to transcend class lines, not to be bounded by them, yet the actual social organization is such that there exists class differentials in accessibility of the goals. In this setting, a cardinal American virtue, "ambition" promotes a cardinal American vice, "deviant behavior".

(Merton, 1980: 121)
Cloward and Ohlin (1960) extended Dirkheim's and Merton's work by combining the principles of the strain theory with the principle of differential association theory (Sutherland and Cressy, 1974). They maintained that a limited opportunity for achieving conventional goals is the motivational stimulus of delinquent behavior. However, the specific forms and patterns of delinquent behavior are acquired through the normal learning process. Experiences of limited or blocked opportunities (as a result of structural limitations on success) leads to alienation (perceived anomie) and actively seeking out alternative groups and settings in which particular patterns of delinquent behavior are acquired and reinforced. For both Cloward and Ohlin (1960) and Merton (1957), the discrepancy between desired goals and a legitimate means of achieving them, and the strain associated with it was primarily a lower class phenomenon. The lower class youth who have internalized conventional success goals usually have limited access to these goals because of their class position. In other words, for Merton (1957) and Cloward and Ohlin (1960), the primary variable which influences the aspiration-opportunity discrepancies was the differential access to legitimate opportunities to achieve commonly held success goals. Delinquency is directly linked to the class structure of society.

Many lower class persons in short, are victims of a contradiction between the goals towards which they have been led to orient themselves, and the socially structured means of striving for these goals. Under these conditions, there is an acute pressure to depart from institutional norms and to adopt illegitimate alternatives. (Cloward and Ohlin, 1960: 105)

More recent formulations of the strain theory have criticized Merton (1957) and Cloward and Ohlin's (1960) formulation as being class biased. Alternative conceptualizations of strain theory have
been proposed which are independent of social class. Simon and Gagnon (1976) argue that the strain produced by differential opportunities to achieve success is the characteristic of societies during periods of scarcity. During periods of affluence when nearly all persons have reasonable access to opportunities for achieving success, it is the differential commitment to traditional success goals which generates strain and motivation for deviance. Elliott and Voss (1974) asserted that middle-class and upper-class youth are just as likely to aspire beyond their means as lower-class youth. While the absolute levels of aspirations and opportunities may vary by class, the discrepancy between personal goals and the opportunities to realize these goals might be greater for a middle-class youth than a lower-class one. According to Elliott and Voss (1974), it is the variations in both commitment to success goals and access to opportunities that produces strain and the deviant behavior, not social class.

All of these theories imply that delinquency is a response to actual or anticipated short-comings of the existing environmental resources and supplies to gratify the actual or perceived needs or motives of the individual. All can be interpreted as P-E fit incongruence of motives vs. opportunities in which the demands for status, wealth, and power that the individual places on the environment are greater than the existing opportunities in the environment.

B. Theories Emphasizing Personal, Psychological, and Intellectual Shortcomings of the Individual as the Cause of Delinquency.

A variety of theoretical and empirical findings emphasize short-comings of various psychological, personal and intellectual attributes
and abilities as the cause of delinquent behavior. These include: 1) theories of delinquent behavior which focus on deficiencies in cognitive-intellectual abilities (Silberberg and Silberberg, 1971; Singer, 1976; Hirschi and Hindelang, 1977). 2) The theories which emphasize the abilities to control ego and superego as determinant of delinquent behavior (Grossbard, 1962). 3) Role inadequacy theories which emphasize the inability to fill successfully certain social roles as the cause of delinquent behavior (Gold, 1970). 4) Theories which emphasize that low academic ability and school failure is an important element in provoking delinquent behavior. 5) Finally status frustration theories which consider the inability to meet the pervasive requirements of job or school to achieve success as important determinant of delinquency (Cohen 1955; Reiss and Rhodes, 1963). These theories all imply an incongruence of abilities vs. demands, in which personal abilities and skills of the individual are not sufficient to meet the demands and expectations of the environment.

Hirschi and Hindelang (1977) asserted that regardless of sociologists' disregard of the importance of individual IQ differences in prediction of delinquent behavior, IQ is as important a correlate of delinquency as social class or race. Relying on the evidence offered by Reiss and Rhodes (1963) and Hirschi (1969), the authors concluded that IQ affects delinquency through its affects on school and job performance (Hirschi and Hindelang 1977: 584). This is quite consistent with Kulka, Mann, and Klingel's (1980) assertion that incongruency between a person's abilities (in this case IQ score) and the environmental demands (in this case school or job requirements) causes delinquency.
Recently Menard and Morse (1984), have taken issue with Hirschi and Hindlangs' (1977) position about the effect of IQ on delinquency through school performance. They argued that the apparent relationship between IQ and delinquency is not because IQ exerts any causal influence on delinquent behavior, but because in certain institutional settings (the schools), it may be selected by the institution as a criterion for differential treatment. The differential treatment in turn leads to alienation and self-reported delinquency. Menard and Morse (1984) presented empirical evidence supporting their position. However, regardless of the nature of the controversy on the actual form of the relationship between IQ and delinquency, Menard and Morses' (1984) position also tends to support P-E fit theory of delinquency. The differential treatment based on IQ also implies an incongruency between environmental demands (higher IQ for better treatment) and individual abilities (in this case IQ score) which leads to alienation and delinquency.

Cohen's (1955) status frustration theory also offers an explanation in which lower level abilities of lower class children and youth to compete with middle and higher class children and youth are considered the most important cause of the abundance of delinquent behavior among lower class children and youth. Cohen argued that lower-class Americans embrace the middle class success ethics. Such ethics emphasize free competition and the ability to get ahead. However, their ability to compete and to get ahead is hindered by their social class position. The parents of these children and youth do not have the economic resources and social power that middle-class parents
have; money, clothes, a home, a respectable neighborhood, or the capacity to intercede effectively with schools or influential employers. Beside these disadvantages, the ability of lower-class children is hindered by inappropriate socialization practices of lower-class parents, such as, severe discipline, extreme deference to authority and reduced aspiration (Rubin, 1976).

According to Cohen (1955), decreased ability to compete produces strain and increased strain produces delinquent behavior. This is quite consistent with P-E fit theories' assertion that, incongruence between the abilities (in this case, class performance or educational and technical skills to handle the job) and the environmental demands (in this case to perform better than others in school or on the job) causes psychological strain which in turn leads to delinquency.

C. Theories Emphasizing Loose Social Bonds and Lack of Commitment and Belief to Conventional Norms and Activities as the Major Causes of Delinquency

A variety of theories, including social control theory (Hirschi, 1969), argue that loose social bonds and lack of commitment to conventional activities are the primary causes of delinquent behavior. These theories also lend support for the P-E fit theory of delinquency since they imply a rejection of societal expectations for performance, resulting in decreasing motivation and ability to meet the environmental demands or to take advantage from the existing environmental supplies or opportunities. Increasing incongruency in both abilities vs. demands and motives vs. opportunities dimension of P-E fit.
eventually leads to delinquency.

Social control theories (Nye, 1958; Hirschi, 1969; Hewitt, 1970) are not concerned with delinquency-causing motivations or provocations, but rather with factors that prevent deviance. As Hirschi (1969) noted, "The question 'why do they do it' is simply not the question the theory is designed to answer. The question is 'why don't we do it'? (Hirschi, 1969: 34).

Control theorists maintain that human beings are inherently non-conformist and anti-social. "We are all animals and thus naturally capable of committing criminal acts" (Hirschi, 1969: 31). Then, what prevents most people from becoming delinquents? According to Hirschi (1969), it is the strength of an individual's bond to society that prevents him or her from becoming a delinquent. Delinquent behavior becomes more probable as the individual's bond to society weakens. In Hirschi's (1969) formulation, the bond between the individual and society has four major components; attachment, commitment, involvement, and belief. The stronger the elements of the bond, the less likely the delinquent behavior. Attachment refers to the ties of affection and respect between the individual and his or her significant others, such as parents, teachers, and friends. According to Hirschi (1969), attachment to parents, however, is the most important because children are first socialized by their parents. The children who are strongly attached to their parents are much more likely to internalize the norms of society and develop a sense of responsibility to others including the authorities, their teachers, and their peers.

Hirschi (1969) asserted that his concept of attachment is analogous to Freud's conception of super-ego. But it locates "the 'conscience'
in the bond to others rather than making it a part of the personality" (Hirschi, 1969: 19).

Commitment refers to the extent that the individuals are committed to the ideal age appropriate requirements of the society. For example, getting an education postponing participation in adult activities like drinking and smoking, or being dedicated to a long-time goal. The rational is that if the individual commits himself or herself to these kinds of activities, he or she will develop a stake in conformity, and will be inclined to engage in delinquent behavior. This is primarily because, engaging in such activities will endanger his or her chance of achieving his or her long-term plans. The element of commitment in a social bond is analogous to the element of ego in the Freudian conception (Hirschi; 1969).

The third element of social bond is involvement. It refers to participation in conventional activities which lead toward socially valued successes and status objectives. The rationale is that the more the adolescent is involved in activities such as studying or participating in sports. The less time he or she will have to be delinquent.

The fourth element of social bond is belief. This refers to the acceptance of the validity of the central value system of the society. This element of the bond is particularly important for social control theory, because the less people feel that they have to observe the rules and values of the society, the more likely they will break the rules.

The bulk of empirical support for social control theory comes from Hirschi's (1969) own application of the theory to juvenile delinquency and Hindelang's (1973) replication of Hirschi's work. These studies
found a consistently negative relationship between delinquency and attachment to parents and school. However, the evidence concerning the relationship between attachment to friends and delinquency was not clear and conclusive (Hindelang, 1973). Examination of the relationship between the involvement element of social bond and delinquency showed that involvement in conventional activities was fairly unimportant unless it was coupled with commitment (Hindelang, 1973; 481-484). Commitment to school and scholarly pursuit as measured by school performance and academic achievement was found to be negatively related to delinquency. While belief in the acceptability of law violation was found to be related with delinquency, but Hirschi (1969) concluded that such influence is secondary to the influence of delinquent peers and the influence of delinquent peers must be integrated into principles of social control theory.

As was mentioned earlier, the findings and the rationale of the social control theory also can be interpreted in terms of P-E fit theory of delinquency. Since they imply that the rejection of societal expectation for performance, decreases the motivation and the ability to meet the environmental demands or take advantage of the existing environmental supplies or opportunities, thereby increasing incongruency in both abilities vs. demands and motives vs. opportunities dimensions of P-E fit which eventually might lead to delinquency.

In summary, a broad range of theoretical and empirical findings within the areas of delinquency and aggression research are implicit and consistent with the P-E fit explanation of delinquency and aggression. The underlying causes of insufficient environmental opportunities or insufficient personal abilities, emphasized by social
strain theories, status frustration theory, social control theories, and frustration-aggression theories all can be stated in terms of the incongruency between personal abilities and environmental demands or the incongruency between personal needs and the environmental opportunities, leading to delinquency.

While the predictions and assumptions of the P-E fit theory of delinquency is supported by various theoretical and empirical findings discussed above, the only explicit test and empirical support of the theory comes from Kulka, Klingel, and Mann's (1980) application of the theory to school related delinquency and class misbehavior. Using the data collected by self-administered questionnaire from a random, cross-sectional, sample of 2023 high school students in grades 10-12 at two high schools in suburban Detroit, Kulka, Klingel, and Mann (1980), demonstrated that there is a significant relationship between all three measures of delinquency (school crime, school avoidance and class misbehavior) and the abilities vs. demands dimension of P-E fit. The analysis also shows a significant relationship between the motives vs. opportunities dimension of P-E fit with class misbehavior. The test for non-linearity of the relationship between the measure of P-E fit and measures of delinquency, as predicted by the theory, showed that the relationship between components of P-E fit and measures of delinquency are non-linear in more than half of the cases.
Theoretical, Conceptual, Methodological, and Empirical

Shortcomings of the Existing P-E Fit Theory of Delinquency

Although Kulka, Klingel and Mann's (1980) test of P-E fit theory establishes some evidence concerning the validity and accuracy of P-E fit theory of delinquency, because of a number of conceptual, methodological, and design limitations of the research, it falls far short of providing strong evidence about the accuracy and generalizability of the theory. The conceptual, methodological, and design problems can be divided into two sorts: A) conceptual, methodological, and design problems concerning P-E fit theory in general, and B) the conceptual, methodological, and design problems concerning the Kulka, Klingel and Mann's (1980) test of P-E theory of delinquency in particular.

A. Conceptual, Methodological, and Design Issues Concerning P-E Fit Theory in General

While P-E fit theory offers a unique and potentially useful way to conceptualize the relationship between the individual and his or her environment, at the same time it poses a number of conceptual and methodological questions which have to be addressed. These questions include: 1) which aspect of P-E fit should be assessed: subjective or objective? 2) how should P-E fit scores be calculated? 3) how should various dimensions of P-E fit be combined to adequately represent the theoretical construct of total P-E fit?

1. Objective versus Subjective Assessment of P-E Fit

A survey of the literature on P-E fit reveals that, while most of these studies distinguish between objective and subjective P-E fit in
their theoretical discussion, few of these studies include even a crude measure of objective P-E fit, and fewer have attempted to measure characteristics of the person, independent of his or her perception (Kulka, 1979). While the exclusion of measurement of objective P-E fit in some cases has been deliberate (Feather, 1972 and Lock, 1969), in most cases such exclusion reflects pragmatic difficulties associated with developing reliable objective measures of P-E fit (Kulka, 1979). Veroff and Feld (1970) suggested the use of demographic characteristics of the individual as proxies for objective characteristics of person and environment. Moos (1974), and Schneider and Bartlett (1970) suggested the use of mean "consensual" perceived environmental ratings as an indicator of objective environment. Yet others, such as Jenkins and others (1975), suggested structured observation techniques to measure the objective characteristics of environmental dimensions at the individual level. The problem with the use of proxies is that they only provide a crude (non-commensurate) and unreliable measure of various aspects of objective P-E fit, and the problem with the two latter solutions is that they assume that inhabitants of a common setting experience the same environment (Kulka, 1979).

The problem with subjective measurement of P-E fit, on the other hand, is that the properties and characteristics of the person and environment are influenced or distorted by characteristics of the respondent. As Kulka (1979) pointed out, the existence of such distortions or influences might not be undesirable after all and to the extent that relationships between environmental perceptions and individual characteristics reflect the mediating role of sub-environment or role positions (Moos, 1974). Such subjective measures may often provide a more
accurate approximation of the "actual" environment than many of the rather crude objective measures employed to date (1979:60)


Almost all studies concerning P-E fit theory have used some variant (algebraic, absolute, cumulative, and so on) of a "raw difference" score to measure the extent of P-E fit. This is done by subtracting a measure of environmental characteristics from its commensurate measure of the personal characteristic, or vice-versa. However, as Kulka (1979) has noted, the use of this technique has a number of undesirable limitations and pitfalls which might lead to a number of fallacious conclusions. As he notes:

Some of the potential pitfalls or liabilities associated with the use of discrepancy scores as indicies of fit involve basic scaling problems, such as assumption of commensurate and interval scaling (Cornbach, 1958; French, Rodgers, and Cobb, 1974 and Lord, 1963), the "physicalism-subjectivism dilemma" (Bereiter, 1963 and Imparato, 1972), and problems in assessing profile similarity (Cornbach and Gleser, 1953 and Nunnally, 1962). Other limitations are more statistical in nature, including issues of unreliability, variance, "regression toward the mean," and a host of other potential artifacts associated with the fact that relationships involving different scores can be expressed as exact mathematical functions of the intercorrelations, correlations, and variances of their components (Blau and Duncan, 1967 and Bohrnstedt, 1969).

(Kulka, 1979:61).

Through the years a number of alternative methods to measure P-E fit have been suggested by various researchers. These methods also have important limitations. For example, Lawler (1973) suggested that P-E fit to be calculated as a ratio of P/E or E/P. However, as pointed out in Fuguitt and Lieberson (1974) and Schuessler (1974), the potential problems and pitfalls in use of ration variables are as great as the use of difference of score method. Feather (1972) has suggested the use of product-moment or rank-order correlation coefficients as measures of P-E fit. This method also has some problems, primarily
because rank order correlation coefficients are measures of covariation rather than agreement, and the individuals with large differences between P and I might have scores equal or close to 1 because of identical relative scale magnitude (Kulka, 1979).

A totally different method of measuring P-E fit would be to ask the respondent to make direct judgment of the magnitude of the fit between his/or her characteristics and environmental conditions or characteristics. Although this method avoids some of the problems associated with the other methods mentioned above, as Wylie (1974) pointed out, these measures are more susceptible to cognitive and perceptual distortion than two-part indicies and are only appropriate to measure subjective P-E fit.

3. Multidimensionality of P-E Fit

The issues and problems discussed in the previous two sections were concerned with the measurement and calculation of various aspects of P-E fit individually, the third series of issues or problems concern questions of whether and how these scores measuring various dimensions of P-E fit should be combined together to obtain an adequately representative measure total P-E fit of the individual. Several general ways of calculating the total P-E fit measure have been suggested by Kahana (1978), 1) total fit can be assessed by constructing a simple "index of total fit," in which the number of unfit or incongruent dimensions constitute the measure of total P-E fit. Measurement of total P-E fit in this way requires the naive assumption that dimensions of P-E can be dichotomized as fit or unfit. Furthermore, it tends to over-emphasize the extent of poor fit across the dimensions, while under-emphasizing the extent or the degree of
misfit or incongruence across the dimensions. 2) The second approach is to calculate a cumulative score of misfit by adding up the scores across all the dimensions and use it as such. Or divide it by the number of dimensions to represent the total fit. The danger with this approach is that a large misfit in one dimension might be interpreted as total misfit or, for mathematical or substantative reasons, various dimension might cancel each other out. Consequently, a significant relationship may be overlooked (Kulka, 1979).

The third approach suggests weighting of the scores in various dimensions based on the importance of the dimension and then summing them up or averaging them over all the dimensions. While this approach is:

...both conceptually elegant and logically appealing, a considerable body of research on the impact of differential weighing procedures on reliability and predictive power suggests that the approach will yield disappointing results (Mikes and Hulin, 1968 and Wainer, 1976) (Kulka, 1979:68)

B. Conceptual, Methodological, and Design Issues Concerning P-E Fit Theory of Delinquency in Particular

Besides the general issues and potential problems with P-E fit theory discussed above, Kulka, Klingel and Mann (1980) and Kulka, Mann and Klingel (1980) application and testing of P-E fit to the area of school crime and delinquency, also faces some particular conceptual, methodological, and design problems and short-comings which have to be addressed. The most obvious of these problems is the fact that while the theory asserts that relationship between P-E fit and delinquency is mediated by various dimensions of psychological strains (as it is illustrated in Figure 2.2), Kulka, Klingel and Mann's (1980)
test of the theory fails to include any independent measures of psychological strain in the model. This failure makes the results of such tests suspicious, since one can effectively argue that the observed relationship between P-E fit and delinquency is a spurious one and variations in P-E fit and delinquency are results of variations in psychological and physical strains. Closely related to this criticism is the question of the causal order of the independent, mediating, and dependent variables. The cross-sectional nature of the study prevents strong causal inferences about the relationship between P-E fit measures and delinquency. Using the argument from the labeling perspective, one might effectively argue that the observed variation in P-E fit measures are consequences of the individual's delinquency (or any other behavior) which through various kinds of labeling processes limits the person's ability-demand or motive-opportunity dimension of P-E fit measures. Even if it could be assumed that the model is correct and the causal order of the variables specified in the model are correct, the failure of investigators to include the mediating variable of psychological strain in the analysis still poses another problem. While the theory predicts an indirect effect of P-E fit on delinquency and a nonlinear relationship between psychological strain and P-E fit, the analysis reports the direct effects of P-E fit and tests for nonlinearity between various measures of P-E fit and delinquency, rather than psychological strain. Treated this way, it seems that Kulka, Klingel and Mann (1980) considered delinquency as simply another form of psychological strain, rather than the consequence of it. Relatively weak relationships between delinquency and P-E fit measures, and the failure to obtain the predicted outcomes of
non-linearity between delinquency and P-E fit in half of the cases, might be attributed to the fact that at the empirical level, the authors fail to distinguish these two theoretically distinct constructs.

The Extended P-E Fit Model of Delinquency

Although the issue of subjective versus objective assessment of P-E fit remains mostly unresolved because of the existing limitations in the data set to be used, this study is only concerned with subjective aspects of P-E fit and its effects on psychological strain and delinquency. For similar reasons, plus the fact that this study is only concerned with subjective dimensions of P-E fit, the direct judgment method of measurement of P-E fit, (asking the respondent to make direct judgment of the magnitude of the fit between his or her characteristics and the environmental conditions) will be in the present study.

Employing statistical techniques of confirmatory factor analysis (Long, 1983) and analysis of covariance structures, known as LISREL (Joreskog, and Sorbom, 1981), the present study uses an alternative approach to deal with the problem of multi-dimensionality of total P-E fit. This approach not only enables the investigator to assess the effects of total P-E fit on psychological strain and delinquency, but it also allows the assessment of the relative importance of each of the constituent dimensions in the total measure of P-E fit and the overall affect of each dimension on the same dependent variables without having to introduce any of the problems or biases associated with the approaches discussed in the previous section.
To settle the issues concerning the role of the intervening variable of psychological strain and the causal priority and order among the three variables of P-E fit, psychological strain, and delinquency, a three wave, three variable longitudinal panel test of the relationship between these three variables is proposed. As Kessler and Greenberg (1981), and Rogosa (1979) pointed out, while direct empirical evidence to demonstrate the causal relationship between variables is only possible through experimental manipulation, longitudinal panel analysis provides sufficient information through which the causal order and priority of the relationship between two or more variables can be inferred. The causal model presented in Figure 2.3 is an extension of Kulka, Mann, and Klingel's (1980) model. The specific assumptions and hypothesis concerning this model are as follows:

A. The model assumes that the relationship between P-E fit and delinquency at each measurement period is mediated through psychological strain and P-E fit has no direct effect on delinquency (paths 1, 2, 9, 10, 17, 18). This is consistent with Kulka, Mann, and Klingel's (1980) position that P-E fit incongruency leads to various psychological and physical strains and one of the possible behavioral responses to such strains is delinquency. If these assertions are to be correct, the following hypotheses must hold.

A1. The greater subjective or objective P-E fit incongruency the individual experiences at each measurement period, the greater psychological and physical strain he or she will experience at the same measurement period (Paths 1, 9, 17, Figure 2.3).

A2. The greater psychological strain the individual experiences at each measurement period, the more likely that he or she will
commit a delinquent act (Paths, 2, 10, 18).

A3. The greater the subjective or objective P-E fit incongruency the individual experiences at each measurement period, the more likely that he or she will commit delinquent conduct. However, such a relationship will be mediated through psychological and physical strain at the same measurement period.

B. The model assumes that all three variables of P-E fit, psychological strain and delinquency at each measurement period are directly affected by their own laged effects at the previous measurement period (Paths, 3, 5, 8, 11, 13, 16, Figure 2.3). The assumption about the laged effect of delinquency on later delinquency is consistent with theoretical and empirical findings such as Wolfgang, Figlio and Sellin (1972), Empey (1982) and Bachman, O'Malley, and Johnston (1978), who contended that delinquents at one time are more likely to become delinquent at later times. However, it contradicts Matza's (1964) position, which stressed the situational quality of delinquent behavior, especially among young people. He asserted that juvenile delinquents usually stand in a state of limbo between conventional behavior and crime. The decision to behave one way or another is not determined by some prior set of causes, but by intermix of factors present in the situation. According to Matza (1964), if an adolescent does break the law, the processes leading to such behavior are dictated more by immediate circumstances than the conditions that are predetermined by personality, social position, or membership in a deviant subculture.
Figure 2.3: The Extended P-E Fit Theory of Delinquency.
The assumption about the lagged effect of psychological strain on later measures of psychological strain is also consistent with Wheaton, Muther, Alwin and Summers (1977), Joreskog and Sorbom (1977), and Kessler and Greenberg (1981), who demonstrated that alienation (measured by two indicators of powerlessness and anomie) is fairly stable over time and alienation at one time has a positive impact on subsequent alienations. Bachman, O'Malley and Johnston (1978) also reported relative stability, gradual change and positive correlation among successive measures of happiness, negative affective states, somatic symptoms and self-esteem. Based on these theoretical and empirical evidences, the following relationships are hypothesized.

B1. The more the individual engages in delinquent acts at one period of time, the more likely that he or she will engage in delinquent acts in successive periods. In other words, the frequency of engagement in a delinquent act is relatively stable over time and changes gradually (Paths 8 and 16).

B2. The greater the individual experiences psychological strain at one point of time, the more likely he or she will experience psychological strain in successive periods. In other words, the intensity of psychological strain an individual experiences is relatively stable and changes gradually (Paths 5 and 13).

There is no particular theoretical and empirical evidences concerning the stability of variability of P-E fit over time. However, as Kulka, Mann, and Klingel (1980) pointed out, the P-E fit theory of delinquency in particular, tends to explain short-term causes and processes involved in the production of psychological strain and delinquency rather than long-term. In other
words the theoretical construct of P-E fit is a situational variable, and tends not to be stable over time.

B3. P-E fit is a situational variable and it tends not to be stable over time (Paths 3 and 11).

C. For reasons discussed above, the model does not assume any lagged effect of P-E fit on later psychological strain and delinquency measures. However, P-E fit measures at each period are assumed to be affected by lagged effects of psychological strain and delinquency in previous measurement periods, (Paths, 4, 6, 12, and 14). The assumption about the lagged effect of delinquency can be justified on the grounds that the individual's involvement in delinquent behavior in the past might limit his or her access to the environmental resources and opportunities at the present time. The assumptions about the lagged effect of psychological strain on P-E fit also can be justified on similar grounds. The psychological and physical strains experienced in the previous period may lead to limitations of the individual's abilities to meet the environmental demands and expectations.

C1. The effects of P-E fit on psychological strain and delinquency tends to be contemporaneous, and the lagged effects of P-E fit on subsequent measurements of psychological strain and delinquency tend to be negligible. The dotted lines between P-E fit and later psychological strain and delinquency).

C2. The greater the person's involvement in delinquent acts at each measurement period, the more likely that he or she will experience P-E fit incongruency in the subsequent measurement period (Paths 6 and 14).
C3. The greater psychological strain the person experiences at each measurement period, the more likely that he or she will experience higher P-E fit incongruency in the subsequent measurement period (Paths 4 and 12).

C4. The contemporaneous effects of P-E fit on delinquency and psychological strain are negative and stronger than the lagged effects of psychological strain and delinquency on subsequent P-E fit.

D. Finally, the model assumes that psychological strain at each measurement period is affected by the lagged effect of delinquency at previous measurement periods (Paths 7 and 15). This is consistent with Rosenberg and Rosenberg (1978) and Bynner, O'Malley and Bachman's (1981) findings that delinquency at one measurement period leads to reduction of self-esteem in subsequent measurement periods.

D1. The greater the person's involvement in delinquent acts at each measurement period, the more likely he or she will experience psychological strain in subsequent measurement periods (Paths 7 and 15).

D2. The effect of psychological strain on delinquency is positive and mostly contemporaneous and the lagged effects of psychological strain on later delinquencies tend to be negligible.

D3. The contemporaneous effects of psychological strain on delinquency is stronger than the lagged effect of delinquency on subsequent psychological strain.

E. Considering the fact that parental education and socio-economic status have been shown to contribute to the child's abilities and
aspirations (Cohen, 1955), psychological disorders (Wheaton, et al., 1977; Wheaton 1980), and delinquency (Cloward and Ohlin, 1960), the accuracy of the above model will also be assessed controlling for background variable of socio-economic status.

E1. The lower the parental socio-economic and educational background, the higher the juvenile's magnitude of P-E fit incongruency.

E2. The lower the parental socio-economic and educational background, the higher the juvenile's intensity of psychological strain.

E3. The lower the parental socio-economic and educational background, the higher the frequency of delinquent acts.

Background of the Statistical Method

Analysis of covariance structures, commonly known as, LISREL (Linear Structural Relations), was first introduced by Bock and Bargmann (1966) to describe that is now called confirmatory factor analysis models. It attempts to explain the relationship among a set of observed variables in terms of a general, smaller number of unobserved variables. The application of analysis of covariance structure models generally requires the use of fairly complex mathematical transformations and maximization functions for several variables. Toward this end, Joreskog and Sorbom (1976, 1978, 1981) have developed a computer program called LISREL. The development of this program has played such an important role in the acceptance and application of the analysis of covariance structure models that such models are often referred to as LISREL models (Long, 1983).
A typical LISREL model consists of two parts, measurement model and structural equation model. The measurement model or the confirmatory factor analytic part specifies how the latent variables or the hypothetical constructs are measured in terms of the observed variables. The structural equation model or path analytic part, on the other hand, specifies the causal relationship among the latent variables. In other words, the measurement model, with its parameters, $\lambda_x$, $\lambda_y$, $\theta_\Delta$ and $\theta_e$, address the questions regarding the reliability and validity of the observed variables. The structural equation model, on the other hand, with its parameters of $\beta$, $\Gamma$, $\Psi$ and $\phi$ address the questions regarding the strength of the causal relationship between latent variables and the amount of unexplained variance in the total model. The LISREL model, allows the investigator to account for both the measurement errors and the estimate of the structural parameters in the same model. As McLaughlin (1982) pointed out, LISREL is a "full information technique" because it makes use of all the available information in the model. There are three types of parameters in a LISREL model: (1) Fixed parameters which are fixed in advance, (2) Free parameters whose values are unknown and need to be estimated, and (3) Constrained parameters where parameters are constrained to have the same value.

A LISREL model is also a restricted model, in the sense that a sufficient number of parameters have to be fixed or constrained in advance for it to be identified. A model is identified if the covariance matrix $\Sigma$ associated with it has a unique solution. That is, there is only one combination of linear structural equations that produce the same covariance matrix $\Sigma$. The imposition of restriction on
a LISREL model is totally guided by the theory and an identified model without strong theoretical and substantive rationale would be meaningless. Although the identification of any model depends on the way that it is specified, a necessary but not sufficient condition for identification is that the number of unknown parameters to be estimated from the equations are equal or less than the number of observed variances and covariances (Long, 1983). In just identified or over-identified models LISREL produces sufficient maximum likelihood estimates and standard errors of the parameter estimates. A LISREL output contains summary statistics concerning the measures of goodness of fit, statistical significance of the estimated parameters, and measures of reliability for both the indicators of each latent variable and the measurement model as a whole. The T-values, standard errors, variances, and standardized values of the estimates can also be obtained. The program can also calculate the direct, indirect, and total effects of the latent variables on each other. The parameter estimates are not confined within a particular boundary. Correlations greater than one and negative variances are possible, but they indicate poor fit. The statistical significance of the parameters can be assessed by observing the standard errors and the T-values. The T-values lower than two are usually considered non-significant (Joreskog and Sorbom, 1981).

The maximum likelihood chi-square test is used to assess the goodness of the fit of the model to the data. Values of chi-square which are not statistically significant indicate close fit between the hypothesized model and the observed data (Joreskog and Sorbom, 1981). However, since the value of chi-square is sensitive to sample size and
such values are bound to exceed the chance value in large samples, the ratio of chi-square to degrees of freedom ($\chi^2/df$) is frequently used as the criterion for comparing the extent to which different variations of a model fit the observed data the best (Wheaton et al, 1977). The reliability of each observed variable in the model is indicated by its squared multiple correlation coefficient. The square root of the squared multiple correlation coefficient of each variable is the validity measure of that variable. The coefficients of determination for structural equations, on the other hand, provide the reliability measures of the exogenous or endogenous variables as a whole. For example, in the following measurement model (Figure 2.4), the multiple correlation for each observed variable $x_i$, is the reliability of that variable, and the coefficient of the determination for the $x$ variables is a generalized measure of reliability for the whole measurement model.

Figure 2.4: A Typical Six Indicator Measurement Model.
LISREL is a particularly powerful method for analysis of longitudinal panel data where the same or similar variables are measured at two or more points of time (Schaie and Hertzog, 1982; Kessler and Greenberg, 1981; Joreskog and Wold, 1982). Longitudinal panel designs are used to monitor the levels of change or stability of variables through the time, or to infer the causal sequence or order among two or more variables by time structuring of the data and the use of the causal axiom, "if a, precedes b, b cannot cause a" (Schaie and Hertzog, 1982). This is especially true when for substantive, practical or ethical reasons, the experimental manipulation of the variables to determine causality is not possible. Several chapters in Nesselroad and Baltes (1979) and Kessler and Greenberg (1981) deal with the conceptual, methodological and substantive issues and logic of longitudinal panel studies in developmental psychology, education, and sociology. Articles and papers by Joreskog and Sorbom (1977), Joreskog (1979), Joreskog and Wold (1982), and Long (1983) address the problems of model specification, statistical estimation, and testing in longitudinal panel models and how LISREL can be used to overcome some of these problems. Duncan (1975), Hiese (1975), Wheaton et al. (1977), Wheaton (1980) and Kessler and Greenberg (1981) also discuss the merits of the longitudinal panel designs and how LISREL models can facilitate proper conceptualization and interpretation of stability and change of variables over time.

LISREL models provide important advantages over the traditional path analytic or cross-lagged correlation techniques in the analysis of panel data. First and probably most important of these is the fact
that LISREL allows inclusion of latent variables with multiple indicators in the structural equation model. The ability to use multiple indicators as a measure of various aspects of the latent variables not only address the question of multi-dimensionality of most of these variables, but it also improves the measurement properties of these latent variables in the model and avoids the biases that might be introduced by use of summary scores or factor scores. Furthermore as Wheaton, et al (1977) demonstrated that the use of multiple indicators in longitudinal panel models produces less biased estimates of reliability and stability parameters.

Unlike the traditional Path analysis, LISREL does not require the assumption of uncorrelated error terms. This is particularly important in the analysis of longitudinal panel data where the measurement errors for the same variable tend to be correlated because of retest effects (Joreskog and Wold, 1982). LISREL also allows the investigators to compare and contrast equally plausible causal models to determine the most reasonable of the alternative models.

Beside the advantages discussed above LISREL also has important advantages over cross-lagged correlation models, primarily because cross-lagged correlation models are non-directional in the sense that in these models the values of correlation coefficients relating one variable to another are unaffected by the sequential ordering in time (Bynner et al., 1981). LISREL models are not nondirectional and the regression coefficients used in the model are affected by sequential ordering of the variables in time.
In summary, there is a strong rationale for use of LISREL as a method of choice in this study. The ability to use multiple indicators to represent various aspects of total P-E fit in the model can overcome the problem of multi-dimensionality of P-E fit and avoid the kinds of biases discussed earlier. LISREL enables the investigator to relax some of the most tenuous assumptions such as the absence of serially correlated errors made in path analysis and to obtain more accurate estimates of reliability and stability parameters of the causal models under study.
CHAPTER III

METHODS AND PROCEDURES

The Data Set

The data used in this study come from the Youth in Transition Project, a nationwide longitudinal panel study of male high school students, conducted by the Survey Research Center of the Institute for Social Research at the University of Michigan. Five waves of longitudinal panel data were collected from a stratified, nationally representative sample of high school males. Initially, 2213 students entering 10th grade were interviewed in the fall of 1966. They were subsequently surveyed at the end of the 11th grade (1968), with 1886 responding. The sample was again surveyed just prior to graduation with 1799 respondents (1969) and in June and July of 1970, one year after graduation, with 1620 respondents. The data for the fifth wave of the survey were collected in the spring of 1974 (Bachman et al., 1978). The interview and survey instruments of the project included tests of ability and academic skills, questions about family characteristics, measures of self concept, psychological well being, values, educational and occupational plans, P-E fit and self-reported delinquency.

Variables

The variables used in this study are selected from first (1966), second (1968), and fourth (1970), panels of the Youth in Transition data set. This is due to the fact that measures of P-E fit are only available in the above three periods. The text of corresponding
questions concerning P-E fit, psychological strain, and delinquency may be found in Appendix A; however, they will be discussed here.

A. P-E Fit Measures

Youth In Transition study contains a total of 9 items measuring 9 different dimensions of P-E fit at the school context for all three periods of 1966, 1968 and 1970. Another 9 items measure the same aspects of P-E fit at the job context, but these measures are only available for 1968 and 1970 measurement periods. These 9 dimensions are:

1. The extent to which the respondent's perceived abilities and motives to be independent fit with his perception of the existing environmental demands and opportunities to be independent.

2. The extent to which the respondent's perceived abilities and motives to affiliate with his friends fit with his perception of the existing environmental demands and opportunities to affiliate with his friends.

3. The extent to which the respondent's perceived abilities and motives to achieve success, fit with his perception of the existing environmental demands and opportunities to achieve success.

4. The extent to which the respondent's perceived abilities and motives to affiliate with adults fit with his perception of the existing environmental demands and opportunities to affiliate with the adults.

5. The extent to which the respondent's perceived abilities and motives to improve himself fit with the existing environmental demands and opportunities to improve ones-self.

6. The extent to which the respondent's perceived abilities and
motives to do the things that might fail fit with his perception of
the existing environmental demands and opportunities to do those
things which might fail.

7. The extent to which the respondent's perceived abilities and
motives for self-utilization (doing the things which a person is
already good at), fit with his perception of the existing environ­
mental demands and opportunities for self improvement.

8. The extent to which the respondent's perceived abilities and
motives to use his intelligence fit with his perception of the
existing environmental demands and opportunities to use one's
intelligence.

9. The extent to which the respondent's perceived abilities and
motives to read fit with his perception of the existing environ­
mental demands and opportunities to read.

To measure P-E fit in each of the above dimensions, the respondent
answered 3 to 5 consecutive and related questions. In the first
question (when appropriate or available), the respondent is asked to
make a subjective judgment about his ability with regard to a particular
dimension of person-environment interaction. In the second question,
the respondent is asked to indicate the extent of his need or motive
with regard to that particular dimension. In the third question, the
respondent is asked to indicate the extent of the existing environmental
opportunities to gratify such need. In the fourth question (when
available), the respondent is asked to indicate the extent of the
environmental demands placed upon him in such dimension. In the final
question, the respondent is asked to make an overall subjective judgment
about the extent to which the existing environmental opportunities or
requirements in such dimension fit with what he wants. For example, with regard to "need for use of intelligence" dimension, at the school context, the respondents were asked:

1. How intelligent do you think you are compared with other boys your age?
   1. Far above average (top 10%)
   2. Above average (next 15%)
   3. Slightly above average (25%)
   4. Slightly below average (25%)
   5. Below average (next lowest 15%)
   6. Far below average (bottom 10%)

2. Compared with others your age, how important is it for you to use a lot of intelligence?
   1. Much more important than average
   2. A little more important than average
   3. About average importance
   4. A little less important than average
   5. Much less important than average

3. How often does your school give opportunities for you to use a lot of intelligence?
   1. Very much
   2. Quite a lot
   3. Some
   4. A little
   5. Not at all
4. How often does your school actually require you to use a lot of intelligence?
1. Very much
2. Quite a lot
3. Some
4. A little
5. Not at all

5. How does this (the opportunity or requirement for using a lot of intelligence at school) fit with what you want?
1. Too much compared with what I want
2. A little too much
3. Just about right
4. Not quite enough
5. Not enough compared with what I want

Because of the fact that the P-E fit measures in the Youth In Transition study (Bachman et al, 1967) were developed prior to development of French, Rodgers and Cobb's (1974) quantitative model of P-E fit, the correspondence between the model and the measures is at best crude. As is evident from the question list in Appendix A, questions measuring the individual ability are only available in two dimensions, while questions measuring the environmental demands or requirements are available in five dimensions. The unavailability of ability measures in most of the dimensions virtually eliminates the possibility of calculating ability-demand aspect of P-E fit in most of the above dimensions. Because of these difficulties, it was decided to use the last question "How does this (the opportunity or requirement for ...) fit with what
you want?" as a measure of subjective P-E fit in each of the above dimensions.

The responses to the last question in each dimension were recorded so it would reflect the goodness of the fit, regardless of the direction of the fit. Responses 1 and 5 were coded as 1; responses 2 and 4 were coded as 2; and response 3 remained as 3. So the score of 3 would reflect perfect P-E fit and the score of 1 would indicate a poor P-E fit in that particular dimension.

The preliminary investigations into the loading patterns of above measures on the theoretical construct of P-E fit, indicated that all nine indicators significantly load on the theoretical construct of P-E fit, both at school and job contexts. However, the three indicators of P-E fit in "Need for affiliation with adults", "Need to avoid doing things that might fail" and "Need to do reading" dimensions were consistently the least important indicators of the theoretical construct of P-E fit. To simplify the analysis and facilitate the identification of the models (described later in this chapter) it was decided to drop these three indicators from the analysis.

B. Psychological Strain Measures

Two indices of social support and resentment are used as indicators of the latent variable, psychological strain. The data set contains a number of indices and scales to measure the respondent's negative affective and somatic symptoms of irritability, general anxiety and tension, anxiety, depression, anomie, resentment, low self-esteem and alienation (perceived lack of social support). Because of fairly high inter-correlation among these variables in this data set (Bachman
et al., 1971) and to avoid the biases introduced by the presence of high multi-collinearity among these variables, only two of these indices, the social support index and the resentment index, were chosen as indicators of psychological strain. (For actual questionnaire items and procedures used to construct the indices by Bachman et al., 1978, see Appendix A).

C. Delinquency Measures

Two indices of interpersonal aggression and theft and vandalism are used as indicators of the latent variable, delinquency. As in the case of measures of psychological strain the data set contains at least four indices measuring delinquency, frequency of delinquent behavior index, seriousness of delinquent behavior index, interpersonal aggression index, and theft and vandalism index. These indices are constructed out of responses to 26 items developed by Gold (1966) to measure delinquency (see Appendix A for actual questionnaire items and procedures used to construct the scales). Again, because of high intercorrelation among these indices and to avoid the error introduced by the presence of high multicollinearity, the two indices of interpersonal aggression and theft and vandalism were chosen as indicators of the theoretical construct of delinquency.

D. Background Variable Measure

The single index of family socio-economic level was used as indicator of parental socio-economic and educational background. The index is a mean of six equally-weighted ingredients; Duncan status of Father's occupation, father's educational level, mother's educational
level, number of rooms per person in the home, number of books in the home, and a checklist of other possessions in the home. For detailed description of the index and its construction see Appendix A.

**Missing Data**

Listwide deletion technique was used to handle missing cases. The decision was made based on examination of the frequency of missing values for all the variables to be used in the study (see Table 1). As the table shows, 46 to 47 percent of the responses on P-E fit measures on the school environment and 54 to 55 percent of the responses to P-E fit measures on the job environment are missing at the time of the 1970 measurement. This is primarily because by the time of the fourth survey (1970), most of the respondents had graduated from high school. Only about 53 percent were still at school (including colleges and universities), while about 47 percent were working and not going to school. Because of the non-availability of P-E fit measures in the job context for time 1, and the fact that none of the strategies suggested by Hertel (1976) and Kim and Curry (1977) to deal with missing cases problems (such as estimating the missing values) could be applied for the treatment of missing values of this magnitude, it was decided that the theory was to be tested on two different groups. The first group included all the respondents who were going to school at all three periods on consideration. The second group included those respondents who were going to school in 1966 and 1968, but were working and not going to school in 1970.
Table 3.1. Percentage Frequency of Missing Values at Both School and Job Context.

<table>
<thead>
<tr>
<th>Variable</th>
<th>School Context</th>
<th>Job Context</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T_1$  $T_2$  $T_4$</td>
<td>$T_2$  $T_4$</td>
</tr>
<tr>
<td>P-E fit for independence</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>P-E fit for affiliation</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>P-E fit for self development</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>P-E fit for self utilization</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>P-E fit for use of intelligence</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Index of interpersonal aggression</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Index of theft and vandalism</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Index of lack of social support</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Index of resentment</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

The Stability Models

A three wave, six indicator, one latent variable, explicated confirmatory factor analytic or stability model was used to determine how the six indicators of P-E load on the theoretical construct of total P-E fit in both the student group and the working group. The same model was also used to assess the stability-variability of total P-E fit across the three measurement occasions (Figure 3.1 ). The explicated factor analytic or stability models differ from unexplicated or simple measurement models in that, in unexplicated models, no causal relationship between the latent variable are assumes, while in explicated models the relationship between the latent variables are assumed to be causally related. The explicated confirmatory factor analytic models are particularly useful in assessing stability and reliability patterns of complex variables with panel data (Wheaton et al, 1977).

Proper statistical and theoretical conceptualization and interpretation of stability variability of the theoretical constructs in
longitudinal panel data have been subjects of controversy in recent years. Dealing with a single variable three wave model (Figure 3.2), Hiese (1969) proposed that stability of variable $x$ between any two measurement occasions can be expressed in terms of the Pearson correlation coefficient between $x_t$ and $x_{t+1}$, $r_{xt,xt+1}$. A correlation coefficient close to one would indicate little or no change in the variable and a coefficient close to zero would indicate high variability in the variable between the two measurement occasions. Wheaton et al (1977), and Kessler and Greenberg (1981) and others have objected to such conceptualization of stability or change. They argue that although Hiese's (1969) conceptualization has intuitive appeal, it might be misleading due to components of the correlation not related to the values of $x$ at time one (for example, spurious component). They also show that, such conceptualization does not take into consideration the measurement error, validity and reliability estimates of the variable which might differ through time. Wheaton et al (1977) and Kessler and Greenberg (1981) contend that stability should be conceptualized in terms of change in the position of the individual in the distribution across the time and it should be distinguished from changes that might occur at the group level or due to measurement error. Stability defined in this way then, is concerned with the amount of change or lack of change in $x$ at time "t+1" exclusively due to $x$ at time "t." In other words, stability conceptualized in this way is the degree to which one's score at time "t" determines his or her score at the time "t+1." This conception of stability can be expressed in terms of a partial regression coefficient which expresses the amount
of change in \( x \) at "t + 1" due to change in \( x \) at time "t," controlling for changes due to other variables or measurement error. Wheaton et al (1977) and Kessler and Greenberg (1981) also demonstrate that stability models with multiple indicators tend to produce less biased validity, reliability and stability estimates than the single variable models. LISREL is particularly useful in handling such models. As Wheaton et al (1977: 93) noted:

"Explicated confirmatory factor analytic models provide a number of advantages in estimating reliability-and-stability models with panel data. First, these methods take into account random measurement error in that the amount of this type of error is estimated directly in the model. Second, in the case of multiple indicators, certain measurement error correlations can also be estimated. Third, causal relationships between abstract constructs can be interpreted directly rather than through inference from measure variable relationships. Fourth, the postulated structure relating observed measures to unobserved constructs and unobserved constructs to each other can be tested for fit to the observed variance-covariance matrix. Fifth, the model is thus very amenable to use as a theory construction tool (see the discussion by Burt, 1973). And, sixth, the issue of reliability and stability can be addressed within the context of a general model that has increased specification flexibility and, thus, increase our chances of accurately estimating these parameters."

Another three wave, two indicators, one latent variable, stability model was used to assess the loadings of the social support index and the resentment index on the latent variable of psychological strain. This model also assessed the stability-variability patterns of psychological strain over three measurement occasions in both the student group and the working group (Figure 3.18). A similar three wave, two indicator, one latent variable stability model was also used to assess the similar properties of delinquency indicators and stability of delinquency for both groups, over the three measurement
periods (Figure 3.1C). In stability models like these, the beta coefficient ($\beta$) and the largest eigen value of $\beta \times \beta$ transposed (the stability index) are used to determine the extent of stability-variability of the latent variables across the three measurement occasions. The values close to zero indicate high variability. The goodness of the fit for each model ($\chi^2/df$), the loadings of each indicator on the respective latent variable ($\lambda_y$), the reliability estimates of each indicator (squared multiple correlation coefficient), the reliability estimates of indicators as a whole (the total coefficient of determination for the $y$ variables), and the T-values associated with each coefficient are also reported for each model.

Figure 3.1: The Stability Models

(A) P-E Fit $t_1$ $t_2$ $t_3$

(B) Psychological $t_1$ Strain
    Psychological $t_2$ Strain
    Psychological $t_3$ Strain

(C) Delinquency $t_1$ Delinquency $t_2$ Delinquency $t_3$
The stability-variability patterns of P-E fit, psychological strain and delinquency were further examined by adding the single indicator variable of family socio-economic level as background variable to the above stability models (Figure 3.2 A,B,C). The goodness of the fit, and the accuracy of the following predictions were assessed.

I: In model 3.2:A, Family socio-economic level will have a significant and positive effect on P-E fit at all three measurement periods (Hypothesis E.1).

II: In model 3.2:B Family socio-economic level will have a significant and negative effect on psychological strain at all three measurement occasions (Hypothesis E.2).

III: In model 3.2:C, Family socio-economic level will have a significant and negative effect on delinquency at all three measurement occasions (Hypothesis E.3).

Figure 3.2: Stability Models with Family Socio-Economic Level as Background Variable.
The Causal Models

To investigate the causal relationship between P-E fit, psychological strain and delinquency, different variations of the following (Figure 3.3) causal model were specified and estimated on the computer program LISREL. However, because of small determinants of the covariance matrices to be analyzed (0.450090-19 and 10.44005-20), no satisfactory solution could be obtained for the model in any of the two sub-groups. A small determinant relative to the magnitude of the diagonal elements in the matrix is a measure of "ill conditioning of the matrix" and indicates that there is one or more nearly perfect linear relationship among the observed variables (Joreskog and Sorbom, 1981). The subsequent attempts to remedy this problem without breaking down the total causal model, such as reducing the number of indicators associated with each latent variable, did not yield satisfactory results.

Figure 3.3: The Original Causal Model:
Because of the above difficulties, it was decided to break down the total causal model into smaller causal models for both models, and investigate the relationship between the latent variables in several stages. These stages included (a) cross sectional tests of the theory at all three time periods, (b) three wave longitudinal test of the causal relationship between P-E fit and psychological strain, (c) three wave longitudinal tests of the causal relationship between psychological strain and delinquency, 2nd (d) three wave longitudinal test of causal relationship between P-E fit and delinquency for both sub-groups.

A. Cross-sectional Tests of the Theory

The cross sectional relationship between three variables of P-E fit, psychological strain and delinquency for both the student group and working group were examined employing the following three structural equation models. Similar to Kulka, Klingel and Mann's (1980) work, model 3.4-A assumes a direct causal relationship between P-E fit and delinquency without any intervening variable. In model 3.4-B, psychological strain is introduced as an intervening variable and no direct relationship between P-E fit and delinquency is assumed. Model 3.4-C on the other hand, includes psychological strain as an intervening variable and assumes both direct and indirect relationship between P-E fit and delinquency.

The above models provided the framework within which the following specific predictions were made and tested for both groups.

IV: In model 3.4-A P-E fit will have a negative and significant direct effect on delinquency. However, the direct negative
effect of P-E fit on delinquency will be negligible in model 3.4-C and most of the negative effect of P-E fit on delinquency will be mediated through the intervening variable of psychological strain (Hypothesis A.3).

V: In both models, 3.4-B and 3.4-C, paths from P-E fit to psychological strain will be significant and negative (Hypothesis A.1).

VI: In both models, 3.4-B and 3.4-C, the paths from psychological strain to delinquency will be significant and positive (Hypothesis A.2).

Figure 3.4: The Cross-sectional Models.

(A) P-E fit \[\rightarrow\] Delinquency

(B) P-E fit \[\rightarrow\] Psychological Strain \[\rightarrow\] Delinquency

(C) P-E fit \[\rightarrow\] Psychological strain \[\rightarrow\] Delinquency
B. Longitudinal Test of Causal Relationship Between P-E Fit and Psychological Strain

Following the Kessler and Greenberg (1981) and the Bynner, O'Malley and Bachman (1981) tradition to establish causality in longitudinal panel data, a three wave, eight indicator, two latent variable longitudinal causal model (Figure 3.5) was employed to determine the causal relationship between P-E fit and psychological strain. The overall explanatory power, goodness of the fit and following specific predictions were made and tested.

VII: The path from P-E fit to psychological strain will be consistently negative and stronger than the path from psychological strain to later P-E fit (Hypothesis C.4).

VIII. The path from psychological strain to later P-E will be consistently negative and stronger than the path from P-E fit to later psychological strain (Hypothesis C.1 and C.3).

Figure 3.5: The Causal Relationship Between P-E Fit and Psychological Strain.
C. Longitudinal Test of Causal Relationship Between Psychological Strain and Delinquency

A similar, three wave, eight indicator, two latent variables, longitudinal causal model was employed to determine the causal relationship between psychological strain and delinquency. The overall explanatory power, goodness of the fit, and the following specific predictions were assessed and tested.

IX. The path from psychological strain to delinquency will be consistently positive and stronger than the path from delinquency to later psychological strain (Hypothesis D.3).

X. The path from delinquency to later psychological strain will be positive and stronger than the path from psychological strain to later delinquency (Hypothesis D.1 and D.2).

Figure 3.6: The Causal Relationship Between Psychological Strain and Delinquency.
D. Longitudinal Test of Causal Relationship Between P-E Fit and Delinquency

Another, three wave, eight indicator, two latent variables, longitudinal causal model (Figure 3.7) was employed to determine the causal relationship between P-E fit and delinquency. The overall explanatory power, goodness of the fit, and the following specific predictions were assessed and tested.

XI: The path from P-E fit to delinquency will be consistently negative and stronger than the path from delinquency to later P-E fit (Hypothesis C.4).

XII: The path from delinquency to later P-E fit will be consistently negative and stronger than the path from P-E fit to later delinquency (Hypothesis C.1 and C.2).

Figure 3.7: The Causal Relationship Between P-E Fit and Delinquency.
The background variable of parental level of education, a single latent variable with single indicator was added to model 3.6 to assess the effect of parental education on P-E fit and delinquency (Figure 3.8). The total goodness of fit and following specific prediction were assessed and tested.

XIII: The background variable of family socio-economic level will have a positive effect on P-E fit and a negative effect on delinquency. In other words, the path from family socio-economic level to P-E fit will be significant and positive while the path to delinquency will be significant and negative. (Hypothesis F.1 and F.3)

Figure 3.8: The Causal Relationship Between Parental Background, P-E Fit and Delinquency.
CHAPTER IV

RESULTS

This chapter reports results of the Covariance Structure Analysis (LISREL) of the stability models, cross-sectional models and the causal models described in the third chapter. The LISREL V computer program developed by Joreskog and Sorbom (1981) was used to estimate the desired parameters in each model. The following criteria were used to assess the statistical significance of the estimates and goodness of the fit of the models.

1) Parameter estimates were examined for unreasonable values, e.g., negative variances or correlations greater than one.
2) Parameter estimates with T-values less than two were considered non-significant.
3) The ratio of $\chi^2$/df of equal or less than was taken as indication of acceptable fit.

Several variations of each model were examined to obtain the most satisfactory theoretical and statistical fit. The results of the model with the best theoretical and statistical fit are reported in each case.

The results of the stability models are examined in the first section. The second section reports the results of the cross-sectional models. Results of the longitudinal causal models are examined in the last section.
A. Stability of P-E Fit

Figure 4.1 shows the most satisfactory variation of the stability of P-E fit model (described in Figure 3.1-A in the previous chapter) for the student group. (Those who were at school at all three measurement occasions). The six scale items are indicators of P-E fit in 1966, 1968, and 1970. The two arrows between the three latent constructs of P-E 1966, P-E 1968, and P-E 1970, represent the stability of P-E fit across the measurement periods. The measurement errors associated with each observed variable are indicated by arrows e1 through e18. The best fit (in terms of goodness of the fit and the \( \chi^2/df \) ratio) was achieved by allowing some of the measurement errors to be correlated within and across the measurement occasions.

Figure 4.1 also displays standardized and unstandardized maximum likelihood estimates of the stability coefficient (\( \beta \)), error terms associated with latent variables (\( \psi \)), squared multiple correlation coefficient for the structural equations, goodness of fit index and \( \chi^2/df \) ratio for the model. The standardized values of the estimates are presented in parenthesis. Correlated error term estimates associated with the observed variables (\( \theta_{ij} \)) are also displayed in Figure 4.1.

The standardized and unstandardized maximum likelihood estimates of the loading of each indicator on the theoretical construct of P-E fit, the reliability estimates of each indicator and the \( T \) values associated with each estimate are reported in Table 4.1.
Figure 4.1: Stability of P-E Fit (Student Sub-group).

\[
\begin{align*}
\beta_{21} &= 0.819 (.653) \quad \psi_{33} = 0.070 \quad \theta_{e13-1} = 0.028 \quad \theta_{e13-7} = 0.068 \\
\beta_{32} &= 0.605 (.537) \quad \theta_{e17-11} = 0.053 \quad \theta_{e14-2} = 0.022^* \quad \theta_{e7-8} = 0.045 \\
\psi_{11} &= 0.047 \quad \theta_{e7-1} = 0.064 \quad \theta_{e18-5} = 0.011^* \\
\psi_{22} &= 0.046 \quad \theta_{e13-14} = 0.038 \quad \theta_{e14-8} = 0.052
\end{align*}
\]

Squared multiple correlation coefficient for standard equation 21 = .404
Squared multiple correlation coefficient for structural equation 32 = .289
Goodness of the fit index = 0.965
\[\chi^2 / df = 219 / 124 = 1.766\]
\[N = 719\]
*T-values less than 2.0
a: Standardized values are stated in the parenthesis.
Table 4.1: Item loading of P-E Fit Indicators, 1966, 1968, 1970, Student Sub-group.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>1966</th>
<th></th>
<th>1968</th>
<th></th>
<th>1970</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit, need for independence at school (ID)</td>
<td>1.000</td>
<td>.2166</td>
<td>1.000</td>
<td>.2786</td>
<td>1.000</td>
<td>.3136</td>
</tr>
<tr>
<td>Fit, need for affiliation at school (AF)</td>
<td>1.082</td>
<td>.2336</td>
<td>.684</td>
<td>.190</td>
<td>.529</td>
<td>.166</td>
</tr>
<tr>
<td>Fit, need for achievement at school (AC)</td>
<td>0.921</td>
<td>.199</td>
<td>.810</td>
<td>.225</td>
<td>1.051</td>
<td>.329</td>
</tr>
<tr>
<td>Fit, need for self improvement at school (IM)</td>
<td>1.146</td>
<td>.247</td>
<td>1.339</td>
<td>.372</td>
<td>1.341</td>
<td>.412</td>
</tr>
<tr>
<td>Fit, need for self utilization at school (SU)</td>
<td>1.310</td>
<td>.283</td>
<td>.994</td>
<td>.276</td>
<td>1.011</td>
<td>.317</td>
</tr>
<tr>
<td>Fit, need for use of intelligence at school (IN)</td>
<td>1.248</td>
<td>.269</td>
<td>1.176</td>
<td>.327</td>
<td>1.069</td>
<td>.335</td>
</tr>
</tbody>
</table>

Total coefficient of determination for Y variables (Scale reliability) = .928 N=719
S= Standardized
R= Reliability estimates (squared multiple correlation coefficient for each item)
*=T-values less than 2.0

Examination of the goodness of fit index (0.965) and $\chi^2$/df ratio of (1.799) indicates an excellent fit between the hypothesized model and the observed data. All six indicators significantly load on the theoretical construct of P-E fit and examination of the total coefficient of determination for observed variables (.928) indicates a high scale reliability for the indicators as a whole. Among the indicators, the need for self improvement at school appears to be the
most important and most reliable indicator of P-E fit across the measurement occasions. Need for affiliation with friends, on the other hand, appears to be the least important and least reliable indicator of P-E fit across the measurement occasions. The fact that the measurement errors associated with successive measurement of the same indicators are correlated testifies for the presence of serially correlated measurement errors, which are due to test, re-test effect.

The above finding is consistent with Seltzer (1982) and Sebald's (1984) position that the adolescent's dependence and need to affiliate with friends and primary peer groups tend to decrease in favor of the need for self-improvement and self-utilization, as they move toward completion of unique self-structured and self-centered identities. They increasingly realize that in their efforts to understand themselves and the universe around them, they no longer have to depend on the physical presence of their friends and peer groups. The emphasis of their "quest", at this stage, changes from assessment of "Do I possess the qualities and attributes that my friends have?" To the assessment of "Is it the quality that I want?" "What use will it be to me?" or "Do I have enough of it to utilize it for the purpose that I want?" In other words, they become more interested in finding out "what or who they want to be" and "how they can be what they want to be."

Examination of the stability coefficients of the latent variable P-E fit, (β21=.819, and β32=.605) indicates that P-E fit tends to be relatively stable over time. However P-E fit tends to be more stable between 1966 and 1968 than between 1968 to 1970. The examination of squared multiple correlation coefficients for the structural equations
21 and 32 (.404 and .289) also indicate that P-E fit in 1966 is a much more reliable predictor of P-E fit in 1968 than P-E fit in 1968 is for 1970. The finding that the theoretical construct of P-E fit tends to be relatively stable over time is a bit unexpected, because existing literature, as it was discussed in chapter 2, tends to view P-E fit as a situational variable and subject to more immediate changes in the person-environment interaction (Hypothesis B.3), rather than a slow and evolutionary change. While the finding that P-E fit is relatively stable over time is a bit surprising, the latter finding that P-E fit is more stable between 1966 and 1968 than 1967 and 1970, can be explained in light of the fact that the transition from 10th grade to the 12th grade tends to be less drastic than the transition from high school to the university. Figure 4.2 and Table 4.2 display similar information about the stability of P-E fit for the working group (those who were at school in first and second measurement occasion and were working in the third).

Examination of the goodness of the fit index (.962) and $\chi^2/df$ ratio (1.211) of stability of P-E fit model for the working group also indicate an excellent fit between the hypothesized model of stability of P-E fit and the observed data. All indicators of P-E fit at the school context for the years 1967 and 1968 and at the job context for 1970, significantly load on the theoretical construct of P-E fit for the respective year. The high value of total coefficient of determination for observed variables (.959) also indicate a high scale reliability for the indicators as a whole. For the working group, the need for
Figure 4.2: Stability of P-E Fit (Working Sub-group).

Squared multiple correlation coefficient for structural equation 21 = 0.382
Squared multiple correlation coefficient for structural equation 32 = 0.091

Goodness of the fit index = 0.962

χ²/df = 147.77/122 = 1.211

*: T-values less than 2.0

a: Standardized values are stated in parenthesis

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>1966</th>
<th>1968</th>
<th>1970</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Fit, need for independence at school (ID)</td>
<td>1.000</td>
<td>0.261</td>
<td>0.198</td>
</tr>
<tr>
<td>Fit, need for affiliation at school (AF)</td>
<td>0.863</td>
<td>0.225</td>
<td>0.151</td>
</tr>
<tr>
<td>Fit, need for achievement at school (AC)</td>
<td>0.587</td>
<td>0.153</td>
<td>0.081</td>
</tr>
<tr>
<td>Fit, need for self improvement at school (IM)</td>
<td>0.983</td>
<td>0.257</td>
<td>0.207</td>
</tr>
<tr>
<td>Fit, need for self utilization at school (SU)</td>
<td>1.263</td>
<td>0.330</td>
<td>0.312</td>
</tr>
<tr>
<td>Fit, need for use of intelligence at school (IN)</td>
<td>0.946</td>
<td>0.247</td>
<td>0.239</td>
</tr>
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<td>0.222</td>
</tr>
<tr>
<td>Fit, need for affiliation at the job (AFJ)</td>
<td>0.761</td>
<td>0.257</td>
<td>0.145</td>
</tr>
<tr>
<td>Fit, need for achievement on the job (ACJ)</td>
<td>1.268</td>
<td>0.428</td>
<td>0.381</td>
</tr>
<tr>
<td>Fit, need for self-improvement on the job (IMJ)</td>
<td>1.599</td>
<td>0.540</td>
<td>0.564</td>
</tr>
<tr>
<td>Fit, need for self-utilization on the job (SUJ)</td>
<td>1.358</td>
<td>0.459</td>
<td>0.372</td>
</tr>
<tr>
<td>Fit, need for use of intelligence on the job (INJ)</td>
<td>1.666</td>
<td>0.562</td>
<td>0.594</td>
</tr>
</tbody>
</table>

Total coefficient of determination for Y variables (Scale reliability) = 0.959  N=492
S= Standardized
R= Reliability estimates (squared multiple correlation coefficient for each item)
*=T-values less than 2.0
self-utilization (doing what they are already good at) tends to be one of the best and most reliable indicators of P-E fit at both school and job context. The need for affiliation with friends at school or on the job tends to be the least important indicator of P-E fit at both contexts. While the need for self improvement and the need for the use of intelligence tend to be relatively less important indicators of P-E fit at the school context, these indicators appear to be the two most important indicators of P-E fit on the job context. This is consistent with Bachman et al (1971) who reported a high correlation between job satisfaction and the job characteristics which allow self-utilization, self-improvement, and the opportunity to learn new things. Their analysis shows that, while the above job characteristics show relatively high correlation with job satisfaction (r=.60, r=.51, and r=.49 respectively), having nice and friendly coworkers as a job characteristic is only mildly (r=.34) correlated with job satisfaction.

The coefficients for the stability of P-E fit during 1966-1968 and 1968-1970 (β₃₂=.742 and β₃₂=.326) indicate a fairly high level of stability for P-E fit during 1966-1968 and a relatively low level of stability during 1968-1970 periods among the second group. However, the suggestion that this be taken as evidence that P-E fit is a situational variable and subject to change with immediate environmental changes might be misleading. The apparent drop in stability of P-E fit during the period of 1968-1970 for both students and the working group might be attributed to the fact that the period between 1968 and 1970 represents a unique stage of life (Age 17 to 19, the transition from childhood to adulthood) in the life span of the sample population under study. As
Sebald (1984) notes, American culture and society contain many number of culturally and legally prescribed child-adult role dicotomies that the confusion about which role to take can exert its own brand of strain on the adolescent and his or her interpersonal relationships. The impact of such strain on the adolescent is particularly strong when he or she is right in the midst of transition from the status of a child to the status of an adult. In other words, the apparent changes in P-E fit during this period might, partially be due to this age specific and in a way qualitative change in the life of the adolescent rather than due to contextual and more immediate situational changes. However, the mere fact that P-E fit is more stable for the student group (who experience less contextual changes) than for the working group during this period shows that P-E fit is subject to more immediate environmental changes, but not to a large extent.

The effect of parental background on the stability-variability patterns of P-E fit was assessed by adding the single indicator of the family socio-economic level education as background variable for the models 4.1 and 4.2. Figures 4.3 and 4.4 display the results of the stability of P-E fit with the family socio-economic level as the background variable for both the student and working groups.

As is clear from both figures 4.3 and 4.4, family socio-economic background has no significant effect on P-E fit and its stability-variability patterns for the student group or the working group. These findings are not consistent with Hypothesis E.1 (Chapter 2) and prediction (I) which asserted a significant and positive relationship between P-E fit and family socio-economic background. Hypothesis E.1 cannot be supported.
Figure 4.3: Stability of P-E Fit with the Family Socio-economic Level as Background Variable (Student Sub-group).

\[ \beta_{21} = 0.785 (0.612) \]
\[ \beta_{32} = 0.569 (0.520) \]

Goodness of the fit index = 0.929
\[ x^2/df = 221.32/139 = 1.592 \]
\( a = \) standardized values
\( * = T \)-values less than 2.0

Figure 4.4: Stability of P-E Fit with the Family Socio-economic Level as Background Variable (Working Sub-group).

\[ \beta_{21} = 0.732 (0.599) \]
\[ \beta_{32} = 0.345 (0.334) \]

Goodness of the fit index = 0.950
\[ x^2/df = 194.79/137 = 1.42 \]
\( a = \) standardized values
\( * = T \)-values less than 2.0
The above finding suggests that while it might be true that the children of higher socio-economic background have higher levels of abilities and aspirations, it might be equally the case that more is expected from such children, and the final outcome of P-E fit equation is not effected by changes in family socio-economic level.

B. Stability of Psychological Strain

Figure 4.5 shows the most satisfactory variation of the stability of the psychological strain model (described in Figure 3.1-B, in the previous chapter). The entire sample population was used for this analysis and no separate analysis was performed for the working and student sub-groups. The best fit was achieved by allowing most of the indicators to be correlated with each other within and across the three measurement occasions.

Table 4.3 displays the item loadings of the two indicators of the social support index and resentment index on the theoretical construct of psychological strain across the three measurement occasions.

Examination of the goodness of the fit index (.999) and $\chi^2/df$ ratio of (1.44) indicates an excellent fit between the specified model and the observed data. The two indicators of psychological strain significantly load on the theoretical construct of psychological strain. The total coefficient of determination for the observed variables (.993) also indicates an almost perfect scale reliability for the observed indicators as a whole. The resentment index appears to be a more important and more reliable indicator of the latent variable across the measurement occasions.
Figure 4.5: Stability of Psychological Strain (The Entire Sample):

\[ \begin{align*}
\beta_{21} &= .691 (.624) \\
\beta_{32} &= .571 (.661) \\
\Psi_{11} &= .212 \\
\Psi_{22} &= .159
\end{align*} \]

Squared multiple correlation coefficient for structural equation 21 = .389
Squared multiple correlation coefficient for structural equation 32 = .436
Goodness of the fit index = .999
\[ \chi^2/df = 1.44/1 = 1.44 \]
* = T-values less than 2.0
a: Standardized values


<table>
<thead>
<tr>
<th>ITEMS</th>
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<th></th>
<th>1968</th>
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<td></td>
<td>U</td>
<td>S</td>
<td>R</td>
<td>U</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Social Support Index</td>
<td>1.000</td>
<td>.461</td>
<td>.419</td>
<td>1.00</td>
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<td>.461</td>
<td>.405</td>
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<td>Resentment Index</td>
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<td>1.086</td>
<td>.554</td>
<td>.777</td>
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<td></td>
<td></td>
<td></td>
<td>1.215</td>
<td>.560</td>
<td>.847</td>
</tr>
</tbody>
</table>

Total coefficient of determination for Y variables (Scale reliability) = .993
S= Standardized
R= Reliability
*=T-values less than 2.0
The coefficients of $\beta_{21} = .691 (.624)$ and $\beta_{32} = .597 (.661)$ indicate a relatively high level of stability for the theoretical construct of psychological strain across the measurement occasions.

Figure 4.6 shows the results of the stability of psychological strain with family socio-economic level as the background variable. Family socio-economic level had a weak significant negative effect on psychological strain in 1966 ($-.037$). This is consistent with the Hypothesis (E.2, Chapter 2) and the Prediction II (Chapter 3) which asserted a significant and negative relationship between family socio-economic level and psychological strain. The Hypothesis E.2 is partially supported.

Figure 4.6: Stability of Psychological Strain with Family Socio-economic Level as the Background Variable.

\[ \begin{align*}
Y_{11} &= -.037 (-.091) \quad \beta_{21} = .704 (.612) \\
Y_{21} &= -.005 (-.001)^* \quad \beta_{32} = .592 (.661) \\
Y_{31} &= -.009 (.021) \\
\text{Goodness of the fit index} &= .999 \\
\chi^2/df &= 4.06/4 = 1.01 \\
a &= \text{Standardized values} \\
* &= \text{T-values less than 2.00}
\end{align*} \]
C. Stability of Delinquency

No unique solutions for the stability of delinquency model (described in Figure 3.1, Chapter 3) could be obtained among the working and the student sub-population separately. However, unique solutions could be obtained for the model with the whole population. Figure 4.7 shows the most satisfactory variation of this model.

Figure 4.7: Stability of Delinquency (The Entire Sample):

\[ \beta_{21} = .559(.460) \]
\[ \beta_{32} = .378(.501) \]
\[ \psi_{11} = .098 \]
\[ \psi_{22} = .114 \]
\[ \theta_{e3-1} = .071 \]
\[ \theta_{e5-1} = .062 \]
\[ \theta_{e3-5} = .055 \]

Squared multiple correlation coefficient for structural equation 21 = .211
Squared multiple correlation coefficient for structural equation 32 = .251
Goodness of the fit index = .973
\[ \chi^2/df = 74.84/4 = 18.71 \]
*: T-values less than 2.00
a: Standardized values

Table 4.4 displays the item loadings of the two indicators of theft and vandalism index and interpersonal aggression index on the theoretical construct of delinquency across the three measurement periods.
Table 4.4: Item Loading of Delinquency Indicators 1966, 1968 and 1970 (Entire Population)

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>1966</th>
<th>1968</th>
<th>1970</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Theft and Vandalism</td>
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<td>.313</td>
<td>.909</td>
</tr>
<tr>
<td>Index</td>
<td></td>
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<tr>
<td>Interpersonal</td>
<td>1.520</td>
<td>.476</td>
<td>.407</td>
</tr>
<tr>
<td>Aggression Index</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total coefficient of determination for Y variables (Scale reliability) = .999

S = Standardized
R = Reliability
*= T-values less than 2.00

N = 1254

As is evident from Table 4.4, the two indicators of theft and vandalism index and interpersonal aggression index both significantly load on the theoretical construct of delinquency at all three measurement occasions. While it appears that the interpersonal aggression index is a better indicator of delinquency at two measurement occasions, the theft and vandalism index, on the other hand, appears to be the more reliable indicator of delinquency across all the measurement periods.

The stability coefficients $\beta_{21} = .559 (.460)$ and $\beta_{32} = .378 (.501)$ indicate relatively low stability for the theoretical construct of delinquency across the three measurement periods. Despite the fact that the goodness of the fit index (.973) indicates a good fit, the $\chi^2/df$ of 18.7 indicates that such a fit between the model and the observed data is not probable at all, and the model has to be ruled as unfit.
The introduction of the family socio-economic level as a control variable for the model, also did not make the model more probable. However, when the path from DLQ\textsubscript{66} to DLQ\textsubscript{70} was freed to be estimated, the $\chi^2$/df ratio drops to .61 (Figure 4.8), and the model becomes highly probable.

Figure 4.8: Stability of Delinquency Model (The Lagged Effect of DLQ\textsubscript{66} on DLQ\textsubscript{70} Not Constrained).

The results displayed in Figure 4.8 indicate that delinquency at 1966 is as valid a predictor of delinquency in 1970 as delinquency in 1968. In other words, there might be individuals in the sample who committed delinquent acts in 1966 and 1970, but were not involved in any delinquent acts in 1968.
D. Summary of Findings on Stability Models

1. All six indicators of six different dimensions of P-E fit significantly and consistently loaded on the theoretical construct of P-E fit in both the school and job contexts.

2. Among the indicators of P-E fit, the "need to affiliate with friends" dimension of P-E fit appeared to be the least salient and the least reliable indicator of P-E fit in both the school and the job context. "Need for self improvement" and "Need for self-utilization" dimensions of P-E fit, on the other hand, tended to be two most important and most reliable indicators of P-E fit in school and job contexts respectively.

3. P-E fit was quite stable during 1966 to 1968 among both sub-groups. During 1968 to 1970, however, P-E fit appeared to be less stable, especially among the working-subgroup of the sample population. While part of such instability might be attributed to the fact that the period of 1968 to 1970 was a critical transition period (from childhood to adulthood) in the life cycle of the sample population, the mere fact that P-E fit was more stable among the student sub-group than among the working sub-group, shows that P-E fit is subject to some contextual and environmental changes but not to a large extent.

4. Family socio-economic level as background variable did not have any effect on stability-variability patterns of P-E fit among the student or working sub-groups.

5. The indicators of "social support index" and "resentment index" significantly and consistently load on the theoretical construct of
psychological strain across all three measurement occasions.

6. "Resentment index" appeared to be more salient and more reliable indicator of psychological strain across the measurement occasions.

7. Psychological strain, as a theoretical construct appeared to be relatively stable across all three measurement occasions.

8. Family socio-economic level showed consistently negative effect on psychological strain, however, such effect was only significant in 1966. Introduction of family socio-level, as background variable, did not have any real effect on stability-variability pattern of psychological strain.

9. While interpersonal aggression index appeared to be a better indicator of delinquency during 1966 and 1970, theft and vandalism was a more reliable indicator of delinquency across all three measurement occasions.

10. Delinquency as a theoretical construct appeared to be relatively unstable, the stability coefficients between 1966 and 1968 was $\beta_{21} = .46$, and between 1966 to 1970 it was $\beta_{31} = .28$. The stability coefficient between 1968 and 1970 was $\beta_{32} = .38$.

Cross-sectional Models

A. Time 1 Runs

The results of the cross sectional tests of the models 3.5-A,B and C (described in the previous chapter) with 1966 data are displayed in Figures 4.9, 4.10 and 4.11. There were no subgroups in the 1966 data set and the models were tested with the data from all the sample population.
Figure 4.9: Cross-sectional Model A, 1966.

\[ Y_{11} = -0.381(-.266) \]
\[ \phi_{11} = 0.080 \]
\[ \psi_{11} = 0.153 \]

Goodness of the fit index = 1.000
\[ \chi^2/df = 0.3687/14 = 2.490 \]
* T-values less than 2.0

Figure 4.10: Cross-sectional Model B, 1966.

\[ Y_{11} = -0.561(-.282) \]
\[ \theta_{e11} = 0.075 \]
\[ \theta_{\Delta21} = 0.282(0.33) \]

Goodness of the fit index = 0.986
\[ \chi^2/df = 93.23/28 = 3.32 \]
* T-values less than 2.0
As is clear from Figures 4.9, 4.10 and 4.11 all three specified models indicate a high and probable fit between the specified models and the observed data. In both models 4.9 and 4.11, there is a significant and negative relationship between P-E fit and delinquency. This supports the first part of the Hypothesis A.3 (Chapter 2) and prediction IV in chapter 4 which assert a negative and significant relationship between P-E fit and delinquency. However, the assertion that the effect of P-E fit on delinquency is mediated through psychological strain and the direct effect of P-E fit on delinquency will be substantially reduced in model 4.11 is not supported. The negative direct effect of P-E fit in figure 4.9 ($Y_{11} = -0.381$) remains virtually unchanged by the introduction of psychological strain as intervening variable in figure 4.11 ($Y_{21} = -0.337$).
Hypothesis A.1 and A.2 and predictions V and VI are both supported in models 4.10 and 4.11. P-E fit has a significant and negative effect on psychological strain in both models (γ₁₁ = - .561 and γ₂₁ = - .505). Also, in both models, psychological strain has a significant and positive effect on delinquency (P₂₁ = .282 and P₂₁ = .221).

B. Time 2 Runs

The results of the cross-sectional tests of the models 3.5-A, B and C (described in the previous chapter) with the 1968 data are displayed in Figures 4.12, 4.13 and 4.14. The whole sample population in 1968 are considered and no distinction is made between the student and the working sub-groups in 1968. The findings are exactly the same as the 1966 findings, Hypotheses A.1, A.2 and A.3 are supported and the introduction of psychological strain as the intervening variable in model 4.14 does not drastically change the direct effect of P-E fit on delinquency from what it is in 4.12.

Figure 4.12: Cross-sectional Model A, 1968.

\[ \gamma_{11} = -0.174(-0.177) \quad \phi_{11} = 0.175 \quad \theta_{64} = 0.035 \quad \theta_{A12} = 0.047 \]

\[ x^2/df = 0.34.71/18 = 1.92 \quad N = 1474 \]
Figure 4.13: Cross-sectional Model B, 1968.

\[
\begin{align*}
Y_{21} &= -.337(-.206) \\
\beta_{21} &= .251(.311) \\
\phi_{11} &= .078
\end{align*}
\]

Goodness of the fit index = .991
\[\chi^2/df = 102.11/32 = 3.191\]
* = T-values Less than 2.00

\[N = 1474\]

Figure 4.14: Cross-sectional Model C, 1968.

\[
\begin{align*}
Y_{21} &= -.188(-.121) \\
\beta_{21} &= .232(.281) \\
\phi_{11} &= .080
\end{align*}
\]

Goodness of the fit index = .982
\[\chi^2/df = 92.11/31 = 2.97\]
* = T-Values Less than 2.00

\[N = 1474\]
C. Time 3 Runs

Cross-sectional models were tested separately for the working and the student sub-groups with the 1970 data set. The results of the cross-sectional models with the data from the student sub-group are displayed in Figures 4.15, 4.16 and 4.17.

Figure 4.15: Cross-sectional Model A, 1970 Student Sub-group.

\[
\begin{align*}
Y_{11} &= -.018(-.050)^* \\
\phi_{11} &= .094 \\
\theta_{e11} &= .045 \\
\theta_{e22} &= .045 \\
\theta_{\Delta 21} &= .018^* \\
\theta_{\Delta 64} &= .018^* \\
\end{align*}
\]

Goodness of the fit index = .987

\[\chi^2/df = 19.81/17 = 1.165\]

\* = T-values less than 2.00

N = 753
Figure 4.16: Cross-sectional Model B, 1970 Student Sub-group.

\[ Y_{11} = -0.337(-0.206) \quad \text{fit} \quad \beta_{21} = 0.041(0.056)^* \]

Goodness of the fit index = 0.976
\[ \chi^2/df = 49.49/30 = 1.65 \]
* = T-values less than 2.00

\[ N = 753 \]

Figure 4.17: Cross-sectional Model C, 1970 Student Sub-group.

\[ Y_{12} = -0.054(-0.037)^* \]

Goodness of the fit index = 0.976
\[ \chi^2/df = 48.90/29 = 1.682 \]
* = T-Values Less than 2.00

\[ N = 753 \]
As is evident from Figures 4.16 and 4.17, P-E fit continues to have a relatively high, significant and negative effect on psychological strain and Hypothesis A.1 and prediction V are both supported among the student sub-group of the 1970 data. However, while the relationship between P-E fit and delinquency is still negative in Figures 4.16 and 4.17, in neither of these models this relationship is significant and Hypothesis A.3 and prediction IV cannot be supported. The relationship between psychological strain and delinquency is also positive, as expected in both models B and C. However, these relationships are not significant and the Hypothesis A.2 and prediction VI also are rejected with the student sub-group in the 1971 data.

Figure 4.18: Cross-sectional Model A, 1970 Working Sub-group.

\[
\begin{align*}
Y_1 &= -.016(\pm .015) \\
Y_{11} &= .016(\pm .015) \quad \theta_{e11} = .112 \\
\phi_{11} &= .189 \quad \theta_{e22} = .112 \\
\psi_{11} &= .216 \quad \theta_{e31} = .022 \\
\theta_{\Delta 61} &= .034* \quad \theta_{\Delta 24} = .019* \\
\theta_{\Delta 4} &= .060 \quad \theta_{\Delta 34} = .076 \\
\text{Goodness of the fit index} &= .979 \\
\chi^2/df &= 41.85/15 = 2.79 \\
* &= T-values less than 2.00
\end{align*}
\]
Figure 4.19: Cross-sectional Model B, 1970 Working Sub-group.

\[
Y_{11} = -0.408(-0.297) \quad \psi_{11} = 0.321 \quad \epsilon_{22} = 0.112 \quad \delta_{21} = 0.021* \quad \delta_{34} = 0.081
\]
\[
\beta = 0.205(0.137) \quad \psi_{22} = 0.212 \quad \epsilon_{33} = 0.203 \quad \delta_{33} = 0.029* \quad \delta_{64} = 0.059
\]
\[
\phi_{11} = 0.321 \quad \epsilon_{11} = 0.112 \quad \epsilon_{44} = 0.203 \quad \delta_{42} = 0.013*
\]

Goodness of the fit index = .970
\[x^2/df = 66.53/30 = 2.251\]

Figure 4.20: Cross-sectional Model C, 1970 Working Sub-group.

\[
Y_{12} = -0.0688(0.063) \quad \psi_{22} = 0.211 \quad \epsilon_{33} = 0.203 \quad \delta_{61} = 0.020* \quad \delta_{64} = 0.061
\]
\[
\phi_{11} = 0.187 \quad \epsilon_{11} = 0.112 \quad \epsilon_{44} = 0.203 \quad \delta_{42} = 0.013*
\]

Goodness of the fit index = .971
\[x^2/df = 66.42/29 = 2.290\]
* = T-values less than 2.00
Figures 4.18, 4.19 and 4.20 show the results of the same models among the working subgroup in 1970. As expected, P-E fit has a negative, and significant effect on psychological strain in both models B, and C. Also, the relationship between psychological strain and delinquency is positive and significant in both B, and C models. However, the relationship between P-E fit and delinquency in both models A and C are positive and but not, significant. While models A and C show no significant direct effect between P-E fit and delinquency, an examination of the total effect of P-E fit on delinquency (Table 4.5) shows that P-E fit has an overall negative effect on delinquency via its negative effect on psychological strain.

<table>
<thead>
<tr>
<th>Table 4.5: The Total Effects of P-E Fit on Delinquency (Working Group, 1970):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total effect of P-E fit on Psychological strain</td>
</tr>
<tr>
<td>Total effect of P-E fit on Delinquency</td>
</tr>
<tr>
<td>Total effect of P-E fit on interpersonal aggression index</td>
</tr>
<tr>
<td>Total effect of P-E fit on the theft and vandalism index</td>
</tr>
<tr>
<td>Total effect of P-E fit on the resentment index</td>
</tr>
<tr>
<td>Total effect of P-E fit on the social support index</td>
</tr>
</tbody>
</table>

This tends to support the original contention of the theory that P-E fit affects delinquency through its effect on psychological strain. However, this finding only holds among the working-sub group of the sample in 1970.
D. Summary of Findings on Cross-sectional Models

1. P-E fit had significant and negative direct effect on delinquency in 1966 and 1968 runs.

2. P-E fit had significant and negative effect on psychological strain in 1966 and 1968 runs.

3. In both time one (1966) and time two (1968) runs, all three variations of P-E fit theory of delinquency (variation A, B, and C) were equally valid. The introduction of psychological strain as mediating variable between P-E fit and delinquency, neither drastically reduced the amount of direct effect of P-E fit on delinquency nor drastically increased the total effect of P-E fit on delinquency.

4. Psychological strain had significant and positive effect on delinquency in both 1966 and 1968 runs.

5. P-E Fit had neither direct nor indirect significant effect (via, psychological strain, variations B and C) on delinquency among the student sub-group of 1970 data.

6. P-E fit had a significant and negative effect on psychological strain among the student sub-group of 1970 data.

7. Psychological strain had no significant effect on delinquency among the student sub-group of 1970 data. However such relationships were both significant and positive for the working sub-group of 1970.

8. P-E fit had no significant direct effect on delinquency among the working sub-group of 1970 data. However P-E fit had an overall negative total effect on delinquency through its effect on psychological strain among the working sub-group of 1970 data.
Figure 4.21 displays the most satisfactory variation of the longitudinal causal relationship between P-E fit and psychological strain (described in Figure 3.6, previous chapter) among the student sub-group of the longitudinal panel data (those individuals who were at school at all three measurement occasions).

The goodness of fit index (.936) and the $\chi^2/df$ ratio (1.81) indicate a good fit between the specified model and the observed data within the student sub-group of the longitudinal data. The contemporaneous effect of P-E fit on psychological strain ($Y_{11} = -.343$, $\beta_{32} = -.187$, and $\beta_{54} = -.182$) are all negative and stronger than the lagged effects of psychological strain on later P-E fit ($\beta_{21} = -.048$ and $\beta_{43} = .048$). The lagged effect of psychological strain on both measurement periods are non-significant. These findings are consistent with Hypothesis C.4 (Chapter 2) and prediction VII which asserted that the contemporaneous effect of P-E fit on psychological strain is negative and stronger than the lagged effect of psychological strain on later P-E fit. This also shows that the causal flow in relationship, between P-E fit and psychological strain is from P-E fit to psychological strain rather than from psychological strain to P-E fit. So the alternative explanation that psychological strain might be caused by psychological strain rather the reverse is less likely.
Figure 4.21: The Longitudinal Relationship Between P-E Fit and Psychological Strain, Cross-lagged Effects Not Constrained, Student Sub-group.

**Equations:**

\[ Y_{21} = 0.882(0.649) \]
\[ Y_{31} = 0.113(0.057)* \]
\[ \beta_{31} = 0.710(0.674) \]
\[ \beta_{42} = 0.541(0.569) \]
\[ \beta_{43} = -0.048(-0.074)* \]
\[ \beta_{45} = -0.182(-0.119) \]
\[ \hat{\epsilon}_{17-1} = 0.087 \]
\[ \hat{\epsilon}_{91} = 0.106 \]
\[ \hat{\epsilon}_{17-9} = 0.087 \]

**Goodness of fit index:**

\[ R^2 = 0.936 \]
\[ \chi^2/df = 426.60/236 = 1.81 \]

* = T-values less than 2.00
Comparison of the contemporaneous effects ($\gamma_{11} = .343$, $\beta_{32} = -.187$, and $\beta_{54} = -.182$) and the lagged effects of P-E fit on psychological strain ($\gamma_{31} = .102$, and $\beta_{52} = .201$) partially supports Hypothesis C.1 (Chapter 2) which asserts that the negative effect of P-E fit on psychological strain is mostly contemporaneous and the lagged effect of P-E fit on later measurements of psychological strain is negligible. As it is clear from Figure 4.21, only the lagged effect of P-E fit in 1966 on Psychological strain in 1968 ($\gamma_{31} = .102$) is non-significant. This finding plus the fact that such effect is positive is unexpected, because it suggests that those individuals who enjoy a high level of P-E fit at the 1968 measurement period are more likely to experience psychological strain at later measurement period.

One possible explanation for this finding might be that the students who were very much adjusted to the high-school environment find it difficult to readjust themselves to the college environment. This, plus the fact that the period between 1968-1970 was a critical transition period in the life cycle of the sample population might account for the apparent positive relationship between the lagged effect of P-E fit 1968 and psychological strain 1970. In other words, those who were pretty much adjusted to pre-adulthood roles and expectations, find it harder to readjust themselves to adult roles and expectations and consequently experience higher levels of psychological strain. However as is clear from the Table 4.6, despite the positive direct lagged effect of P-E fit on psychological strain, the overall total lagged effect of P-E fit on later measures of psychological strain is negative.
Table 4.6: The Total Effects P-E Fit and Psychological Strain on Later Measurements of P-E Fit and Psychological Strain, The Student Sub-group (Unstandardized).

<table>
<thead>
<tr>
<th>Measure</th>
<th>1968</th>
<th>1970</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total effect of P-E fit 1966 on P-E fit</td>
<td>.899</td>
<td>.501</td>
</tr>
<tr>
<td>Total effect of P-E fit 1966 on psychological strain</td>
<td>-.299</td>
<td>-.119</td>
</tr>
<tr>
<td>Total effect of P-E fit 1966 on P-E fit</td>
<td>--</td>
<td>.550</td>
</tr>
<tr>
<td>Total effect of P-E fit 1966 on psychological strain</td>
<td>-.187</td>
<td>-.025</td>
</tr>
<tr>
<td>Total effect of psychological strain 1966 on P-E fit</td>
<td>-.048</td>
<td>-.060</td>
</tr>
<tr>
<td>Total effect of psychological strain 1966 on psychological strain</td>
<td>.719</td>
<td>.520</td>
</tr>
<tr>
<td>Total effect of psychological strain 1968 on P-E fit</td>
<td>--</td>
<td>-.048</td>
</tr>
<tr>
<td>Total effect of psychological strain 1968 on psychological strain</td>
<td>--</td>
<td>.731</td>
</tr>
<tr>
<td>Total effect of P-E fit 1966 on social support index</td>
<td>-.299</td>
<td>-.119</td>
</tr>
<tr>
<td>Total effect of P-E fit 1966 on resentment index</td>
<td>-.324</td>
<td>-.124</td>
</tr>
<tr>
<td>Total effect of P-E fit 1968 on social support index</td>
<td>-.187</td>
<td>-.025</td>
</tr>
<tr>
<td>Total effect of P-E fit 1968 on resentment index</td>
<td>-.203</td>
<td>-.027</td>
</tr>
</tbody>
</table>
While the lagged effects of psychological strain on later measures of P-E fit ($\beta_{21} = -0.048$ and $\beta_{43} = -0.048$) are negative as expected, such effects are not statistically significant and Hypothesis C.3 (Chapter 2) cannot be supported with data from the student sub-group. Hypothesis C.3 states that the greater the person experiences psychological strain at each measurement period, the more likely that he or she will experience P-E fit incongruency in subsequent measurement period. Prediction VIII (Chapter 3) which predicted stronger and negative lagged effect of psychological strain on later P-E fit than the lagged effect of P-E fit on later psychological strain, also is not supported.

In a subsequent model, the cross-lagged effects of P-E fit and psychological strain on each other were constrained. Figure 4.22 displays the results of this model.

As is evident from this model, when the cross-lagged effects of P-E fit and psychological strain on each other are constrained, the goodness of the fit index and $x^2$/df ratio remain almost the same. While in Figure 4.21, the contemporaneous effect of P-E fit on psychological strain is non-significant only in 1968, in Figure 4.22, such relationship becomes non-significant in 1970 also.

The non-significant contemporaneous effects of P-E fit on psychological strain for 1968, in the non-constrained model, and for both 1968 and 1970 in the constrained model, are inconsistent with the cross-sectional results in 1968 and 1970 among the student sub-group which indicated negative and statistically significant relationship between P-E fit and psychological strain in 1968 and 1970. Part of the
Figure 4.22: The Longitudinal Relationship Between P-E Fit and Psychological Strain, Cross-lagged Effects Constrained, Student Sub-group.

\[ \gamma_{11} = -0.389 (-0.207) \]
\[ \gamma_{21} = 0.897 (0.669) \]
\[ \beta_{31} = 0.702 (0.671) \]
\[ \gamma_{33} = 0.125 \]
\[ \phi_{e15-7} = 0.045 \]
\[ \phi_{e16-14} = 0.053 \]
\[ \theta_{e9-17} = 0.088 \]
\[ \theta_{e16-14} = 0.053 \]
\[ \chi^2 / df = 439.45 / 239 = 1.84 \]
\[ N = 694 \]
non-significant contemporaneous effect in 1968 might be due to the fact that no distinctions were made between the working and the student sub-group in 1968 cross-sectional analysis.

However, the most likely source of the above inconsistency is the fact that the coefficients designating the contemporaneous effect of P-E fit on psychological strain in longitudinal models are partial regression coefficients. In being so, they show the extent of contemporaneous effect of P-E fit on psychological strain while controlling the lagged and cross-lagged effects of the same variables in previous measurement periods. On the other hand, the coefficients designating the effects of P-E fit on psychological strain in cross-sectional models are simple regression coefficients and they show the extent of such relationships without controlling for any other exogenous variables.

In other words, the results of the model 4.21 indicates that the contemporaneous effect of P-E fit on psychological strain is non-significant in 1968 when the lagged and cross-lagged effects of P-E fit and psychological strain in 1966 are controlled. However, the same relationship remains significant in 1970 despite similar controls for lagged and cross-lagged effect of P-E and psychological strain in 1968.

Considering the relative stability of P-E fit and psychological strain during 1966 to 1968, and that the respondents were in a similar environment (high school) during these two periods, and in a different environment (college) in 1970, the above findings suggest that the contemporaneous effect of P-E fit on psychological strain does not change appreciably when the environment is not substantially different. In other words, the significant effects of P-E fit on psychological
strain in 1966 and the strong-lagged effects of these variables on 1968 measures already account for all the variations in psychological strain in 1968. Consequently the contemporaneous effect of P-E fit on psychological strain becomes non-significant. However, despite similar controls, the contemporaneous effect of P-E fit in 1970 remains significant as the environment changes from high school to the university. This tends to reiterate the previous findings that P-E fit and its consequences are subject to situational and environmental changes, but not to a very large extent. In other words, the environmental changes has to be quite substantial to have a significant effect on P-E fit.

Figures 4.23 and 4.24 display the results of the similar models among the working sub-group of the longitudinal data. Unlike the results with the student sub-group, in both models the contemporaneous effects of P-E fit on psychological strain are significant at all three measurement periods. Similar to the results with the student sub-group, the cross-lagged effects of psychological strain and P-E fit on latter measures of P-E fit and psychological strain are non-significant except for positive and significant effect of P-E fit 1968 on psychological strain 1970. The significant contemporaneous effects of P-E fit on psychological strain, despite all the controls for lagged and cross-lagged effects in both models, indicates that the situationality of P-E fit and its contemporaneous effect on psychological strain is more pronounced among the working sub-group than the student sub-group.
Figure 4.23: The Longitudinal Causal Relationship Between P-E Fit and Psychological Strain, Cross-lagged Effects, Not Constrained, Working Sub-group.

Goodness of fit index = .923

$\chi^2/df = 338.22/235 = 1.44$

* = T-values less than 2.00
Figure 4.24: The Longitudinal Causal Relationship Between P-E Fit and Psychological Strain, Cross-lagged Effects, Constrained, Working Sub-group.

Goodness of fit index = .923
\( \chi^2/df = 345.78/239 = 1.45 \)
* = T-values less than 2.00

\begin{align*}
\beta_{31} &= .609(.526) \\
\beta_{32} &= -.165(-.114) \\
\beta_{33} &= .322(.304) \\
\psi_{11} &= .186 \\
\psi_{22} &= .191 \\
\theta_{e17} &= .085 \\
\theta_{e14-16} &= .028 \\
\theta_{e17-19} &= .138 \\
\theta_{e3-11} &= .037 \\
\theta_{e7-15} &= .034 \\
\end{align*}
B. Longitudinal Causal Relationship Between Psychological Strain and Delinquency

Figure 4.25 displays the most satisfactory variation of the longitudinal causal relationship between psychological strain and delinquency (described in Figure 3.7, in the previous Chapter) among the student sub-group of the longitudinal data. The goodness of fit index (.953) and $\chi^2/df$ ratio both indicate a good fit between the specified model and the observed data. The contemporaneous effects of psychological strain on delinquency are positive and statistically significant in 1966 and 1968 ($\gamma_{11}=.236$ and $\beta_{32}=.176$). But such effect, while still positive, is not statistically significant in 1970. This is consistent with the cross sectional results which showed no significant relationship between psychological strain and delinquency among the student sub-group in 1970. The lagged effects of delinquency on later measures of psychological strain ($\beta_{21}=.042$ and $\beta_{43}=.81$) are both non-significant. The lagged effects of psychological strain later measures of delinquency ($\gamma_{31}=-.068$, and $\beta_{52}=-.018$) are also non-significant. These findings lend partial support to Hypothesis D.2 (Chapter 2) which asserts that the effects of psychological strain on delinquency is mostly contemporaneous and the lagged effects of psychological strain on later delinquencies are negligible. The findings also partially support Hypothesis D.3 and prediction IX (Chapter 3) which asserted that the path from psychological strain to delinquency would be positive and stronger than the path from delinquency to later psychological strain. The Hypothesis D.1 which
asserted a positive and significant lagged effect of delinquency on later measures of psychological strain is rejected with these findings. Prediction X, which asserted that the path from delinquency to later psychological strain would be stronger than the path from psychological strain to later delinquency cannot be supported also.

Figure 4.26 displays the results of the same model when the cross-lagged effect of psychological strain and delinquency on each other are constrained. The contemporaneous effect of psychological strain on delinquency still remains positive and significant in 1966 and 1968, and non-significant in 1970. The goodness of fit index remains virtually unchanged and $x^2/df$ ratio decreases slightly in comparison with the unconstrained model.

The results of the longitudinal causal relationship between psychological strain and delinquency among the working sub-group of the longitudinal data are displayed in Figures 4.27 (the cross-lagged effects not constrained), and 4.28 (the cross-lagged effects constrained).

Findings of the both models (the constrained and unconstrained) are quite similar to the ones obtained with the student sub-group. Except for the fact that the contemporaneous effects of psychological strain on delinquency are significant in all three periods in both models. This suggests that the contemporaneous relationship between psychological strain and delinquency also tends to be more pronounced among the working sub-group than the student sub-group.
Figure 4.25: Longitudinal Causal Relationship Between Psychological Strain and Delinquency, Cross-lagged Effects Not Constrained, Student Sub-group.

Goodness of fit index = .953
χ²/df = 137.88/33 = 4.17
* = T-values less than 2.00
Figure 4.26: Longitudinal Causal Relationship Between Psychological Strain and Delinquency, Cross-lagged Effects Constrained, Student Sub-group.

Goodness of fit index = .951
χ²/df = 140.93/37 = 3.80
* = t-values less than 2.00
Figure 4.27: Longitudinal Causal Relationship Between Psychological Strain and Delinquency, Cross-lagged Effects not Constrained, Working Sub-group.

Goodness of fit index = .928
\( \chi^2/df = 134.01/33 = 4.01 \)
* = T-values less than 2.00
Figure 4.28: Longitudinal Causal Relationship Between Psychological Strain and Delinquency, Cross-lagged Effects Constrained, Working Sub-group.

\[ \begin{align*}
Y_{21} &= .719(.634) \\
\beta_{31} &= .613(.460) \\
\beta_{32} &= .092(.123) \\
\end{align*} \]

\[ \begin{align*}
Y_{21} &= .719(.634) \\
\beta_{31} &= .613(.460) \\
\beta_{32} &= .092(.123) \\
\end{align*} \]

Goodness of fit index = .924
\[ \chi^2/df = 139.90/37 = 3.80 \]
* = T-values less than 2.00

N = 481
C. Longitudinal Test of the Relationship Between P-E Fit and Delinquency

Figure 4.29 displays the most satisfactory variation of the longitudinal causal relationship between P-E fit and delinquency (described in Figure 3.8 in the previous Chapter) among the student sub-group of the longitudinal data. The goodness of fit and $\chi^2/df$ indicate good fit between the model and the observed data. Except for the significant and negative effect of P-E fit 1966 on delinquency in 1966 ($r_{11} = -0.200$), none of the contemporaneous effects of P-E fit on delinquency ($\beta_{32} = -0.078$ and $\beta_{54} = -0.012$) are significant among the student group. The lagged effects of delinquency on later P-E fit measures ($\beta_{21}$, and $\beta_{43}$) are nil and statistically non-significant. So, Hypothesis C.2 (Chapter 2) which asserts that the greater person's involvement in delinquent act at each measurement period the more likely that he or she will experience higher P-E fit incongruency in the subsequent measurement period can not be supported. The lagged effects of P-E fit on later measures of delinquency ($\gamma_{31}$ and $\beta_{52}$) are also non-significant. This result partially supports Hypothesis C.1 which asserts that the negative effect of P-E fit on delinquency is mostly contemporaneous and the lagged effect of P-E fit on later delinquency tends to be negligible. However, in light of the fact that the contemporaneous effects of P-E fit in 1968 and 1970 on delinquency in 1968 and 1970 are also non-significant, such support by no means is conclusive. The evidence concerning the accuracy of predictions XI and XII are also ambiguous and none of these predictions can be ruled
accurate. The alternative model with cross-lagged effects constrained (Figure 4.30) does not show any change on any of the results obtained in the non-constrained model and the effects of P-E fit on delinquency in 1968 and 1970 are still non-significant.

The non-significant contemporaneous effect of P-E fit on delinquency in 1968 is also inconsistent with the cross-sectional findings on the relationship between P-E fit and delinquency in 1968. However, the finding that P-E fit had no significant effect on delinquency among the student sub-group in 1970 is consistent with cross-sectional findings about the same relationship among the same sub-group in 1970. However as was explained earlier, the apparent inconsistency stems from the fact that the results obtained in longitudinal models show the contemporaneous effect of P-E fit on delinquency while controlling the lagged and cross-lagged effects of P-E fit and delinquency in 1966, while the cross-sectional results are obtained controlling any of those relationships.

The results of the test for longitudinal causal relationship between P-E fit and delinquency among the working sub-group of the longitudinal data are displayed in Figures 4.31 and 4.32. Unlike the results from the student sub-group, in both of these models, the contemporaneous effects of P-E fit on delinquency are significant and negative in both 1966 and 1968. The contemporaneous effect of P-E fit on delinquency during 1970 remains non-significant in both models. This is consistent with cross-sectional results in 1970 for the group which showed no direct effect between P-E fit and delinquency in 1970 among the working sub-group.
Figure 4.29: Longitudinal Causal Relationship Between P-E Fit and Delinquency, Cross-lagged Effects Not Constrained, Student Sub-group.

\[ \gamma_{21} = 0.837(0.686) \]
\[ \beta_{42} = 0.566(0.561) \]
\[ \gamma_{31} = 0.498(0.459) \]
\[ \beta_{53} = 0.350(0.523) \]
\[ \phi_{11} = 0.071 \]
\[ \phi_{11} = 0.087 \]
\[ \phi_{55} = 0.035 \]
\[ \theta_{e17-9} = 0.050 \]
\[ \theta_{e17-9} = 0.074 \]
\[ \theta_{e15-16} = 0.053 \]
\[ \theta_{e17-1} = 0.066 \]
\[ \theta_{e11-3} = 0.052 \]
\[ \theta_{e15-7} = 0.046 \]

Goodness of fit index = .917
\[ \chi^2/df = 481.22/235 = 2.050 \]
* = T-values less than 2.00
Figure 4.30: Longitudinal Causal Relationship Between P-E Fit and Delinquency, Cross-lagged Effects Constrained, Student Sub-group.

\[ Y_{11} = -0.197(-.173) \]
\[ Y_{21} = .833(.681) \]
\[ Y_{31} = .503(.465) \]
\[ \beta_{32} = .040(.040)* \]
\[ \beta_{42} = .564(.561) \]

\[ Y_{16} = .833(.681) \]
\[ Y_{14} = .143(.132) \]
\[ Y_{12} = .122(.112) \]
\[ Y_{11} = -0.197(-.173) \]
\[ Y_{21} = .833(.681) \]
\[ Y_{31} = .503(.465) \]
\[ \beta_{32} = .040(.040)* \]
\[ \beta_{42} = .564(.561) \]

Goodness of fit index = .917
\[ \chi^2/df = 481.93/239 = 2.020 \]

* = T-values less than 2.00

N = 696
Figure 4.31: Longitudinal Causal Relationship Between P-E Fit and Delinquency, Cross-lagged Effects not Constrained, Working Sub-group.

\[
\begin{align*}
\gamma_{21} &= .713(6166) \\
\beta_{32} &= .333(306) \\
\gamma_{31} &= .447(390) \\
\beta_{53} &= .539(606) \\
\end{align*}
\]

\[
\begin{align*}
\gamma_{11} &= -.229(-.200) \\
\beta_{32} &= -.119(-.153) \\
\gamma_{31} &= -.066(-.056)* \\
\beta_{52} &= -.025(-.025)* \\
\beta_{21} &= -.153(-.151) \\
\beta_{51} &= .447(.390) \\
\end{align*}
\]

\[
\begin{align*}
\phi_{11} &= .089 \\
\psi_{55} &= .076 \\
\theta_{17-9} &= .061 \\
\psi_{11} &= .112 \\
\theta_{e16-14} &= .027 \\
\phi_{22} &= .067 \\
\theta_{e17-1} &= .064 \\
\psi_{33} &= .122 \\
\theta_{e11-3} &= .044 \\
\phi_{44} &= .129 \\
\theta_{e15-7} &= .038 \\
\phi_{43} &= .049(.051)* \\
\end{align*}
\]

Goodness of fit index = .895
\[\chi^2/df = 460/235 = 1.957\]

* = T-values less than 2.00

N = 476
Figure 4.32: Longitudinal Causal Relationship Between P-E Fit and Delinquency, Cross-lagged Effects Constrained, Working Sub-group.

\[ Y_{11} = -0.220(-.217) \]
\[ Y_{21} = 0.748(0.667) \]
\[ \beta_{31} = 0.459(0.376) \]
\[ \beta_{32} = -0.186(-.165) \]
\[ \beta_{42} = 0.325(0.294) \]
\[ \gamma_{11} = -0.094 \]
\[ \gamma_{12} = 0.064 \]
\[ \psi_{33} = 0.120 \]
\[ \psi_{44} = 0.129 \]
\[ \psi_{55} = 0.073 \]
\[ \theta_{e1-1} = 0.066 \]
\[ \theta_{e1-2} = 0.063 \]
\[ \theta_{e11-3} = 0.045 \]
\[ \theta_{e15-9} = 0.038 \]
\[ \theta_{e17-9} = 0.069 \]
\[ \theta_{e16-14} = 0.027 \]

Goodness of fit index = .895
\[ \chi^2 / df = 466.87 / 239 = 1.954 \]
* = T-values less than 2.00

N = 476
D. Summary of Findings on Longitudinal Causal Models

1. The contemporaneous effects of P-E fit on psychological strain were consistently higher, negative and stronger than the lagged effects of psychological strain on later measurements of P-E fit among both the student and working sub-groups.

2. None of the lagged effects of psychological strain on later measures of P-E fit were significant among both the student and working sub-groups.

3. The contemporaneous effect of P-E fit on psychological strain among the student sub-group, while still negative, was non-significant in both constrained and non-constrained models.

4. The contemporaneous effects of P-E fit on psychological strain among the working sub-group were both negative and significant at all three measurement occasions in both the constrained and non-constrained models.

5. The lagged effects of P-E fit on later measures of psychological strain were positive for both the student and working sub-group.

6. The positive lagged effects of P-E fit on psychological strains were only significant for P-E fit 1968 effecting psychological strain 1970, for both the student and working sub-groups.

7. Despite the positive direct lagged effects of P-E fit 1968 on psychological strain 1976, the total lagged effects of P-E fit 1968 on psychological strain 1970 are negative in both the student and working sub-population.
8. Overall comparison of the results for the student and working sub-groups indicates that the contemporaneous effect of P-E fit on psychological strain is more pronounced among the working group.

9. The contemporaneous effects of psychological strain on delinquency were positive and significant in 1966 and 1968 but non-significant for 1970 among the student sub-group. All the contemporaneous effects of psychological strain on delinquency were positive and significant at all measurement occasions among the working sub-group.

10. The lagged effects of delinquency on later measures of psychological strain were non-significant among both the student and working sub-groups.

11. The lagged effects of psychological strain on later delinquencies were non-significant among both sub-groups.

12. The effects of psychological strain on delinquency were mostly contemporaneous among both sub-groups.

13. The contemporaneous effect of P-E fit on delinquency among the student sub-group, while negative at all the measurement periods, was only significant in 1966. Among the working sub-groups, the relationship was both negative and significant for both 1966 and 1968.

14. The lagged effects of delinquency on later measures of P-E fit were nil and non-significant for both the student and working sub-groups.

15. The lagged effects of P-E fit on later measures of delinquency were also nil and non-significant for both the student and the working sub-groups.
CHAPTER V

CONCLUSIONS AND DISCUSSION

Before the overall findings and conclusions of the present study can be discussed, it is necessary to point out a number of conceptual, methodological and design problems which effectively might have influenced the findings of this study, and limit the scope and generality of its findings and conclusions. A good number of these problems were due to the limitation imposed by the use of secondary data. Some others were due to the problems associated with longitudinal data, subject matter under investigation, self-imposed limitations or a combination of some or all of the above problems. The alternative ways of gathering more accurate and design-specific informations were both impractical (in terms of time, resources) and costly. These problems and limitations were:  A) The Youth in Transition data set was a male only data set and the study was limited to males only. B) Some of the questions used as measurement instruments of P-E fit in various dimensions were double-barreled questions, consequently the internal validity and reliability of P-E fit might have been threatened. C) Panel attrition and the fact that it might have special implication in longitudinal panel study of self-reported delinquency. D) The curve-linearity of the relationship between P-E fit and psychological strain was not addressed.

A. Males Only Sample Population

Considering the increasing involvement of women in every facet of American society, including crime and delinquency (Alder, 1975; Simon
and Benson, 1980; Steffensmeier and Steffensmeier, 1980; and Agton, 1983) during the past 30 years, the exclusion of females from the study of P-E fit, psychological strain and delinquency is a serious drawback for the present study.

As Ageton (1983) notes, there are few truly representative data sets to study the theoretical and empirical basis of female delinquency. The research in this area has basically relied on data from non-probability or restricted area samples and cross-sectional designs. While some delinquency studies such as Gold (1970), Elliott and Voss (1974), and Hindelang et al (1981) have provided more generalizable data on female delinquency, the sampling constraints and inadequate conceptualization of delinquency have restricted the usefulness of these data for describing and explaining female delinquency (Agton, 1983). Besides, only one of these studies is longitudinal.

Among the national studies, only a handful contain extensive delinquency measures. These are Williams and Gold, 1972; Gold and Reimer, 1974; Bachman, O'Malley and Johnston, 1978; Johnston, Bachman and O'Malley, 1979; and Elliott, Agton, Huizinga, Knowles and Canter, 1983. Only three of these studies, the Youth in Transition study (Bachman et al., 1978); Monitoring the Future Project (Johnston et al., 1979) and the National Survey of Youth (Elliott et al., 1983) are longitudinal. Of these three, Monitoring the Future Project is not a panel study, and the Youth in Transition project is a males only study. The third study, National Survey of Youth, appears to be an excellent source of longitudinal panel data on delinquency for both sexes. However, because of unavailability of this data set to the public in 1984 and the fact that it might not contain the necessary
information to operationalize P-E fit and psychological strain, the scope of the present was limited to males only.

B. Measurement of P-E Fit

As was pointed out earlier, this research used the "direct judgment" method to measure P-E fit in various dimensions. The respondents were asked to make a direct judgment on the magnitude of the discrepancy between their abilities or motives and the environmental demands or opportunities. However, as is clear from the question list in Appendix A, double-barreled questions were used in assessment of the extent of P-E fit in "need for self-development", "need for self-utilization", and "need for use of intelligence" dimensions of P-E fit in both the school and job contexts. This presents real threats to the internal validity and reliability of theoretical construct of P-E fit. However, despite the double barreled nature of these measurement instruments, examination of the stability of P-E fit models in Chapter 4 shows that these three measures were among the most reliable indicators of P-E fit across all the measurement occasions among both the student and the working sub-groups. In other words, these questions, despite their double barreled nature, consistently measured the same underlying construct over time. To shed more light on the question of internal validity, the cross-sectional models for 1966 and 1970 among both the student and working subgroups were repeated. Different sets of questions from the same data set and the alternative method of "raw difference in score" were used to measure P-E fit in various dimensions (see Appendix B of operationalization). The results of these replications were very similar to those obtained in
Chapter 4. Table 5.1 shows the item loadings of the new indicators on the theoretical construct of total P-E fit in 1966. Figure 5.1 shows the results of 1966 cross-sectional model B with these new indicators. The fact that the results obtained in Chapter 4 are replicable with different sets of questions and an alternative method of measurement, increases the validity and reliability of the P-E fit measures and the overall results of the present study.

Figure 5.1: Cross-Sectional Relationship Between P-E Fit, Psychological Strain and Delinquency 1966, Alternative P-E Fit Measures:

$Y_{11} = 0.464(.310)^a$  
$\beta_{21} = 0.302(.341)$  
$\phi_{11} = 0.122$  
$\theta_{A22} = 0.767$  
$\theta_{A33} = 0.509$  
$\theta_{A44} = 0.445$  
$\theta_{A66} = 0.668$  
$\theta_{A77} = 0.492$  
$\theta_{A88} = 0.630$  

Goodness fit index = 0.979  
$\chi^2/df = 184.23/52 = 3.542$  
N = 1740
Table 5.1: Item Loadings of P-E Fit Indicators, 1966 Cross-sectional Run, Alternative P-E Fit Measures:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DIMENSION</th>
<th>U</th>
<th>S</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-E fit in &quot;need to be independent&quot;</td>
<td>Motive-Opportunity</td>
<td>1.000</td>
<td>.334</td>
<td>.153</td>
</tr>
<tr>
<td>P-E fit in &quot;need of affiliation with friends&quot;</td>
<td>Motive-Opportunity</td>
<td>.703</td>
<td>.235</td>
<td>.067</td>
</tr>
<tr>
<td>P-E fit in &quot;need for achievement&quot;</td>
<td>Motive-Opportunity</td>
<td>.748</td>
<td>.250</td>
<td>.109</td>
</tr>
<tr>
<td>P-E fit in &quot;need for self-improvement&quot;</td>
<td>Motive-Opportunity</td>
<td>1.671</td>
<td>.224</td>
<td>.102</td>
</tr>
<tr>
<td>P-E fit in &quot;need for self-utilization&quot;</td>
<td>Motive-Opportunity</td>
<td>1.078</td>
<td>.361</td>
<td>.163</td>
</tr>
<tr>
<td>P-E fit in &quot;need to use intelligence&quot;</td>
<td>Motive-Opportunity</td>
<td>.555</td>
<td>.185</td>
<td>.065</td>
</tr>
<tr>
<td>P-E fit in &quot;Ability to do reading&quot;</td>
<td>Ability-Demand</td>
<td>.337</td>
<td>.124</td>
<td>.025</td>
</tr>
<tr>
<td>P-E fit in &quot;Ability vs requirement to use intelligence&quot;</td>
<td>Ability-Demand</td>
<td>.376</td>
<td>.126</td>
<td>.025</td>
</tr>
</tbody>
</table>

C. Panel Attrition

The problem of panel attrition in longitudinal studies and its possible consequences has been noticed by several researchers. For example, Sewell and Hauser (1976) in their study of late adolescents, showed that those who remained in the panel tend to represent a biased picture of the initial population. The remainers of the panel, when contrasted with non-remainers, were more likely to be from higher
contrasted with non-remainers, were more likely to be from higher socio-economic status, to do better in terms of school achievement and to have higher levels of aspiration. Rehberg and Rosental (1978) report similar differences in terms of school achievement, curriculum location and future aspirations among panel remainers vs. non-remainers. Bachman and his associates (1978) also reported lower scores on ability measures, future plans, average grades, positive family relations and measures of socio-economic level among the non-remainers of Youth In Transition study. The non-remainers of the Youth In Transition study scored higher in negative school motivation need for social approval and parental punitiveness. They also were more likely to be black and from broken families (Bachman et al 1978: 259).

The problem of panel attrition might be specially acute when the purpose of panel investigation is delinquency, since there is both direct and indirect evidence that panel attrition and delinquency are correlated. The findings that educational achievement and aspirations are correlated with panel loss and widely held position that the educational achievement and aspiration are correlated with delinquency indirectly suggests that panel attrition and delinquency might be correlated. Elliott and Voss (1974), Polk and Ruby (1978) and Lefkowitz, Eron, Walder and Housman (1977) all present direct evidence concerning significant relationships between the initial involvement in delinquency and panel loss.
Considering the fact that the primary focus of the present study is delinquency, and the basic underlying theoretical construct of P-E fit is closely related to variables such as ability, motive and negative affective states, the problem of panel-loss might have potentially significant implications in terms of the findings of the present study. However the above conclusion might be premature in light of the increasing evidence that while univariate estimates of a variable such as delinquency, might be distorted by panel loss, the multivariate estimates of the relationship between that variable and other variables is not affected by panel loss. Cordray and Polk, (1983) studied the implication of panel attrition on seven different longitudinal panel studies of delinquency, including, including Youth In Transition. Their findings indicate that while the univariate estimates of delinquency are consistently underestimated among the remainers the multivariate estimates of the relationship between delinquency and other variables among the remainers provides close approximations to that observed in the base population. This tends to be true even when the panel attrition rate tends to be quite high. Considering the fact that longitudinal panel studies are usually designed to study multivariate and causal relationships rather than univariate estimation, Cordray and Polk (1983:234) conclude that "The strength of the panel method lies precisely where the attrition problem seems to be the least pressing, i.e., causal analysis". In light of the above evidence, it is more likely that the findings of the present study are not affected by panel attrition.
D. The Issue of Non-Linearity

While P-E fit theory asserts that the relationship between P-E fit and psychological strain can take either of the three curvilinear shapes discussed in Chapter 2, the present study conceptualizes, operationalizes and tests for a cumulative, continuous, two directional and symmetric linear relationship (which is a close approximation of the U shaped curve) between P-E fit and psychological strain (Figure 5.2).

Figure 5.2: Linear and Non-Linear Relationships Between P-E Fit and Psychological Strain.
Such model assumes that P-E fit incongruence in both directions, whether positive or negative, are associated with psychological strain and lower levels of psychological strain are associated with perfect fit. While such conceptualization, operationalization and test of the relationship between P-E fit and psychological strain is one of the most commonly reported in literature (Kulka, 1979), there are other equally valid and plausible conceptions of such relationships that has to be considered (for a detailed discussion of various forms and conceptualizations of the relationship between P-E fit and psychological strain see Kulka, 1975, 1979). In short "the concept of person-environment fit is not as simple and straightforward as it may appear upon cursory examination. Correlation coefficients and assumptions for linear relationship between P-E fit and behavior simply may not do justice to this complex interaction" (Hall, 1970: 212). Further test of the non-linearity of the relationships between P-E fit and psychological strain and delinquency plus the assessment of the implications of employing alternative ways of conceptualization of such relationships would be an excellent addition to the results obtained in this research and the field of P-E fit research as a whole.

Discussion

A number of theoretical, conceptual and methodological issues concerning P-E fit theory in general and P-E fit theory of delinquency in particular were addressed in this study. Among the issues concerning the P-E fit theory in general, the issues of multidimensionality and measurement of total P-E fit were most effectively addressed.
The use of statistical technique of LISREL, which allowed various measures of P-E fit in different dimensions to be used as indicators of the underlying construct of total P-E fit, represented a clear and superior alternative method of addressing the issues of multidimensionality and measurement of total P-E fit. Unlike the previous methods suggested by Kahana (1978) and Kulka (1979), this method not only allowed the assessment of the effects of total P-E fit on the dependent variables of psychological strain and delinquency but it also allowed the assessment of relative contribution of each dimension to the theoretical construct of total P-E fit and its effects on the dependent variables. In other words, while in previous studies the multidimensionality of P-E fit and varying contributions of each dimension to the theoretical construct of total P-E fit were theoretically assumed, in the present study such multidimensionality was empirically investigated and the relative contribution of each dimension on total P-E fit were empirically assessed. The results of such investigation showed that all 9 dimensions of P-E fit significantly loaded on the theoretical construct of total P-E fit. Among the various dimensions, the P-E fit in three dimensions of "Need for self improvement", "Need for self utilization," and "Need to use intelligence" were consistently the most important and most reliable indicators of P-E fit in both the school and the job contexts. These results are consistent with Sebald's (1984) and Seltzer's (1982) observation that the closer the adolescent moves toward adulthood, the more he or she becomes interested in elements such as self-utilization and self-improvement which are the building blocks of his or her more permanent and unique self-structure.
Another issue concerning the P-E fit theory in general was stability-variability patterns of P-E fit over time. This issue was particularly interesting since no previous study could be found that addressed this issue. P-E fit was quite stable during both 1966 to 1968 and 1968 to 1970 among the student sub-group of the sample population. However it was more stable during the 1966 to 1968 period than the 1968 to 1970 period. P-E fit was also quite stable during 1966 to 1968 among the working sub-group. However, it was relatively unstable during 1968 to 1970 when the subjects within the working sub-group made the transition from the school environment to the work environment. The implications of these results are two-fold. First, P-E fit appears to be quite stable during the last two years of high school and the more immediate situational and environmental changes within the high school environment does not appear to affect P-E fit during this period. Second, while P-E fit is subject to change with contextual and environmental changes, but such contextual changes has to be quite pronounced to have a noticeable effect on the P-E fit. The greater the extent of such contextual and environmental changes the greater the change in P-E fit. In other words, while the environmental and contextual changes from high school environment to the work or the university environment both had noticeable effect on stability of P-E fit during 1968 to 1970, but the extent such effect had was much greater when the change was from high school to the work rather than to the university environment. Such difference in effect is quite expected in light of the fact that, despite some basic differences the high school and the college or university environments, both offer
quite similar opportunities for the individual to gratify his or her needs, and demand similar abilities and motive from the individual. The background variable of family socio-economic level did not have any significant effect on stability-variability patterns of P-E fit within neither the student sub-group nor the working sub-group.

P-E fit had a significant and negative contemporaneous effect on psychological strain in all cross-sectional models. The contemporaneous effects of P-E fit on psychological strain were continuously negative and stronger than the lagged effects of psychological strain on latter measurements of P-E fit in all longitudinal models. This tended to support the arguments that causal flow of relationship between P-E fit and psychological strain, is from P-E to psychological strain rather than the reverse. Further examination of the longitudinal relationship between P-E fit and psychological strain among the student sub-group showed that the contemporaneous effect of P-E fit on psychological strain in 1968 and 1970 were non-significant when the lagged effects of previous measurements of P-E fit and psychological strain were controlled. In other words, the initial significant relationship between P-E fit and psychological strain in 1966 and high stability of both P-E fit and psychological strain across the measurement occasions effectively account for all the variations in psychological strain measures in 1968 and 1970. The contemporaneous effects of P-E fit on psychological strain in longitudinal model among the working sub-group continued to remain negative and significant despite the similar controls for lagged and cross lagged effects of P-E fit on psychological strain on later measurements of the same variables.
This tended to support the idea that the contemporaneous effect of P-E fit on psychological strain is more pronounced among the working sub-group than the student sub-group.

P-E fit measures in 1968 had a significant and positive lagged effect on psychological strain measures of 1970, among both the working and student sub-groups. This suggests that those who were pretty much adjusted to the high school environment are more likely to experience psychological strain in the work or the university environment.

With regard to the issues concerning P-E fit theory of delinquency in particular, the questions concerning the nature and longitudinal causal relationship between P-E fit, psychological strain and delinquency were investigated. P-E fit had a significant, negative, and direct effect on delinquency in 1966 and 1968 cross-sectional models. The introduction of psychological strain as intervening variable did not have any noticeable effect on the relationship between P-E fit and delinquency. All three variations of the cross-sectional models (A, B and C) were equally valid for these runs. The cross-sectional relationship between psychological strain and delinquency were significant and positive for 1966 and 1968. However, none of these relationships were significant among the student sub-group of the 1970 cross-sectional data. Among the working sub-group of 1970 data, P-E fit did not have any significant direct effect on delinquency and such effect was mediated through the significant relationship between P-E fit and psychological strain on the one hand and psychological strain and delinquency on the other.
The longitudinal investigation of the causal relationship between P-E fit and delinquency among the student and working sub-groups of the longitudinal data, showed that the contemporaneous effects of P-E fit on psychological strain were consistently negative and stronger than the lagged effects of delinquency on later measurements of P-E fit. The lagged effects of delinquency on later measurements of P-E fit were non-significant at all measurement occasions and among both sub-groups. This was also true about the lagged effects of delinquency on later measurements of psychological strain which were non-significant in all measurement occasions and among both sub-groups. In light of these results, the alternative argument that the observed variations in both the P-E fit measures and the psychological strain might have been caused by the adolescents involvement in delinquency is not supported. These findings plus the fact that the lagged effects of psychological strain on later measures of P-E fit were also non-significant supports Kulka, Kingel and Mann's (1980) position that the causal flow of the relationship between P-E fit, psychological strain and delinquency is from P-E fit to psychological strain and delinquency. The findings are also consistent with most other delinquency theories which assert that the causal flow of the relationship between psychological strain and delinquency is from strain to delinquency.

The predicted relationships between P-E fit, psychological strain, and delinquency, all were more pronounced among the working sub-group than the student sub-group of the longitudinal data. This was partially due to the fact that the P-E fit and psychological strain were both more stable among the student sub-group than the working
sub-group. The initial measurements of P-E fit and psychological strain in 1966 could account for all or most of the variations in later measurements of these variables in 1968 and 1970.

P-E fit was a better and more consistent predictor for psychological strain than it was for delinquency in both the longitudinal and the cross-sectional models. The relationships between psychological strain and delinquency were also more consistent and reliable than the relationships between P-E fit and delinquency in both the longitudinal and cross-sectional models. All relationships were more pronounced among the working sub-group than the student sub-group.

Implication and Intervention Possibilities

Considering consistent and significant relationship between P-E fit and delinquency on one hand and psychological strain and delinquency on the other, P-E fit theory offers a potentially useful intervention framework to improve the adolescent's mental health and to reduce the probability of their involvement in delinquency. P-E fit theory provides at least four different elements (abilities, demands, motives, and opportunities) in each dimension that can be identified and improved. Considering the relative stability of P-E fit within the school environment, such interventions, if successful are more likely to produce long-lasting improvements in the mental health of the adolescent while he or she is at the school or college environment. However, the intervener has to keep in mind that such interventions must be done at the individual level. Intervention at the aggregate
levels might improve the P-E fit and mental health of some individuals while having adverse consequences on the others.
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Appendix A

Measurement Instruments

The contents of this Appendix can be found in:


P-E FIT MEASURES:

Following are the questionnaire items concerning person-environment interaction in 9 dimensions described in Chapter 3. Questions designated by **** are the ones used for measurement of P-E fit in the study, others are the ones used in alternative measurement of P-E fit.

1. Independence

A. The first questions are about being independent -- that is, having a lot of freedom to decide what you will do; and not having people watching over you and telling you what to do. Compared with (T2=others, T1=other boys) your age, how important is it for you to be independent?

   1. Much more important than average ............
   2. A little more important than average .............
   3. About average importance ......................
   4. A little less important than average .............
   5. Much less important than average ...............  
   9 & 0. Not ascertained; inappropriate .............

B. How much does your school give you a chance to be independent?

   1. Very much. ........................................
   2. Quite a bit. ........................................
   3. Some ................................................
   4. A little ............................................
   5. Not at all ...........................................
   9 & 0. Not ascertained; inappropriate ............. 

****C. Now, how does the amount of independence you have in school fit with what you want--is it just about right, or not enough, or too much?

   1. Too much, compared with what I want. ...........
   2. A little too much. .................................


3. Just about right ........................................
4. Not quite enough .......................................
5. Not enough, compared with what I want. ...........
9 & 0. Not ascertained; inappropriate .................

D. How much does your job give you a chance to be independent?

1. Very much .............................................
2. Quite a bit .............................................
3. Some ...................................................
4. A little ................................................
5. Not at all ..............................................
9 & 0. Not ascertained; inappropriate .................
8. DK

E. Now, how does the amount of independence you have in your job fit in with what you want—-is it just about right, or not enough, or too much?

1. Too much, compared with what I want. ...........
2. A little too much .....................................
3. Just about right .....................................
4. Not quite enough .....................................
5. Not enough, compared with what I want. .......
9 & 0. Not ascertained; inappropriate .................
8. DK

2. Affiliation

A. The next questions are about spending time with friends—being together and enjoying each other's company. Compared with (T2 -others, T1 -other boys) your age, how important is it for you to spend time with friends?

1. Much more important than average ............... 
2. A little more important than average ...........
3. About average importance ........................
4. A little less important than average ..........
5. Much less important than average ............. 
9 & 0. Not ascertained; inappropriate ...............

B. How much does your school give you a chance to spend time with friends?

1. Very much .............................................
2. Quite a bit .............................................
3. Some ...................................................
4. A little ................................................
5. Not at all ..............................................
9 & 0. Not ascertained; inappropriate .................
8. DK 7. Undocumented (T4)
****C. How does this (the chance for spending time with friends) fit in with what you want?

1. Too much, compared with what I want ..............
2. A little too much ....................................
3. Just about right ....................................
4. Not quite enough ....................................
5. Not enough, compared with what I want ..............
9 & 0. Not ascertained; inappropriate ..................

D. How much does your job give you a chance to spend time with your friends?

1. Very much .............................................
2. Quite a bit .............................................
3. Some ....................................................
4. A little ..................................................
5. Not at all ..............................................
9 & 0. Not ascertained; inappropriate .................

****E. How does this (the chance for spending time with friends) fit in with what you want?

1. Too much, compared with what I want ..............
2. A little too much ....................................
3. Just about right ....................................
4. Not quite enough ....................................
5. Not enough, compared with what I want ..............
9 & 0. Not ascertained; inappropriate ..................

3. Achievement Motivation

A. The next questions are about achieving success --doing things that are challenging; winning in competition with others; trying to reach difficult goals. Compared with (T2-others, T1-other boys) your age, how important is it for you to do things where you might win or achieve success?

1. Much more important than average ..............
2. A little more important than average ............
3. About average importance .........................
4. A little less important than average ............
5. Much less important than average ..............
9 & 0. Not ascertained; inappropriate ..............
8. DK
B. How much does your school give you a chance to do things where you might win or achieve success?

1. Very much ........................................
2. Quite a bit ........................................
3. Some ............................................... 
4. A little ...........................................
5. Not at all .......................................... 
9 & 0. Not ascertained; inappropriate. ..............
8. DK

****C. How does this (the chance to do things where you might win or achieve) fit in with what you want?

1. Too much, compared with what I want ...........
2. A little too much ................................
3. Just about right ...................................
4. Not quite enough ..................................
5. Not enough, compared with what I want .......
9 & 0. Not ascertained; inappropriate. ..............
8. DK

D. How much does your job give you a chance to do things where you might win or achieve success?

1. Very much ........................................
2. Quite a bit ........................................
3. Some ............................................... 
4. A little ...........................................
5. Not at all .......................................... 
9 & 0. Not ascertained; inappropriate. ..............

****E. How does this (the chance to do things where you might win or achieve) fit in with what you want?

1. Too much, compared with what I want ...........
2. A little too much ................................
3. Just about right ...................................
4. Not quite enough ..................................
5. Not enough, compared with what I want .......
9 & 0. Not ascertained; inappropriate. ..............
4. Affiliation With Adults

A. The next questions are about getting to know adults well -- having a chance to talk to them privately and get their opinions or advice. Compared with (T2=others, T1=other boys) your age, how important is it for you to get to know adults well?

1. Much more important than average ..........................
2. A little more important than average ..........................
3. About average importance ......................................
4. A little less important than average ..........................
5. Much less important than average ............................
6. Not ascertained; inappropriate ...............................  

B. How much does the school give you a chance for getting to know adults well -- like teachers, for example?

1. Very much ......................................................
2. Quite a bit ...................................................
3. Some ...........................................................
4. A little .........................................................
5. Not at all ......................................................
6. Not ascertained; inappropriate ...............................  

C. How does this (the chance for getting to know adults well) fit in with what you want?

1. Too much, compared with what I want .........................
2. A little too much ............................................
3. Just about right ..............................................
4. Not quite enough ............................................
5. Not enough, compared with what I want ......................
6. Not ascertained; inappropriate ...............................  

D. How much does your job give you a chance for getting to know adults well?

1. Very much ......................................................
2. Quite a bit ...................................................
3. Some ...........................................................
4. A little .........................................................
5. Not at all ......................................................
6. Not ascertained; inappropriate ...............................  

****E. How does this (the chance for getting to know adults well) fit in with what you want?

1. Too much, compared with what I want. ............
2. A little too much. ...........................................
3. Just about right. ............................................
4. Not quite enough. ............................................
5. Not enough, compared with what I want. ............
9 & 0. Not ascertained; inappropriate ..................

5. Avoiding Failure

A. People feel differently about doing things where they risk failing. Compared with (T2=others, T1=other boys) your age, how important is it for you to avoid doing things where you might fail?

1. Much more important than average ............
2. A little more important than average ............
3. About average importance ........................
4. A little less important than average ............
5. Much less important than average ............
9 & 0. Not ascertained; inappropriate ............

B. How much does the school give you a chance to do things where you might fail?

1. Very much ............................................
2. Quite a bit ............................................
3. Some. ............................................
4. A little. ............................................
5. Not at all. ............................................
9 & 0. Not ascertained; inappropriate ............

C. Now can you tell me how much your school actually requires you to do things where you might fail?

1. Too much, compared with what I want ............
2. A little too much ...........................................
3. Just about right. ............................................
4. Not quite enough. ............................................
5. Not enough, compared with what I want ............
9 & 0. Not ascertained; inappropriate ............
D. How does this (the opportunity or requirement for doing things where you might fail) fit in with what you want?

1. Too much, compared with what I want ............
2. A little too much ..................................
3. Just about right. ..................................
4. Not quite enough. .................................
5. Not enough, compared with what I want .........
9 & 0. Not ascertained; inappropriate. ............
8. DK

E. How much does your job give you a chance to do things where you might fail?

1. Very much ........................................
2. Quite a bit ......................................
3. Some ............................................
4. A little .......................................... 
5. Not at all ........................................
9 & 0. Not ascertained; inappropriate. ............
8. DK

F. Now can you tell me how much your job actually requires you to do things where you might fail?

1. Very much ........................................
2. Quite a bit ......................................
3. Some ............................................
4. A little .......................................... 
5. Not at all ........................................
9 & 0. Not ascertained; inappropriate. ............

G. How does this (the opportunity or requirement for doing things where you might fail) fit in with what you want?

1. Too much, compared with what I want ............
2. A little too much ..................................
3. Just about right. ..................................
4. Not quite enough. .................................
5. Not enough, compared with what I want .........
9 & 0. Not ascertained; inappropriate. ............
6. **Self-Development**

A. The next questions are about self-improvement—learning new things; doing better than you have been able to do in the past. Compared with (T2=others, T1=other boys) your age, how important is it for you to try to improve yourself?

1. Much more important than average . . . . . . . . . .
2. A little more important than average . . . . . . . . .
3. About average importance . . . . . . . . . . . . . . .
4. A little less important than average . . . . . . . . .
5. Much less important than average . . . . . . . . .
9 & 0. Not ascertained; inappropriate . . . . . . .

B. How much does your school give you a chance for improving yourself?

1. Very much . . . . . . . . . . . . . . . . . . . . . . . . .
2. Quite a bit . . . . . . . . . . . . . . . . . . . . . . . . .
3. Some . . . . . . . . . . . . . . . . . . . . . . . . . . . .
4. A little . . . . . . . . . . . . . . . . . . . . . . . . . . .
5. Not at all . . . . . . . . . . . . . . . . . . . . . . . . . .
9 & 0. Not ascertained; inappropriate . . . . . . .
8. DK

C. How much does your school actually require you to improve yourself?

1. Very much . . . . . . . . . . . . . . . . . . . . . . . . .
2. Quite a bit . . . . . . . . . . . . . . . . . . . . . . . . .
3. Some . . . . . . . . . . . . . . . . . . . . . . . . . . . .
4. A little . . . . . . . . . . . . . . . . . . . . . . . . . . .
5. Not at all . . . . . . . . . . . . . . . . . . . . . . . . . .
9 & 0. Not ascertained; inappropriate . . . . . . .

****D. How does this (the opportunity or requirement for improving yourself) fit in with what you want?

1. Too much, compared with what I want . . . . . . . . .
2. A little too much . . . . . . . . . . . . . . . . . . . . .
3. Just about right . . . . . . . . . . . . . . . . . . . . .
4. Not quite enough . . . . . . . . . . . . . . . . . . . .
5. Not enough, compared with what I want . . . . . . .
9 & 0. Not ascertained; inappropriate . . . . . . .
E. How much does your job give you a chance for improving yourself?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
9 & 0. Not ascertained; inappropriate

F. How much does your job actually require you to improve yourself?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
9 & 0. Not ascertained; inappropriate

****G. How does this (the opportunity or requirement for improving yourself) fit in with what you want?

1. Too much, compared with what I want
2. A little too much
3. Just about right
4. Not quite enough
5. Not enough, compared with what I want
9 & 0. Not ascertained; inappropriate

7. Self-Utilization

A. The next questions are just a bit different. Instead of asking about improving yourself, these questions are about doing things you're already good at --this means doing the things you have learned how to do well and enjoy doing; being able to use the skills and abilities that you already have. Compared with (T2=others, T1=other boys), your age, how important is it for you to be doing things you're already good at?

1. Much more important than average
2. A little more important than average
3. About average importance
4. A little less important than average
5. Much less important than average
9 & 0. Not ascertained; inappropriate
B. How much does your school give you a chance for doing things you're already good at?
1. Very much .........................................................
2. Quite a bit ..........................................................
3. Some ............................................................... 
4. A little ..............................................................
5. Not at all ............................................................
9 & 0. Not ascertained; inappropriate .................................

C. How much does your school actually require you to do things you're already good at?
1. Very much ..........................................................
2. Quite a bit ..........................................................
3. Some ............................................................... 
4. A little ..............................................................
5. Not at all ............................................................
9 & 0. Not ascertained; inappropriate .................................

D. How does this (the opportunity or requirement for doing things you're already good at) fit in with what you want?
1. Too much, compared with what I want .........................
2. A little too much ..................................................
3. Just about right ..................................................
4. Not quite enough ................................................
5. Not enough, compared with what I want ......................
9 & 0. Not ascertained; inappropriate .................................

E. How much does your job give you a chance for doing things you're already good at?
1. Very much ..........................................................
2. Quite a bit ..........................................................
3. Some ............................................................... 
4. A little ..............................................................
5. Not at all ............................................................
9 & 0. Not ascertained; inappropriate .................................

F. How much does your job actually require you to do things you're already good at?
1. Very much ..........................................................
2. Quite a bit ..........................................................
3. Some ............................................................... 
4. A little ..............................................................
5. Not at all ............................................................
9 & 0. Not ascertained; inappropriate .................................
8. **Intelligence**

A. **The first questions are about intelligence**—having a quick mind; catching on to things fast. **How intelligent do you think you are, compared with (T2=others, T1=other boys) your age?**

1. Far above average (top 10%)
2. Above average (next 15%)
3. Slightly above average (25%)
4. Slightly below average (25%)
5. Below average (next lowest 15%)
6. Far below average (bottom 10%)

9 & 0. Not ascertained; inappropriate.

7. Other (T1) 8. Other (T2)

B. **Compared with (T2=others, T1=other boys) your age, how important is it to you to be able to use your intelligence? --how much do you enjoy using your intelligence?**

1. Much more important than average
2. A little more important than average
3. About average importance
4. A little less important than average
5. Much less important than average

9 & 0. Not ascertained; inappropriate.

C. **How much does your school give you a chance for using a lot of intelligence?**

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all

9 & 0. Not ascertained; inappropriate.

8. DK
D. How much does your school actually require you to use a lot of intelligence?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
6 & 0. Not ascertained; inappropriate.
8. DK

****E. How does this (the opportunity or requirement for using a lot of intelligence in school) fit in with what you want?

1. Too much, compared with what I want
2. A little too much
3. Just about right
4. Not quite enough
5. Not enough, compared with what I want
6 & 0. Not ascertained; inappropriate.
8. DK

F. How much does your job give you a chance for using a lot of intelligence?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
6 & 0. Not ascertained; inappropriate.

G. How much does your job actually require you to use a lot of intelligence?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
6 & 0. Not ascertained; inappropriate.
****H. How does this (the opportunity or requirement for using a lot of intelligence in your job) fit in with what you want?

1. Too much, compared with what I want
2. A little too much
3. Just about right
4. Not quite enough
5. Not enough, compared with what I want

9 & 0. Not ascertained; inappropriate.

9. Reading ability

A. The next questions are about being a good reader -- reading quickly without making mistakes; reading difficult books. How good a reader do you think you are, compared with (T2=others, T1=other boys) your age?

1. Far above average (top 10%)
2. Above average (next 15%)
3. Slightly above average (25%)
4. Slightly below average (25%)
5. Below average (next lowest 15%)
6. Far below average

9 & 0. Not ascertained; inappropriate

7. Other

8. DK

B. Compared with (T2=others, T1=other boys) your age, how important is it to you to do a lot of reading -- how much do you like reading?

1. Much more important than average
2. A little more than average
3. About average importance
4. A little less important than average
5. Much less important than average

9 & 0. Not ascertained; inappropriate.

C. How much does your school give you a chance to read?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all

9 & 0. Not ascertained; inappropriate.
D. How much does your school actually require you to read?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
9 & 0. Not ascertained; inappropriate.

****E. How does this (the opportunity or requirement for reading in school) fit in with what you want?

1. Too much, compared with what I want
2. A little too much
3. Just about right
4. Not quite enough
5. Not enough, compared with what I want
9 & 0. Not ascertained; inappropriate.

F. How much does your job give you a chance to read?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
9 & 0. Not ascertained; inappropriate.

G. How much does your job actually require you to read?

1. Very much
2. Quite a bit
3. Some
4. A little
5. Not at all
9 & 0. Not ascertained; inappropriate.

****H. How does this (the opportunity or requirement for reading in your job) fit in with what you want?

1. Too much, compared with what I want
2. A little too much
3. Just about right
4. Not quite enough
5. Not enough, compared with what I want
9 & 0. Not ascertained; inappropriate.
PSYCHOLOGICAL STRAIN MEASURES:

1. Social Support Index: Is the mean of the responses to the following three items:

   A. I feel that nobody wants me
   1. Almost always true
   2. Often true
   3. Sometimes true
   4. Seldom true
   5. Never true
   8-0. Missing data

   B. I feel lonesome
   1. Almost always true
   2. Often true
   3. Sometimes true
   4. Seldom true
   5. Never true
   8-0. Missing data

   C. I feel loved
   1. Almost always true
   2. Often true
   3. Sometimes true
   4. Seldom true
   5. Never true
   8-0. Missing data

2. Resentment Index is the mean of 6 out of 7 responses to the following items:

   A. I don't seem to get what is coming to me
   1. Almost always true
   2. Often true
   3. Sometimes true
   4. Seldom true
   5. Never true
   8-0. Missing data

   B. I feel I get a raw deal out of life
   1. Almost always true
   2. Often true
   3. Sometimes true
   4. Seldom true
   5. Never true
   8-0. Missing data
C. If I let people see the way I really feel, they would think I was hard to get along with

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D. Other people always seem to get the breaks

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E. Although I don't show it, I am very jealous

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F. I am likely to hold a grudge

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G. When I look back on what's happened to me, I feel cheated

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DELINQUENCY MEASURES:

1. Interpersonal Aggression Index is the mean of 7 out of 8 of the responses to the following items:

   A. Got into a serious fight with a student in school (or at work - T4)
      1. 5 or more times
      2. 3 or 4 times.
      3. Twice
      4. Once.
      5. Never
      0,9. Missing data.

   B. Get something by telling a person something bad would happen to him if you did not get what you wanted
      1. 5 or more times
      2. 3 or 4 times.
      3. Twice
      4. Once.
      5. Never
      0,9. Missing data.

   C. Hurt someone badly enough to need bandages or a doctor
      1. 5 or more times
      2. 3 or 4 times.
      3. Twice
      4. Once.
      5. Never
      0,9. Missing data.

   D. Hit a teacher (an instructor or supervisor - T4)
      1. 5 or more times
      2. 3 or 4 times.
      3. Twice
      4. Once.
      5. Never
      0,9. Missing data.

   E. Hit your father
      1. 5 or more times
      2. 3 or 4 times.
      3. Twice
      4. Once.
      5. Never
      0,9. Missing data.
F. Taken part in a fight where a bunch of your friends are against another bunch

1. 5 or more times
2. 3 or 4 times.
3. Twice
4. Once.
5. Never
0,9. Missing data.

G. Hit your mother

1. 5 or more times
2. 3 or 4 times.
3. Twice
4. Once.
5. Never
0,9. Missing data.

H. Used a knife or gun or some other thing (like a club) to get something from a person

1. 5 or more times
2. 3 or 4 times.
3. Twice
4. Once.
5. Never
0,9. Missing data.

2. Theft and Vandalism Index Is the mean of 7 out of 9 of the responses to the following items:

A. Taken something not belonging to you worth under $50.00

1. 5 or more times
2. 3 or 4 times.
3. Twice
4. Once.
5. Never
0,9. Missing data.

B. Taken an expensive part of a car without permission of the owner

1. 5 or more times
2. 3 or 4 times.
3. Twice
4. Once.
5. Never
0,9. Missing data.
C. Taken something not belonging to you worth over $50.00

1. 5 or more times  
2. 3 or 4 times.  
3. Twice  
4. Once.  
5. Never  
0,9. Missing data.

D. Taken an inexpensive part of a car without permission of the owner

1. 5 or more times  
2. 3 or 4 times.  
3. Twice  
4. Once.  
5. Never  
0,9. Missing data.

E. Went onto someone's land or into some house or building when you weren't supposed to be there

1. 5 or more times  
2. 3 or 4 times.  
3. Twice  
4. Once.  
5. Never  
0,9. Missing data.

F. Set fire to someone else's property on purpose

1. 5 or more times  
2. 3 or 4 times.  
3. Twice  
4. Once.  
5. Never  
0,9. Missing data.

G. Damaged school property on purpose

1. 5 or more times  
2. 3 or 4 times.  
3. Twice  
4. Once.  
5. Never  
0,9. Missing data.
H. Taken something from a store without paying for it

1. 5 or more times
2. 3 or 4 times
3. Twice
4. Once
5. Never
0,9. Missing data

I. Taken a car that didn't belong to someone in your family without permission of the owner

1. 5 or more times
2. 3 or 4 times
3. Twice
4. Once
5. Never
0,9. Missing data
FAMILY SOCIO-ECONOMIC LEVEL MEASURES:

The following ingredients, weighted equally, are the basis for the measure of socio-economic level (SEL)**:

1. **Father's Occupational Status.** During the interview each boy was asked to describe his father's occupation. The responses were coded according to Duncan's (1961) socio-economic index of occupations. For occupations of fathers in our sample (Time 1 Probability Sample), the mean Duncan scale value was 38.06, and the median was 37.

2. **Parent's Education.** Parents' levels of educational attainment, as reported by their sons in the interview, were coded into five categories; less than high school; some high school; completed high school; some college; and completed college. Based on the Time 1 Probability Sample, the median level of education for fathers and mothers is the same --high school graduation. More fathers than mothers have completed college, but it is also the case that more fathers failed to reach high school.

3. **Possessions In The Home.** A list of nineteen items (the first part of the Mathis (1966) "Environmental Participation Index") was presented in the questionnaire, and a respondent was asked to indicate which items were in his home. A respondent's "score" along this dimension consisted of the total number of items he checked as being present in his home; the mean score for all respondents was just over fifteen items.

4. **Number Of Books In The Home.** A single questionnaire item asked respondents to check the number of books in their homes, using a six-point scale; none or very few (0-10); a few books (11-15); one
bookcase full (26-100); two bookcases full (101-250); and a room full --a library (501 or more). The item was one of several questionnaire items taken from the Student Information Blank used in Project TALENT's massive national survey of high school students (Flanagan, et al, 1964). It is of interest to note that our frequency distribution for tenth-grade boys in 1966 is nearly identical to that reported by Flanagan, et al, for their sample of twelfth-grade males in 1960.

5. Number of rooms per person in the home. Two open-ended questionnaire items asked respondents to write in the number of people living in their homes ("count all rooms: bedrooms, bathrooms, kitchen, living room, dining room, recreation room, enclosed porch, etc."). About half of the respondents reported five to eight rooms in their home, and the other half reported five to eight rooms in their home, and the other half reported nine or more rooms. The median number of people living at home was five. A "rooms per person" ratio was computed for each respondent simply by dividing the total number of rooms by the total number of persons in the home; the median value was found to be 1.8 rooms per person.

The Meaning Of Socio-economic Level (SEL). There is no broad agreement about just what is meant by the terms socio-economic status and socio-economic level. We have just been examining the dimensions which, weighed equally, provide a composite measure of SEL that has proved useful. In summary, our measure of SEL consists of one "part" father's occupational status, two "parts" parents' education, and three "parts" having to do with family possessions. While most or all of these ingredients undoubtedly have a bearing upon a family's status in the eyes of the community, they have perhaps even more to do with the
quality of home environment available to children. To the extent that this is true, the SEL index is particularly well suited as a measure of one class of family background influences in our study of adolescent boys.
Appendix B

To operationalize the alternative measures of P-E fit, the following steps were taken.

1. The ability questions on "self rated intelligence" (8.1) and "self rated reading ability" (9.1) were recorded as 1 = 1, 2 = 2, 3 and 4 = 3, 5 = 4, and 6 = 5.

2. The absolute values of the ability question (self rated abilities), whenever available, minus the demand questions (How much does your . . . require you to do . . .) were taken as the ability-demand measure of P-E fit in each dimension.

3. The absolute values of the need or motive questions (How important is it for you to do . . .) minus the opportunity questions (How does your . . . give you a chance to do . . .) were taken as the measures motive-opportunity measure of P-E fit in each dimension.
PERSONAL: Born September 19, 1953

EDUCATION: B.S. (Political Science and Economics), National University of Iran, 1975.


DISSERTATION: Person-Environment Interaction, Psychological Strain, and Delinquency: A Longitudinal Test of Theory.

WORK EXPERIENCE: 1979-1985: Research and Teaching Assistant, Department of Sociology, Utah State University, Logan, Utah.

1984-1985: Research Assistant, Early Intervention Research Institute, Developmental Center for Handicapped Persons, Logan, Utah.