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ADOLESCENT SUBSTANCE USE PATTERNS: TESTING
A MULTIDIMENSIONAL SOCIOGENIC MODEL

by

Eric O. Johnson

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Sociology

Western Michigan University
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ADOLESCENT SUBSTANCE USE PATTERNS: TESTING
A MULTIDIMENSIONAL SOCIOGENIC MODEL

Eric O. Johnson, Ph.D.

Western Michigan University, 1993

This dissertation begins with the understanding that behavior is a product of a variegated and complex web of social factors. Bringing this approach to the subfield of adolescent substance use, both substance use itself (alcohol, cigarettes and a broad range of illicit drugs) and the factors that influence such use are viewed as existing within the complex of demographic/structural, social contextual, attitudinal, and behavioral layers of adolescents' social worlds.

The Patterns of Adolescent Substance Use Typology, developed by Stanley S. Robin and me (1992a), is used to categorize the overall level and kind of substance use, over time, that adolescents report. The typology consists of seven patterns of use: (1) abstainers, (2) experimenters, (3) reconsiders, (4) switchers, (5) light users, (6) users, and (7) accumulators. A Multidimensional Sociogenic Adolescent Substance Use Model as an original theoretical explanation is developed. This model consists of social variables organized into a series of structural levels. In this model the demographic/structural, social contextual,

attitudinal and behavioral layers of social reality are arranged as distal to proximal in their influence on the patterns of substance use: the structural as the most distal and the behavioral as the most proximal. The model also contains social and individual phenomena within each layer of social reality ordered as topically distal to proximal to patterns of substance use.

These data consist of 15,172 eighth, tenth and twelfth graders from forty Michigan public school districts which participated in the Michigan Alcohol and Other Drugs School Survey twice at a two year interval, once during the 1989-90 and again during the 1991-92 academic year.

The research findings strongly support the Patterns of Adolescent Substance Use Typology as correctly and exclusively fitting the vast majority of subjects (93.0 or more percent) into one of the seven patterns of use and as showing increasing levels of involvement over time. The analysis of the Multidimensional Sociogenic Adolescent Substance Use Model as an explanatory model was more weakly supported. Nevertheless, the model predicted patterns of substance use well, explaining between 29% and 55% of the variance in patterns of use. The findings provide increased understanding of adolescent substance use, direction for further research, and implications for education and therapeutic application for adolescents.

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Western Michigan University, 1993

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Eric O. Johnson

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CHAPTER I

INTRODUCTION TO ADOLESCENT SUBSTANCE USE

Over the past two and a half decades adolescent substance use has received much attention and increasingly loomed large in the public eye. Consequently, billions of dollars have been spent by a plethora of groups and institutions on programs of treatment, intervention, and prevention, as well as a great deal of research to evaluate and guide such efforts.

As is often the case with subfields of the social sciences with large investments in an applied approach to putative social problems, the adolescent substance use literature lacks both empirical comprehensiveness and theoretical coherence. Much of what has been done is either large scale prevalence and incidence rate studies (yielding distribution and trend information) or very specific problem oriented etiological studies (whose conceptual breadth is confined and therefore whose broad applicability is lacking). Indeed, in Adolescents at Risk (1990) Dryfoos finds the adolescent substance use literature to be the most problematic for her meta-analysis of the four risk areas she addresses (other areas being delinquency, pregnancy and school failure/dropping out).

An inevitable consequence of this state of the literature on adolescent substance use is that our understanding of the etiology, and the use behavior itself, tends toward the simplistic. Focusing on a very specific aspect of adolescent substance use, a particular drug or evaluating a particular program in etiological research increases the idiosyncratic character of relationships tested, results found and public policy implications derived. Such research, therefore, contributes to defeating its own purpose by confining our knowledge of adolescents' social world (of which substance use or nonuse is but one part) which inherently reduces the effectiveness of the efforts to which the application oriented research is directed. In contrast, more basic and broadly based research provides the opportunity to look not only at the role of social phenomena we believe closely linked with substance use but also the broader social context in which adolescents encounter drugs and which influences choices made about their use.

This dissertation begins with the understanding that behavior (including adolescent substance use) is the culmination of a variegated and complex web of social realities. Even the behavior under study, to achieve useful understanding, needs to be conceptualized in a more complicated way than a dichotomy of use and non-use of this

or that substance or even the extent and frequency of use of substances. Any social behavior, such as substance use, exhibits patterns and variations across individuals and within individuals, reflecting different behavioral complexes and decisions made about them over time.

Bringing this approach to the subfield of adolescent substance use, this dissertation is an attempt to analyze the complex patterns of adolescent substance use (previously developed by the author and Stanley S. Robin) as dependent variables to be explained (Robin & Johnson, 1992a). This analysis will be pursued by proposing a comprehensive conceptual model of adolescent substance use as a configuration of independent variables. Firstly, this model will be guided by a understanding (and a suggested framework) of adolescent substance use behavior as the culmination of the many influences of different levels of social reality on choices made by adolescents. Secondly, extant theories of adolescent substance use, research results and broader social phenomenon will be integrated within this framework. Thirdly, relationships within the model will be developed empirically through a series of interrelated steps intended to create the most powerful explanatory model possible. Fourthly, this research will pay particular attention to differences in substance use patterns and explanatory variables over time, through a

quasi-longitudinal research design. Finally, a theoretical approach which will help capture the social complexity contributing to (or predicting) the differing complex patterns of adolescent substance use will be derived.

CHAPTER II

A THEORETICAL AND EMPIRICAL CONSTRUCTION OF ADOLESCENT SUBSTANCE USE PATTERNS AND A CONCEPTUAL MODEL

Understandings of Adolescent Substance Use

Adolescents' recreational use of drugs has been tracked by survey research since 1971 (Dryfoos, 1990). Since that beginning, academic interest in and, theories and research about, substance use have flourished.

Attempts to explain and understand adolescent use of alcohol and drugs have proceeded from a variety of perspectives. These range from theories that emphasize social integration (Hawkins, et al. 1985), psychogenic development theory (Greenspan 1985), cognitive development (Inhelder & Piaget 1985), behavioral intention theory (Fishbein & Ajzen 1975), social learning theory (Akers, Krohn, Lanza-Kaduce & Radosevich 1979; Parcel & Baranowski 1981), habituation (Stephens & Marlett 1987), through socialization theories (Baumrind 1985; Huba, Wingard & Bentler 1979; Huba & Bentler 1980; 1982), to multivariate problem behavior theoretical frameworks (Jessor & Jessor 1977). Correlates and risk factors have been associated with use of specific drugs (Abad & Swarez 1975; Bailey & Hubbard 1990; Jessor,

Chase & Donovan 1980; Johnson & Matre 1978; Lau, Quadrel & Hartman 1990; Thompson 1989; Zeblocki et al. 1991). Risk factors for more general substance use have also been isolated (Bry, McKeon & Pandina 1982; Johnson & Kaplan 1990; Newcomb et al. 1987; Robinson, et al. 1987).

However two major approaches to adolescent substance use have emerged. One is the problem behavior model (White 1991; White, Johnson & Horowitz 1986; Zablocki, et al. 1991; Jessor & Jessor 1977; Jessor et al. 1980). From this approach adolescent substance use is investigated as one of several problem behaviors and theoretically explained by various aspects of personality, and family and peer relationships.

The second is the incremental model (or gateway phenomenon model), itself a subset of the psycho-social development approach (Kandel 1982; Kandel & Faust 1975; Kandel & Logen 1984; Kandel et al. 1984; Kandel & Yamaguchi 1985; Yamaguchi & Kandel 1984a, 1984b; Robin & Johnson 1991). In these efforts the sequence of substance use, typically from "soft" drugs--tobacco, alcohol & marijuana to a variety of "hard" drugs is examined. Research has supported the observation that childhood and early adolescent use of tobacco, alcohol and drugs is associated with heavy, and further use of these substances.

However, these theoretical developments and the

research supporting them both reflect and produce the reduction of the investigation of causes of adolescent substance use and the behavior itself to very limited phenomena. This occurs in two interconnected ways.

Firstly, there has been an assertion that adolescent substance use is pathological by definition. In the words of Erich Goode (1989, p. 55) the perspective contends that:

It is not "normal" to use drugs outside a medical context; only a drug-free existence is normal. No one uses psychoactive drugs to get high unless there's something identifiably wrong with him or her. When things are working right, there's no "need" to take drugs.

This assertion is implicitly and explicitly made by both of the currently dominant theories, as well as, by the majority of other etiological theories. This stance flies in the face of the empirical evidence: 89.5 percent of U.S. high school seniors report having used alcohol in their lifetime, 64.4 percent using cigarettes and 40.7 percent using marijuana (Johnston et al., 1991b, p. 6). It is difficult to see the usefulness of adolescent substance use monolithically approached as aberrant. Nevertheless, this approach is dominant and has constrained the conceptualization of adolescent substance use. Generally use is neatly dichotomized into non-use and use or measured by frequency of use. Consequently, all users are viewed and treated the same, whether they be occasional weekend drinkers or daily drinkers; two very different patterns of use, with differ-

ent consequences and, one would guess, different causal influences. Again this contributes to defeating the very purpose of these studies by limiting our conceptualization and knowledge, and thereby the effectiveness of policy and programs.

Secondly, and relatedly, the pathological frame of reference has generally constrained theory to a concern with the "aberrant and diseased" individual thus tending to be confined to psychological and/or behavioral causation. For example, adolescent substance use is primarily "caused" or predicted by the dynamics of the personality system in the case of the problem behavior model (Jessor & Jessor, 1977) and the grade of first use of cigarettes, inhalants, alcohol, and marijuana in the gateway model (Kandel 1982; Kandel & Faust 1975; Kandel & Logen 1984; Kandel et al. 1984; Kandel & Yamaguchi 1985; Yamaguchi & Kandel 1984a, 1984b; Robin & Johnson 1991).

It is not the contention in the conduct of this research that these approaches are useless. In fact, much of the research testing them have been supportive. Indeed, in my own research with Stanley Robin the gateway variables overshadowed other variables that were compared with them in the creation of discriminant functions intended to discriminate types of users (Robin & Johnson, 1992a, p. 13). Instead, the point is that these psychological and

behavioral based models are too limited.

Adolescent Substance Use as Complex Patterns:
The Dependent Variables

In the development of a typology of complex patterns of adolescent substance use, Robin and Johnson (1992a) focused on a alternate model to the dominant approaches discussed above: an approach proposed by Glassner and Loughlin (1987). Theirs is a sociogenic model in which substance use is normative (at least from the perspective of the users), recreational and peer driven. Their approach emphasizes the peer group memberships, peer attitudes, and personal assessment of substance use as group and recreational activity, and subsequent behavior as a specific social process taking place within a well ordered social system. Thus the sociogenic model, as used by Glassner and Loughlin (1987, p. 8-14), views the behaviors of substance use as part of and resulting from, not only psychological influences and behavioral antecedents, but as largely influenced by adolescents' social worlds: that is the total social context - structural, cultural, subcultural and peer group - in which adolescents' develop relationships, attitudes, and behavioral repertoires.

In addition to the more sociological orientation of Glassner and Loughlin's (1987) perspective, another major

difference between it and the dominant approaches is that the use of drugs cannot be viewed as a dichotomous variable: use or abstinence.

While abstinence can be easily defined as the absence of nonmedical use of alcohol, drugs or tobacco it represents a very small proportion of adolescents and is consequently of little use in discussing the issue of adolescent substance use. Even more problematic in conceptualizing adolescent substance use dichotomously, is viewing behavior as simply "substance use": any and all uses viewed as one phenomenon. A variety of drugs are used for a variety of reasons in a variety of ways (Glassner and Loughlin, 1987 p. 41-90). Not surprisingly, research from other perspectives reflect the problem of lumping all drugs together in a single variable (or as simply soft and hard drugs). They show large degrees of variance in the usefulness of their theories prediction of substance use depending on the substance used being predicted. For example, different substances vary greatly in their relationships to the gateway model: differing in level of prediction and the significance of the relationship between grade of first use of a particular gateway drug and the use of a particular "hard" drug (Robin & Johnson, 1991 p. 19).

This amount of variance or complexity in adolescent substance use makes the simple category "substance use or

user" not only inaccurate but harmful to our understanding of substance use behaviors, to etiological research, prevention/treatment program development and public policy applications. For the same reasons substance use is not usefully viewed as a simple linear variable: i.e. the frequency or amount of use. In addition to the frequency of use and the number of occasions used, which drug or drugs in what combinations or patterns of use are important aspects of substance use behavior that must be accounted for. Indeed, the patterns of substance use used in this research incorporate the abstinence, use/level of use (in lifetime, past year & past month), the length of use, and combinations of substances used of fourteen different substances.

Further developing this approach, we noted that when adolescents encounter drugs they have, as they do for other cultural traits, a series of decisions to make. In varying subcultural contexts, the adolescent may make, abandon, alter and remake decisions and patterns of substance use over time. It is clear that substance use is not a solitary activity but takes place within a social environment in which a wide variety of behaviors occur, including other recreational activities, of which substance use may be one.

The use of drugs involves a set of choices, therefore,

that may range from the conscious to the ready acceptance of well established group norms. Further, these behaviors, once adopted, may or may not alter with time. Aging, changing group memberships, changing group norms, attempts at social control and personal, idiosyncratic life circumstances may all be factors in the reconsideration or alteration of substance use patterns.

It was proposed by Robin and Johson (1992a) that adolescent responses to an environment in which psychoactive substances exist and social pathways to their use are available cultural traits, may create several, mutually exclusive substance use patterns:

1. Abstainers: those adolescents who have never used any substances.
2. Experimenters: those adolescents who have used substances limitedly and then discontinued use.
3. Reconsiderers: those adolescents who have used substances extensively and have discontinued use.
4. Switchers: those adolescents who have used substances extensively, have discontinued one or more substances and have begun extensive use of at least one other substance.
5. Users: those adolescents who have used substances extensively and continue to use them.
6. Accumulators: Those adolescents who used at least

one substance extensively, continue to use it and have added at least one other substance. Two or more substances are currently in use.

These adolescent patterns were viewed in two ways: considering all psychoactive substances and considering all psychoactive substances except alcohol and cigarettes. Since alcohol and cigarettes are legal, even if not for adolescents, in this society, and have limited predictive value as gateway predictors, due to the ubiquity of their use (Robin & Johnson, 1991), we were inclined to think that the special status might realistically create substantial differences in the relative proportion of adolescents exhibiting the six patterns listed above. Thus Robin and I (1992a) investigated the nature and existence of adolescent substance use patterns separately with and without alcohol and cigarettes as substances. Indeed, this distinction proved useful since there were substantial differences in the number of cases assigned to each pattern of substance use when alcohol and cigarettes were included versus when they were excluded (Robin & Johnson, 1992a). Consequently, this distinction will be maintained in the data analysis in this dissertation.

Initial examination of the distributions of pattern of adolescent substance use (Robin & Johnson, 1992a) revealed that almost 25 percent of the respondents, when examining

the use of drugs alone, were unaccounted for. Analysis of unclassified respondents showed that one possible pattern of use had not been anticipated. These were adolescents who report having used a single drug, but less extensively than "users", and continue to use it at that level. These adolescents were classified as "light users". With the addition of the light user pattern the adolescent substance use patterns accounted for over 93 percent of the total sample when alcohol and cigarettes use was included and over 95 percent when they were excluded. An important typology of drug-using behavior which is an alternative to the one presented here was developed by the Shafter Commission in 1970. Their typology consisted of: (a) experimental drug use, (b) social or recreational drug use, (c) circumstantial or situational drug use, (d) intensified drug use, and (e) compulsive drug use (National Commission on Marihuana and Drug Abuse, 1970 p. 94). However, the so-called usage patterns which constitute this typology combine behavior (amount and frequency of drug use), motivations for use (curiosity, situational coping strategy, persistent coping strategy, or need for a sense of security and physiological and psychological dependency) and an underlying continuum from non-pathological to pathological use (National Commission on Marihuana and Drug Abuse, 1970 pp. 95-98). As a consequence the typology

inappropriately combines etiology (motivations for use) and the behavior to be explained (patterns of drug use). In addition, the element of pathology is introduced for some forms of use behavior. While such pathology may be a part of the etiology of some forms of drug use its incorporation into the behavior to be explained violates the distinction between independent and dependent variables. Thus, although the Schaffer Commission's typology emphasizes some interesting points about substance use, such as the role that the drug plays in the life of the user, it fails to make the essential distinction between the causes of the behavior and the behavior to be explained. By its pathological assumptions for some use behavior, this typology also maintains a reduction of etiology tending toward individual psychological causes for at least some use behavior and consequently places the phenomenon assumed outside our ability to test.

In light of our patterns of adolescent substance use typology's (PASUT's) empirical success, the lack of a pathological assumption and maintenance of the distinction between the use behavior and its etiology, it is an important and substantial improvement on measurements and an addition to the theoretical understanding of adolescent substance use behavior. First, this typology moves beyond the simple dichotomy of abstinence versus use but still

accounts for the difference between abstainers and the various types of users. Second, the typology also goes beyond a linear frequency of use account of substance use behavior. Instead, we use the frequency of use, the number of substances used and level of consistency of use to classify adolescents into substantively meaningful patterns (with a good deal of success). Third, this typology does not require, indeed discourages, a pathological interpretation of all adolescent substance use. The typology, instead, shows the usefulness of a sociogenic model, free from the confines of the disease model (physical or psychological).

In "Abstainers, Experimenters, Reconsiderers, Switchers, Users And Accumulators: Patterns of Adolescent Responses to Drugs" (Robin & Johnson, 1992a) the primary focus was on the development and assessment of the patterns of adolescent substance use. A secondary and less successful concern was with, which independent factors discriminated between patterns as assessed through discriminant function analyses.

This dissertation takes the analysis of the PASUT in a different direction by using these complex behavior patterns as the dependent variables to be explained. Additionally the PASUT is theoretically enhanced by viewing it in this research as expressing a dimension of increasing

complexity of patterns of, and involvement in, substance use: from abstainer to accumulator.

In addition to moving away from the pathological assumption of adolescent substance use, our theoretical understanding must also move away from its predilection for individual deviance, and primarily psychological, conceptualization of the causes of adolescent substance use to a more comprehensive understanding. This approach relies on the notion that, as with any human behavior, adolescent substance use behaviors are the result of a complex set of social influences and personal choices set within a social world. These more social context/world influences vary in their degree of impact on substance use behavior, as do the more personal influences. What will be proposed in this research is a model of adolescent substance use behaviors in which the different layers of social reality, ranging from the closest most specific phenomenon (antecedent behavior) through mid-range social reality (attitudes and social psychological or small group context) to the furthest and most general layer of social reality (demographic or structural influences), are incorporated to help explain the different complex patterns of adolescent substance use.

Beginnings of a Model: Layers of Social Reality
as Distal to Proximal

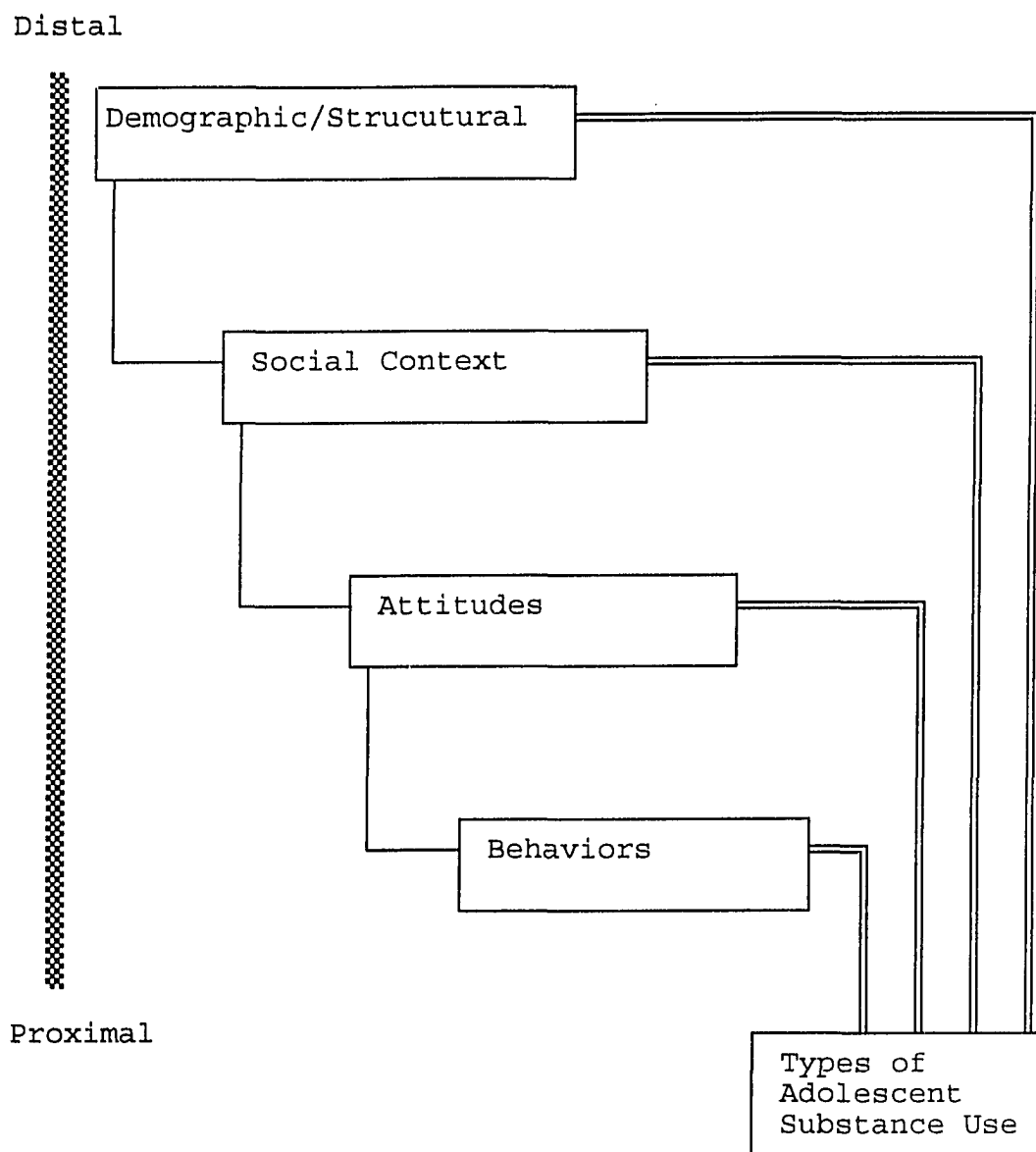
The beginning point of the development of the conceptual model of adolescent substance use is that the entire range of antecedent social phenomena that may have an influence on adolescent substance use, is bound in a continuous social process in which social context influences personal choices made and behavior acted out. Within this process antecedent social phenomena can be usefully (and representatively) conceptualized as relatively distal or proximal to the patterns of use. Distal social phenomena "are relatively more remote in the logic of the causal chain, variables that do not directly or necessarily implicate problem behavior but can be linked to its occurrence by reliance on theory and the mediation of other variables" (Jessor & Jessor, 1977, p. 27). Conversely, proximal social phenomena are "rather directly or obviously related to the likelihood of occurrence of problem behavior" (Jessor & Jessor, 1977, p. 28). In short, social phenomena interact in a complex social and personal process wherein they have different proximities in influencing a specific type of behavior. Recognition of this relationship between the social and individual behavior is the primary conceptual building block of this model.

From this perspective the complex social environment

of an individual (which includes everything from socioeconomic status to specific personal history of behavior) can be conceptually arrayed in an continuum of distal to proximal. For the purposes of this research the continuum will be broken into easily recognizable categories of social phenomena which have conceptually distinct characteristics in both their relative distal to proximalness to behavior and their substantive content. Consequently, social phenomena as characterized by variables can be located within the conceptual, categorical structure (variable placement will be discussed in a subsequent section). This social environment (continuum and substance) can be usefully broken down into four categories: (1) Demographic/Structural, (2) Social Context, (3) Attitudes, and (4) Behaviors (see Figure 1).

The most distal is the demographic and structural complex of characteristics of an individual which set the most general parameters around ones life. Characteristics such as sex, race/ethnicity, or urbanness of ones physical environment are patterning influences on the kinds of encounters one will have with society (ranging from life chances to role expectations).

The next most distal social complex is the more specific social context (real or perceived) in which one lives. This group of influences on behavior is composed of



Legend. — Indirect Relationship
 == Direct Relationship

Figure 1. Distal to Proximal Social Layers.

things such as expectations of family and friends, the institutional environments of which one is a part, etc.

This level of social reality is the most directly experienced structure of society, setting more specific constraints and opportunities within which people behave, that is nevertheless nested within the broader demographic /structural complex.

A more proximal social complex is that of attitudes. Here we find the much more individual manifestation of the more distal layers of social reality in the motivations for and constraints on behavior. Attitudes provide the psychological/mental environment in which proneness to particular behaviors occurs. Attitudes are the raw material of the weighing of alternative behaviors relative to knowledge, one's values, and other's values pulled together to formulate a decision to act.

Finally, the most proximal social complex is the actual (or reported) past behavior of an individual. Behaviors have consequences both on the actor's social environment as well as him/herself. Viewing the interaction between the actor and his/her social environment (primarily meaning other actors) from a Symbolic Interactionist viewpoint initial behavior influences subsequent behavior through a complex cycle of action, reaction and adjustment (Mead, 1934 p. 215). In this process, initial behavior sets off reactions (either positive or negative) from others in the social context. In this sense then, the

social context of the individual is influenced by the initial behavior. Subsequent behavior is in turn affected by the social context through the individual's adjustments of his/her behavior to that social context (i.e. the reactions of others evaluated relative to goal achievement). However, not all behavior is equally antecedent to subsequent behavior. The importance of a particular previous behavior varies by differences in the social context and type of behavior under consideration.

In addition to having the most personalizing effects on ones environment (of all the social complexes), behavior has a concreteness that establishes a history. This history provides routines of actions within a particular social environment which not only makes it likely that when faced with a situation one will tend to behave as one has before in similar situations (or very differently should previous behavior had undesired consequences), but also sets the stage for behavior that is relatively consistent with ones general behavioral history in new situations. In this sense then, ones behavioral history is most proximal in predicting and explaining subsequent behavior, though it is deeply nested within each of the previous layers of social reality.

Conceptualizing social reality in this way provides the ability (if artificially and roughly) to crack apart

the web of society and individual process most fundamentally. Such conceptual tools are helpful for the purposes of theoretically understanding the social phenomena that influence specific behavior (or types thereof) and to test and empirically refine such theorizing.

With this explanation of the first dimension of the conceptual model (layers of social reality as relatively distal to proximal), I now turn to the second dimension of the model proposed in this dissertation: social phenomena as topically distal to proximal.

Filling Out the Model: Social Phenomena as Distal to Proximal

As layers of social reality are constructed as relatively distal or proximal to any behavior of interest, so too social phenomena (as represented by variables) within and comprising them are proposed as relatively distal or proximal in their influence on a particular type of behavior. That is, there is a topically distal to proximal dimension in addition to the social layers dimension. What is meant by this topicalness is that within social layers some variables are more closely about substance use behavior (such as perceived health risk of using a drug) than others (such as general life satisfaction), though both may causally influence substance use behaviors. Thus, not only are variables, thought to have

some bearing on the adolescent substance use typology, arranged by their level of social reality (from structural to behavioral) but also within each level by their topical distal or proximalness.

This section will present the variables within each social layer and propose their relative place within that level by topical proximalness of the variable to the patterns of use.¹ Where empirical findings are available they will be used to locate variables within their social layer. A particularly useful source is Dryfoos's (1990) meta-analysis of adolescent drug and alcohol literature; it will be used as the primary source. Additional empirical findings will be used, including the author's and Robin's own (as yet unpublished) work. Where empirical findings are lacking a reasoned order of topical proximalness of the variable will be used.

The Demographic/Structural Layer

The variables included in this layer of social reality are father's/mother's education (in proxy for socioeconomic

¹ It should be noted that the variables, both in number and substantive content, included in the model are constrained by the use of Michigan Alcohol and Other Drug School Survey Project secondary, if as yet unanalyzed, quasi-longitudinal data. Also note that models are always limited by the imagination of the theorist and access to data. The theoretical limitations will become apparent to the reader as the empirical limitations and relative usefulness of variables is revealed at the end.

status which is not included in the Michigan AOD School Survey data), race/ethnicity, sex, and urbanness.² (see Figure 2).

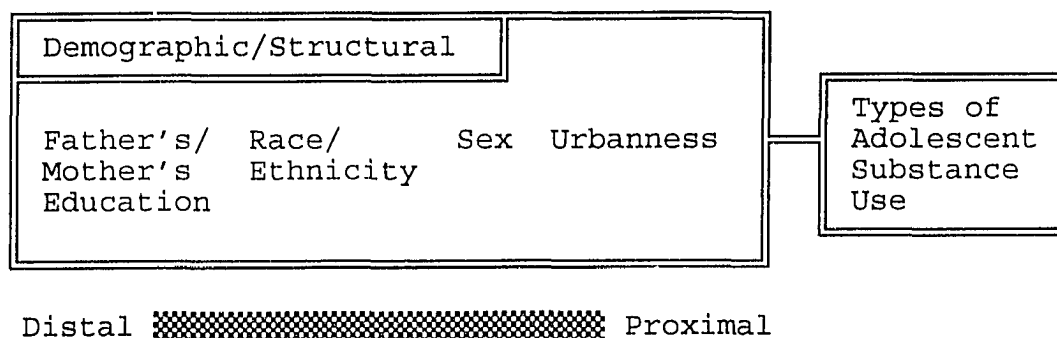


Figure 2. Variables of the Demographic/Structural Social Layer as Distal to Proximal.

The most distal demographic/structural variable is father/mother's education. For this variable Dryfoos (1990) reports very inconsistent weak findings for socioeconomic status as predicting adolescent substance use. However, socioeconomic status's more general impact on life chances and its association with race/ethnicity, urbanness and variables in more proximal layers of social reality justify its inclusion in the model.

The next most topically distal variable is race/ethnicity. Here Dryfoos (1990) reports inconsistent

² The measurement of variables will not be discussed here but in the methods section unless it is necessary to their theoretical presentation.

data on the predictiveness of the variable. However, epidemiologically there are very consistent findings. Native American youth report the highest levels of substance use, then Hispanic American youth followed by Caucasian American, Asian American and African American youth (Bachman et al., 1991; Johnson & Robin, 1992). Additionally, Johnson and Robin (1992) found that race/ethnic groups formed three clusters of Native and Hispanic American youth, Caucasian American youth, and Asian and African American youth, which differed significantly from one another in their level of use of almost all drugs and did so consistently across grades eight, ten and twelve. However, though statistically significant, the direct predictive value of race/ethnicity in these clusters was meager. Thus it is suspected that race/ethnicity's influence on types of adolescent substance use is largely indirect through its influence on other demographic /structural variables and the more proximal social layers.

The most proximal among the variables in the Demographic/Structural layer of social reality are sex and the level of urbanness. Dryfoos (1990) reports that the summary of findings indicate a consistent predictive relationship between increased urbanness, being male and increase likelihood and level of adolescent substance use. Dryfoos (1990, p. 55) does not indicate any difference in

the strength of prediction for these two variables. However, Johnston, O'Malley and Bachman (1989, p. 41-48) indicate that the difference in level of substance use by level of urbanness is greater than that by sex. Consequently, sex is placed in the model as the second most proximal variable and level of urbanness as the most topically proximal of the Demographic/Structural layer.

The Social Context Layer

Repetition of a grade, knowledge of school policy, implementation of school policy, ease of getting drugs, drug education, peer pressure and peer disapproval are the variables in the social context of adolescents with regard to substance use (see Figure 3).

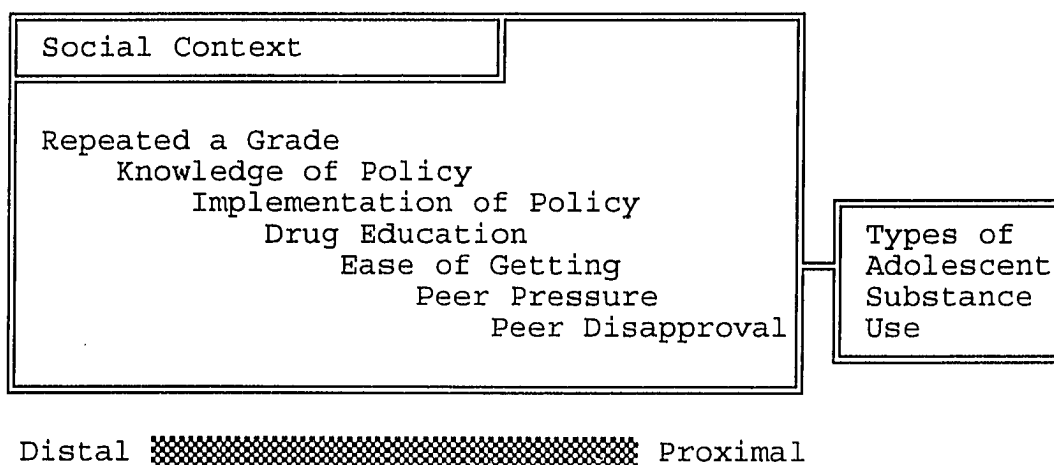


Figure 3. Variables of the Social Context Layer as Distal to Proximal.

A student repeating a grade is clearly related to behavior leading to poor grades and, possibly, a variety of problem behaviors. However, once this has occurred repeating a grade has consequences of its own. It is clearly a change in his/her social context with such possibilities as having a change in peers, being stigmatized and simply being older than one's classmates. These somewhat unique circumstances may have an impact on substance use behavior. To my knowledge this has not been tested but it seems worthwhile to include this variable as the most distal social context variable.

Although Dryfoos (1990) mentions other aspects of the social context of school and adolescent behavior therein, the likelihood of knowledge of school policies and enforcement of those policies with regard to substance use is not addressed. None-the-less, their topical proximalness is clear, they represent classical and control theories of deviance, and are very much a part of the social context in which adolescents form attitudes, make choices and act out those choices (at least for those in school and thus for the sample in this research and the majority of U.S. adolescents). Knowledge of school policies and implementation of those policies are place in the model as the second and third most distal variables in this layer based on the rationale that the effectiveness of school policies as

deterrence requires that the students believe that the policies will be implemented (i.e. enforced). If students do not believe that implementation will occur it does not matter what the policy is or whether or not they know of it.

Drug education is the next most proximal element of the social context layer of social reality. While drug education is not a causal factor in adolescent substance use, it is a factor in the social context in which adolescents are influenced and make choices about substance use and is therefore included in the model. The drug education variable is in fact a series of yes or no responses to having participated in a variety of drug education activities. According to Dryfoos (1990, p. 151-155), drug prevention or education programs vary greatly in their approach to the problem and in their effectiveness of changing behavior. Consequently, including a series of drug education activities is important in a comprehensive model of adolescent substance use. In addition, such educational efforts (whether they are effective or not) are topically, quite proximal to use behavior and therefore properly placed as one of the more proximal elements in the social context layer.

Though not discussed in Dryfoos (1990), ease with which an adolescent can get psychoactive substances (the

variable ease of getting) clearly sets a context in which choices about the use of these substances will have to be made more or less often. The more available various drugs are (or are thought to be), the higher the potential for substance use. This may in turn effect the pattern of use an adolescent can exhibit. For these reasons the ease of getting is the third most proximal variable at this layer.

Peer pressure and peer disapproval are addressed in Dryfoos (1990) under the rubric of peer influences. Peer influences are significant "risk markers" in almost all research on adolescent substance use (Dryfoos, 1990). I keep these two variables separate here based on the finding that degree of peer disapproval has a much stronger association with adolescent substance use than peer pressure, though both are of significance (Robin & Johnson, 1992b). Additionally, they have different theoretical meanings. Peer disapproval is a broader concept in that it is not proactive and specific, as peer pressure is, but rather a general standing constraint. This aspect of peer disapproval coincides with the typology of adolescent substance use patterns in that the patterns likewise are not substance specific but are general measures of reactions to and decisions made about substance use. Thus peer pressure occupies the second most proximal place in the social context layer of this model; with peer disapproval

the most proximal.

The Attitudinal Layer

Attitudinal variables which are included in this model are: (a) life satisfaction, (b) predicted college plans, (c) attitudes about school, (d) importance of religion, (e) drug education effect on interest, (f) perceived value of drug education, (g) prediction of future substance use and perceived risk of use (see Figure 4).

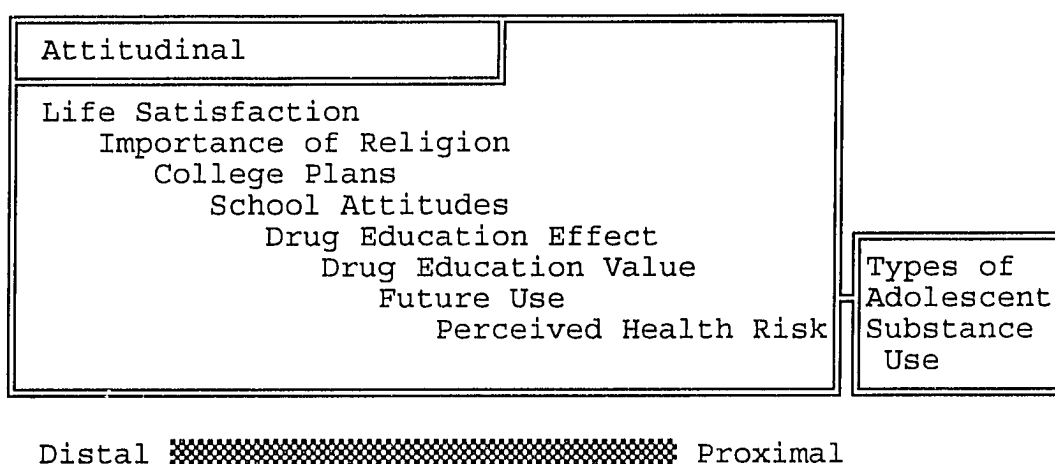


Figure 4. Variables of the Attitudinal Layer as Distal to Proximal.

While hardly a precise measurement of attitudes (or psychological states) on stress, depression, or self-esteem, overall life satisfaction is a general indicator for these more explicit variables. It seems unlikely that should one be depressed, overly stressed or experiencing

weakened self-esteem that one would have a high level of life satisfaction. Given that several sources show a strong relationship between stress, depression and adolescent substance use (Dryfoos, 1990; Glassner & Loughlin, 1987), it seems reasonable to include life satisfaction as the most distal of the attitudinal variables.

The importance of religion is the next most topically distal attitudinal variable. While Dryfoos (1990) only comments on religious service attendance, it seems reasonable to include the value that adolescents place on religion given that nearly all formal religions have some prohibitions on most recreational use of drugs. In addition, Dryfoos (1990) indicates that church attendance is consistently reported as a major predictor of adolescent substance use. An attitude which has, arguably, a strong relationship with such a useful variable ought also be included in a model attempting a comprehensive representation of influencing factors.

Attitudes toward college plans and school variables have, under the rubric of expectations for education, been consistently shown as good predictors of adolescent use of psychoactive substances (Dryfoos, 1990). Additionally, as in the case of the importance of religion, these attitudes about school appear to connect with school behavior, a very useful behavioral level predictor of adolescent substance

use, as will be discussed in the next section. The variable attitudes toward school is viewed as more topically proximal than college plans because of the immediacy of the school environment, attitudes toward it and behavior within it to the population under study. The more immediate the attitudes to one's environment the more influence those attitudes are to current behavior. Consequently these two variables are placed in the model as the fifth and sixth most proximal attitudes.

The third and fourth most topically proximal variables in the attitudinal layer are attitudes about drug education: how the experiences an adolescent has had effected him/her (drug educ. effect) and how valuable (drug educ. value) such experiences were. It would seem that a crucial part of the effectiveness of drug education is the attitudes one has about that experience. Indeed, Bachman, O'Malley and Johnston (1990, p. 182) found that the level of credibility given by adolescents to the information provided has a large impact on the effectiveness of such drug education efforts. These attitudinal variables, therefore, are topically proximal, important in their effect on the attitudinal environment pertaining to substance use, and appropriately included in this model.

The next most topically proximal attitude is that of predicted future use of psychoactive substances. To my

knowledge no research has been done concerning this variable's predictive value. However, it is clearly more topically related to adolescent drug than the prior variables; thus its position as second most proximal. Additionally, the quasi-longitudinal design of this research may produce some very interesting findings with regard to predicted behavior versus actual behavior.

Most research agrees that perceived riskiness of use is a very important predictor of adolescent substance use; in fact the "leading" attitudinal predictor (Dryfoos, 1990; Bachman et al. 1990; Robin & Johnson, 1991). Perceived riskiness of use, therefore, is placed in the most proximal position within the attitudinal layer of the model.

The Behavioral Layer

The final layer of social reality, the behavioral, contains seven variables. In the order of most distal to most proximal they are: (a) grade point average, (b) attendance of religious services, (c) school behavior, (d) cut classes, (e) evenings out, (f) location of use and (g) grade of first use (see Figure 5).

The most distal variable included in the behavioral layer of social reality is attendance of religious services. Dryfoos (1990, p. 55) indicates that low attendance is consistently found as a major predictor of substance use.

As mentioned when discussing the variable importance of religion, most formal religions have a general anti-drug theological influence and explicitly or implicitly place prohibitions on the recreational use of drugs. It seems

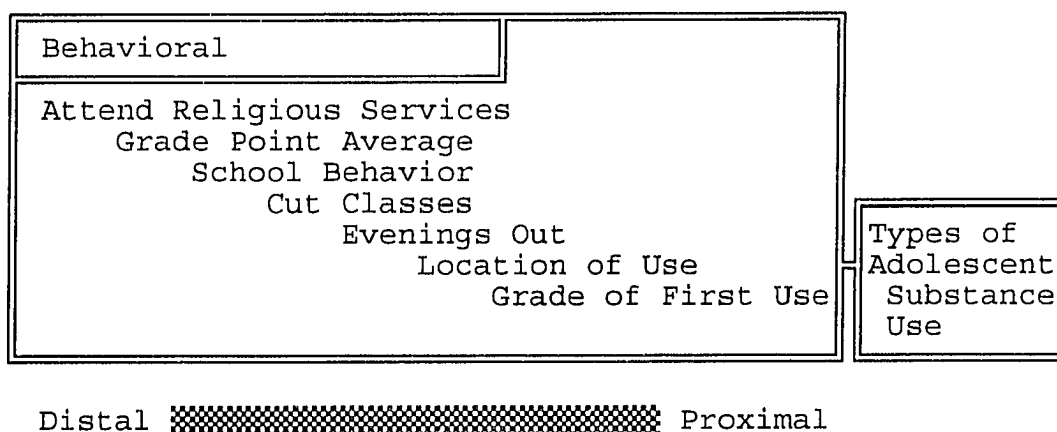


Figure 5. Variables of the Behavioral Layer as Distal to Proximal.

reasonable to expect that repeated exposure to such an environment will effect choices and the behaviors of substance use. Again, inclusion of this variable is warranted in a comprehensive model of adolescent substance use.

According to Dryfoos (1990 p. 54), school problems is among "the list of factors that are 'risk markers' for later substance abuse on which there appears to be almost complete agreement." The next three most distal variables come under this rubric. Dryfoos (1990 p. 54) includes low grades, acting out and truancy among the school problems

associated with increased adolescent substance use. The variables included in this model that correspond to these three are: GPA, school behavior and cut classes. These school problem variables are ordered from the most general indicator of school behavior to the most acute with regard to adolescent substance use which corresponds to their respective level of proximalness. The importance of including these variables is well founded and the inclusion of them at this place in the model seems to make distal-proximal sense.

The next two variables in the conceptual model are not addressed by Dryfoos (1990), nor anyone else to my knowledge. However, the number of evenings spent outside the home for recreation and the location of use are topically proximal or related to substance use.

The variable "number of evenings out" is the third most topically proximal variable in this layer and merits inclusion in this model based on its logical relationship to substance use itself and relationship to other factors known to influence use. Most adolescents report that home and school are not generally places in which they use substances (Michigan Alcohol and Other Drug School Survey, 1990-92 unpublished data). It would therefore seem reasonable to suggest that the more time spent away from home, during non-school hours, the more likely substance

use is, certainly more opportunity is there. Additionally, number of evenings out also seems related to increased peer influence and involvement in other high risk behavior. The more time spent with peers the larger their influence and more time is spent looking for something interesting to do. Indeed, both the degree of peer influence and being involved with other high risk behaviors are known to be related to increased substance use (Dryfoos, 1990 p. 54-55).

While location of use is in a sense a use variable, this is not a problem in this research because the dependent variable is not simply use (in which case location of use would pre-determine a relationship to use) but is a typology of patterns. It is the location aspect (whether use is at parties only or at one's home or at school functions or a combination of such locations) that may be particularly associated with different patterns of substance use. Location of use is included in this model as more proximal than evenings out because it is of necessity tied to patterns of use (though how location may be related to different patterns is unknown), whereas evenings out only increases the opportunity to use substance and use them in varying ways. Thus this somewhat unusual variable merits inclusion in this model as the second most topically proximal variable.

The grade of first use variable's relationship to adolescent substance use is that the earlier the initiation of substance use (particularly the so called gateway drugs) the heavier the use of drugs and the more serious (or harder) the drugs being used will be. This relationship is one of, if not the, most consistently significant in adolescent substance use literature. The grade of first use variable is also one of the best predictions of the extent and kind of substance use by adolescents (Dryfoos, 1990; Kandel, 1982; Kandel & Faust, 1975; Kandel & Logen, 1984; Kandel et al. 1984; Kandel & Yamaguchi, 1985; Yamaguchi & Kandel, 1984a, 1984b; Robin & Johnson, 1991). Indeed the strength of the effects of grade of first use are so strong, as mentioned earlier, that they often overshadow the effects of other variables (Robin & Johnson, 1992a). The placement of grade of first use in this model is thus very easy; it is the most proximal variable in the model.

As with the social layers dimension, the topical dimension provides a theoretically promising way in which to organize the factors that are believed to or may influence the use of substances by adolescents. The usefulness of conceptualizing the relationship between specific variables to adolescent substance use within specific layers of social reality can only be addressed in

the application of the model.

With the conclusion of the discussion of the topical dimension the conceptual model is complete. The next section presents that model.

A Sociogenic Model of Adolescent Substance Use

The Multidimensional Sociogenic Adolescent Substance Use Model (MSASUM), combining the distal to proximal dimensions of layers of social reality and topicalness of variables within those layers, is presented in Figure 6.

By arranging the variables by social layer (distal to proximal) and variables within them (topically distal to proximal) a comprehensive and coherent conceptual model has been developed. Indeed, the MSASUM includes almost all the major variables in the adolescent substance use literature (and all useable variables from the MAOD School Survey project instrument, see Appendix A), incorporates existing theory and prior research and unique logic and theory. This model provides a comprehensive template of the social world through which analysis of the influences on different patterns of adolescent substance use and the changes therein over time can be examined. The MSASUM will be the major source of hypotheses (others hypotheses will reflect specific factors of adolescent development in relation to the effect of different parts of the model).

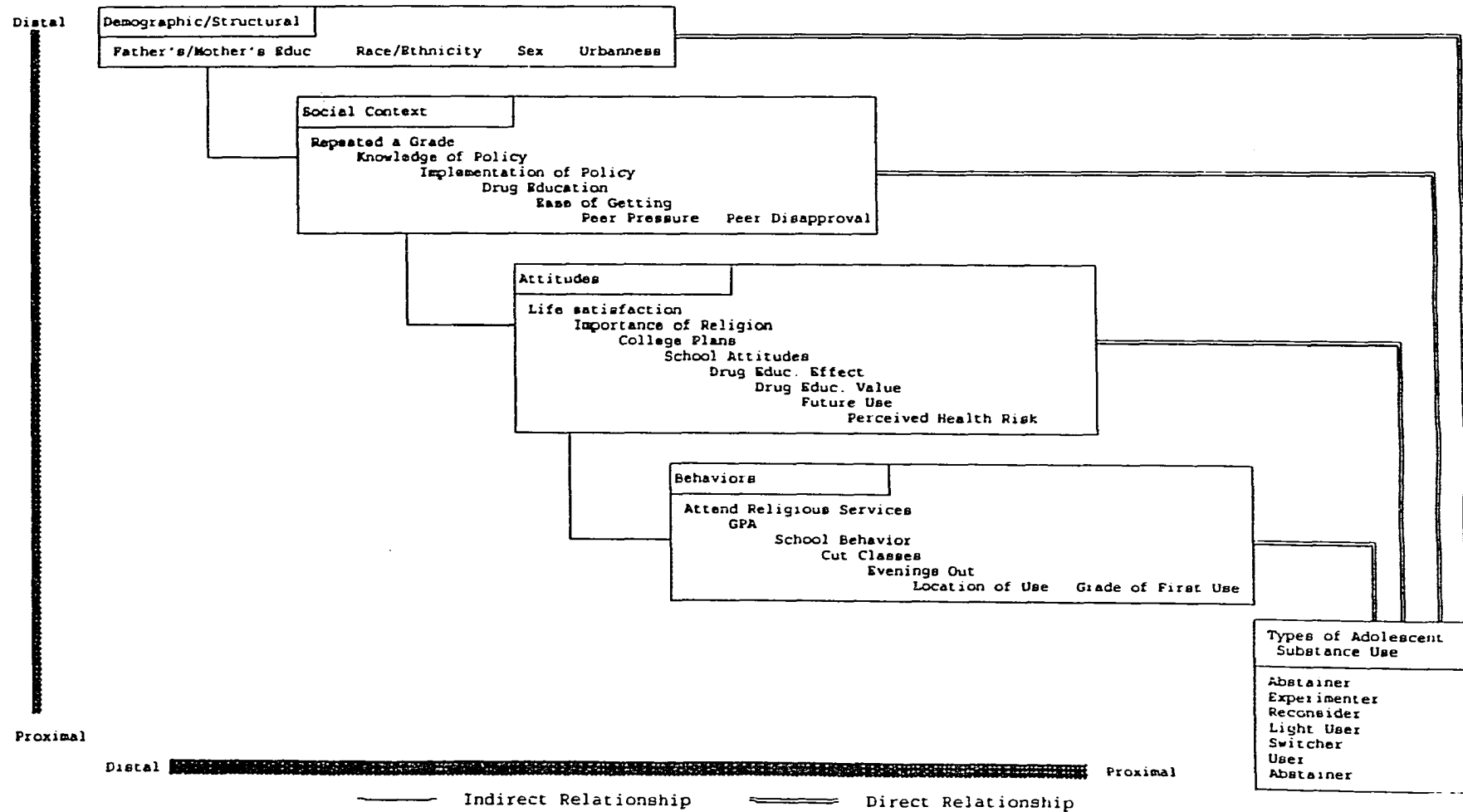


Figure 6. A Multidimensional Sociogenic Adolescent Substance Abuse Model.

However, it is important to remember that the MSASUM, as presented, is a first approximation in the effort toward a comprehensive theoretical representation and understanding of patterns of substance use in relation to the adolescent social world. This presentation is intended as a starting point of explanation. Going beyond hypothesis testing, empirical examination of this model will be used to refine and revise the model, generating subsequent theoretical understanding. In short the model here developed is both a system of conceptual relationships and a theoretical tool with which to examine specific relationships among independent variables, their social layers and their predictive power to understand the dependent variables. Specifically, the use of the MSASUM to analyze complex patterns of adolescent substance use will provide:

1. An additional test of the usefulness of the use pattern typology to characterize adolescent substance use (both including and excluding cigarettes and alcohol as substances), developed by Robin and Johnson (1992a).

2. An assessment of the usefulness of viewing social reality as composed of layers which are relatively distal or proximal to behavior and the usefulness (or lack thereof) of including such distinctions within a model.

3. An assessment of the usefulness of viewing social phenomena within layers of social reality as relatively

distal or proximal to a particular type of behavior (in this case adolescent substance use patterns) and the importance (or lack thereof) of including such distinctions within a model.

4. Through the socially complex comprehensive view of etiology and use behavior, an assessment of a sociogenic perspective of adolescent substance use.

5. An empirical redefinition, reorganization and refinement of the specific relationships among the independent variables themselves, and among those variables and the dependent variables (the patterns of use); thus empirically generating adolescent substance use theory within the models conceptual structure.

An additional element of the adolescent social world must guide the use of this model. With the goal of comprehensiveness, the unexamined view of adolescents and adolescent social worlds as monolithic, regardless of age or grade level cannot be endorsed. The next section discusses the role of grade level in the use of this conceptual model on a quasi-longitudinal basis.

Quasi-Longitudinal Analysis: Grade Level, Life Experience, Distal to Proximal Social Reality, and Use of the Model

While models of social reality in relation to some phenomena are useful, they never completely represent that

reality. The primary weaknesses of models is that they are static representations of the social reality they model. They are snapshots, even if they are complex snapshots. Like much of the research in the social sciences generally, adolescent substance use research is often conducted without regard for the passage of time and how it effects the relationships being researched. The passage of time, however, is particularly important given the immature nature but rapid development of adolescents.

There are two important exceptions to the cross sectional research in this field. The first is research done by Denise Kandel and her associates with the gateway model (Kandel 1982; Kandel & Faust 1975; Kandel & Logen 1984; Kandel et al. 1984; Kandel & Yamaguchi 1985; Yamaguchi & Kandel 1984a, 1984b). The gateway model views adolescent substance use as developmental. That is, heavy, chronic use of the so-called hard drugs does not suddenly happen. Rather, such use, if it ever occurs, is developed over time, via a process begun by initiation into the use of "softer" drugs: generally cigarettes. Once initiated, for those who eventually use "harder" drugs, a developmental progression, occurs with the passage of time from "softer" to "harder" drugs; from cigarettes to alcohol to marijuana to "hard" drugs.

The second approach which takes into account the

processual and time bound nature of adolescent substance use is presented by Glassner and Loughlin (1987). By viewing adolescent recreational use of psychoactive substances as a normal part of adolescent social worlds Glassner and Loughlin (1987, p. 261-264) recognize that, like many other behaviors, substance use develops in adolescence, takes particular forms and generally begins to dissipate with movement into adult social worlds. Indeed, in developing the typology of adolescent substance use patterns from Glassner and Loughlin's sociogenic perspective Robin and I (1992a) took into account the time and/or developmental elements of adolescent substance use by incorporating into the definition and measurement of the patterns of use, the understanding that adolescents may over time make, abandon, alter and remake decisions regarding patterns of substance use.

To understand adolescent substance use as developmental and time bound is to be consistent with the patterns of use being predicted and to overcome the primary weakness of using static conceptual models to predict behavior a longitudinal view must be taken.

Ideally, one would pursue the issues raised in this research by tracking a cohort of individuals from pre-teen years through young adulthood modeling their behavior throughout this time period. However this simply is not

within the scope of this research. Other, less ideal, methods must be used.

The Michigan AOD School Survey Project conducts surveys of public school district populations of eighth, tenth and twelfth graders. Using the MSASUM in separate analysis of grades eight, ten and twelve is a step in ameliorating problems associated with cross sectional analysis. However, an analysis that stops at this point is subject to the familiar cohort effect problem (Mason & Fienberg, 1985). In this instance the problem is that it would be impossible to know whether differences (if found), for example, between the eighth graders and the tenth graders are the result of developmental differences or simply some unique cohort characteristic reflecting differences in the social realities of age groups independent of the development and processual characteristics of adolescence.

Fortunately, the data available allows one further step that ameliorates the cohort effect problem. Forty school districts have participated in the Michigan Alcohol and Other Drug School Survey twice, with one year between administrations (every second year). This means that, for those school districts, for the initial survey eighth and tenth graders are tenth and twelfth in the second survey. With this kind of data a quasi-longitudinal analysis can be

done by tracking one cohort from eighth to tenth and another one from tenth to twelfth.

These data will provide a longitudinal view required in this research and it also provides the opportunity to assess one more aspect of the social layers dimension of the MSASUM.

The MSASUM that I have developed conceptualizes layers of social reality as relatively distal or proximal to, adolescent substance use (ranging from the demographic /structural to the behavioral layers in their level of direct influence on substance use behavior). However, this general statement or these relationships must be modified longitudinally.

It has already been stated (when discussing the distal to proximal dimension of the layers of social reality) that behavior has a concreteness that establishes a history. This history provides routines of actions within a particular social environment which makes it likely that, when faced with a situation, persons will tend to behave as they have before in similar situations. In this sense then, a behavioral history is most proximal in predicting and explaining subsequent behavior, though it is deeply nested within each of the other (more distal) layers of social reality.

The longer, richer and more complex this history in a

situation (such as substance use), the stronger the relationship between previous behavior and current actions. Conversely, when this history of actions is shallow or absent in reference to a particular set of situations, the weaker the relationship between previous behavior and current actions.

In application to the MSASUM, this observation leads to the prediction that the more developed and experienced adolescents are, the stronger will be behavioral layer (most proximal) in prediction of substance use patterns: the less developed and experienced adolescents are the weaker the behavioral layer's predictive potential. Since the behavioral history with regard to substance use is likely to be more developed for adolescents in twelfth grade than tenth, and more in tenth than eighth, the relative strength of prediction of the behavioral layer will decrease as grade level does and the more distal layers (each in proportion to their distalness) will increase in their relative prediction as grade level decreases.

However, since the MSASUM is intended to be generally predictive it is not anticipated that the proximal and distal layers will be inverted by this longitudinal modification of the general relationships for any group of adolescents, but that their relative contribution to

prediction will be altered.

With the completion of the discussion of the developmental and time bound elements of adolescent substance use and the theoretical and analytical ways of incorporating them into this MSASUM and research design, I can now present an explicit list of hypotheses to be assessed.

Hypotheses

In any attempt to explain complex social phenomena such as adolescent substance use, particularly in such a complex and comprehensive way as in this dissertation, many hypotheses could be derived and tested. It is, however, the theoretician's responsibility to extract the seminal relationships in a model and state them as hypotheses. From the prior discussion five relationships meet this criterion, two explicitly concerning the PASUT and three concerning the MSASUM developed.

Typology of Patterns Hypotheses

1. The patterns of adolescent substance use typology will correctly and exclusively fit the vast majority of respondents into one of the seven patterns.

2. The distribution of patterns of substance use will vary by grade and that variation will show an increasing level of involvement/complexity in patterns of use from the

eighth to the tenth to the twelfth grade.

Model Hypotheses

3. The variables within each layer of social reality will vary in the strength of their relationship to the patterns of substance use according to their level of proximalness as shown in the model -- the more proximal the stronger the relationship.

4. The different layers of social reality's absolute strength of relationship to the patterns of substance use will vary according to their level of proximalness -- demographic/structural layer having the weakest influence, then the social context layer, the attitudinal layer and the behavioral layer having the strongest relationship.

4a. The layers of social reality will be sufficiently different in their levels of association to justify maintaining the conceptual distinctions among layers.

5. Each layer of social reality's relative relationship to patterns of substance use will vary by grade of respondent -- the more proximal the layer the stronger the relative relationship will become as grade level increases; the more distal the layer the weaker the relative relationship will become as grade level increases.

Testing these hypotheses will provide an assessment of the key relationships specified by the MSASUM and its

longitudinal use. Additionally, through the examination of data and the analytic testing of these hypotheses I am in a position to modify the MSASUM empirically. I am not trapped in the simple logic of rejecting or failing to reject the hypotheses above but am able to test theory through the model proposed empirically. Additionally, by testing these hypotheses, the MSASUM and the theory that has generated it can be revised and refined to generate a more powerful model and theory of adolescent substance use.

CHAPTER III

METHODS OF ANALYSIS

The Data

The data for this research constitute a subset of the Michigan Alcohol and Other Drug School Survey (MAOD) data. The MAOD has surveyed populations of 8th, 10th and 12th graders in 262 public school districts in the state of Michigan: approximately 135,000 students. This research will use data from the 40 public school districts which have been surveyed twice with one year between administrations; creating a data set in which the first administration 8th graders are 10th graders in the second administration, the first 10th are the second 12th. The first administration of the survey took place in the 1989-90 school year, the second in 1991-92 and a total of 31,043 useable cases were gathered.

Surveys were conducted by trained Research Associates administering the questionnaire on site at each school district. Complete confidentiality and anonymity were guaranteed each school district and participating student.

A fifty-five item questionnaire, closely adapted from the Monitoring the Future instrument, National Seniors

Survey, (Johnston, et al. 1991a), amended and altered for lower grades was used to collect the data (See Appendix A for a copy of the instrument). Close approximation of raw substance use rates between the 12th graders in the sample and the Monitoring The Future national senior sample was achieved.

Subjects were asked to report their use of alcohol and each of twelve drugs during their lifetimes, in the 12 months prior to the survey and in the 30 days prior to the survey. For each time frame, subjects reported the number of occasions on which a drug was taken in seven response categories: zero, 1-2 times, 3-5 times, 6-9 times, 10-19 times, 20-39 times and 40+ times. Tobacco (cigarette) use was measured in two ways: Respondents were asked if they ever have smoked cigarettes (never, once or twice, occasionally, regularly in the past and regularly now) and how often they smoked cigarettes in the past 30 days (not at all, less than one per day, 1-5 per day, a half pack per day, a pack per day, 1-1/2 packs per day and 2 or more packs per day).

The Dependent Variable

The dependent variable, patterns of adolescent substance use typology (PASUT), will be measured twice. Once for drugs, alcohol and cigarettes combined and again

for drugs only, exclusive of alcohol and cigarettes. Respondents will be categorized in the following ways:

1. Abstainers are those who report that they have never used any of the substances during their lifetimes.

2. Experimenters are those who report using cigarettes once, twice or occasionally during their lifetimes but not during the past month; alcohol or other drugs on one to five occasions during their life but not during the past month or year, or on one to five occasions during the past year, but not during the past month.

3. Reconsiderers are those who report using cigarettes regularly in the past but not during the past month or alcohol or any drug ten or more times during their lifetimes but not during the past month or year, or ten or more times during the past year, but not during the past month.

4. Switchers are those who report beginning to use a substance in a earlier grade six or more times during their lifetimes, discontinuing the use of that substance but using another substance three or more times during the past year or month.

5. Light Users are those who report smoking cigarettes regularly in the past and who currently smoke less than five per day or who used alcohol or any drug less than ten times during the past year.

6. Users are those who report smoking cigarettes regularly in the past and who currently smoke every day or who used alcohol or any drug ten or more times during the past year and used the same substance at least once during the past month.

7. Accumulators are those who report beginning to use a substance in a earlier grade, continuing the use of that substance but also using at least one other substance three or more times during the past year or month.

The Independent Variables

Twenty-six variables makeup the conceptual model (Figure 6) used to predict the PASUT. For clarity of conceptualization and presentation, all of the variables shown in figure 6 are represented as single measurements. However, only thirteen of the variables are single measurement variables: (1) race/ethnicity; (2) sex; (3) urbaness; (4) repeated a grade; (5) drug education; (6) life satisfaction; (7) importance of religion; (8) drug education effect; (9) drug education value; (10) attend religious services; (11) GPA; (12) cut classes and (13) evenings out. The remainder of the variables are composite variables: (a) father's/ mother's education, (b) knowledge of school policy, (c) implementation of school policy, (d) ease of getting, (e) peer pressure, (f) peer disapproval, (g)

college plans, (h) school attitudes, (i) future use, (j) perceived health risk, (k) school behavior, (l) location of use, (m) grade of first use.

While all of the variables listed immediately above are variables composed of more than one measurement, there are two methods by which these variables are indexed. Father's/mother's education is the only composite variable indexed based on a mean of responses to two questions (the educational level of each parent). The remainder of the composite variables consist of a single general question with multiple stems, each requesting a response. For these variables the responses to each stem of a question are added together to form a single measure for each composite variable in this analysis. For example, the variable knowledge of school policy is a summation of the responses to knowledge of school policy about: smoking cigarettes, plus, using (or possessing) alcohol, plus, using (or possessing) an illegal drug, plus, selling an illegal drug.

To aid the clarity in discussing so many variables and various ways in which they are measured, this section of the dissertation will discuss the variables in each layer of social reality separately and reference the survey instrument in Appendix A for specific wording of questions, stems and response categories. Where appropriate the response categories for a question will be reverse coded so

that all variables should have a positive correlation with substance use.

Demographic/Structural Variables

Moving left to right (distally to proximally), the first variable in this layer is father's/mother's education. Following the procedure used by the Monitoring the Future national study conducted by the Institute for Social Research at University of Michigan (Johnston et al.. 1989 p. 49), socioeconomic status will be represented here by the average of father's and mother's education index score for respondents who answered for both parents; when only one parent's education is indicated his/her score will be used. Parental education information is taken from questions 35 and 36 in the MAOD questionnaire (see Appendix A). The next variable, race/ethnicity, comes from question 33 and will be used in the model as a series of special case variables in the analysis (scored 0 = no and 1 = yes for each racial/ethnic group). Sex (question 32) is scored dichotomously as one equals female and two equals male. The final variable in the demographic/structural layer is the only variable to come from outside the MAOD questionnaire: level of urbanness. Level of urbanness will be measured by assigning the percent of the population in the county who are defined as urban by the 1990 U.S. Census to

each respondent based on the county in which the school district the student attends is located.

Social Context Variables

Again moving left to right within this layer of social reality, repeated a grade is the first variable. This variable comes from question 7 of the MAOD questionnaire and is measured dichotomously (1 = no; 2 = yes). The next two variables are knowledge of school policy and belief in implementation of school policy; coming from questions 54a-d and 55a-d respectively. The responses to each set of questions will be indexed additively (i.e. responses to stems a through d will be added together for each variable) to provide a single score for each of these two variables. The variable drug education is composed of a series of educational experiences from question 52 which the respondent marks as many as he/she has participated in. This will be another special class variable, each educational experience being coded as zero equal yes and one equal no. Ease of getting a substance is a composite variable drawn from questions 9a-i and will be additively indexed. In the same manner the variables peer pressure and peer disapproval are composite variables coming from questions 46a-d and 45a-o respectively.

Attitudinal Variables

Life satisfaction and importance of religion are the first two variables in this layer of social reality, are single measure (i.e. question) variables, and come from questions 1 and 38 respectively. Again following procedures used by the Monitoring the Future Study (Johnston et al., 1989 p. 43), the variable, college plans is measure as the likelihood of attending a four year college: drawn from question 34b. The next variable at this level of the model is school attitudes. This is another composite variable additively indexed based on questions 4a,b and d. Drug education effects and drug education value are single measurement variables taken from questions 51 and 53 respectively. The last two variables in the attitudinal layer of social reality are future use and perceived health risk. Both of these variables are composite additively indexed variables. Future use is drawn from questions 44a-e. The perceived health risk variable comes from questions 8a-t.

Behavioral Variables

Attendance of religious services and the respondents self reported grade point average (GPA) are single measurement variables drawn from questions 37 and 5 respectively. School behavior is another of the composite variables and

incorporates stems c, e and f of question 4. The variable cut classes is a single measurement variable which reports the self-reported number of times the respondent had cut classes in the last month (question 6). Likewise, evenings out is a single measurement variable. This variable reports the average number of evenings spent outside the home for recreational purposes in a week (question 2). Location of use represents seven variables (question 47 stems a-g). Each stem for the location of use question represents a unique location of use and the frequency of use in that location. Since it is the location element (not the amount of use) that is theoretically important for this item, it does not make sense to additively index the responses to each stem. Consequently, each stem must constitute a unique variable. The final independent variable in the conceptual model is grade of first use and in fact comprised two composite variables. The first of these is the grade of first use of the gateway drugs (question 43 stems a-f). The second is grade of first use of hard drugs (question 43 stems g-q). This distinction is made based on analysis from Robin and Johnson (1992a) which shows these two groups to be unique factors. For a graphical depiction of the independent variables, their related questions and measurement see Appendix B.

The Analysis

The analysis of the MSASUM proposed in this dissertation cannot be tested in a single analytic step. Instead the test of the complete model must be built up from evaluations of its key components. In general terms, the analysis in this research, consequently, follows the logic of the five hypotheses specified earlier; each stage of the analysis building on previous ones.

The analysis begins with descriptive evaluation of the patterns of adolescent substance use. The next stage in the analysis evaluates the topical distal to proximal dimension of the model within each layer of social reality. Next the social layers distal to proximal dimension is assessed cross-sectionally. Lastly the MSASUM will be evaluated quasi-longitudinally.

By building the analysis of the MSASUM in this sequential way, not only will the hypotheses be tested but revisions of the model that may be suggested from the results of earlier evaluations can be built into the model as each new analytic step is taken. In this way both testing and empirical generation of theory is achieved.

Stage 1: The Typology of Patterns of Substance Use

This stage of the analysis consists of the examinations of the frequencies and proportions of each pattern of

adolescent use of drugs, alcohol and cigarettes combined and drugs only (exclusive of alcohol and cigarettes). This descriptive analysis is performed separately for eighth, tenth and twelfth graders (both years' data) and for the total sample. The descriptive analysis here will test hypothesis 1: that the patterns of adolescent substance use typology will correctly and exclusively fit the vast majority of respondents into one of the seven patterns.

Should the results of these analyses indicate that there are substantial numbers of respondents who do not fit within the typology, these cases will be analyzed to determine if there is a pattern(s) to the substance use of these adolescents. New patterns will be incorporated into the typology.

This descriptive analysis is done a second time, comparing the same cohort at different times, the 1989-90 eighth graders to the 1991-92 tenth graders and the 1989-90 tenth graders to the 1991-92 twelfth graders. The second descriptive evaluation will test hypothesis 2: the distribution of adolescents fitting particular patterns of substance use will vary by grade and that variation will show an increasing level of complexity in patterns of use from the eighth to the tenth to the twelfth grade.

Stage 2: The Topical Distal to Proximal Dimension

In this stage of the analysis the relationships between the individual variables within each layer of social reality and the patterns of substance use will be examined. For each layer of social reality, separately, a polychotomous stepwise logistic regression analysis will be conducted to assess the strength and significance of the relationships between each variable within the layer of social reality and the patterns of substance use.

Polychotomous stepwise logistic regression is a statistical technique in which a polychotomous dependent variable (i.e. either a nominal or ordinal level variable with more than two categories) can be regressed on multiple interval, ordinal or nominal level independent variables (Moran, Engelman, FitzGerald & Lynch, in Bio-Medical Programs, 1990 p. 1047-77; Agresti & Finlay, 1986 p. 482-504; Everitt & Dunn, 1983 p. 154-175). Additionally, this type of logistic regression is conducted in a stepwise manner which adds and removes independent variables in the model depending on the p-value of the independent to dependent variable relationships. At each step in the logistic regression, this technique provides an improvement of the X^2 goodness of fit measure compared to prior steps and regression coefficients for each variable included in that step. The polychotomous stepwise logistic regression

ends when no more variables can be added or removed from the model; resulting in the best fitting model (most parsimonious and most explanatory) possible with the available independent variables³.

Polychotomous stepwise logistic regression (PSLR) analysis is an appropriate statistical technique for this analysis. It is the only statistical technique capable of regressing polychotomous dependent variables, such as the PASUT (which is categorical/ordinal), on interval, ordinal and nominal level independent variables, such as the set of independent variables in the MSASUM of this research.

Through PSLR, two types of information essential to testing hypothesis 3 (upon which proceeding to tests of hypotheses 4, 4a and 5 depends) are produced. First, the test of hypothesis 3 is dependent on finding that at least two variables' improvement of X^2 goodness of fit measure for the final model in each polychotomous stepwise logistic regression run be significant. In short, should the best fitting model of the independent variables not have at least two variables that fit the data significantly at, at

³ Stepwise analysis eliminates the need to enter every configuration (model) of the same set of independent variables in the process of finding the best fitting model by processing the changes in the goodness of fit of the model made by adding and removing variables based on significance level criteria. In short, the stepwise program does model fitting automatically. Thus the testing of the possible configurations for the best fit by forced entry would be redundant of the stepwise process.

least the .05 level, then the order, and of course the magnitude of standardize regression coefficients, of the independent variables will not be meaningful and the test of the hypotheses concerned will fail automatically. Second, if the minimum criterion of a significant goodness of fit measure is met, then the specific relationships hypothesized in hypothesis 3 can be assessed with the information (in the form of the relative size of the improvement of X^2 goodness of fit and the standardized regression coefficients) on the strength of the relationship between each independent variable and the PASUT, which is produced by PSLR analysis.

Hypothesis 3 (that the variables within each layer of social reality will vary in the strength of their relationship to the patterns of substance use according to their level of proximalness as shown in the model: the more proximal the stronger the relationship) will be supported, therefore, when at least two variables' improvement in X^2 goodness of fit measure in the final model are significant and when the relative strength of improvement in X^2 goodness of fit and/or the standardized regression coefficients for variables that have significant relationships to the patterns of substance use within a layer of social reality are linear, showing increasing strength of relationship

from the most distal to the most proximal variable.⁴ Variables that do not have significant relationships will not be considered in testing this hypothesis. Indeed, nonsignificant predictor variables will be eliminated from all subsequent analyses.

The test of hypothesis 3 will be conducted for both dependent variable typologies, first including cigarettes, alcohol and drugs, and the second including only drugs. Separate analyses will be done for each grade level and the total sample.

Stage 2a: Data Preparation for Hypotheses 4, 4a, and 5

Hypotheses 4, 4a and 5 are concerned with the relationships among the layers of social reality and the patterns of substance use. Therefore, a change in the constitution of the independent variables of the MSASUM, from the previous analyses is required. To effect this change a single z score will be calculated for each layer of social reality for each respondent. These calculations

⁴Both the order in which the independent variables are entered in the regression and the magnitude of relationships between the independent variables and the PASUT, as shown by the PSLR procedure, are effected by the colinearity of the independent variables. A correlation matrix consisting of all independent variables will be created to assess the degree of colinearity. A correlation of .70 or greater will require either dropping one of the correlated variables or, if theoretically appropriate, the combination of them.

will be accomplished by creating a z score for each of the subject's responses to all of the individual variables (remaining after testing hypothesis 3) within a layer of social reality, summing them and then converting those summed z scores to a z score of the layer of social reality as a whole. The z score will thus represent that layer of social reality, for that respondent in the subsequent analyses. Consequently, there will be four variables in the model to be assessed in subsequent analyses, one for each layer of social reality.

Stage 3: Social Layers Distal to Proximal Dimension

In this stage of the analysis the relationships among the layers of social reality and their relationship to the patterns of substance use will be assessed. Having converted the variables of each layer into a representative z score, each social layer (demographic /structural, social context, attitudes and behavior) will be a single variable. To analyze these relationships and test hypotheses 4 and 4a path analytic analyses will be employed.

A change in statistical analysis for hypotheses 4 and 4a is justified, and made for two reasons. Since the independent variables are now interval level measurements (continuous z scores) the use of multiple regression (the engine of path analysis) is permissible. While the

dependent variable remains at the ordinal level of measurement, any error incurred by the use of this statistical method will reduce the size of the prediction (erring on the conservative side). However, any reduction in the size of prediction of the model will be more than offset by the benefits of using this method. First, multiple regression /path analysis will provide a measure of the significance and amount of variance in the dependent variable explained by the model as a whole (an Adjusted R^2), which PSLR does not. Second, the use of multiple regression permits the use of path analytic techniques for establishing not only direct relationship between each layer of social reality and the PASUT but also relationships between each layer of social reality and the indirect effects of each layer of social reality through the more proximal ones to the PASUT. In short, this second benefit allows a test of the model as shown in Figure 1.

Information on the significance and level of relationship between each independent variable (social layer) and the patterns of substance use provides a test of hypothesis 4, that: the different layers of social reality's absolute strength of relationship to the patterns of substance use will vary according to their level of proximalness -- demographic/structural layer having the weakest influence, then the social context layer, the attitudinal layer and

the behavioral layer having the strongest relationship.

Hypothesis 4 will be supported, therefore, when the Adjusted R^2 is significant at, at least the .05 level and the independent variables' (layers of social reality) standardized regression coefficients for each layer of social reality are linear, showing increasing strength of relationship from the most distal to the most proximal layer of social reality. Hypothesis 4 will be partially supported if two or three of the layers of social reality are significant and linear (most distal being weakest to most proximal being strongest). While one or more layers of social reality may drop out of the analysis (not have significant relationships to the PASUT), as long as at least two layers remain and the strength of their relationships to the PASUT are linear in the form of the more proximal having the stronger and the more distal the weaker, the social layers distal to proximal dimension is still supported (though the contents of the dimension may have changed). However, should any of the layers have a nonsignificant relationship to the patterns of substance use this will reflect upon hypothesis 4a which is discussed below.

As with previous stages of this analysis, this stage will be conducted for both dependent variable typologies (one typology including cigarettes, alcohol and drugs; the

second including only drugs). Additionally, separate analyses will be done for each grade level and the total sample.

Stage 3a: Social Layers as Empirically Distinct

This stage of the analysis is to assess the hypothesis 4a, that: the layers of social reality will be sufficiently different in their levels of association to justify maintaining the conceptual distinctions between layers. This hypothesis will be tested with information derived from the previous regression analyses.

Hypothesis 4a will be supported when each layer of social reality contributes uniquely the explained variance of the PASUT: has a significant direct effect.

As in each prior stage of analysis separate evaluations will be conducted for each grade level and the total sample.

Stage 4: Longitudinal Interaction of Grade Level and Social Layers Distal to Proximal Dimension

This stage of the analysis tests hypothesis 5, that: each layer of social reality's relative relationship to patterns of substance use will vary by grade of respondent -- the more proximal the layer, the stronger the relative relationship will become as grade level increases; the more distal the layer the weaker the relative relationship will

become as grade level increases.

To test this hypotheses two additional multiple regression/path analytic analyses are required. The additional analyses will be conducted for the samples of '91-'92 tenth and twelfth graders. With the additional information from these analyses the differing effects of the layers of social reality may have on patterns of substance use at differing grade levels can be assess quasi-longitudinally. By comparing the results of the multiple regression/path analytic analyses from the '89-'90 eighth and tenth graders (from stage 3 of this analysis) to the '91-'92 tenth and twelfth graders, the effects of the layers of social reality on the same group of adolescents as eighth and tenth graders, and the same group (though different from the prior eighth/tenth) of adolescents as tenth and twelfth graders can be see.

Hypothesis 5 will be supported when, comparing the standardized regression coefficients of each layer from the '89-'90 eighth graders to those of the '91-'92 tenth graders and from the '89-'90 tenth graders to those of the '91-'92 twelfth graders, the standardized regression coefficients will: 1) for the most distal layer (demographic/structural), show a relative reduction in strength as grade level increases; 2) for the most proximal layer (behavior), show a relative increase in strength as grade

level increases; 3) for the "middle layers" (social context and attitudes), not show as much variance over grade levels as the more extreme layers, if any, but in the appropriate directions based on the social layers distal to proximal dimension.

Caveats About the Analysis

The above presentation of an analytic strategy is limited to the specific tests of the hypotheses developed earlier, which systematically test the key components of the MSASUM developed in this research. However, two additional and related analytic issues must be addressed. First, while hypothesis 3 is dependent on the significance of at least two variables improvement in X^2 goodness of fit and hypotheses 4 through 5 are likewise dependent on the significance of the Adjusted R^2 's, no hypothesis is effected by the absolute degree of improvement in goodness of fit made by a variable or the amount of explained variance shown by the Adjusted R^2 's. However, this information is substantively important in that it will reflect on the overall usefulness of the MSASUM and theoretical understandings of adolescent substance use. Second, it is important to point out that while the first role of the analytic strategy followed here is to test the hypotheses of this research, the analysis will also provide ample

information for empirical refining of the conceptual model, its component parts and the theoretical understandings which prompted and supported its development.

CHAPTER IV

FINDINGS

As stated in the discussion of the analytic strategy, the analysis of the Multidimensional Sociogenic Adolescent Substance Use Model (MSASUM) proposed in this dissertation cannot be tested in a single analytic step. Instead the test of the complete model must be aggregated through evaluations of its key components as in hypotheses 1 through 5. Consequently, the findings are presented in subsections, each corresponding to a dimension of the model.

Stage 1: Tests of the Typology of Patterns of Substance Use

Testing Hypothesis 1

Hypothesis 1 states that: the patterns of adolescent substance use typology will correctly and exclusively fit the vast majority of respondents into one of the seven patterns. This hypothesis applies to the PASUT both when alcohol, cigarettes and drugs are included and when drugs only are included.

Tables 1 and 2 provide the data to test this hypothesis when alcohol, cigarettes, and drugs are considered in

Table 1

Distribution of Adolescents into the Patterns of
Adolescent Substance Use Typology (Drugs, Alcohol
and Cigarettes) for 1989-90 Sample

Sample	Pattern of Use	f	% of Patterned	% of Total
All grades	Abstainers	1,637	11.5	10.8
	Experimenters	4,274	30.2	28.2
	Reconsiders	63	.4	.4
	Switchers	245	1.7	1.6
	Lt. Users	3,117	22.0	20.5
	Users	2,537	17.9	16.7
	Accumulators	2,301	16.2	15.2
	Unclassified	998	-. -	-. -
Total		15,172	99.9	93.4
8th grade	Abstainers	940	19.4	18.1
	Experimenters	1,926	39.8	37.0
	Reconsiders	18	.4	.3
	Switchers	77	1.6	1.5
	Lt. Users	1,037	21.4	19.9
	Users	469	9.7	9.0
	Accumulators	369	7.6	7.1
	Unclassified	363	-. -	-. -
Total		5,199	99.9	93.0
10th grade	Abstainers	477	9.6	9.0
	Experimenters	1,497	30.0	28.2
	Reconsiders	20	.4	.4
	Switchers	107	2.1	2.0
	Lt. Users	1,191	23.9	22.5
	Users	873	17.5	16.5
	Accumulators	815	16.4	15.4
	Unclassified	321	-. -	-. -
Total		5,305	99.9	94.0
12th grade	Abstainers	220	5.0	4.7
	Experimenters	851	19.5	18.2
	Reconsiders	25	.6	.5
	Switchers	61	1.4	1.3
	Lt. Users	889	20.4	19.0
	Users	1,195	27.4	25.6
	Accumulators	1,113	25.6	23.8
	Unclassified	314	-. -	-. -
Total		4,668	99.9	93.1

Table 2

Distribution of Adolescents into the Patterns of
Adolescent Substance Use Typology (Drugs, Alcohol
and Cigarettes) for 1991-92 Sample

Sample	Pattern of Use	f	% of Patterned	% of Total
All grades	Abstainers	2,133	14.4	13.4
	Experimenters	4,617	31.2	29.1
	Reconsiders	66	.4	.4
	Switchers	233	1.6	1.5
	Lt. Users	3,221	21.7	20.3
	Users	2,480	16.7	15.6
	Accumulators	2,067	14.0	13.0
	Unclassified	1,054	-. -	-. -
Total		15,871	100.0	93.4
8th grade	Abstainers	1,162	21.5	20.0
	Experimenters	2,055	38.0	35.4
	Reconsiders	24	.4	.4
	Switchers	72	1.3	1.2
	Lt. Users	1,165	21.6	20.1
	Users	563	10.4	9.7
	Accumulators	363	6.7	6.2
	Unclassified	405	-. -	-. -
Total		5,809	99.9	93.0
10th grade	Abstainers	649	12.9	12.1
	Experimenters	1,518	30.2	28.2
	Reconsiders	20	.4	.4
	Switchers	96	1.9	1.8
	Lt. Users	1,127	22.4	21.0
	Users	831	16.5	15.5
	Accumulators	788	15.7	14.7
	Unclassified	349	-. -	-. -
Total		5,378	100.0	93.5
12th	Abstainers	322	7.3	6.9
	Experimenters	1,044	23.8	22.2
	Reconsiders	22	.5	.5
	Switchers	65	1.5	1.4
	Lt. Users	929	21.2	19.8
	Users	1,086	24.8	23.2
	Accumulators	916	20.9	19.6
	Unclassified	300	-. -	-. -
Total		4,684	100.0	93.6

determining respondents pattern of use for both the 1989-90 and 1991-92 samples. In these tables the raw frequency, percent of patterned responses, and the percent of the total for each pattern are presented for the total samples and for each grade distinction relevant to subsequent analyses for each sample. Most important for this discussion is the percent of the total, which indicates the percentage of the total sample that fits a particular pattern and the percentage of the total sample that fits all of the patterns combined. The percent of the total samples which correctly and exclusively fits respondents into one of the patterns of use in the PASUT (Patterns of Adolescent Substance Use Typology) ranges from 93.0 percent (the 8th grade in both samples) to 94.0 percent (the 10th grade in the 1989-90 sample).

Tables 3 and 4 present the same type information as Tables 1 and 2 but for when drugs only are considered in determining respondents pattern of use. Here the percent of the total samples which correctly and exclusively fits respondents into one of the patterns of use in the PASUT ranges from 94.0 percent (8th grade in the 1989-90 sample) to 96.4 percent (12th grade in the 1989-90 sample).

The vast majority of respondents fit one of the patterns of substance use in the PASUT and hypothesis 1 is supported. Analysis of the 4.7 and 5.1 percent of the

Table 3

Distribution of Adolescents into the Patterns of
Adolescent Substance Use Typology (Drugs
Only) for 1989-90 Sample

Sample	Pattern of Use	f	% of Patterned	% of Total
All grades	Abstainers	7,565	52.3	49.9
	Experimenters	3,746	25.9	24.7
	Reconsiders	104	.7	.7
	Switchers	118	.8	.8
	Lt. Users	1,323	9.1	8.7
	Users	953	6.6	6.3
	Accumulators	652	4.5	4.3
	Unclassified	711	-. -	-. -
Total		15,172	99.9	95.3
8th grades	Abstainers	3,144	64.3	60.5
	Experimenters	1,108	22.7	21.3
	Reconsiders	20	.4	.4
	Switchers	15	.3	.3
	Lt. Users	258	5.3	5.0
	Users	209	4.3	4.0
	Accumulators	135	2.8	2.6
	Unclassified	310	-. -	-. -
Total		5,199	100.1	94.0
10th grade	Abstainers	2,640	52.1	49.8
	Experimenters	1,327	26.2	25.0
	Reconsiders	27	.5	.5
	Switchers	41	.8	.8
	Lt. Users	491	9.7	9.3
	Users	299	5.9	5.6
	Accumulators	245	4.8	4.6
	Unclassified	235	-. -	-. -
Total		5,305	100.0	95.6
12th grade	Abstainers	1,781	39.6	38.2
	Experimenters	1,311	29.1	28.1
	Reconsiders	57	1.3	1.2
	Switchers	62	1.4	1.3
	Lt. Users	574	12.7	12.3
	Users	445	9.9	9.5
	Accumulators	272	6.0	5.8
	Unclassified	166	-. -	-. -
Total		4,668	100.0	96.4

Table 4

Distribution of Adolescents into the Patterns of
Adolescent Substance Use Typology (Drugs
Only) for 1991-92 Sample

Sample	Pattern of Use	f	% of Patterned	% of Total
All grades	Abstainers	8,612	57.2	54.3
	Experimenters	3,541	23.5	22.3
	Reconsiders	76	.5	.5
	Switchers	102	.7	.6
	Lt. Users	1,219	8.1	7.7
	Users	911	6.0	5.7
	Accumulators	604	4.0	3.8
	Unclassified	806	-. -	-. -
Total		15,871	100.0	94.9
8th grade	Abstainers	3,605	66.2	62.1
	Experimenters	1,184	21.8	20.4
	Reconsiders	16	.3	.3
	Switchers	10	.2	.2
	Lt. Users	283	5.2	4.9
	Users	232	4.3	4.0
	Accumulators	112	2.1	1.9
	Unclassified	367	-. -	-. -
Total		5,809	100.1	93.7
10th grade	Abstainers	2,816	55.0	52.4
	Experimenters	1,220	23.8	22.7
	Reconsiders	22	.4	.4
	Switchers	36	.7	.7
	Lt. Users	454	8.9	8.4
	Users	324	6.3	6.0
	Accumulators	250	4.9	4.6
	Unclassified	256	-. -	-. -
Total		5,378	100.0	95.2
12th	Abstainers	2,191	48.7	46.0
	Experimenters	1,137	25.3	24.3
	Reconsiders	38	.8	.8
	Switchers	56	1.2	1.2
	Lt. Users	482	10.7	10.3
	Users	355	7.9	7.6
	Accumulators	242	5.4	5.2
	Unclassified	183	-. -	-. -
Total		4,684	100.0	96.1

1989-90 and 1991-92 samples respectively which did not fit into one of the patterns of the PASUT revealed that these respondents were inconsistent in their responses and therefore either could not fit any pattern of use or fit more than one such pattern. Consequently, no reliable and/or recognizable pattern of use is discernable and no new patterns could be created to include these respondents into the PASUT. These unclassifiable respondents (4.7 and 5.1 %) are not included in any of the subsequent analysis.

Findings Beyond the Test of Hypothesis 1

Tables 1 through 4 also present two findings of interest which are not directly relevant to the testing of hypothesis 1. First, there is a large difference in the distribution of patterns of use when alcohol, cigarettes and drugs are considered versus when drugs only are considered. While the percent of the total who are abstainers is small (only 10.8 percent for the total 1989-90 sample and 13.4 for the total 1991-92 sample) when alcohol, cigarettes and drugs are considered, these percentages are quite large (49.9 and 54.3 percent for the 1989-90 and 1991-92 samples respectively) when drugs only are considered. Consequently the percent of total which fit the patterns of use indicating a greater involvement with the use of substances (lt. users, users, accumulators)

are considerably reduced from the PASUT including alcohol, cigarettes and drugs to that including drugs only. This indicates not only that a large number adolescents use alcohol and cigarettes but also the large role that these substances play in the more involved patterns of use. Relatively few adolescents "advance" beyond experimentation with the use of drugs alone to consistent levels of use (light users or users) or accumulation of more than one substance used consistently (accumulators).

Second, it should also be noted that for all samples very few adolescents fit either the reconsider or switcher patterns of use. This suggests that, for adolescents, once a substance has been used it is unlikely that it will be given up with no replacement (reconsiderers) or given up and use of another substance begun (switchers). Adolescence is an attenuated age range when considering substance use and it seems likely that the number of reconsiderers and switchers would increase considerably as adolescents begin to invest themselves in adult roles; though these data cannot assess this hypothesis. Nevertheless, since giving up the use of substances once it has begun is unlikely for adolescents, it seems that delaying the initiation into substance use as much as possible would be important to any substance use or abuse prevention policy or program.

Testing Hypothesis 2

Also evaluating the usefulness of the PASUT, hypothesis 2 states that: the distribution of patterns of substance use will vary by grade and that variation will show an increasing level of involvement/complexity in patterns of use from the eighth to the tenth to the twelfth grade.

Table 5 shows the cohort changes in the percent of total fitting each pattern of substance use of one cohort from their 8th grade year to their 10th grade year and a second cohort from their 10th grade year to their 12th grade year. The distinction between the PASUT including alcohol, cigarettes and drugs, and the PASUT including drugs only is maintained.

Almost without exception, the percent of total fitting the least involved/complex patterns of use (abstainers and experimenters) declines from 8th to 10th to 12th grades. At the same time the percent of the total fitting the more involved/complex patterns increases from 8th to 10th to 12th grades. The exceptions to this pattern are: experimenters from 8th to 10th grade (drugs only) which increase by 1.1 percent of total; and switchers and light users from 10th to 12th grade (alcohol, cigarettes and drugs) which decrease by 0.6 and 2.7 respectively.

Despite the 3 exceptions, within the 28 comparisons made, the distribution of patterns of substance use does

Table 5
Cohort Changes in Patterns of Substance Use
from 8th to 10th and 10th to 12th Grades¹

Pattern of Use	8th grade 1989-90	10th grade 1991-92	Percent Difference	10th grade 1989-90	12th grade 1991-92	Percent Difference
Alcohol, Cigarettes and Drugs						
Abstainers	19.4	12.9	-6.5	9.6	7.3	-2.3
Experimenters	39.8	30.2	-9.6	30.0	23.8	-6.2
Reconsiders	.4	.4	0.0	.4	.5	+0.1
Switchers	1.6	1.7	+0.1	2.1	1.5	-0.6
Lt. Users	21.4	22.4	+1.0	23.9	21.2	-2.7
Users	9.7	16.5	+6.8	17.5	24.8	+7.3
Accumulators	7.6	15.7	+8.1	16.4	20.9	+4.5

Drugs Only						
Abstainers	64.3	55.0	-9.3	52.1	48.7	-3.4
Experimenters	22.7	23.8	+1.1	26.2	25.3	-0.9
Reconsiders	.4	.4	0.0	.5	.8	+0.3
Switchers	.3	.7	+0.4	.8	1.2	+0.4
Lt. Users	5.3	8.9	+3.6	9.7	10.7	+1.0
Users	4.3	6.3	+2.0	5.9	7.9	+2.0
Accumulators	2.8	4.9	+2.1	4.8	5.4	+0.6

¹ All values are the percentage of patterned use from Tables 1 through 4

vary by grade, showing an increase in the level of involvement/complexity in patterns of use as grade level increases. Thus hypothesis 2 is supported.

These findings and those concerning hypothesis 1 not only corroborate the earlier research which developed the PASUT but also indicates its usefulness in conceptualizing and empirically evaluating the complex substance use behavior patterns of adolescents. With the support of the dependent variable, the analysis can proceed to prediction of the PASUT by the various dimensions of the MSASUM.

Stage 2: Tests of the Variable Arrangement as Topically Distal to Proximal

The topical distal to proximal prediction is tested in hypothesis 3: the variables within each layer of social reality will vary in the strength of their relationship to the patterns of substance use according to their level of proximalness as shown in the MSASUM -- the more proximal the stronger the relationship.

Several outcomes are possible when testing hypothesis 3. First, the strengths of the relationships between the independent variables within a social layer and the PASUT could be linear: showing increasing or decreasing strength with proximalness. Second, the relationships could be near linear: showing increasing or decreasing strength with proximalness with the reversal of one or two pairs of

contiguous variables. Third, the strengths of relationships could exhibit a general trend: showing relationships in which most of the proximal variables as a group have the stronger relationships (or weaker than the distal) but not in a linear fashion. Fourth, the relationships between the independent variables within a social layer and the PASUT could be random: showing no particular pattern of strength of relationship corresponding to the distal to proximal dimension proposed.

These outcome possibilities are used to give structure to the evaluation of the distal to proximal dimension for each layer of social reality (demographic/structural, social context, attitudinal, behavioral) separately. As discussed earlier, a polychotomous stepwise logistic regression (PSLR) is done for each layer of social reality. While PSLR provides measures of improvement in X^2 , these measures are concerned with the improvement of the fit of the overall model each subsequent variable can provide rather than the explicit predictive strength of an independent variable. A regression coefficient (also provided by PSLR) is a more direct measure of the predictive strength of each independent variable. However, to compare the regression coefficients of different independent variables appropriately, with different ranges and distributions, these coefficients must be standardized. Consequently, the

X^2 measure for each variable, indicating its unique contribution to the fit of the model, and beta weights for each variable, indicating the specific comparable strength of relationship to the PASUT, are the statistical backbone of the test of hypothesis 3. To aid the interpretation of results, the strength of relationship for each of the variables and the PASUT are ranked in the subsequent tables by the size of their respective beta weights. In concert the separate evaluations of each layer of social reality will test hypothesis 3.

The Demographic/Structural Layer: Testing Hypothesis 3

Tables 6 and 7 provide the outcomes of polychotomous stepwise logistic regressions (PSLRs) for the entire 1989-90 sample and each grade separately. Table 6 provides these outcomes when alcohol, cigarettes and drugs are considered in determining respondent pattern of use and Table 7 provides them for when drugs only are considered. Of primary importance in these tables is the rank of each variable by the strength of the relationship between it and the PASUT. This analysis will focus on this summary measure.

The relative ranks of variables in Tables 6 and 7 show a near linear relationship, both across grades and for all substances and drugs alone. The reordering of one or two

Table 6

Results of Polychotomous Stepwise Logistic Regression of
 Substance Use Patterns (including Alcohol, Cigarettes
 and Drugs) on the Demographic/Structural
 Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Father/Mother Educ.		103.02	-.076	2
	Race/Ethnicity		148.57		1
		(African American)		-.015	
		(Puerto Rican Am.)		.018	
		(Caucasian Am.)		.114	
		(Mexican American)		.044	
		(Native American)		.062	
	Sex	(Male)	16.06	.027	4
	Urbanness		19.40	.033	3

8th	Father/Mother Educ.		46.19	-.097	1
	Race/Ethnicity		34.06		2
		(African American)		.019	
		(Puerto Rican Am.)		.023	
		(Caucasian Am.)		.076	
		(Mexican American)		.060	
		(Native American)		.099	
	Sex	(Male)	NS	NS	
	Urbanness		11.56	.050	3

10th	Father/Mother Educ.		17.59	-.053	2
	Race/Ethnicity		66.06		1
		(African American)		-.001	
		(Puerto Rican Am.)		.029	
		(Caucasian Am.)		.114	
		(Mexican American)		.073	
		(Native American)		.089	
	Sex	(Male)	NS	NS	
	Urbanness		NS	NS	

¹ Variables are listed from most distal to most proximal
 from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 6 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th	Father/Mother Educ.		NS	NS	
	Race/Ethnicity		128.03		1
		(African American)		-.045	
		(Puerto Rican Am.)		.006	
		(Caucasian Am.)		.135	
		(Mexican American)		.020	
		(Native American)		.085	
	Sex	(Male)	22.23	.064	2
	Urbanness		8.25	.040	3

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

variables would provide a linear relationship for all but the outcome for the 12th grade when drugs only were included. As can be seen however, the near linearity for the demographic/structural layer is the reverse of that predicted by hypothesis 3. The more distal the variable the stronger the relationship.

Findings Beyond the Test of Hypothesis 3

Looking past the testing of hypothesis 3 for the demographic/structural layer, several interesting findings can be seen in comparisons by grade and by inclusion rules in the PASUT.

Comparing regression (PSLR) outcomes by grade it is

Table 7

Results of Polychotomous Stepwise Logistic Regression of
Substance Use Patterns (Drugs Only) on the Demographic/
Structural Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Father/Mother Educ.		94.70	-.088	2
	Race/Ethnicity		102.08		1
		(African American)		.028	
		(Puerto Rican Am.)		.036	
		(Caucasian Am.)		.143	
		(Mexican American)		.090	
		(Native American)		.087	
	Sex	(Male)	53.43	.061	3
8th	Urbanness		7.60	.025	4
	Father/Mother Educ.		36.13	-.124	2
	Race/Ethnicity		39.05		1
		(African American)		.036	
		(Puerto Rican Am.)		.030	
		(Caucasian Am.)		.136	
		(Mexican American)		.125	
		(Native American)		.135	
10th	Sex	(Male)	15.48	.072	3
	Urbanness		4.67	.045	4
	Father/Mother Educ.		31.66	-.086	2
	Race/Ethnicity		78.30		1
		(African American)		-.007	
		(Puerto Rican Am.)		.067	
		(Caucasian Am.)		.095	
		(Mexican American)		.096	
		(Native American)		.104	
	Sex	(Male)	4.67	.030	3
	Urbanness		NS	NS	

¹ Variables are listed from most distal to most proximal
from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 7 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th	Father/Mother Educ.		4.23	.029	4
	Race/Ethnicity		37.50		2
		(African American)		.052	
		(Puerto Rican Am.)		.005	
		(Caucasian Am.)		.161	
		(Mexican American)		.069	
		(Native American)		.076	
	Sex	(Male)	38.19	.082	1
	Urbanness		7.01	.036	3

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

interesting to note that Father's/Mother's Education exerts a much stronger impact on the patterns of use for 8th and 10th graders (for whom it has the second largest impact most often and first otherwise) than for 12th graders (for whom Father's/Mother's Education is either nonsignificant or ranks fourth). It may very well be that as a child's education approaches that of their parents the salience of their own education may increase and thereby diminish the import of that of their parents; reducing the impact of parental education level.

The other important finding with regard to differences by grade is that the variable Sex is much more important in 12th grade than in either 10th or 8th grades. This finding

makes sense in that, as adolescents develop they increasingly incorporate more of the sex specific role expectations of adulthood. Since one such expectation for males is greater risk taking and for females role conformity (substance use being such a risk taking behavior but not a role conforming one), it is not surprising that differences in sex significantly help explain patterns of substance use as adolescent approach adulthood.

Comparing the MSASUM prediction of the PASUT when alcohol, cigarettes and drugs are considered versus when drugs only are considered is important in that the MSASUM is intended to be a general, comprehensive etiological model. It should, therefore, predict patterns of use similarly and equally well regardless of content or distribution of the patterns. Using the PSLR outcomes for all of the grades combined, shows that the demographic/structural layer's general prediction of the PASUT both when all substances and drugs alone are considered is essentially the same. The one difference is the switching of the ranks of sex and urbanness. Since the distribution of patterns of use is very different when all substances are considered versus when drugs alone are considered, the consistency of prediction by the MSASUM indicates a real strength of the model.

Finally, the consistent rank of race/ethnicity as the

variable with the strongest relationship to the PASUT, except for 8th graders in Table 6 and the 12th graders in Table 7 where it is the second strongest, is surprising -- it is not predicted from the literature or the Johnson and Robin research (1992). However, in this research race/ethnicity emerges more strongly from the context of the demographic/structural layer (which is comprised of relatively weak predictor variables) than from previously conducted general analyses in which race/ethnicity is used along side stronger (not demographic/structural) variables. Indeed the X^2 s and corresponding betas for race/ethnicity are not very large: ranging from 148.57 to 34.06 for the improvement in X^2 values and from -.001 to .136 for the beta weights.

The Social Context Layer: Testing Hypothesis 3

Tables 8 and 9 provide the outcomes of PSLRs for the social context layer of the MSASUM. The order of ranks of the variables within this layer indicate a general trend in the expected direction. Peer disapproval, the most proximal variable, is consistently ranked first. The third most proximal variable, ease of getting, is ranked second for all outcomes except for 12th graders when alcohol, cigarettes and drugs are considered (Table 8), where it ranks third. And, peer pressure (the second most proximal

Table 8

Results of Polychotomous Stepwise Logistic Regression of Substance Use Patterns (including Alcohol, Cigarettes and Drugs) on the Social Context Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Repeated a Grade	(yes)	37.10	.044	5
	Knowledge of School Policy		160.89	-.097	3
	Implementation of School Policy		9.12	-.024	6
	Drug Education				
	(Special Course)	(yes)	NS	NS	
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	NS	NS	
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	4.91	.018	7
	Ease of Getting		842.19	.218	2
	Peer Pressure		102.78	.074	4
	Peer Disapproval		2173.34	.376	1
8th	Repeated a Grade	(yes)	76.97	.119	4
	Knowledge of School Policy		56.45	-.101	5
	Implementation of School Policy		NS	NS	
	Drug Education				
	(Special Course)	(yes)	7.51	.036	6
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	NS	NS	
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	5.63	.031	7
	Ease of Getting		283.41	.234	2
	Peer Pressure		113.13	.144	3
	Peer Disapproval		390.70	.287	1

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 8 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th	Repeated a Grade	(yes)	18.23	.054	4
	Knowledge of School Policy		17.99	-.056	5
	Implementation of School Policy		12.22	-.047	7
	Drug Education				
	(Special Course)	(yes)	NS	NS	
	(Health Course)	(yes)	12.54	-.044	6
	(Regular Course)	(yes)	NS	NS	
	(Special Event)	(yes)	6.14	-.030	8
	(Special Discussion)	(yes)	NS	NS	
	Ease of Getting		208.64	.187	2
12th	Peer Pressure		31.75	.072	3
	Peer Disapproval		822.28	.398	1
	Repeated a Grade	(yes)	NS	NS	
	Knowledge of School Policy		34.58	-.088	2
	Implementation of School Policy		22.57	-.074	4
	Drug Education				
	(Special Course)	(yes)	4.45	.030	6
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	NS	NS	
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	NS	NS	
	Ease of Getting		27.37	.076	3
	Peer Pressure		6.20	.037	5
	Peer Disapproval		1001.92	.510	1

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

variable) is ranked third in the outcomes for 8th and 10th graders both when all substances and drugs alone are

Table 9

Results of Polychotomous Stepwise Logistic Regression of
Substance Use Patterns (Drugs Only) on the
Social Context Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Repeated a Grade	(yes)	70.14	.074	5
	Knowledge of School Policy		180.38	-.126	3
	Implementation of School Policy		NS	NS	
	Drug Education				
	(Special Course)	(yes)	NS	NS	
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	11.41	-.031	6
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	7.92	.025	7
	Ease of Getting		741.97	.267	2
	Peer Pressure		116.90	.095	4
	Peer Disapproval		2206.84	.484	1
8th	Repeated a Grade	(yes)	82.58	.173	4
	Knowledge of School Policy		49.89	-.145	5
	Implementation of School Policy		NS	NS	
	Drug Education				
	(Special Course)	(yes)	NS	NS	
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	NS	NS	
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	7.69	.053	6
	Ease of Getting		290.83	.361	2
	Peer Pressure		109.52	.197	3
	Peer Disapproval		402.65	.405	1

¹ Variables are listed from most distal to most proximal
from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 9 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th	Repeated a Grade	(yes)	25.94	.076	5
	Knowledge of School Policy		32.72	-.089	4
	Implementation of School Policy		NS	NS	
	Drug Education				
	(Special Course)	(yes)	NS	NS	
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	10.86	-.050	6
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	NS	NS	
	Ease of Getting		195.61	.227	2
12th	Peer Pressure		33.86	.085	3
	Peer Disapproval		770.28	.442	1
	Repeated a Grade	(yes)	15.07	.053	4
	Knowledge of School Policy		36.36	-.092	3
	Implementation of School Policy		12.36	-.055	6
	Drug Education				
	(Special Course)	(yes)	NS	NS	
	(Health Course)	(yes)	NS	NS	
	(Regular Course)	(yes)	NS	NS	
	(Special Event)	(yes)	NS	NS	
	(Special Discussion)	(yes)	NS	NS	
	Ease of Getting		76.89	.130	2
	Peer Pressure		13.57	.051	5
	Peer Disapproval		1098.17	.518	1

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

considered.

In spite of these nearly linear outcomes the grade by

grade comparisons show the reduced relative rank of peerpressure in the 12th grade under both inclusion modes and the increasing relative rank of knowledge of school policy across grades. Additionally, the consistent low rank of all statistically significant drug education variables also violates the expected topical distal to proximal relationships. With these exceptions to linearity the overall evaluation of the topical distal to proximal dimension indeed shows a general trend in the expected direction.

Findings Beyond the Test of Hypothesis 3

Going beyond testing of hypothesis 3 for the social context layer, it is interesting to note that as adolescents develop the relative influence of peer pressure and drug education lessens while the relative influence of knowledge and perceived implementation of school policy increases. All of these changing elements are consistent with the view of adolescent development as gradual preparation for adulthood, wherein both a greater level of individualism and, though contradictory, greater compliance with social control is expected.

In comparing the PSLR outcomes when alcohol, cigarettes and drugs are considered versus when drugs only are considered, it can be seen that their outcomes are essen-

tially the same: as in the demographic/structural layer. The only notable exception to this similarity is counter-intuitive. The relative strength of relationship of perceived likelihood of implementation of school policy to the PASUT is less when drugs only were included versus when everything was included. It would seem that the perceived likelihood of implementation of school policy would have more of an effect on patterns of substance use for drugs only (under the current definition) as the penalties are likely to be more severe than those for the use of alcohol and cigarettes. However, as described in the following paragraph, perceived likelihood of implementation of school policy and knowledge of school policy require a caveat to their interpretation.

In addition to the relative weights (and corresponding ranks) in this analysis, two anomalies in the beta weights should be mentioned. For all of the PSLRs the variables knowledge of school policy and implementation of school policy (where significant) have negative beta weights. These independent variables' values had been recoded so that less knowledge of and less perceived likelihood of implementation of school policies the greater a respondent's score. Thus less knowledge and less perceived implementation (score increasing as knowledge and perceived implementation decreases) should have theoretically

corresponded to an increase in the involvement/complexity of the patterns of substance use (a positive relationship). Instead, these negative relationships indicate that the more knowledge of and the greater the perceived likelihood of implementation of school policy greater the complexity of patterns of drugs. I can only speculate on the reasons for these anomalous findings. It may be that these outcomes are an expression of a latent relationship between the independent variables and the dependent variable, wherein the school policies and implementation of them are more well known and more stressed by school faculty and staff at schools in which substance use is high. Consequently, knowledge of and perceived likelihood of implementation of school policies and the level of involvement/complexity of substance use patterns may vary together, creating the negative relationships seen in Tables 8 and 9 where these variables have been inversely recoded. Clearly some caution is required in the interpretation of these variables given the above discussion and the unfortunate reality that the specific content and implementation policies of school districts which participate in the Michigan AOD School Survey are unknown.

The Attitudinal Layer: Testing Hypothesis 3

Tables 10 and 11 report the PSLR outcomes for the

Table 10

Results of Polychotomous Stepwise Logistic Regression of Substance Use Patterns (including Alcohol, Cigarettes and Drugs) on the Attitudinal Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Life Satisfaction		NS		
		(Happy)		NS	
		(Mixed Feelings)		NS	
		(Unhappy)		NS	
		(Very Unhappy)		NS	
	Importance of Religion		28.94		5
		(Pretty Important)		.023	
		(A Little Important)		.053	
		(Not Important)		.042	
	College Plans (attend 4yr College)		10.80		6
		(Probably Will)		-.004	
		(Probably Won't)		.016	
		(Definitely Won't)		.026	
	School Attitudes		124.73	.099	2
	Drug Educ. Effects		57.34		3
		(No Change)		.060	
		(More Interested)		.047	
	Drug Educ. Value		8.87		7
		(Considerable)		.006	
		(Some)		.027	
		(Little)		.003	
	Future Use		5012.80	.875	1
	Perceived Health Risk		49.54	.068	4

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 10 - Continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
8th	Life Satisfaction		16.93		6
		(Happy)		-.013	
		(Mixed Feelings)		.053	
		(Unhappy)		.024	
	Importance of Religion	(Very Unhappy)		-.006	
			17.02		5
		(Pretty Important)		.011	
		(A Little Important)		.065	
		(Not Important)		.053	
	College Plans (attend 4yr College)		16.02		7
		(Probably Will)		.017	
		(Probably Won't)		.001	
		(Definitely Won't)		.065	
	School Attitudes		39.28	.105	2
	Drug Educ. Effects		29.56		3
		(No Change)		.050	
		(More Interested)		.080	
	Drug Educ. Value		NS		
		(Considerable)		NS	
		(Some)		NS	
		(Little)		NS	
	Future Use		1188.81	.751	1
	Perceived Health Risk		20.74	.080	4

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 10 - Continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th	Life Satisfaction		13.59		4
	(Happy)			-.014	
	(Mixed Feelings)			.025	
	(Unhappy)			-.0004	
	(Very Unhappy)			.040	
	Importance of Religion		12.62		5
	(Pretty Important)			.033	
	(A Little Important)			.064	
	(Not Important)			.042	
	College Plans (attend 4yr College)		NS		
	(Probably Will)			NS	
	(Probably Won't)			NS	
	(Definitely Won't)			NS	
	School Attitudes		64.57	.124	2
	Drug Educ. Effects		9.04		6
	(No Change)			.035	
	(More Interested)			.037	
	Drug Educ. Value		NS		
	(Considerable)			NS	
	(Some)			NS	
	(Little)			NS	
	Future Use		1787.43	.876	1
	Perceived Health Risk		28.09	.087	3

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 10 - Continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th	Life Satisfaction		NS		
	(Happy)		NS		
	(Mixed Feelings)			NS	
	(Unhappy)			NS	
	(Very Unhappy)			NS	
	Importance of Religion		12.67		4
	(Pretty Important)			.057	
	(A Little Important)			.073	
	(Not Important)			.061	
	College Plans (attend 4yr College)		NS		
	(Probably Will)			NS	
	(Probably Won't)			NS	
	(Definitely Won't)			NS	
	School Attitudes		46.76	.116	2
	Drug Educ. Effects		6.84		5
	(No Change)			.017	
	(More Interested)			.052	
	Drug Educ. Value		NS		
	(Considerable)			NS	
	(Some)			NS	
	(Little)			NS	
	Future Use		1763.09	.956	1
	Perceived Health Risk		17.76	.087	3

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 11

Results of Polychotomous Stepwise Logistic Regression of
Substance Use Patterns (Drugs Only) on the
Attitudinal Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Life Satisfaction		10.89		6
	(Happy)			-.005	
	(Mixed Feelings)			.024	
	(Unhappy)			.005	
	(Very Unhappy)			.022	
	Importance of Religion		NS		
	(Pretty Important)			NS	
	(A Little Important)			NS	
	(Not Important)			NS	
	College Plans (attend 4yr College)		43.55		5
	(Probably Will)			.039	
	(Probably Won't)			.060	
	(Definitely Won't)			.042	
	School Attitudes		63.07	.089	4
	Drug Educ. Effects		160.12		2
	(No Change)			.113	
	(More Interested)			.085	
	Drug Educ. Value		NS		
	(Considerable)			NS	
	(Some)			NS	
	(Little)			NS	
	Future Use		3419.82	.749	1
	Perceived Health Risk		131.91	.133	3

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 11 - Continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
8th	Life Satisfaction		14.98		6
	(Happy)			.021	
	(Mixed Feelings)			.095	
	(Unhappy)			.048	
	(Very Unhappy)			.010	
	Importance of Religion		17.02		4
	(Pretty Important)			.011	
	(A Little Important)			.065	
	(Not Important)			.053	
	College Plans (attend 4yr College)		11.23		7
	(Probably Will)			.011	
	(Probably Won't)			.032	
	(Definitely Won't)			.072	
	School Attitudes		15.66	.097	5
	Drug Educ. Effects		83.97		2
	(No Change)			.152	
	(More Interested)			.146	
	Drug Educ. Value		NS		
	(Considerable)			NS	
	(Some)			NS	
	(Little)			NS	
	Future Use		692.58	.706	1
	Perceived Health Risk		37.16	.151	4

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 11 - Continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th	Life Satisfaction		17.59		6
	(Happy)			.001	
	(Mixed Feelings)			.069	
	(Unhappy)			.011	
	(Very Unhappy)			.034	
	Importance of Religion		NS		
	(Pretty Important)			NS	
	(A Little Important)			NS	
	(Not Important)			NS	
	College Plans (attend 4yr College)		40.17		3
	(Probably Will)			.082	
	(Probably Won't)			.097	
	(Definitely Won't)			.049	
	School Attitudes		27.98	.098	5
	Drug Educ. Effects		41.21		2
	(No Change)			.098	
	(More Interested)			.082	
	Drug Educ. Value		NS		
	(Considerable)			NS	
	(Some)			NS	
	(Little)			NS	
	Future Use		1164.82	.722	1
	Perceived Health Risk		40.03	.119	4

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 11 - Continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th	Life Satisfaction		NS		
	(Happy)			NS	
	(Mixed Feelings)			NS	
	(Unhappy)			NS	
	(Very Unhappy)			NS	
	Importance of Religion		NS		
	(Pretty Important)			NS	
	(A Little Important)			NS	
	(Not Important)			NS	
	College Plans (attend 4yr College)		14.37		5
	(Probably Will)			.042	
	(Probably Won't)			.052	
	(Definitely Won't)			.031	
	School Attitudes		25.17	.084	4
	Drug Educ. Effects		26.61		3
	(No Change)			.059	
	(More Interested)			.070	
	Drug Educ. Value		NS		
	(Considerable)			NS	
	(Some)			NS	
	(Little)			NS	
	Future Use		1300.74	.744	1
	Perceived Health Risk		74.54	.165	2

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

attitudinal layer of the MSASUM when alcohol, cigarettes

and drugs were included and when drugs only were included, respectively. As in the social context layer of the model, this layer also shows a general trend in strength of relationships of variables with the PASUT in the expected topically distal to proximal direction. The more proximal variables generally have a higher relative ranks than the more distal variables. However, the relative ranks of variables are not linear. For example, while perceived health risk is the most proximal variable in this layer of the MSASUM it most often ranks third or fourth (and second once) whereas the second most proximal variable, future use, consistently ranks first.

Findings Beyond the Test of Hypothesis 3

For the attitudinal layer, by grade comparisons show a similarity across grade levels. There are, however, a few exceptions. First, there is a trend toward decreasing influence of the drug education effects variable from 8th to 12th grades. Second, life satisfaction is consistently nonsignificant or ranked as the sixth lowest strength of relationship across all grades and under both inclusion modes, except for the 10th graders when alcohol, cigarettes and drugs are considered, where it is ranked fourth. Third, when drugs only are considered the relative rank of perceived health risk shows a curvilinear relationship

bygrade. Fourth, importance of religion is much stronger in the 8th, than in the 10th and 12th grades when drugs only are considered.

Comparing PSLR outcomes when alcohol, cigarettes and drugs were included versus when drugs only were included show a large degree of similarity. The only substantial exception is the flip-flop of the relative ranks of school attitudes and drug education effects.

Two additional outcomes for the attitudinal layer bear comment. First is the consistent overwhelming influence of future use on PASUT. Future use is far and away the strongest predictor of the PASUT as indicated by the very large X^2 improvements made by it and its corresponding large beta weights. The degree of difference in strength of relationship is truly surprising. Second, it is interesting that drug education value (measuring the degree of value students place on their drug education experiences: great, considerable, some, or little/none) is completely unimportant even though drug education effects (measuring whether students' drug education experiences made them less interested, more interested or no change in their interest in trying drugs) is consistently significant and quite highly ranked when drugs only are considered. Apparently, the perceived value of drug education has little impact on the education's impact on use patterns.

The Behavioral Layer: Testing Hypothesis 3

Tables 12 and 13 report the PSLR outcomes for the behavioral layer of the MSASUM when alcohol, cigarettes and drugs were included and when drugs only were included, respectively. Unlike the previous layers of social reality the PSLR outcomes differ considerably when alcohol, cigarettes and drugs were considered compared to when drugs only were considered. Consequently the two inclusion modes will be considered separately.

The PSLR outcome for the PASUT when alcohol, cigarettes and drugs were included (see Table 12) shows a random pattern of relative ranks. Despite the consistent rank of grade of first use of gateway drugs as the most influential variable (the second most proximal variable in the model) the other most proximal variables have relative ranks ranging from mid-level ranks to some of the weakest ranks. One unexpected but valid result of the PSLR outcomes for this inclusion mode is that the outcome for all grades combined and for the 12th grade have exactly the same improvement in X^2 values for each variable. Despite the stepwise process proceeding differently for all grades combined and the 12th grade only groupings (i.e. steps variables into the equation in a different order and with different initial values), the end product is exactly the same.

Table 12

Results of Polychotomous Stepwise Logistic Regression of Substance Use Patterns (including Alcohol, Cigarettes and Drugs) on the Behavioral Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL	Attend Religious Services	(once or twice/month)	64.83	.042	8
		(rarely)		.057	
		(never)		.066	
	Grade Pt. Average		30.29		10
		(A-)		-.004	
		(B+)		-.011	
		(B)		-.021	
		(B-)		-.009	
		(C+)		-.052	
		(C)		-.024	
		(C-)		-.016	
		(D or below)		-.026	
	School Behavior		43.46	.070	9
	Cut Classes		117.88		5
		(1 day)		.060	
		(2 days)		.046	
		(3 days)		.040	
		(4-5 days)		.047	
		(6-10 days)		.048	
		(11 or more)		.020	
	# of Evening Out		69.18		7
		(one)		.015	
		(two)		.042	
		(three)		.062	
		(four or five)		.094	
		(six or seven)		.070	
	Location of Use (Alcohol)				
	At Home		303.21		3
		(1-2 times)		.137	
		(3-5 times)		.092	
		(6+ times)		.033	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
ALL					
Continued	At School Event		10.99		14
	(1-2 times)			.028	
	(3-5 times)			.012	
	(6+ times)			.011	
	At School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	At Friends House/ In a Car/		1720.56		2
	(1-2 times)			.298	
	At a Party (3-5 times)			.306	
	(6+ times)			.352	
	Location of Use (Drugs)				
	At Home		24.84		11
	(1-2 times)			.042	
	(3-5 times)			.032	
	(6+ times)			.054	
	At School Event		15.63		12
	(1-2 times)			-.024	
	(3-5 times)			-.045	
	(6+ times)			-.044	
	Near School/		14.93		13
	At School/ (1-2 times)			.038	
	In a Car/ (3-5 times)			.031	
	(6+ times)			.050	
	At Friends House/		215.92		4
	At a Party (1-2 times)			.124	
	(3-5 times)			.099	
	(6+ times)			.129	
	Grade of 1st Use Gateway Drugs		2452.56	.571	1
	Grade of 1st Use Hard Drugs		98.26	.142	6

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
8th	Attend Religious Services	(once or twice/month)	NS	NS	
		(rarely)		NS	
		(never)		NS	
	Grade Pt. Average		NS		
		(A-)		NS	
		(B+)		NS	
		(B)		NS	
		(B-)		NS	
		(C+)		NS	
		(C)		NS	
		(C-)		NS	
		(D or below)		NS	
	School Behavior		24.76	.087	4
	Cut Classes		16.23		5
		(1 day)		.027	
		(2 days)		.025	
		(3 days)		.042	
		(4-5 days)		.027	
		(6-10 days)		.034	
		(11 or more)		.005	
	# of Evening Out		15.27		6
		(one)		-.001	
		(two)		.015	
		(three)		.027	
		(four or five)		.045	
		(six or seven)		.065	
	Location of Use (Alcohol)				
	At Home		255.77		2
		(1-2 times)		.231	
		(3-5 times)		.162	
		(6+ times)		.079	
	At School Event		NS		
		(1-2 times)		NS	
		(3-5 times)		NS	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
8th					
Continued	At School Event				
	(6+ times)			NS	
	At School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	At Friends House/		119.40		3
	In a Car/ (1-2 times)			.141	
	At a Party (3-5 times)			.111	
	(6+ times)			.161	
	Location of Use (Drugs)				
	At Home		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	At School Event		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School/		11.86		7
	At School/ (1-2 times)			.022	
	In a Car/ (3-5 times)			.056	
	(6+ times)			.077	
	At Friends House/		10.32		8
	At a Party (1-2 times)			.124	
	(3-5 times)			.099	
	(6+ times)			.129	
	Grade of 1st Use Gateway Drugs		1090.37	.741	1
	Grade of 1st Use Hard Drugs		9.52	.232	9

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th	Attend Religious Services	(once or twice/month)	8.79	.038	10
		(rarely)		.035	
		(never)		.035	
	Grade Pt. Average		NS		
		(A-)		NS	
		(B+)		NS	
		(B)		NS	
		(B-)		NS	
		(C+)		NS	
		(C)		NS	
		(C-)		NS	
		(D or below)		NS	
	School Behavior		29.92	.091	7
	Cut Classes		21.04		9
		(1 day)		.046	
		(2 days)		.008	
		(3 days)		.018	
		(4-5 days)		.032	
		(6-10 days)		.013	
		(11 or more)		.055	
	# of Evening Out		31.81		6
		(one)		.010	
		(two)		.025	
		(three)		.028	
		(four or five)		.085	
		(six or seven)		.078	
	Location of Use (Alcohol)				
	At Home		165.06		3
		(1-2 times)		.173	
		(3-5 times)		.123	
		(6+ times)		.045	
	At School Event		NS		
		(1-2 times)		NS	
		(3-5 times)		NS	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th					
Continued					
	At School Event				
	(6+ times)			NS	
	At School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	At Friends House/		654.20		2
	In a Car/ (1-2 times)			.320	
	At a Party (3-5 times)			.307	
	(6+ times)			.340	
	Location of Use (Drugs)				
	At Home		27.60		8
	(1-2 times)			.096	
	(3-5 times)			.042	
	(6+ times)			.067	
	At School Event		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School/		NS		
	At School/ (1-2 times)			NS	
	In a Car/ (3-5 times)			NS	
	(6+ times)			NS	
	At Friends House/		57.66		5
	At a Party (1-2 times)			.100	
	(3-5 times)			.051	
	(6+ times)			.141	
	Grade of 1st Use Gateway Drugs		1055.17	.654	1
	Grade of 1st Use Hard Drugs		73.12	.221	4

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th	Attend Religious Services	(once or twice/month)	64.83	.045	8
		(rarely)		.063	
		(never)		.076	
	Grade Pt. Average	(A-)	30.29	-.004	10
		(B+)		-.012	
		(B)		-.023	
		(B-)		-.010	
		(C+)		-.056	
		(C)		-.026	
		(C-)		-.016	
		(D or below)		-.018	
	School Behavior		43.46	.072	9
	Cut Classes		117.88		5
		(1 day)		.074	
		(2 days)		.063	
		(3 days)		.053	
		(4-5 days)		.063	
		(6-10 days)		.067	
		(11 or more)		.024	
	# of Evening Out		69.18		7
		(one)		.015	
		(two)		.045	
		(three)		.069	
		(four or five)		.106	
		(six or seven)		.077	
	Location of Use (Alcohol)				
	At Home		303.21		3
		(1-2 times)		.152	
		(3-5 times)		.112	
		(6+ times)		.040	
	At School Event		10.99		14
		(1-2 times)		.034	
		(3-5 times)		.015	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 12 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th					
Continued	At School Event				
	(6+ times)			.014	
	At School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	At Friends House/		1720.56		2
	In a Car/ (1-2 times)			.349	
	At a Party (3-5 times)			.387	
	(6+ times)			.452	
	Location of Use (Drugs)				
	At Home		24.84		11
	(1-2 times)			.051	
	(3-5 times)			.038	
	(6+ times)			.072	
	At School Event		15.63		12
	(1-2 times)			-.030	
	(3-5 times)			-.052	
	(6+ times)			-.055	
	Near School/		14.93		13
	At School/ (1-2 times)			.047	
	In a Car/ (3-5 times)			.036	
	(6+ times)			.065	
	At Friends House/		215.92		4
	At a Party (1-2 times)			.163	
	(3-5 times)			.130	
	(6+ times)			.166	
	Grade of 1st Use Gateway Drugs		2452.56	.560	1
	Grade of 1st Use Hard Drugs		98.26	.122	6

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 13

Results of Polychotomous Stepwise Logistic Regression of
Substance Use Patterns (Drugs Only) on the
Behavioral Layer of the MSASUM^{1 2}

Grade	Variables	Design Variables Improvement	X ²	Beta	Rank ³
ALL	Attend Religious Services	(once or twice/month) (rarely) (never)	32.73	.026 .060 .056	8
	Grade Pt. Average	(A-) (B+) (B) (B-) (C+) (C) (C-) (D or below)	17.00	.020 .022 .023 .050 .022 .040 .013 .008	10
	School Behavior		26.35	.064	9
	Cut Classes	(1 day) (2 days) (3 days) (4-5 days) (6-10 days) (11 or more)	104.99	.064 .051 .043 .040 .057 .034	5
	# of Evening Out	(one) (two) (three) (four or five) (six or seven)	NS	NS NS NS NS NS	12
	Location of Use (Alcohol)				
	At Home	(1-2 times) (3-5 times) (6+ times)	13.07	.029 .020 -.010	11

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta Rank ³
ALL				
Continued	At School Event		13.78	
	(1-2 times)			.030
	(3-5 times)			.014
	(6+ times)			-.015
	At School		NI ⁴	
	(1-2 times)			NI
	(3-5 times)			NI
	(6+ times)			NI
	Near School		NS	
	(1-2 times)			NS
	(3-5 times)			NS
	(6+ times)			NS
	At Friends House/ In a Car/		178.58	4
	(1-2 times)			.074
	At a Party			.130
	(3-5 times)			.101
	(6+ times)			
	Location of Use (Drugs)			
	At Home		83.86	6
	(1-2 times)			.070
	(3-5 times)			.067
	(6+ times)			.066
	At School Event		NI	
	(1-2 times)			NI
	(3-5 times)			NI
	(6+ times)			NI
	Near School/		39.79	7
	At School/			.065
	(1-2 times)			.023
	In a Car/			.050
	(3-5 times)			
	(6+ times)			
	At Friends House/		655.10	3
	At a Party			.212
	(1-2 times)			.172
	(3-5 times)			.251
	(6+ times)			
	Grade of 1st Use Gateway Drugs		1470.99	1
	Grade of 1st Use Hard Drugs		1012.34	2

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

⁴ NI indicate that the variable was not included.

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
8th	Attend Religious Services	(once or twice/month)	7.88	.009	6
		(rarely)		.063	
		(never)		.047	
	Grade Pt. Average		NS		
		(A-)		NS	
		(B+)		NS	
		(B)		NS	
		(B-)		NS	
		(C+)		NS	
		(C)		NS	
		(C-)		NS	
		(D or below)		NS	
	School Behavior		33.20	.143	4
		Cut Classes	28.58		5
		(1 day)		.063	
		(2 days)		.077	
		(3 days)		.014	
		(4-5 days)		.006	
		(6-10 days)		.047	
		(11 or more)		.044	
	# of Evening Out		NS		
		(one)		NS	
		(two)		NS	
		(three)		NS	
		(four or five)		NS	
		(six or seven)		NS	
	Location of Use (Alcohol)				
		At Home	NI ⁴		
		(1-2 times)		NI	
	At School Event	(3-5 times)		NI	
		(6+ times)		NI	
			NI		
		(1-2 times)		NI	
		(3-5 times)		NI	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

⁴ NI indicate that the variable was not included.

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
8th					
Continued	At School Event				
	(6+ times)				
	At School		NI ⁴		NI
	(1-2 times)				NI
	(3-5 times)				NI
	(6+ times)				NI
	Near School		NI		
	(1-2 times)				NI
	(3-5 times)				NI
	(6+ times)				NI
	At Friends House/		86.06		3
	In a Car/ (1-2 times)			.106	
	At a Party (3-5 times)			.139	
	(6+ times)			.174	
	Location of Use (Drugs)				
	At Home		NI		
	(1-2 times)				NI
	(3-5 times)				NI
	(6+ times)				NI
	At School Event		NI		
	(1-2 times)				NI
	(3-5 times)				NI
	(6+ times)				NI
	Near School/		NI		
	At School/ (1-2 times)				NI
	In a Car/ (3-5 times)				NI
	(6+ times)				NI
	At Friends House/		NI		
	At a Party (1-2 times)				NI
	(3-5 times)				NI
	(6+ times)				NI
	Grade of 1st Use Gateway Drugs		421.19	.597	2
	Grade of 1st Use Hard Drugs		590.41	.740	1

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

⁴ NI indicate that the variable was not included.

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th	Attend Religious Services	(once or twice/month)	NS	NS	
		(rarely)		NS	
		(never)		NS	
	Grade Pt. Average		22.68		
		(A-)		.062	
		(B+)		.084	
		(B)		.073	
		(B-)		.105	
		(C+)		.106	
		(C)		.116	
		(C-)		.098	
		(D or below)		.093	
	School Behavior		7.49	.059	12
	Cut Classes		12.39		9
		(1 day)		.033	
		(2 days)		.010	
		(3 days)		.020	
		(4-5 days)		.017	
		(6-10 days)		.028	
		(11 or more)		.045	
	# of Evening Out		NS		
		(one)		NS	
		(two)		NS	
		(three)		NS	
		(four or five)		NS	
		(six or seven)		NS	
	Location of Use (Alcohol)				
	At Home		19.46		7
		(1-2 times)		.047	
		(3-5 times)		.042	
		(6+ times)		-.038	
	At School Event		13.66		8
		(1-2 times)		.043	
		(3-5 times)		.018	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
10th					
Continued	At School Event	(6+ times)		-.042	
	At School	(1-2 times)	NS	NS	
		(3-5 times)		NS	
		(6+ times)		NS	
	Near School	(1-2 times)	12.16	-.004	
		(3-5 times)		.060	
		(6+ times)		-.012	
	At Friends House/		26.67		5
	In a Car/	(1-2 times)		.064	
	At a Party	(3-5 times)		.081	
		(6+ times)		.086	
	Location of Use (Drugs)				
	At Home		54.20		4
		(1-2 times)		.108	
		(3-5 times)		.091	
		(6+ times)		.059	
	At School Event		NS		
		(1-2 times)		NS	
		(3-5 times)		NS	
		(6+ times)		NS	
	Near School/		10.29		11
	At School/	(1-2 times)		.058	
	In a Car/	(3-5 times)		.032	
		(6+ times)		.032	
	At Friends House/		160.63		3
	At a Party	(1-2 times)		.175	
		(3-5 times)		.135	
		(6+ times)		.227	
	Grade of 1st Use Gateway Drugs		650.00	.575	1
	Grade of 1st Use Hard Drugs		419.47	.523	2

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th	Attend Religious Services	(once or twice/month)	9.09	.014	10
		(rarely)		.043	
		(never)		.053	
	Grade Pt. Average		NS		
		(A-)		NS	
		(B+)		NS	
		(B)		NS	
		(B-)		NS	
		(C+)		NS	
		(C)		NS	
		(C-)		NS	
		(D or below)		NS	
	School Behavior		14.87	.067	8
	Cut Classes		22.89		7
		(1 day)		.046	
		(2 days)		.031	
		(3 days)		.039	
		(4-5 days)		.033	
		(6-10 days)		.054	
		(11 or more)		.019	
	# of Evening Out		NS		
		(one)		NS	
		(two)		NS	
		(three)		NS	
		(four or five)		NS	
		(six or seven)		NS	
	Location of Use (Alcohol)				
	At Home		NS		
		(1-2 times)		NS	
		(3-5 times)		NS	
		(6+ times)		NS	
	At School Event		NS		
		(1-2 times)		NS	
		(3-5 times)		NS	

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

Table 13 - continued

Grade	Variables	Design Variables	X ² Improvement	Beta	Rank ³
12th					
Continued	At School Event				
	(6+ times)			NS	
	At School		11.40		9
	(1-2 times)			.009	
	(3-5 times)			.032	
	(6+ times)			.056	
	Near School		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	At Friends House/		69.87		4
	In a Car/ (1-2 times)			.096	
	At a Party (3-5 times)			.119	
	(6+ times)			.138	
	Location of Use (Drugs)				
	At Home		31.95		5
	(1-2 times)			.081	
	(3-5 times)			.047	
	(6+ times)			.073	
	At School Event		NS		
	(1-2 times)			NS	
	(3-5 times)			NS	
	(6+ times)			NS	
	Near School/		29.98		6
	At School/ (1-2 times)			.097	
	In a Car/ (3-5 times)			.014	
	(6+ times)			.051	
	At Friends House/		534.72		2
	At a Party (1-2 times)			.327	
	(3-5 times)			.254	
	(6+ times)			.355	
	Grade of 1st Use Gateway Drugs		658.64	.517	1
	Grade of 1st Use Hard Drugs		282.14	.122	3

¹ Variables are listed from most distal to most proximal from top to bottom of each panel.

² NS indicates nonsignificant values.

³ Rank is assigned by relative improvement in X²

In contrast, the PSLR outcome for the behavioral layer of the MSASUM when drugs only were considered (see Table 13) shows a general trend in the expected direction. The more proximal variables generally have the highest relative ranks and the more distal having the lower relative ranks. Indeed the three most proximal variables (grade of 1st use of hard drugs, grade of first use of gateway drugs, and location of substance use at friends house or party) consistently are ranked first, second or third across all grades.

It should be mentioned, however, that when drugs only were considered the PSLR runs for all grades combined and the 8th grade for the behavioral layer required that some independent variables be left out of the analysis. For all grades combined two variables were omitted (alcohol use at school and substance use at school event). For the 8th grade all of the location of use variables, except alcohol use at a friends house/in a car/at a party, were dropped from the analysis. The reason for omitting these variables is that combining the skewed distribution of 8th grade responses for the location variables (the vast major of respondents indicating no use at these locations) with the skewed distribution of 8th grade respondents by pattern of use when drugs only were considered, some of the logarithms ended with a value of zero which violates statistical

assumptions and prevents the computation of the analysis. Consequently, these variables had to be dropped in order to secure the PSLR analysis for the 8th graders and all grades combined.

While the elimination of most of the location of use variables in the 8th grade analysis may have contributed to the near linear pattern of relative ranks of variables included in the analysis, both the 10th and 12th grade analyses (where no variables were eliminated) display a general trend in the expected direction. Therefore, the conclusion that the behavioral layer of the MSASUM when drugs only are considered shows a general trend in relative ranks seems warranted in spite of the necessary modification of variables included in the behavioral layer for the 8th grade and all grades combined analyses.

Findings Beyond the Test of Hypothesis 3

For the behavioral layer, as discussed above, comparing PSLR outcomes when alcohol, cigarettes and drugs were included versus when drugs only were included show few similarities. The one similarity that is present is the consistent ranking of grade of first use of gateway drugs variable as first or second across all grades under both inclusion modes. This finding lends further support to the importance of grade of initiation of use, as Kendel's

incremental or gateway model would suggest (Kandel 1982; Kandel & Faust 1975; Kandel & Logen 1984; Kandel et al. 1984; Kandel & Yamaguchi 1985; Yamaguchi & Kandel 1984a, 1984b; Robin & Johnson 1991). One interesting difference between the PSLR outcomes for the two inclusion modes is the sign of the beta weights for grade point average (GPA) where it is significant (all grades combined and the 12th grade when all substances were considered and all grades combined and the 10th grade when drugs only were considered). When all substance were considered, GPA has an inverse relationship to the PASUT. Since GPA was recoded so that the lower the respondents GPA the higher the code number (producing a positive relationship when a lower GPA is associated with patterns of use indicating more involvement), the inverse relationship here indicates that the higher the GPA the more involved/complex the pattern of use. However, when drugs only were considered the lower a respondents GPA the more involved the pattern of use: the expected relationship.

The difference in PSLR outcomes for the behavioral layer when all substance were considered and when drugs only were considered is striking given the similarity of outcomes for the other three layers of social reality. This is an important finding in two ways. First, the behavioral layer's influence over patterns of use may be

much more substance specific, where as the more distal layers may - as is argued in the proximal to distal arrangement of layers of social reality - influence substance use patterns only in a more general way. Consequently, the ability to predict substance use patterns generally from a specific set of behaviors may be restricted by this more specific relationship between particular antecedent behavior and the type of use of a particular substance or group of substances. Second, since the behavioral layer is expected to have the greatest level of prediction of patterns of use, this specificity of relationship restriction may present an important limitation on the theoretical and empirical understanding of what causes adolescent substance use patterns. As a result the effective application of social science research to the prevention of substance use generally may be inherently limited.

Concluding Remarks on Stage 2 Findings

As a strict test of hypothesis 3 (that the variables within each layer of social reality will vary in the strength of their relationship to the patterns of substance use according to their level of proximalness as shown in the MSASUM -- the more proximal the stronger the relationship) these findings fail to support the hypothesized

relationships. None of the layers of social reality show a linear set of relative strengths of relationships between independent variables to the PASUT: much less in the expected topically distal to proximal direction.

There is considerable variance in the patterns of relative strengths (ranks) of variables by layer of social reality, however (See Table 14). The demographic-/structural layer shows the greatest linearity of any of the layers of social reality, though in the opposite direction of that which was predicted. This layer of the MSASUM does not support hypothesis 3 as the variables are currently arranged. However, the near linearity of the relative strengths of independent variables to the PASUT may indicate that, rather than the absence of a topically distal to proximal dimension (where there would

Table 14

Results of Testing the Topically Proximal
to Distal Dimension in Brief

	<u>Layer of Social Reality</u>	<u>Status</u>	<u>Direction</u>
All Substances, & Drugs Only	Demographic/Struct.	Near Linear	Inverse
	Social Context	General Trend	Predicted
	Attitudes	General Trend	Predicted
All Substances	Behaviors	Random	None
Drugs only	Behaviors	General Trend	Predicted

be no consistent patterned relative strength of relationships), this dimension does exist but is misspecified in the current MSASUM (variables arranged in the wrong and/or opposite direction).

In addition to supporting the concept of a topically distal to proximal dimension, the social context and attitudinal layers of social reality and the behavioral layer, when drugs only were considered, do indicate some support of the arrangement of variables in the MSASUM as topically distal to proximal based on the current adolescent substance use literature by showing a general trend in relative rank in the expected distal to proximal direction. Consequently, the social context and attitudinal layers of social reality and the behavioral layer, when drugs only were considered, do provide weak support for hypothesis 3 and the concept it operationalizes.

In contrast to the three most distal layers of the MSASUM and the behavioral layer when drugs only were considered, the behavioral layer when all substances were considered, shows randomness. The independent variables relative strength of relationships to the PASUT are close to random compared to their distal to proximal arrangement in the MSASUM. The difference between the PSLR outcomes for the behavioral layer when all substances and when drugs only were considered leads to an important possibility. It

may be that finding a particular set of behaviors as consistently and generally predictive of use behaviors may not be possible, at least not in an ordered way. Consequently, the usefulness of the most important class of social phenomena, behaviors, in the prevention of adolescent substance use may be considerably reduced.

While hypothesis 3 cannot be formally supported by the findings of this analysis, neither are the findings so contradictory to the hypothesis that the concept of a topical distal to proximal dimension be dismissed. Rather, it would appear that in three and a half of the four layers of social reality there is some support for the existence of a topical distal to proximal dimension.

One strong possibility that would explain the absence of consistent supporting findings concerning the topical to distal dimension of the MSASUM is the basis on which the variables were arranged as topically distal to proximal. In constructing the MSASUM generally and even more so in proposing the placement of variables within each layer of social reality the existing literature was heavily relied upon. The existing literature, however, is substantially different from this research in two very important respects. The first is that the MSASUM is a comprehensive quantitative sociogenic model and thereby unlike the extant research literature. The second, and the one of major

importance here, is the dependent variable: the PASUT. The PASUT is a very different and more complex dependent variable than that which is used in the extant literature. The PASUT is not only quantitatively different from simple dichotomous use/non-use and frequency measures of substance use behavior, by combining frequency measures for 14 different substances, but is qualitatively different as well, in combining these frequency measures in different combinations, over different time periods to arrive at a comprehensive typology of substance use behavior patterns. Therefore, while there is no other place to begin research but with the extant literature, it is not unlikely that the extant findings on the contribution of various independent variables would have very limited applicability in attempting to predict in a reliably patterned way, something other than what they were intended to and did predict, patterns of substance use as opposed to frequency of use.

It is expected and reasonable to begin research with the extant literature, as was done in this research. However, as stated when developing the MSASUM, it is considered as the starting point for understanding the complex patterns of adolescent substance use not the end point. The MSASUM as originally developed will be revised and refined by these topically proximal to distal dimension findings to more appropriately fit the more complicated

dependent variable: the Patterns of Adolescent Substance Use Typology.

Stage 3: Tests of the Layers of Social Reality as
Distal to Proximal

Hypotheses 4, 4a and 5 are concerned with the distal to proximal relationships among the layers of social reality and the patterns of substance use. Testing these hypotheses depends upon using each of the layers of social reality (demographic/structural, social context, attitudes and behaviors) as single entity or variable. At this stage of the research I am not interested in the content of each layer but the strength of relationships between each of the layers of social reality and the PASUT.

To use each of the layers themselves as independent variables, a change in the format of the data for the research is required. To affect this change, each variable remaining in a layer of social reality after testing hypothesis 3 was standardized by converting each respondents score to a z-score. Then, in order to create a single score for each respondent for each layer of social reality, the standardized responses of each respondent for each layer of social reality independently were summed and standardized: providing a single z-score for each layer of social reality for each respondent. Consequently, there are four variables in the tests of hypotheses 4, 4a and 5

(demographic/structural, social context, attitudes and behaviors). Changing the nature of the data for testing these hypotheses to z-scores (all independent variables were measured at the interval level) allows the method of statistical analysis to be changed. Though none of the hypotheses is directly dependent on the degree to which the MSASUM as a whole predicts the PASUT it is a relevant piece of information. Since PSLR does not provide a measure for ordinal level dependent variables, the remaining analysis is conducted using multiple regression which provides such a measure in the form of an adjusted R^2 .

Testing Hypothesis 4

Hypothesis 4 states: the different layers of social reality's absolute strength of relationship to the patterns of substance use will vary according to their level of proximalness -- demographic/structural layer having the weakest influence, then the social context layer, the attitudinal layer and the behavioral layer having the strongest relationship.

Figures 7 and 8 show the resulting beta weights of the direct paths from the multiple regression analysis when all substances and when drugs only were considered in the PASUT, respectively. The relative strength of relationships among the layers of social reality and the PASUT are

All Grades:Demographic/structural -.028Social Context .066Attitudes .232Behaviors .404Adjusted $R^2 = .35$

PASUT

8th Grade:Demographic/structural NSSocial Context .107Attitudes .117Behaviors .528Adjusted $R^2 = .41$

PASUT

10th Grade:Demographic/structural -.024Social Context .027Attitudes .149Behaviors .500Adjusted $R^2 = .35$

PASUT

12th Grade:Demographic/structural NSSocial Context NSAttitudes .348Behaviors .268Adjusted $R^2 = .29$

PASUT

Figure 7. Results of Testing the Layers of Social Reality as Distal to Proximal for the PASUT Considering Drugs, Alcohol and Cigarettes.

All Grades:Demographic/Structural -.021Social Context .031Attitudes .128Behaviors .648Adjusted $R^2 = .55$

PASUT

8th Grade:Demographic/Structural NSSocial Context .075Attitudes .100Behaviors .633Adjusted $R^2 = .52$

PASUT

10th Grade:Demographic/Structural NSSocial Context .048Attitudes .122Behaviors .639Adjusted $R^2 = .53$

PASUT

12th Grade:Demographic/structural NSSocial Context NSAttitudes .185Behaviors .598Adjusted $R^2 = .53$

PASUT

Figure 8. Results of Testing the Layers of Social Reality as Distal to Proximal for the PASUT Considering Drugs Only.

linear and in the expected direction for all analyses except for the 12th grade when alcohol, cigarettes and drugs were considered. In this 12th grade analysis the only significant layers of social reality, attitudes and behaviors, have relative strengths of relationships to the PASUT which are opposite of the expected: attitudes having the stronger relationship to the PASUT. Nevertheless, the weight of the evidence supports hypothesis 4.

Findings Beyond the Test of Hypothesis 4

As mentioned previously, while the amount of variance that the MSASUM as a whole explains in the PASUT does not directly test the hypotheses, it is nonetheless important in assessing the general utility of the MSASUM. The adjusted R^2 s range from .29 as the smallest value (12th graders when all substances were considered) to a substantial high of .55 (all grades combined when drugs only were considered): the majority of R^2 s well above .29. Based on the adjusted R^2 s the MSASUM predicts patterns of adolescent substance use quite well relative to most of the findings in social science research.

However, in comparing the multiple regression outcomes when all substances versus when drugs only are considered, it should be mentioned that the skewedness of the distribution of patterns of use when drugs only were considered has

probably inflated the adjusted R^2 s relative to those when all substances were considered: to what degree is unknown.

Comparing adjusted R^2 s across grades, there is only a minor difference of .01 among the 8th, 10th and 12th grade when drugs only were considered. In contrast when all substances were considered the MSASUM explains much more of the variance of the PASUT for the 8th grade (adjusted R^2 = .41) than for the 10th (adjusted R^2 = .35) or the 12th (adjusted R^2 = .29) and much more for the 10th than the 12th grade.⁵

Testing Hypothesis 4a

Figures 7 and 8 also provide the primary information to test hypothesis 4a: the layers of social reality will be sufficiently different in their levels of association to justify maintaining the conceptual distinctions between layers.

While all four layers of social reality have unique significant influences on the PASUT for all grades combined both when all substances and when drugs only were considered, hypothesis 4a is less consistently supported when respondents were grouped by grade. Indeed, the multiple regression outcomes by grade very clearly fail to support

⁵ Comparisons of the relative strengths of relationships among the layers of social reality and the PASUT by grade will be made while testing hypothesis 5.

hypothesis 4a with regard to the demographic/structural layer of social reality. It is only in the 10th grade, when all substances were considered, in which the causal influence of the demographic/structural layer reaches a significance at $\alpha=.05$. Even where the demographic/structural layer is significant its strength of relationship to the PASUT is weak: beta weights ranging from $-.021$ to $-.028$. Additionally, when the demographic/structural layer's influence on the other layers of social reality are taken in to consideration, the same weak relationships are found even if this layer has a significant influence (data are not shown). The significant beta weights of the demographic/structural layer's influence on the other layers of social reality range from a low of $.017$ and a high of $.098$. The demographic/structural layers relationships are strongest with the social context layer and it may be that the demographic/structural layer should be incorporated within it. Another possibility is that the variables included are not the most suitable nor sufficiently comprehensive to adequately represent the layer of social reality. For example, parents education only approximates socioeconomic status rather roughly. The inclusion of a more adequate measure of socioeconomic status might improve the predictive power of the demographic/structural layer. Nevertheless, it is clear in this

research that the demographic/structural layer of social reality has not shown sufficient influence to remain a conceptually distinct part of the MSASUM. However, if a failure for a layer of social reality to remain a distinct predictive component of the model was to be predicted it would be the demographic/structural layer given its distalness to the PASUT.

The only other point at which one of the layers of social reality fails to have a unique significant influence on the PASUT is the social context layer in the 12th grade, when all substances and when drugs only were considered. Since the social context layer is significant for 8th graders and 10th graders (in addition to all grades combined) and that the influence of this layer is strongest in the 8th grade, weaker in the 10th and nonsignificant in the 12th (the relative strength of the beta weights following the pattern predicted by hypothesis 5), the nonsignificance of the social context layer in the 12th grade does not undermine the importance of this layer of social reality. Instead it simply point to how the influences on patterns of adolescent substance use change over the course of development into adults.

Testing Hypothesis 5

Testing hypothesis 5 constitutes the quasi-longitudi-

nal component of this research stating that: each layer of social reality's relative relationship to the patterns of substance use will vary by grade of respondent - the more proximal the layer the stronger the relative relationship will become as grade level increases; the more distal the layer the weaker the relative relationship will become as grade level increases.

To test this hypothesis, data from both the 1989-90 and 1991-92 survey administrations in the 40 school districts selected for this research are used. This analysis proceeds by comparing the same cohorts as 1989-90 8th graders and as 10th graders in 1991-92. Likewise, the same cohorts as 1989-90 10th graders and as 12th graders in 1991-92 are also compared.

Figures 9 and 10 present the direct effects beta weights by which to make comparisons of these cohorts over grade level when alcohol, cigarettes and drugs were considered in the PASUT. Comparing the same cohorts as 8th and 10th graders, reveals only partial support for hypothesis 5. Contrary to expectations the demographic/structural layer increases its causal influence from nonsignificance in the 8th grade to weak significance in the 10th. While the relationships to the PASUT of the social context layer weakens and that of the attitudinal layer strengthens as is anticipated from hypothesis 5, the relationship between

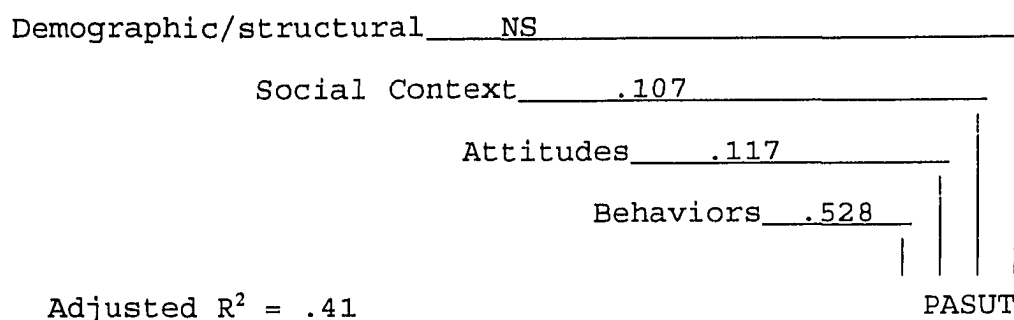
8th Grade: 1989-90 Sample

Figure 9. Quasi-longitudinal Comparison of 8th to 10th Grade Changes in the Layers of Social Reality as Distal to Proximal for the PASUT Considering Drugs, Alcohol and Cigarettes.

behavioral layer and the PASUT weakens which is not as expected. Comparing the same cohorts as 10th graders in 1989-90 and 12th graders in 1991-92 similar mixed results are found. While the demographic/structural layer's relationship to the PASUT weakens and the attitudinal layer's relationship PASUT strengthens as expected, contrary to hypothesis 5, the social context layer's relationship to the PASUT increases and the behavioral

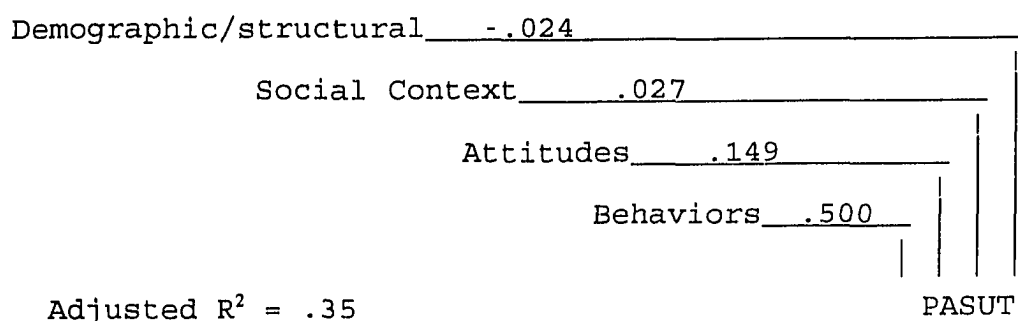
10th Grade: 1989-90 Sample

Figure 10. Quasi-longitudinal Comparison of 10th to 12th Grade Changes in the Layers of Social Reality as Distal to Proximal for the PASUT Considering Drugs, Alcohol and Cigarette.

layer's relationship weakens to the point that its beta weight is actually smaller than the attitudinal layer.

Figures 11 and 12 present the direct effects beta weights by which to make comparisons of these cohorts over grade level when drugs only were considered in the PASUT. The comparisons of the same cohorts as 1989-90 8th and 1991-92 10th graders as well as the same cohorts as 1989-90 10th and 1991-92 12th graders consistently show the social

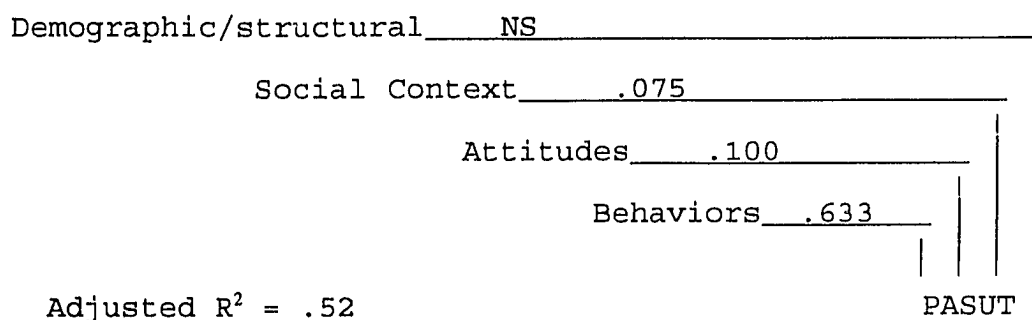
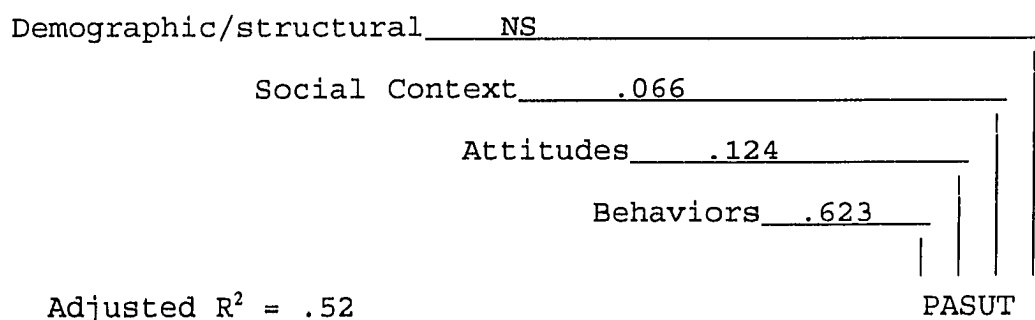
8th Grade: 1989-90 Sample10th Grade: 1991-92 Sample

Figure 11. Quasi-longitudinal Comparison of 8th to 10th Grade Changes in the Layers of Social Reality as Distal to Proximal for the PASUT Considering Drugs Only.

context layer's relationships to the PASUT weakening as grade level increases and the attitudinal layer's relationships increasing: both as expected. However, the behavioral layer's relationships show a decrease in strength as grade level increases; both in the 1989-90 8th to 1991-92 10th and the 1989-90 10th to 1991-92 12th comparisons.

The conclusion to be drawn from these comparisons as a whole is that hypothesis 5 is only partially supported.

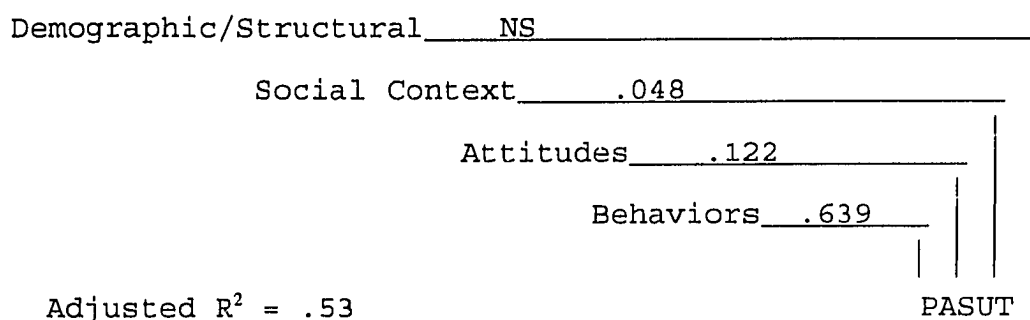
10th Grade: 1989-90 Sample

Figure 12. Quasi-longitudinal Comparison of 10th to 12th Grade Changes in the Layers of Social Reality as Distal to Proximal for the PASUT Considering Drugs Only.

The most interesting finding is that while, in all but one multiple regression analysis (1991-92 12th graders - all substances), the behavioral layer has the strongest relationship to the PASUT its influence declines as gradelevel increases. In contrast the attitudinal layer's relationship to the PASUT consistently increases as grade level increase: even superseding the behavioral layer in 1991-92 12th graders when all substance were considered.

If this trend continues into adulthood it is entirely possible that the attitudes one has relevant to substance use may be a stronger factor than the behaviors that are related to patterns of use. This possibility is beyond the scope of this research but one that is etiologically important to pursue in subsequent research.

Summation of Findings

Figure 14 presents the five hypotheses tested in this research and the general findings regarding each (see Figure 14). It will be remembered that the first two hypotheses concern the Patterns of Substance Use Typology. Testing hypotheses 1 and 2 assesses how well the PASUT captures the complex patterns of adolescent substance use in a theoretically meaningful way. In short, the PASUT works very well; it correctly and exclusively fits the vast majority of respondents into one of its categories, and as would be expected, shows an increasing level of involvement/complexity in patterns of use as grade level increases.

Testing hypotheses 3, 4, 4a and 5 assess how well different dimensions of the Multidimensional Sociogenic Adolescent Substance Use Model predict patterns of adolescent substance use in a theoretically meaningful way (see Figure 13). The testing of hypothesis 3 assesses the

topically distal to proximal dimension of the MSASUM and shows that the arrangement of variables within each layer only partially reflects the relationships of the independent variables to the PASUT actually found in the analysis, though the degree of success varies among the layers of social reality. Hypotheses 4 and 4a concern the layers of social reality as distal to proximal (demographic/structural, social context, attitudes and behaviors). Testing these hypotheses shows that the actual strength of relationships between the layers of social reality and the PASUT match the distal to proximal arrangement of these layers in the MSASUM (except for the 12th grade when all substances were considered) and that the conceptual distinction of these layers of social reality reflects the actual unique predictive contributions of these layers, with the exception of the demographic/structural layer in most of the analyses. In hypothesis 5 the predicted changes in the relative predictive power of the layers of social reality as grade level increased were tested. The prediction that the more proximal the layer the stronger the relationship will become, while the more distal the weaker the relationship will become as grade level increases, was only partially supported.

Hypothesis 1. The patterns of adolescent substance use typology will correctly and exclusively fit the vast majority of respondents into one of the seven patterns.

Finding: 93.0% - 96.4% of sample fit a pattern in PASUT

Hypothesis 2. The distribution of patterns of substance use will vary by grade and that variation will show an increasing level of involvement/complexity in patterns of use from the eighth to the tenth to the twelfth grade.

Finding: of the 28 comparisons made, only 3 exceptions

Hypothesis 3. The variables within each layer of social reality will vary in the strength of their relationship to the patterns of substance use according to their level of proximalness as shown in the model - the more proximal the stronger the relationship.

Finding: Demo/struct. (near linear but inverse), Soc. context & Att. (general trend as predicted), Behavioral (all substances, random; drugs only , general trend as predicted)

Hypothesis 4. The different layers of social reality's absolute strength of relationship to the patterns of substance use will vary according to their level of proximalness - demographic/structural layer having the weakest influence, then the social context layer, the attitudinal layer and the behavioral layer having the strongest relationship.

Finding: of the 8 analyses only one exception

Hypothesis 4a. The layers of social reality will be sufficiently different in their levels of association to justify maintaining the conceptual distinctions among layers.

Finding: of the 4 layers only the demographic/ structural failed to remain distinct

Hypothesis 5. Each layer of social reality's relative relationship to patterns of substance use will vary by grade of respondent - the more proximal the layer the stronger the relative relationship will become as grade level increases; the more distal the layer the weaker the relative relationship will become as grade level increases.

Finding: 7 of 12 cohort comparisons were supportive

Figure 13. Summary of Hypothesis Tests.

CHAPTER V

CONCLUSIONS FROM THE ANALYSIS OF THE PASUT AND MSASUM

Cautions and Limitations

Before presenting the conclusions, some of the limitations of this research and the cautions made necessary by them need to be addressed. The limitations of this research stem from the secondary use of Michigan Alcohol and Other Drugs School Survey data. The most general and most problematic limitation of this research is the restriction of variables to those contained in the Michigan Alcohol and Other Drug School Survey questionnaire. While the use of this data provides a more comprehensive set of variables than is typical for adolescent substance use research and is highly comparable to the Monitoring the Future studies (Johnston et al., 1991a), one of the most important on going national studies of adolescent substance use, this research probes theoretical questions which are not anticipated by either the Michigan Alcohol and Other Drugs School Survey or the Monitoring the Future studies on which it is based. As a consequence, the number of demographic/structural variables is at best limited. Having a true measure of socioeconomic status (rather than

Father's/Mother's Education), including region of the country, and adding other cultural factors would have provided for a better assessment of the demographic /structural layer. Additionally, any information about the family and family life of the adolescent is missing from the social context, attitudes and behavioral layers of social reality. Given the important role of the family has in adolescents' social worlds the lack of measurements in this area is an unfortunate and serious limitation of this research. With the exclusion of important social phenomena from the analyses, the research undertaken here is a conservative assessment of the sociogenic perspective and consequently the degree to which the findings support the perspective is all the more noteworthy.

Somewhat less problematic than the limitation of variables is the partial measurement of the longitudinal component of this research. Because the Michigan Alcohol and Other Drugs School Survey provides complete anonymity to all participants, there is no way in which to associate individuals' responses over repeated questionnaire administrations. As a result, only quasi-longitudinal analysis was possible; comparing the same cohorts over a two year period of time. Since the unit of analysis for the measurement of all the variables was the individual respondent, hypotheses about longitudinality should have

been tested using the same level of analysis. Instead, owing to this limitation, the unit of analysis was each entire grade.

While these limitations upon the research require that some caution be exercised in drawing and accepting conclusions from this research, the strengths of the research more than out weight them. Thus the findings and conclusions drawn from this research remain productive and important insights into the patterns of adolescent substance use and the etiology of those patterns.

What Has Gone Before

Currently the subfield of adolescent substance use tends toward the simplistic: both in terms of research and theory. Given the subfield's applied approach to this putative social problem, much of the research focuses on a very specific aspect of adolescent substance use, a particular drug or evaluating a particular program which increases the idiosyncratic character of relationships tested, results found and public policy implications derived. At the theoretical level, most of the etiological theories - including the dominant problem behavior and gateway models - assume that any and all adolescent substance use is pathological. Not only is this a faulty assumption, given the empirical evidence to the contrary

(Johnston et al., 1991b, p. 6), but assuming that adolescent substance use is or denotes illness or deviance promotes a proclivity toward individualistic psychological and/or behavioral explanations. It is not that these theories and researches in the subfield are invalid but rather that they are too limited to provide empirical comprehensiveness, theoretical coherence and policy guidance.

What is needed (and here attempted) is an approach which recognizes that adolescent substance use behavior is the culmination of, and the etiology of that behavior is set within, a variegated and complex web of social realities; seeing adolescent substance use as behaviors which exhibit patterns and variations across individuals and within individuals, reflecting different behavioral complexes and decisions made about them over time which are causally influenced by the processual web of social existence. In short, a sociogenic approach to the use behavior itself and its causal influences is required for comprehensive research and coherent theory (Glassner & Loughlin, 1987).

In this research I have attempted to further the development of such a sociogenic approach in two ways. First, this research used and advanced the further development and assessment of the Patterns of Adolescent Substance

Use Typology (PASUT) as characterizing the complex patterns of substance use behavior on a continuum of increasing levels of involvement/complexity, and particularly doing so over time - if quasi-longitudinally. Second, in this research the Multidimensional Sociogenic Adolescent Substance Use Model (MSASUM) was developed and tested.

The usefulness of these sociogenic approaches were discussed in detail in the previous chapter. In general however, the PASUT characterized the complex patterns of adolescent substance use very well. Likewise, the change over time (increasing grade level) of the distribution of respondents expressing one of the seven patterns of use was almost exclusively as predicted. The only modification to the PASUT that could be suggested from this research is to eliminate reconsiderers and switchers from the PASUT since so few respondents of this age fit one of these patterns. However, the reconsiderer and switcher patterns of use provide a conceptual continuity to the construct of the PASUT and a potentially useful analysis of older populations which should not be dismissed lightly. Thus, as a broadly applicable typology, no modifications of the PASUT are indicated from this research. In contrast, some dimensions or aspects of the MSASUM corresponded to the results of the analysis, while other dimensions or aspects of the model did not. Thus a reformulation of the MSASUM

in light of these results is necessary.

Reformulation of the MSASUM

It will be remembered from Chapter IV that the results showing weakest support for the MSASUM as originally conceived were the topically distal to proximal dimension and the unique contribution of the demographic/structural layer of social reality. Figure 14 revisits the original MSASUM and Figure 15 shows the modification to the MSASUM indicated by the results of the overall analysis.⁶

The most obvious and general revision of the MSASUM is the removal of the demographic/structural layer of social reality and the incorporation of those variables into the social context layer (see Figure 15). The removal of this layer from the model is based on the lack of significant relationships between the demographic/structural layer, as a unique variable, and the PASUT in most of the analyses. These variables, however, did have significant relationships to the PASUT when the analyses of the topically

⁶It should be noted, however, that the specific placement of variables as topically distal to proximal within the layers is derived from the results for all of the grades combined when all substances were considered in the PASUT. While it is recognized that using the results of the all grades combined when all substances were considered glosses over both grade differences and differences by substances considered (though pronounced only in the behaviors layer), it is necessary at this point to present a general case model in order to discuss the conceptual model's reformulation.

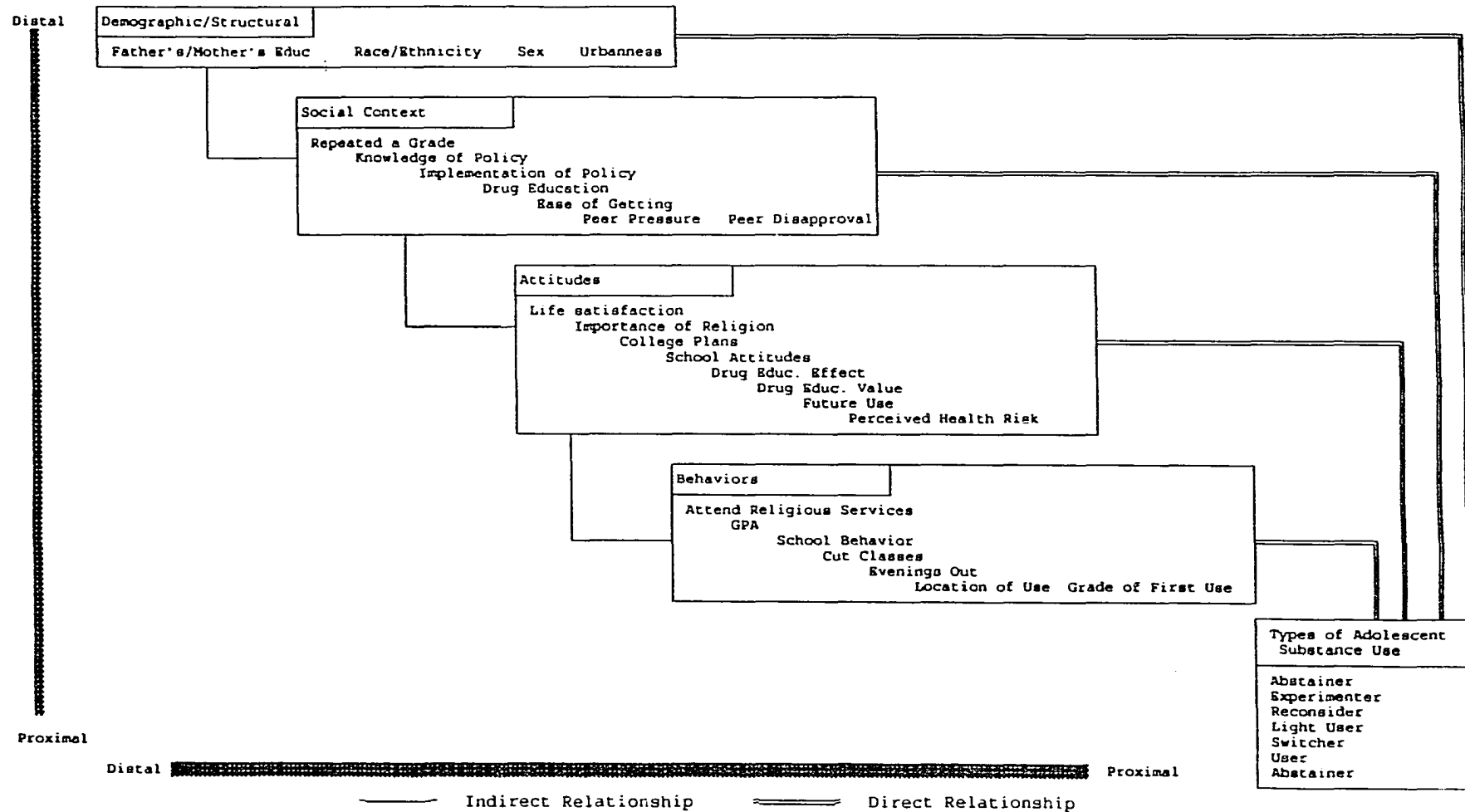


Figure 14. The Multidimensional Sociogenic Adolescent Substance Use Model Revisited.

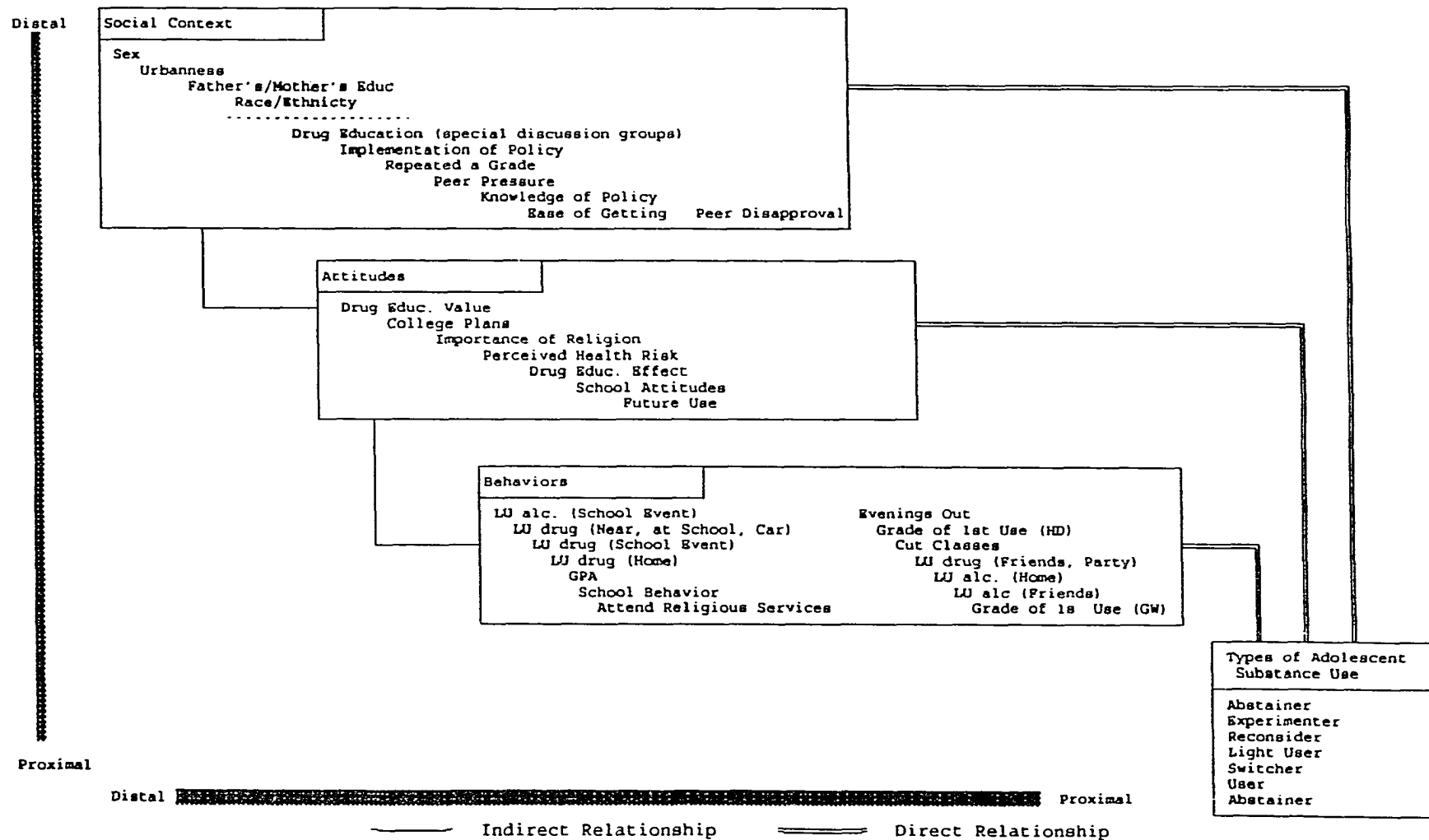


Figure 15. A Multidimensional Sociogenic Adolescent Substance Use Model Revised.

distal to proximal dimension were conducted. Additionally, the demographic/structural layer did have significant, if relatively small, relationships with the social context layer in most of the regression analyses. Consequently, rather than lose the predictive power they do contain, the variables Sex, Urbanness, Father's/Mother's Education and Race/Ethnicity are incorporated as the most distal variables within the social context layer.

While this modification to the MSASUM is empirically based, it also makes theoretical sense. Both layers were conceptualized as setting parameters (patterns of kinds of encounters one will have with society or more specific constraints and opportunities) within which individuals develop attitudes and behave. The rationale for distinguishing between the demographic/structural and the social contextual layers of social reality within the overall web of social influences was the degree to which each constituted directly experienced structure of society. The distinction made, seems to be of less heuristic use than was original thought. However, by retaining Sex, Urbanness, Father's/Mother's Education and Race/Ethnicity as the most distal variables of the social context layer the reformulated MSASUM maintains an, albeit less distinctive, theoretical continuum of directly experienced and individual manifestations of social structures or parameters while

grouping theoretically similar kinds of social phenomena together. Thus, the social context layer of social reality more broadly represents all of the societal level influences on behavior.

The other general revision to the MSASUM is the reordering of variables within each layer of social reality from the topically distal to proximal dimension proposed to the relative strength of predictive relationship between each variable and the PASUT actually found. Eschewing the level of specificity of the findings chapter, there are several important observations to be made within the three layers remaining in the model.

First, it should be noted that only one variable (life satisfaction) is completely eliminated from the model. While this may seem a little surprising and relatively unimportant, it is neither. The variable life satisfaction provides a measure of overall happiness with one's life. Its' lack of significance indicates that whether one is very happy or very unhappy with one's life is of no importance in explaining patterns of adolescent substance use. That is, as would be expected from the sociogenic perspective, neither an assumption of health and happiness nor pathology and distress is necessary to explain substance use patterns -- rather, social influences and personal choices made within one's social world are the

significant and necessary explanatory factors.

For several other general variables, such as drug education and location of use, some specific forms of them were also eliminated from the model (drug education: special course, health course, regular course, and special event; location of use of alcohol at school and near school). However, other specific forms of drug education and location of use variables remain in the model; thus the general variable as a whole was not eliminated from the model.

Second, within the social context layer it is notable that while peer disapproval and ease of getting substances remain very proximal, peer pressure is much more distal and knowledge of school policy (in contrast to the perceived level of implementation of that policy) is much more proximal than initially conceived. Additionally, it is important to point out that within the drug education variable only special discussion groups remain as predictive of substance use patterns and then only as one of the more distal social context variables.

Third, within the attitudinal layer the most important revisions are the much greater distalness of perceived health risks and drug education value (despite the continued proximalness of drug education effect), and the much greater proximalness of school attitudes. Fourth, within

the behavioral layer it is interesting that the locations of use show two distinct clusters, one as the most distal and the other as the second most proximal. The cluster of locations of use variables which is most distal is primarily school oriented locations of substance use, whereas the more proximal cluster is oriented toward friends and home locations of alcohol use. Another notable revision in the model is the difference in topical distalness to proximalness of the grade of first use of "gateway drugs" and that of "hard drugs". However, when drugs only are considered the grade of first use of "hard drugs" is second in proximalness only to grade of first use of "gateway drugs." An additional revision of topical distalness to proximalness is the change of placement of cutting classes from mid-range proximalness in the original MSASUM to a position as one of the more proximal variables.

While the findings-driven reformulation of the MSASUM is important, the most important task is to make theoretical sense of these empirically based changes. However, before the theoretical meaning of the findings of this research can be draw together, findings additional to the specific tests of the hypotheses regarding the MSASUM must be reviewed. It will be remembered that for each hypothesis tested, serendipitous findings were made. These additional findings should be synthesized into those of the

specific hypotheses in order to fully utilize the complexity of this research and more fully address a sociogenic perspective of substance use.

Beyond Hypotheses Testing

In addition to providing tests of the hypotheses in this research, the analyses conducted provide additional information on the PASUT, the MSASUM, their use and adolescent substance use more generally. In this section I will discuss only the most important additional findings in a general way: as a detailed account of these findings can be found in the findings chapter.

Implications of Substances Considered

The analyses for hypotheses 1 and 2 not only assess the usefulness of the PASUT but likewise indicate the importance of distinguishing between cigarettes and alcohol as apposed to other drugs which are illicit in this country not only for adolescents but also for adults. The difference in the distribution of adolescents among the seven patterns of use when all substances (including cigarettes and alcohol) compared to when drugs only were considered is substantial. Almost 90% of adolescents of all grades expressed a pattern of use other than abstinence when all substances considered. In contrast, when drugs only were

considered, only about 50% of the adolescents expressed a pattern of use other than abstinence and the more involved/complex patterns of use (light user, user and accumulator) are expressed much less frequently. This indicates not only the ubiquity of cigarette and alcohol use among adolescents but also the key role that their use plays in patterns of use which express more involvement in the use of substances. This would seem to provide further, if indirect, support for the designation of cigarettes and alcohol as gateway substances and the need for the careful specification of which drugs are considered when research is conducted on substance use and abuse. Additionally, these findings further indicate that adolescents do not form attitudes and behave in a social vacuum but are cognizant of and act upon the special legal, and adult, status given to the use of cigarettes and alcohol in our society. These findings also seem to attest to the influence of culturally defined adult behavior and the availability on the substance chosen for use.

Despite the differences found in the distribution of adolescents into different patterns of use as discussed above, one of the most general findings of the distal to proximal dimension of the MSASUM (hypothesis 3) is the similarity of relationships between the variables within each layer (except for the behavioral layer) and the PASUT

both when all substance were considered and when drugs only were considered. This leads to two important observations. First, despite the large difference in the distribution of respondents among the seven patterns of use when alcohol, cigarettes and other drugs were considered compared to when drugs only were considered, the variables which constitute the reformulated social context and attitudinal layers of social reality are generally consistent in their relative prediction of patterns of use regardless of the substances considered to establish the patterns. Second, in contrast to this consistency of the variables in the social context and attitudinal layers the variables that remain in the behavioral layer and the relative strength of their relationships to the PASUT vary to a moderate extent. In short, the variables within the behavioral layer appear to be more sensitive to the particular substances considered in establishing the pattern of use. These findings fit with the general conceptualization of the layers of social reality as distal to proximal. The more distal the layers the greater the degree to which their causal influence take on the characteristics of general parameters within which behavior antecedent to and the behavior of interest itself (in this case substance use) are specifically acted out. The general consistency of relative strength of relationship between the variables in the social context and

attitudinal layer and the sensitivity of variables in the behavioral layer to the substances considered are consistent with the broader conceptualization of the social world as composed of relatively more distal to proximal layers of social reality.

Implications of Differences by Grade

Another, general finding is that the relative prediction of substance use patterns by the independent variables within the layers of social reality show differences by grade which can be loosely associated with developmental differences through the adolescence. Not surprisingly, where changes in the relative prediction of substance use patterns by particular independent variables occurs, the trend seems to be toward a reduction in family and small group influence to, at the same time, more individual and broad social expectations. The relative predictive strength of father's/mother's education, peer pressure, drug education, drug education effects all decrease as grade level increases while that of sex, knowledge and implementation of school policy increases. While the importance of ones parent's education, the pressure that peers may create to use substances and the school's attempt to formulate opinions of substance use for the adolescent all lessen in importance, the male role of risk-taking and

the female role of social conformity and the direct attempts at social control through policy and implementation increase seems to show a shift from local to broader social expectations and individual responsibility to those broader expectations.

Predictive Power of the Model

Beyond assessing the layers of social reality as distal to proximal and the relative changes of the contribution of the different layers, some findings additional to hypothesis 4, 4a and 5 were found. Particularly, while the amount of variance in the PASUT explained by the MSASUM (or the adjusted R^2 s) is not necessary to test the layers as distal to proximal dimension of the model such measurements are important in gauging the overall usefulness of the model. Considering all of the multiple regressions (all grades combined and each grade both when all substances and only drugs were considered for both the 1989-90 and 1991-92 samples) the MSASUM explains 29 to 55 percent of the variance in the PASUT: very respectable amounts for social science models. Two observations should be made about the adjusted R^2 results. First, the size of the adjusted R^2 s vary by grade level. When all substance are considered the amounts of variance explained by the model decreases as grade level increases, while when drugs only were consid-

ered the amounts of variance explained increases as grade level increases. Second, it seems reasonable to suspect that the large adjusted R^2 s obtained (.52 to .55) when drugs only were considered are partially the result of the skewed distribution of respondents in expressed patterns of use. An approximal analog of this skewed distribution can be seen in the all substances considered analyses. Consequently, even if the drugs only distribution of the PASUT was altered it is very unlikely that the new measurements would be reduced below that of the majority of all substances considered analysis. Since the majority of all substances considered measurements resulted in a .35 adjusted R^2 (or better), the predictive power of the model would remain substantial.

With a review of the hypothesis related findings, the reformulation of the MSASUM and a discussion of findings beyond the specific test of the hypotheses now completed, I can move to the task of drawing the findings and implications of this research together in order to formulate an adolescent substance use theory.

A Theoretical Integration

Sociogenesis as a Paradigm

In large part this research is a quantitative empirical assessment of a paradigm. The sociogenic perspective

of Glassner and Loughlin (1987) is viewed as a paradigm for adolescent substance use in that it provides a set of basic propositions or "a fundamental image of the subject matter" (Ritzer 1991, pg. 508) which, if accepted, tell us where to look and what to look at, for the explanation of adolescent substance use. Most fundamental to this sociogenic paradigm of adolescent substance use is the perspective that substance use constitutes neither pathology nor health but is a normal cultural segment of social activity in our society. Adolescent substance use is first and foremost, simply a social behavior not unlike many others. As a result, at the paradigmatic level, the sociogenic perspective takes a general view of what causes a particular type of behavior among a certain population; that is, substance use among adolescents is the result of a the processual interaction between a complex of social phenomena and the individual.

This explanatory framework forms the guideposts with which the quantitative empirical models in this research were developed and the assessments of them made. Consequently, it is not surprising that these premises also constitute the foundations and the interrelation between the two theories to be derived from what has been done hitherto: a way of viewing substance use behavior and the causes of that behavior.

About Substance Use

A theory addressing any phenomenon must provide a conceptual framework that encompasses what is empirically known if it is to advance understanding. This and other researches have clearly demonstrated that substance use by adolescents is nearly universal in contemporary U.S. society. Consequently, substance use is broader than any notion, or measured extent, of pathology (unless 90% or more of this sample and U.S. adolescents generally suffer from some mental or physical illness, or are juvenile delinquents) (see Tables 1 and 2 pages 71 and 72 in this work or Johnston et al. 1991a). Similarly, the assumption of health can not be ubiquitously supported. Rather, substance use is a broader social phenomenon; it is an available cultural trait about which adolescents make decisions, ranging from the conscious to the ready acceptance of group patterns. Substance use behavior, as a cultural trait, is usefully thought of in several forms: (a) abstinence, (b) experimentation, (c) reconsideration, (d) switching, (e) light use, (f) use, and (g) accumulation. These forms are supported empirical patterns, but also represent a specific conceptualization of use as a continuum varying by level of involvement with substance use activity. With this conceptualization, the notion of adolescent substance use shifts from being conceptualized

as the expression of individual wickedness, weakness or deficiency that exists until "cured", to a more involved approach in which there are different patterns of use that individuals develop as repertoires of behavior and which are subject to revision over time.

Adoption of the pathology label by researchers and theorists in this area seems to be a result of adult society's discomfort with adolescents emulation of many of our culture's adult defined behaviors. Indeed, the typology of substance use patterns developed and extended in this research and the distribution of adolescents among the different patterns suggest that in their use behavior, adolescents, in large part, attempt to emulate aspects of the adult social world for which they are in general, preparing and being prepared for.

In particular this emulation seems to take the form of relatively high levels of involvement with the use of alcohol and cigarettes. Throughout this research patterns of substance use have been considered both including and excluding alcohol and cigarettes. This separation also corresponds to the inclusion or exclusion of the recreational drugs which are legal for adults in the U.S.. The use of these substances is not only ubiquitous among adolescents but also forms the mainstay of the degree of general involvement with substance use. In short, the

general cultural traits for the accepted use of alcohol, particularly, and cigarettes is more than evident as part of adolescent substance use. Additionally, as one would suspect if this emulation proposition is correct, the level of involvement with the use of these substances increases as adolescent approach adulthood.

Adolescent substance use is then, a patterned repertoire of behaviors expressing a cultural trait in an age specific context, which is largely endemic to our substance using culture.

An Explanation of Adolescent Substance Use Behavior

An etiological framework for adolescent substance use requires two levels of explanation. Since the object of the theorizing is the explanation of a set of behaviors characterizing a general cultural trait, a general approach to behavior must be set forth. At the same time, the effort here is to explain the diverse behavioral repertoires or specific forms of a general cultural trait and therefore the most influential antecedent social phenomena must be situated within the general explanation of behavior.

Behavior as Sociogenic: The Social World Concept

Social behavior is the action of individuals set

within and is a part of the ongoing process of one's social world. A social world is an individual phenomenon; it is society and self as experienced in the actions and interactions of individuals within a sociohistoric context. An individual's social world encompasses the complex web of interacting social realities in which the individual takes part and is influenced by. Reflecting the structure of society, one's social world is composed of three components: (1) the broad social and cultural structures which set general parameters and more specific sets of institutional and subcultural/peer based constraints and opportunities for behavior, (2) the psychological or mental environment of attitudes which develop in interaction with society and form the proneness toward particular behavior, and (3) the behavioral history of the individual: the repertoire of previous goal-oriented actions.

Though represented linearly in the structure of the MSASUM, as a process, the relationships among these components of the social world can be seen as a set of soft-sided containers: one inside another, which, at the innermost point is a particular behavior. Each container influences the context and participation in the next by constraining or directing action more or less specifically - the innermost container (behavioral history) having the greatest influence, then the attitudinal container and

finally the social contextual or societal container. These components of an individuals social world are represented here as soft-sided to illustrate that they are subject to change in form, based on changes in other components of the social world and an individual's actions. In terms of individual action, the amount of influence specific behavior has on changing the form or shape of the containers decreases as one moves from behavioral history to the sociocultural context. That is, the social world is effected by the choices acted out by individuals, though the greatest effect is made on an individual's behavioral history, then attitudes and least of all on the broader social context. The social world is supported or maintained by action that fits well within previous behavior, matches attitudes already held, and is supported by social contextual parameters. One's social world is altered by changes in the sociocultural structure of society that is experienced, when attitudes alter to match change in either the social context or behavioral history, and by behaviors that do not fit the defined behavioral history.

It is within this complex of the relatively distal to proximal social and individual influences that decisions are made and behavior is acted out by human beings. Though much of the social world influences each behavior, even if very diffusely and indirectly, only particular aspects of

each of these components of an individual's social world are most relevant to (i.e. influential upon) particular types of behavior. Thus within this broad conceptualization of individual behavior as sociogenic, the elements of each component of adolescent social worlds and their interrelationships must be proposed as theory.

The Adolescent Social World and Substance Use

Though social worlds are individual, those who share in a particular experience of society thereby have a similarity of social worlds. In this research the primary similarity of the social worlds of the subjects is that of adolescence; a specific culturally defined stage with its own special attributes. Being an "adolescent" is a primary shaper of "society as experienced". The stage itself is a process of becoming less like a child and more like an adult; a socialization process, which at the same time, demands an increasing adult-like independence while being constrained by an adolescent status. At the most general level adolescent substance use is, as mentioned earlier, the adoption (if in uniquely adolescent ways) of a general trait in our substance using culture -- it is an emulation of adult society, a part of being socialized in our culture.

The socialization of a general cultural trait in

adolescence is only the most general of answers to the most general of questions: what "causes" adolescent substance use? As has been discussed earlier, since almost all adolescents use or have used substances this general question and its general answer only begin to address adolescent substance use. What is more interesting, difficult and useful is addressing the question; what influences the level of involvement or pattern of substance use behaviors of adolescents - what aspects of the adolescent social world are most influential?

The adolescent social world is most broadly defined by the social context which they experience and act within. Most generally, this context is defined by adolescentness - meaning not only the cultural expectations of development and socialization into an adult but also more structurally as a social world set within the parameters of family, peers and educational institutions. As a general cultural trait, substance use by adolescents most broadly begins within this context. In addition to the cultural emulation proposition discussed earlier, the most influential social phenomena at this level fit within two general descriptors: adolescent social structure and subculture. Structurally it is the availability of substances, increasing importance and extent of peer group interaction, and the knowledge of the educational institutions' prohibitions which begin to

shape substance use behavior. Additionally, though evidenced as school attitude in the attitudinal layer of the MSASUM, the degree of like or dislike for the experience of school is more than an attitude. It is expressive of a structural element in adolescent social worlds, the degree of social cohesion with or integration into the dominant social institution of these worlds. In contrast to adolescent culture and adult culture, which is the source of the emulation of substance use, integration into the educational institution provides the "official" norms for adolescent - neither the peer driven nor of the adult social world - which requires abstinence. At the same time that adolescents are effected by these experienced structures they are deeply involved in a peer driven and oriented culture which has norms of action specifically regarding substance use behavior of its own. These peer driven norms encourage and prohibit the use of particular substances in particular ways through social rewards and punishments.

It is within the milieu of adolescent structures and culture that attitudes are developed and, in turn, provide the decision making material for the actions of individuals in connection with their social world. At this level of the social world, the important elements are, with the exception of feelings of integration into the school

system, less explicitly social. Instead they are oriented toward individual perceptions of substance use and the substances themselves. Both perceived risks of use and interest in the effects of substance use are weighed in the determination of decisions to act. Much more heavily weighed however, is the combination of past experience (or the behavioral repertoire) with the current social context to formulate the intention to act. Behavioral intention and its importance to substance use patterns illustrates one aspect of the dynamic relationship between components of the social world. The historical behavioral repertoire of an individual is used within the attitudinal complex of the social world to formulate future action. Not only is this aspect of the attitudinal complex the most important at this level, but it connects directly to the influence that age of first use has on the patterns of use behavior.

Past behavior is the part of the adolescent's social world which most personalizes that social world (how one has behaved effecting one's environment) but it also establishes a history, which provides routines of action. It is in this sense that a behavioral repertoire not only makes it likely that when faced with a situation one will tend to behave as one has before in similar situations (or very differently should previous behavior had undesired consequences), but also sets the stage for behavior that is

relatively consistent with ones general behavioral history in new situations. Thus the age of initiation of substance use is very important in that use changes the behavioral repertoire. Substance use is no longer "new" but is a part of the individual's social world, attitudes about it are formed, the social context is selected, and, given a similar situation, future use is made more likely. The explanation of why this is so, not only bespeaks of past behavior as routines of action for current behavior but also of the connection between the success or failure of past behavior and attitudes/intentions to behave in a certain way. This connection expresses a pattern of behaviors which is integrated across layers of social existence. This pattern "works" for the individual in that it permits him/her to broadly function within the social world that exists as a result of his/her selection and happenstance.

However, it would be a mistake to look at behavior as purely an individual manifestation of the influences of other layers of the social world and past behavior. Rather, what is clear from this research (and much of the literature) is that substance use behavior is not a solitary activity but individual choices acted out in concert with other's actions. Initiation of use, use with friends (their house or party), cutting classes and number

of evenings per week spent outside the home for recreational activity are all adolescent group activities. Thus, while behavior is this process of individualizing one's environment based on specific choices made and behaviors acted out, as well as, building repertoires of behaviors; with regard to explaining patterns of adolescent substance use behavior explicitly, it is also a group- or peer-driven phenomenon which takes place outside social contexts controlled by adults.

Defining and explaining substance use as a general cultural trait, and substance use behavior as influenced generally by the individuals' social worlds and specifically by various social phenomena within the layers of these social worlds, presents both a theory of what substance use is and a theory of what the causal influences of use behaviors are. The remainder of the theoretical integration section provides further specification and some more speculative propositions based on the central theoretical themes derived from this research and presented above.

Propositions That Define a Social Worlds Theory of Adolescent Substance Use

What has been presented thus far is a theoretical discussion of adolescent substance use patterns derived from this research, as an assessment of the sociogenic paradigm particular to the process of socialization. What

remains to be specified is a set of interrelated propositions which define the social worlds theory of adolescent substance use, which are as follows:

1. Most generally adolescent substance use is the adoption (if in uniquely adolescent ways) of a general trait in our substance using culture -- it is an emulation of adult society, a part of being socialized in our culture. As such, neither pathology nor health (general happiness and adjustment nor unhappiness and lack of adjustment) explain these patterns of behavior.

Within this general socialization:

2. As structural availability of substances increases, integration into the educational institution (the dominant social institution which expresses "official" norms for adolescents) decreases, and the peer driven and oriented culture or norms of action fail to prohibit, and/or even promote, substance use, the social context of the social world is set for increases in levels of involvement with (or complexity of) patterns of substance use behavior.

3. Within the milieu of a drug using culture and specifically adolescent structures and culture; as interest in the effects of substance use increase, perceived health risks of use decreases, and the intention to use increases, the proneness toward making decisions that increase the

level of involvement with (or complexity of) patterns of substance use behavior will increase.

4. Conditioned by all of the above; the earlier substance use behavior is initiated into an individuals behavioral history, the more efforts to take part in peer governed social settings, and a increased history of substance use in those setting, the greater the level of involvement with (or complexity of) patterns of substance use behavior.

Speculation on a Developmental Perspective

In addition to these propositions a more speculative idea is encouraged by the longitudinal view taken in this research. While the behavioral layer of reality or component of the social world generally has the most influence on other behavior, the expectation that as this behavioral history grew in depth and complexity with regard to substance use as an adolescent grew older so too would the level of its relative influence, was not found comparing twelfth graders to tenth (though is was found comparing eighth to tenth graders). Two interrelated explanations for this finding are presented here. It may be that as one makes the transition from one life stage to another (as from child to adolescent and adolescent to adult for example) one is faced with an array of ways of performing

the new role and that during that transition time behaviors that one tries out are crucial to the development of the behavioral repertoire which will largely define how one will perform the role. Additionally, as one becomes set within a particular life stage, though the behavioral layer of the social world is still very influential, attitudes toward particular behaviors become habitual to a particular way of performing the role at that life stage. Behavior which had occurred some time ago and is not consistent with the now habituated attitudinal complex of an individual become less influential than the attitudinal complex and the behavior repertoire which is consistent with it. It may indeed be that the entire adolescent social world of individuals is subject to developmental changes which alter how society and the self are experienced. Clearly, though these explanations are stimulated by and congenial to this research, formal hypotheses can not be tested by it but await future research.

Social Worlds and Other Theories of Adolescent Substance Use

Before leaving the theoretical integration derived from this research, the relationship between the extant theories of adolescent substance use and the proposed social worlds theory must be discussed. It will be remembered that throughout explanation of the sociogenic

perspective and the development of the PASUT and the MSASUM it had been stressed that it was not that the extant theories were necessarily incorrect but rather that they were too limited. Not surprisingly then, three theories of adolescent substance use are evident as themes or components in the social worlds theory developed here.

Most predominantly, Jessor and Jessor's (1977) problem behavior model is represented in the general structure of the argument made here. That is, their recognition that different aspects of the society in which we live are, by category (social context, attitudes and behavior), distal to proximal in their influence on specific behavior. However, unlike the problem behavior model, the theory proposed here does not include substance use within a larger set of putative problem behaviors, does not ascribe problem or pathological attributes to all use behavior, and (partly as a consequence) does not focus on the personality system.

Aspects of Kendal's gateway model (1982) and Fishbein and Ajzen's behavioral intention theory (1975) were incorporated into the MSASUM from the beginning, have remained throughout the tests of the model and are now part of the social worlds theory. Particularly, the age of initiation of use (from the gateway model) is one of the most important explanations of current patterns of use as

it is the point at which substance use becomes part of an individual's repertoire of behaviors, which as part of the behavioral history influences the social environment of the individual, provides a routine of substance use actions to be used in similar (or even expanding kinds of) situations, and influences attitudes toward use. These attitudes, in the form of predicted future use, are in fact intentions for behavior (behavioral intention theory) which combine past behavior and experience (consequences of behavior) with current situations to formulate the intentions (or plans) for action. However, in the social worlds theory, the gateway and behavioral intention theories are first stripped of the assumption of pathology, the mystical and inevitable progression in the gateway model is eliminated, and then both are incorporated as only a part of the overall social world.

Generally, in addition to combining these theories, the social worlds theory posits a social context which sets parameters that make different types of use more or less likely, proposes and takes seriously the larger cultural background of individuals' social worlds in which substance use (particularly alcohol and cigarettes) is not only tolerated, but in many ways encouraged as an appropriate recreational behavior for adults, sees the topical relation between causal social phenomena as important, and strips

away the pathological assumption generally ascribed to substance use. Furthermore, as part of the social worlds theory of substance use, use behavior is conceptualized as complex patterns of behavior about which adolescents make decisions which both vary across individuals and within individuals across time. While partially based on the types of measurements of substance use which are typical of the adolescent substance use subfield (i.e. use and nonuse, and frequency of use), the Patterns of Substance Use Typology takes an important step forward in this subfield by expanding to include the number of substances used, and, most importantly, the patterns in which substances are used over time. The result of this kind of conceptualization and measurement is a theoretically meaningful continuum of categories of substance use expressing a gradation of levels of complexity and involvement with substance use and descriptive patterns which are empirically accurate. Thus the PASUT more fruitfully and accurately reflects the complex social behavior of substance use than is generally the case in the extant literature.

Future Research

The analyses and findings of this research suggest several directions for future investigations of adolescent and adult substance use. With the success of the Patterns

of Adolescent Substance Use Typology two areas of investigation are important. First, rather than the quasi-longitudinal analysis of this research, a true longitudinal analysis of the development and changes in patterns of use which tracks individuals at least through the adolescent years would likely improve our understanding the development and progression (where it exists) of complex patterns of substance use. Second, the use of this typology should be expanded to adult subjects to assess how universal this typology might be and to expand, and connect with a continuous flow of time and experience, the sociogenic perspective of substance use behavior to adults.

The weaknesses, strengths and findings from the Multidimensional Sociogenic Adolescent Substance Use Model also indicate the need for further research. First, an analysis with the reformulated MSASUM should be undertaken to assess how well it predicts substance use patterns and the relative relationships of the broadened social context layer's impact on the findings of this research. Second, a new analysis should be conducted which incorporates important variables not found in the Michigan Alcohol and Other Drug School Survey data, including family relationships as well as more and more accurate demographic /structural variables such as socioeconomic status. This analysis should first be done retaining the currently

integrated demographic/structural layer: the new and more accurate variables may increase the unique influences that this layer has on patterns of substance use and thus reinstate this layer as part of the MSASUM. As part of the first two future analyses, the variables within each layer should be entered individually and the relative influence of each variable compared to the stepwise outcome of the PSLR. This procedure would provide a check of conlinearity among the independent variables within a social layer, in addition to the correlation matrix approach used in the analyses done in this research, which might effect the stepwise entry order. Third, analyses specifically on the inter-relationships of the layers of social reality and the elements within them should be developed in order to further define and develop a quantitative sociogenic perspective on and the social worlds theory of adolescent substance use patterns proposed here: particularly focusing on the propositions stated earlier. It may also be useful to assess the possibilities for developing conceptual distinctions within the layers of social reality to introduce further specificity of understanding into the MSASUM. A cluster analysis of the variables within each layer would provide an empirical assessment of, or prompting for the development of, such within layer divisions. As with further research on the PASUT, a true longitudinal

analysis of the MSASUM's change over time and development of adolescents should also be undertaken. It is particularly important to incorporate the speculative propositions on life stage changes and the relative explanatory role of different layers of social reality into such longitudinal and inter-relationships of layers of reality research. Additionally, the relationship of the overall culture within which adolescent social worlds are set must not be forgotten. Future research is needed to provide more specific analyses of the effects of the general cultural trait of substance use and the differing forms it takes over time and in comparison with other cultures.

The perspective, theory and analyses developed in this research have furthered our understanding of substance use behavior and etiology of that behavior, developing research which follows the directions suggested here show a great deal of promise further developing the necessarily complex understanding of substance use behavior.

Implications for Application

The Traditional U.S. Approach

The implications of this research for application in "traditional" programs or public policy, particularly a heavy reliance on law enforcement and use of "drug education", designed to reduce or eliminate adolescent substance

use are not promising. The most causally influential layer of social reality, behaviors, is not very amenable to direct social control. In our society adolescents are given a certain amount of time, which increases with age, in which social situations are peer rather than adult directed. It is in these situations that individual choices regarding the use of substances are acted out. Once actions have been taken they become the elements most influential of subsequent behavior; this process is largely, though not entirely, beyond direct adult or institutional social control.

To effect patterns of substance use and the behaviors most influential of them, such as grade of first use, programs and public policy must rely on effecting more distal layers of social reality: attitudes, the social context and possibly the overall cultural perspective on substance use. Despite the inclusion of several drug education variables (five types of drug education, the value of that education and the effect of drug education) the findings of this research indicate that only one type of drug education (special discussion groups or "rap" groups) had a significant relationship to patterns of use which was fairly weak at that. The results of this research give a strong indication that the reason this type of drug education works at all is that it is peer oriented

and thus accesses the adolescent social worlds: influencing, if limitedly, the ongoing definitions of adolescent subculture whereas the other drug education attempts lay outside this peer driven definitional process. Likewise, the value of drug education experiences was significant but had a weak relationship to the patterns of use. The only drug education variable which had a significant and strong relationship to the patterns of use was to what degree the adolescents became more or less interested in substance use as a result of their drug education experiences.

This research suggests that programs and policies which use peers to provide a peer driven social context (effecting adolescent social world culture) such that substance use is disapproved of and peer pressure is low, in combination with a low availability of substances, and which stress integration of adolescents into school life, drug education that makes substance use less interesting and developing increased perceived health risk are those programs and policies which have a chance of effecting adolescent choices of patterns of substance use.

Another Direction for Adolescent Substance Use Policy

The findings of this research and the theories derived from them are more consistent with public policy perspective which seeks to reduce harm rather than eliminate

substance use per se, as in the traditional approach. The model for this application to adolescent substance use is the Repressive Tolerance Model developed in the Netherlands (Oppenheimer, 1991). In contrast to the self fulfilling pathology and deviance assumptions substance use policies in the U.S., which actively promote what seems to be the impossible goal of complete abstinence for all adolescents, the Netherlands' policy attempts to use our understanding of substance use as a cultural and social pattern of behavior. Rather than increasing the alienation between adolescent and adult social worlds, the Repressive Tolerance Model is an attempt to reintegrate the user into society which recognizes a distinction between substance use and substance dependency and uses the closer social integration of substance users with broader society to culturally control the level of substance use, lessen the likelihood of dependency and reduce the harm associated with extensive substance use (Oppenheimer, 1991).

As was stated in the discussion of the traditional U.S. approach, the most influential causal phenomena (the social behaviors of adolescents) are currently, in large measure, outside adult social control and thus little effected by current U.S. policies. Even most of our health and drug education attempts directed at the social contextual and attitudinal complexes of adolescent social world

do not make use of, or attempt to connect with, adolescents' peer driven and oriented social structure and subculture. Rather than pursuing substance use policy which forces adolescent to strictly hide any and all substance use from adult society, this research suggests that some tolerance be extended to adolescent substance use patterns which emulate broader social norms. As a consequence, adult society may have a closer and more credible connection to adolescent social worlds in order to influence the adolescent subcultural definitions of unacceptable and dangerous substance use patterns. It is not that adolescent substance use should be encouraged but rather that it should be anticipated and cultural steps taken to diffuse the potential for unchecked substance use and the physical, mental and social harm that such patterns of dependent use can bring about.

While it is unlikely that the Repressive Tolerance Model will hold much suasion in the current sociohistoric and political context in the U.S., the research findings are not only congenial with it but support it in an additional sociocultural context. At the same time this research suggests that the U.S. tradition of law enforcement repression and medicalization of this putative social problem are unlikely to significantly reduce the realized harm and harm potential of adolescent substance use.

Indeed, the values that promote traditional U.S. adolescent substance use policy may be part of and reflect the problems of adolescent substance use in this society.

Usefulness of the Research and Perspective:
A Sociology of Adolescent Substance Use

The usefulness of this research can be gauged by how well it met its objectives. As was mentioned in the section on model development, the Multidimensional Sociogenic Adolescent Substance Use Model is a first attempt to develop a quantitative sociogenic model of adolescent social worlds as they pertain to substance use. As an initial general scheme for a sociogenic perspective the MSASUM has worked remarkably well: three of the four layers of social reality (social context, attitudes and behaviors) have significant unique contributions to the explanation of adolescent substance use patterns, and these layers' relationship to the Patterns of Adolescent Substance Use Typology do follow the proposed distal to proximal dimension (with one exception out of eight analyses). Additionally, the MSASUM accounts for between 29 and 55 percent of the variance in the PASUT, much larger percents than that which is explained by many simpler models with simpler dependent variables (Robin & Johnson, 1991). While the topically distal to proximal dimension of the MSASUM had the weakest support, since the arrangement of variables

within each layer was largely drawn from existing literature in which simple use/nonuse or frequency of use is the dependent variable, it is not surprising that the findings from this literature would be only partially applicable to explaining a typology of use patterns such as the PASUT. Both the assessment of the Patterns of Adolescent Substance Use Typology as correctly and exclusively fitting 93.0% or more of subjects, other than those from which it was developed, and the predicted quasi-longitudinal change in patterns of use, qualify these tests of the PASUT as major successes. Further research based on the findings here is likely to provide a much more detailed and comprehensive etiological theory of adolescent substance use patterns to complement the comprehensive and necessarily complex treatment of substance use in the PASUT.

More broadly however, this research has developed a theoretical perspective which incorporates the extant findings and dominant theories of the adolescent substance use subfield into a model which attains success in representing the complex web of social realities that constitute adolescent social worlds. With the aims of comprehensiveness and coherence, the Multidimensional Sociogenic Adolescent Substance Use Model cracks apart the processual web of the social environment into relatively distal to proximal layers of social reality and within them, social

phenomena as topically distally to proximally related to substance use and then reintegrates them in theoretical etiological explanations. In addition to this more comprehensive, coherent and complex depiction of etiological influences, in the Patterns of Adolescent Substance Use Typology use behavior itself has been fruitfully conceptualized as complex patterns of substance use behavior in a continuum of level of involvement with and complexity of substance use.

At their root both the MSASUM and the PASUT are possible only by a moving away from the pathological assumptions that pervade the adolescent substance use subfield toward a sociology (or sociogenic perspective) of adolescent substance use. As has been discussed earlier the assumption that only a drug free existence is normal and thus any use of them is aberrant and pathological, not only flies in the face of the available empirical evidence but limits our understanding of adolescent substance use to a individualistic behavioral and/or psychological etiology, and deterministically tends to remove the element of choice. This perspective ignores much of the broader social phenomena which this research shows are important factors in the pattern of use which adolescents report, completely ignores substance use as a general cultural trait and tends to eliminate the active role individuals

have in creating their social worlds.

What has been argued for, developed and empirically supported in this research is an explicitly sociological perspective on adolescent substance use. As it has in other applied subfields, the sociological perspective allows us to take the empirical evidence on a putative social problem, eliminate the overly individualistic assumptions which are dominate in U.S. culture, and provide a better explanation of group and individual behavior by accounting for the social context in which humans live. Applying the adolescent social worlds paradigm of Glassner and Loughlin (1987) and unique social theorizing to a quantitative empirical model of the complex social and individual process of the etiology of complex patterns of behavior has resulted in a comprehensive and coherent social theory of adolescent substance use. The cultural trait and social worlds theories of adolescent substance use not only recognize, but draw together the etiological influence of behavioral, attitudinal, social contextual and broader cultural phenomena into the necessarily complex, interactive, and processual explanation of adolescent substance use while not forgetting the time and choice bound nature of behavior: an integration which can only be realized within a sociological framework.

Appendix A
Michigan Alcohol and Other Drug School Survey Instrument

MICHIGAN

ALCOHOL AND OTHER DRUGS SCHOOL SURVEY

This questionnaire was developed for use in secondary schools throughout the state of Michigan to help increase our understanding of a number of important behaviors of students--but in particular, their use of cigarettes, alcohol, and other drugs. It is designed to parallel closely the questionnaire used in the nationwide school surveys conducted each year by the University of Michigan.

This is not a test; the questions simply ask for your experiences and attitudes in a number of areas. It is important that you answer each question as thoughtfully and honestly as you can. If you have trouble understanding a question, raise your hand for assistance. If you do not always find an answer which fits exactly, use the one that comes closest. If a question does not apply to you, leave it blank.

This study is completely voluntary. Also, if there is any question that you or your parents would find objectionable for any reason, just leave it blank.

This questionnaire contains nothing which identifies you. Nobody ever knows who filled out any questionnaire. After you and your classmates complete your questionnaires, they will be taken directly to Western Michigan University where an optical scanner will be used to read the answers onto a computer tape for analysis. All results will be reported in group form--never for individuals or classrooms.

Other students have said that they have found this questionnaire interesting, and that they enjoy filling it out. We hope you will too.

MARKING INSTRUCTIONS

- USE A NO. 2 PENCIL ONLY.
- DARKEN THE CIRCLE COMPLETELY NEXT TO THE ANSWER YOU CHOOSE.
- ERASE CLEANLY ANY MARKS YOU WISH TO CHANGE.
- DO NOT MAKE ANY STRAY MARKS ON THIS FORM.



These kinds of markings
will work: ● ● ●

These kinds of markings
will NOT work: ◐ ◑ ✖



PART A

BEFORE BEGINNING BE SURE YOU READ THE INSTRUCTIONS ON THE COVER.

- 1 How happy are you with your life these days?

☐ 1 Very unhappy
☐ 2 Unhappy
☐ 3 Mixed feelings
☐ 4 Happy
☐ 5 Very happy

- 2 During a typical week, on how many evenings do you go out for fun and recreation? (Don't count things you do with your parents or other adult relatives.)

☐ 1 Less than one ☐ 3 Three
☐ 2 One ☐ 4 Four or five
☐ 3 Two ☐ 5 Six or seven

The next questions are about your experiences in school.

- 3 What is your grade level in school?

☐ 1 7th grade ☐ 2 10th grade
☐ 3 8th grade ☐ 4 11th grade
☐ 4 9th grade ☐ 5 12th grade

- 4 Now, thinking back over the past year in school, how often did you...

a. Enjoy being in school? 1 2 3 4 5
 b. Hate being in school? 1 2 3 4 5
 c. Try to do your best work in school? 1 2 3 4 5
 d. Find the school work too hard to understand? 1 2 3 4 5
 e. Fail to complete or turn in your assignments? 1 2 3 4 5
 f. Get sent to the office, or have to stay after school, because you misbehaved? 1 2 3 4 5

- 5 Which of the following best describes your average grade in the most recent grading period or semester?

☐ 1 A (93-100) ☐ 2 B (83-86) ☐ 3 C (73-76)
☐ 4 A- (90-92) ☐ 5 B- (80-82) ☐ 6 C- (70-72)
☐ 7 B+ (87-89) ☐ 8 C+ (77-79) ☐ 9 D (69 or below)

- 6 During the LAST FOUR WEEKS, how many whole days of school have you missed because you skipped or "cut"?

☐ 1 None ☐ 2 4 to 5 days
☐ 2 1 day ☐ 3 6 to 10 days
☐ 3 2 days ☐ 4 11 or more
☐ 4 3 days

- 7 Have you ever had to repeat a grade in school?

☐ 1 No ☐ 2 Yes

The next questions ask for your opinions on the effects of using certain drugs and other substances.

- 8 How much do you think people who do these things risk harming themselves (physically or in other ways): (Mark one circle for each line.)

- a Smoke one or more packs of cigarettes per day

No Risk Slight Risk Moderate Risk Great Risk Very Serious
 1 2 3 4 5

- b Use smokeless tobacco regularly (chewing tobacco, snuff, plug, dipping tobacco)

1 2 3 4 5

- c Try marijuana once or twice

1 2 3 4 5

- d Smoke marijuana occasionally

1 2 3 4 5

- e Smoke marijuana regularly

1 2 3 4 5

- f Try LSD ("acid") once or twice

1 2 3 4 5

- g Take LSD regularly

1 2 3 4 5

- h Try heroin once or twice

1 2 3 4 5

- i Try amphetamines (uppers, pep pills, bennies, speed) once or twice

1 2 3 4 5

- j Take amphetamines regularly

1 2 3 4 5

- k Try cocaine in powder form once or twice

1 2 3 4 5

- l Take cocaine powder occasionally

1 2 3 4 5

- m Take cocaine powder regularly

1 2 3 4 5

- n Try "crack" cocaine once or twice

1 2 3 4 5

- o Take "crack" cocaine occasionally

1 2 3 4 5

- p Take "crack" cocaine regularly

1 2 3 4 5

- q Take one or two drinks of an alcoholic beverage (beer, wine, liquor) nearly every day

1 2 3 4 5

- r Take four or five drinks nearly every day

1 2 3 4 5

8. Have five or more drinks once or twice each weekend

Not At All
Slightly More
Moderately More
Quite More
Very Much More

① ② ③ ④ ⑤

9. Take steroids to increase athletic performance or muscle development

① ② ③ ④ ⑤

9. How difficult do you think it would be for you to get each of the following types of drugs, if you wanted some? Mark one circle for each line

- a. Marijuana (pot, grass)

Probably Impossible
Very Difficult
Fairly Difficult
Fairly Easy
Very Easy

① ② ③ ④ ⑤

- b. LSD ("acid")

① ② ③ ④ ⑤

- c. Amphetamines (uppers, pep pills, bennies, speed)

① ② ③ ④ ⑤

- d. Barbiturates (downers, reds, yellows, etc.)

① ② ③ ④ ⑤

- e. Tranquilizers (like Valium)

① ② ③ ④ ⑤

- f. "Crack" cocaine

① ② ③ ④ ⑤

- g. Cocaine in powder form

① ② ③ ④ ⑤

- h. Heroin

① ② ③ ④ ⑤

- i. Some other narcotic (methadone, opium, codeine, paregon, etc.)

① ② ③ ④ ⑤

- j. Steroids (anabolic steroids)

① ② ③ ④ ⑤

- k. Alcoholic beverages (beer, wine or liquor)

① ② ③ ④ ⑤

- l. Cigarettes

① ② ③ ④ ⑤

PART B

The following questions are about tobacco, alcohol and drinking.

10. Have you ever smoked cigarettes?

- ① Never
② Once or twice
③ Occasionally but not regularly
④ Regularly in the past
⑤ Regularly now

11. How often have you smoked cigarettes during the past 30 days?

- ① Not at all
② Less than one cigarette per day
③ One to five cigarettes per day
④ About one-half pack per day
⑤ About one pack per day
⑥ About one and one-half packs per day
⑦ Two packs or more per day

12. Have you ever taken or used smokeless tobacco (chewing tobacco, snuff, plug, dipping tobacco)?

- ① Never
② Once or twice
③ Occasionally but not regularly
④ Regularly in the past
⑤ Regularly now

13. How often have you taken smokeless tobacco during the past 30 days?

- ① Not at all
② Once or twice
③ Once or twice per week
④ Three to five times per week
⑤ About once a day
⑥ More than once a day

14. Next we want to ask you about drinking alcoholic beverages, including beer, wine, wine coolers, and liquor. Have you ever had any beer, wine, wine coolers, or liquor to drink?

- ① No—GO TO QUESTION 18.
② Yes—CONTINUE WITH QUESTION 15.

15. On how many occasions have you had alcoholic beverages to drink... (Mark one circle for each line.)

- a. in your lifetime? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ 11 or more
- b. during the last 12 months? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ 11 or more
- c. during the past 30 days? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ 11 or more

16. On occasions that you drink alcoholic beverages, how often do you drink enough to feel pretty high?

- ① On none of the occasions
② On few of the occasions
③ On about half of the occasions
④ On most of the occasions
⑤ On nearly all of the occasions

- 17 Think back over the **LAST TWO WEEKS**. How many times have you had five or more drinks in a row? (A "drink" is a glass of wine, a bottle of beer, a wine cooler, a shot glass of liquor, or a mixed drink.)

☐ None
☐ Once
☐ Twice
☐ Three to five times
☐ Six to nine times
☐ Ten or more times

The next major section of this questionnaire deals with various other drugs. There is a lot of talk these days about this subject, but not enough accurate information. Therefore, we still have a lot to learn about the actual experiences and attitudes of people your age.

We hope that you can answer all questions, but if you find one which you feel you cannot answer honestly, we would prefer that you leave it blank.

Remember that your answers are anonymous; they cannot be connected with your name.

18. On how many occasions (if any) have you used marijuana (grass, pot) or hashish (hash, hash oil) ... (Mark one circle for each line.)

a. in your lifetime? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 b. during the last 12 months? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 c. during the past 30 days? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more

19. On how many occasions (if any) have you used LSD ("acid")...

a. in your lifetime? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 b. during the last 12 months? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 c. during the past 30 days? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more

20. On how many occasions (if any) have you used psychedelics other than LSD (like PCP, mescaline, psilocybin)...

a. in your lifetime? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 b. during the last 12 months? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 c. during the past 30 days? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more

21. On how many occasions (if any) have you taken "crack" cocaine (cocaine in chunk or rock form)...

a. in your lifetime? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 b. during the last 12 months? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 c. during the past 30 days? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more

22. On how many occasions (if any) have you taken cocaine in any other form...

a. in your lifetime? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 b. during the last 12 months? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 c. during the past 30 days? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more

23. Amphetamines have been prescribed by doctors to help people lose weight or give people more energy. They are sometimes called uppers, ups, speed, bennies, dexies, pep pills, and diet pills. Drugstores are not supposed to sell them without a prescription from a doctor.

Amphetamines do NOT include any non-prescription drugs, such as over the counter diet pills (like Dinitrol®) or stay awake pills (like No-Dox®), or any over-the-counter drugs.

On how many occasions (if any) have you taken amphetamines on your own--that is, without a doctor telling you to take them...

a. in your lifetime? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 b. during the last 12 months? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more
 c. during the past 30 days? ☐ 0 ☐ 1-2 ☐ 3-5 ☐ 6-9 ☐ 10-19 ☐ 20-39 ☐ 40 or more

24. Barbiturates are sometimes prescribed by doctors to help people relax or get to sleep. They are sometimes called downs, downers, goofballs, yellows, reds, blues, rainbows.

On how many occasions (if any) have you taken barbiturates on your own--that is, without a doctor telling you to take them...

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

25. Tranquilizers are sometimes prescribed by doctors to calm people down, quiet their nerves, or relax their muscles. Librium, Valium, and Miltown are all tranquilizers.

On how many occasions (if any) have you taken tranquilizers on your own--that is, without a doctor telling you to take them...

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

26. On how many occasions (if any) have you used heroin (smack, horse, skag)

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

These are a number of narcotics other than heroin such as methadone, opium, morphine, cocaine, demerol, paregoric, talwin, and meperidine. These are sometimes prescribed by doctors.

27. On how many occasions (if any) have you taken narcotics other than heroin on your own--that is, without a doctor telling you to take them...

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

28. On how many occasions (if any) have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled other gases or sprays in order to get high...

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

29. Steroids, or anabolic steroids, are sometimes prescribed by doctors to promote healing from certain types of injuries. Some athletes, and others, have used them to try to increase athletic performance or muscle development.

On how many occasions (if any) have you taken steroids, on your own--that is, without a doctor telling you to take them...

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

30. On how many occasions (if any) have you taken any of these drugs (like heroin, cocaine, amphetamines or steroids) by injection with a needle... (Do not include anything you took under a doctor's orders.)

- a. in your lifetime? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- b. during the last 12 months? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50
- c. during the past 30 days? ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29 ☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39 ☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49 ☐ 50

PART C

These next questions ask for some background information about yourself.

31. How old are you?

- ① 11 years old or less ⑥ 15 years old
② 12 years old ⑦ 16 years old
③ 13 years old ⑧ 17 years old
④ 14 years old ⑨ 18 years old or more

32. What is your sex?

- ① Male ② Female

33. How do you describe yourself?

- ① American Indian
- ② Black or Afro-American
- ③ Mexican American or Chicano
- ④ Puerto Rican or other Latin American
- ⑤ Oriental or Asian American
- ⑥ White or Caucasian
- ⑦ Other

34. How likely is it that you will do each of the following things after high school? (Mark one for each line.)

- a. Graduate from a two-year college ① ② ③ ④
- b. Graduate from college (four-year program) ① ② ③ ④

The next two questions ask about your parents. If you were raised mostly by foster parents, step-parents, or others, answer for them. For example, if you have both a step-father and a natural father, answer for the one that was the most important in raising you.

35. What is the highest level of schooling your father completed?

- ① Completed grade school or less
- ② Some high school
- ③ Completed high school
- ④ Some college
- ⑤ Completed college
- ⑥ Graduate or professional school after college
- ⑦ Don't know, or does not apply

36. What is the highest level of schooling your mother completed?

- ① Completed grade school or less
- ② Some high school
- ③ Completed high school
- ④ Some college
- ⑤ Completed college
- ⑥ Graduate or professional school after college
- ⑦ Don't know, or does not apply

37. How often do you attend religious services?

- ① Never
- ② Rarely
- ③ Once or twice a month
- ④ About once a week or more

38. How important is religion in your life?

- ① Not important
- ② A little important
- ③ Pretty important
- ④ Very important

Next are some questions about your experience as a driver, or as a passenger in a car.

39. During the LAST TWO WEEKS, how many times (if any) have you been a passenger in a car...

- a. when the driver had been drinking? ① ② ③ ④ ⑤ ⑥

- b. when you think the driver had 5 or more drinks? ① ② ③ ④ ⑤ ⑥

40. During the LAST TWO WEEKS, how many times (if any) have you driven a car, truck, or motorcycle after...

- a. drinking alcohol? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- b. having five or more drinks in a row? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

41. When you drive a car, how often do you wear seat belts? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

42. When you are riding in the front passenger seat of a car, how often do you wear a seat belt? ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

PART D

43. In what grade did you FIRST do each of the following things? Don't count anything you took because a doctor told you to; and mark "never" if you have never done it. (Mark one circle for each line.)

- a. Smoke your first cigarette ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- b. Smoke cigarettes on a daily basis ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- c. Try smokeless tobacco (snuff, plug or chewing tobacco) ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- d. Try an alcoholic beverage more than just a few sips ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- e. Drink enough to feel drunk or very high ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- f. Try marijuana or hashish ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
- g. Try LSD ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

- h. Try any psychedelic other than LSD ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- i. Try amphetamines ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- j. Try barbiturates ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- k. Try tranquilizers ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- l. Try crack cocaine ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- m. Try any other form of cocaine ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- n. Try heroin ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- o. Try any narcotic other than heroin ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- p. Try inhalants (sniff glue, aerosols, etc.) ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- q. Try steroids ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
- r. Try injecting some drug with a needle (without a doctor's orders) ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨
44. Do you think that in the future you will ever...
- a. smoke cigarettes ① ② ③ ④
- b. drink alcoholic beverages ① ② ③ ④
- c. try or use marijuana ① ② ③ ④
- d. try or use cocaine ① ② ③ ④
- e. try or use any other illegal drug ① ② ③ ④
45. How do you think your CLOSE FRIENDS feel (or would feel) about YOU doing each of the following things?
- a. Smoking one or more packs of cigarettes per day ① ② ③
- b. Trying marijuana once or twice ① ② ③
- c. Smoking marijuana occasionally ① ② ③
- d. Smoking marijuana regularly ① ② ③
- e. Trying LSD once or twice ① ② ③

- f. Trying an amphetamine (upper pep pill, bennie, speed) without a doctor's orders once or twice ① ② ③
- g. Trying 'crack' cocaine once or twice ① ② ③
- h. Taking 'crack' cocaine occasionally ① ② ③
- i. Trying cocaine powder once or twice ① ② ③
- j. Taking cocaine powder occasionally ① ② ③
- k. Taking one or two drinks nearly every day ① ② ③
- l. Taking four or five drinks nearly every day ① ② ③
- m. Having five or more drinks once or twice each weekend ① ② ③
- n. Using smokeless tobacco regularly ① ② ③
- o. Taking steroids ① ② ③
46. How much pressure do you feel from your friends and schoolmates to...
- a. smoke cigarettes ① ② ③ ④
- b. drink alcoholic beverages ① ② ③ ④
- c. use marijuana ① ② ③ ④
- d. use other illegal drugs ① ② ③ ④
47. During the past 30 days, how often (if ever) have you used alcohol in each of the following places?
- a. At your home ① ② ③ ④
- b. At friends' houses ① ② ③ ④
- c. At a school dance, a game, or other event ① ② ③ ④
- d. At school during the day ① ② ③ ④
- e. Near school ① ② ③ ④
- f. In a car ① ② ③ ④
- g. At a party ① ② ③ ④

48. During the past 30 days how often, if ever, have you used marijuana or any other drugs (like cocaine, amphetamines, etc.) in each of the following places?

- a. At your home 1 2 3 4
 b. At friends' houses 1 2 3 4
 c. At a school dance, a game, or other event 1 2 3 4
 d. At school during the day 1 2 3 4
 e. Near school 1 2 3 4
 f. In a car 1 2 3 4
 g. At a party 1 2 3 4

49. If you ever found yourself "hooked" on drugs, or otherwise needed help related to your drug or alcohol use, would you be likely to turn to any of the following sources for help? (Mark one circle for each line.)

- a. Members of your family 1 2 3
 b. Friends 1 2 3
 c. A teacher 1 2 3
 d. A school counselor 1 2 3
 e. A doctor 1 2 3
 f. A drug clinic 1 2 3
 g. A minister, priest, or rabbi 1 2 3

The next questions are about any drug education activities you may have had in school.

50. Have you had any drug education courses, films, or lectures in school?

- ① No— **GO TO QUESTION 54**
 ② Yes— **CONTINUE WITH QUESTION 51**

51. Would you say that the information about drugs that you received in school classes or programs has

- ① Made you less interested in trying drugs.
 ② Not changed your interest in trying drugs
 ③ Made you more interested in trying drugs

52. How many of the following drug education experiences have you had in school? (Mark all that apply.)

- ① A special course just about drugs
 ② A part of a health course
 ③ Films, lectures, or discussions in one of my other regular courses
 ④ Films or lectures, outside of my regular courses
 ⑤ Special discussions ("rap" groups) about drugs

53. Overall, how valuable were these experiences to you?

- ① Little or no value
 ② Some value
 ③ Considerable value
 ④ Great value

These final questions concern your school rules.

54. Do you know what your school's policy is for dealing with students caught doing the following things on school property...

- a. ...smoking cigarettes 1 2 3
 b. ...using (or possessing) alcohol 1 2 3
 c. ...using (or possessing) an illegal drug 1 2 3
 d. ...selling an illegal drug 1 2 3

55. If a student is caught doing each of the following things on school property by a teacher, how likely is it that something will be done (like punishment, notification of parents, referral to treatment, etc.)?

- a. ...smoking cigarettes 1 2 3
 b. ...using (or possessing) alcohol 1 2 3
 c. ...using (or possessing) an illegal drug 1 2 3
 d. ...selling an illegal drug 1 2 3

THANK YOU AGAIN FOR YOUR HELP.

This questionnaire was developed by the Comprehensive School Health Unit of the Michigan Department of Education, the Office of Substance Abuse Services, Western Michigan University, and Dr. Lloyd Johnston of the University of Michigan.

Appendix B
Measurement of Model Variables

Measurement of Model Variables

Variable	Item(s)	Measurement
Father's/Mother's Educ.	Composite of Questions 35 & 36	Average of responses to each question: 1 = completed grade school or less 2 = some high school 3 = completed high school 4 = some college 5 = completed college 6 = graduate or professional school
Race/ethnicity	Special case from Question 33	Series of dichotomous variables: 0 = no 1 = yes for each of the following: American Indian Black or Afro-American Mexican American or Chicano Puerto Rican or other Latin American Oriental or Asian American White or Caucasian Other
Sex	Question 32	Dichotomous: 1 = female 2 = male
Urbanness	From 1990 Census	Percent Urban of the County in which the School District resides
Repeated a Grade	Question 7	Dichotomous: 1 = no 2 = yes

Measurement of Model Variables

Variable	Item(s)	Measurement
Knowledge of Policy	Composite of Question 54, stems: a. smoking cigarettes b. using/possessing alcohol c. using/possessing an illegal drug d. selling an illegal drug	Summation of responses from each stem: 1 = yes; 2 = I think so; 3 = no
Implementation of Policy	Composite of Question 55, stems: a. smoking cigarettes b. using/possessing alcohol c. using/possessing an illegal drug d. selling an illegal drug	Summation of responses from each stem: 1 = yes; 2 = I think so; 3 = no
Drug Education	Special case from Question 52	Series of dichotomous variables: 0 = no 1 = yes for each of the following: A special course just about drugs A part of a health course Films, lectures, or discussions in one of my other courses Films or lectures, outside of my regular courses Special discussion (rap groups) about drugs
Ease of Getting	Composite of Question 9, stems: a. marijuana; b. LSD c. amphetamines; d. barbituates;	Summation of responses from each stem: 1 = probably impossible 2 = very difficult 3 = fairly difficult 4 = fairly easy

Measurement of Model Variables

Variable	Item(s)	Measurement
	e. tranquilizers; f. crack cocaine; g. cocaine powder; h. herion i. other narcotic; j. steriods k. alcohol; l. cigarettes	
Peer Pressure	Composite of Question 46, stems: a. smoke cigarettes b. drink alcohol c. use marijuana d. use other illegal drugs	Summation of responses from each stem: 1 = none 2 = a little 3 = some 4 = a lot
Peer Disapproval	Composite of Question 45, stems: a. smoke 1 or more packs daily b. try marijuana once or twice c. smoke marijuana occasionally d. smoke marijuana regularly e. trying LSD once or twice f. trying amphetamines once or twice g. trying crack cocaine once or twice h. taking crack cocaine occassionally i. trying cocaine powder once or twice j. taking cocaine powder occasionally k. taking 1 or 2 drinks near daily l. taking 4 or 5 drinks near daily m. having 4 or 5 drinks once or twice each weekend n. using smokeless tobacco regularly o. taking steriods	Summation of responses from each stem: 1 = strongly disapprove 2 = disapprove 3 = not disapprove

Measurement of Model Variables

Variable	Item(s)	Measurement
Life Satisfaction	Question 1	1 = very happy 2 = happy 3 = mixed feelings 4 = unhappy 5 = very unhappy
Importance of Religion	Question 38	1 = very important 2 = pretty important 3 = a little important 4 = not important
College Plans	Question 34b	1 = definitely will 2 = probably will 3 = probably won't 4 = definitely won't
School Attitudes	Composite of Question 4, stems: a. enjoy being in school b. hate being in school d. find school work too hard to do	Summation of responses from each stem: 1 = never 2 = seldom 3 = sometimes 4 = often 5 = almost always (coding reversed for stem a)
Drug Education Effect	Question 51	1 = made you less interested in trying drugs 2 = not changed your interest in trying drugs 3 = made you more interested in trying drugs

Measurement of Model Variables

Variable	Item(s)	Measurement
Drug Education	Question 53	1 = great value 2 = considerable value 3 = some value 4 = little or no value
Future Use	Composite of Question 44, stems: a. smoke cigarettes b. drink alcohol c. try or use marijuana d. try or use cocaine e. try or use any other illegal drug	Summation of responses from each stem: 1 = definitely won't 2 = probably won't 3 = probably will 4 = definitely will
Perceived Health Risk	Composite of Question 8, stems: a. smoke 1+ packs of cigarettes per day b. use smokeless tobacco regularly c. try marijuana once or twice d. smoke marijuana occasionally e. smoke marijuana regularly f. try LSD once or twice g. take LSD regularly h. try heroin i. try amphetamines once or twice j. take amphetamines regularly k. try cocaine powder once or twice l. take cocaine powder occasionally m. take cocaine powder regularly n. try crack cocaine once or twice o. take crack cocaine occasionally	Summation of responses from each stem: 1 = great risk 2 = moderate risk 3 = slight risk 4 = no risk

Measurement of Model Variables

Variable	Item(s)	Measurement
	p. take crack cocaine regularly q. take 1 or 2 drinks of alcohol near daily r. take 4 or 5 drinks of alcohol near daily s. have 5+ drinks once or twice a weekend t. take steriods	
Attend Religious Services	Question 37	1 = about once a week 2 = once or twice a month 3 = rarely 4 = never
Grade Point Average	Question 5	1 = A; 2 = A-; 3 = B+; 4 = B; 5 = B-; 6 = C+; 7 = C; 8 = C-; 9 = D
School Behavior	Composite of Question 4, stems: c. try to do your best work in school e. fail to complete or turn in your assignments f. get sent to the office, or have to stay after school, because you misbehaved	Summation of responses from each stem: 1 = never 2 = seldom 3 = sometimes 4 = often 5 = almost always (reverse coding for stem c)
Cut Classes	Question 6	1 = none; 2 = 1 day; 3 = 2 days; 4 = 3 days; 5 = 4 to 5 days; 6 = 6 to 10 days; 7 = 11 or more
Evenings Out	Question 2	1 = less than one; 2 = one; 3 = two; 4 = three;

Measurement of Model Variables

Variable	Item(s)	Measurement
		5 = four or five; 6 = six or seven
Location of Use	Question 47, each stem is a variable: a. your home; b. friend's house c. a school dance, game, other d. school during the day e. near school f. in a car g. a party	1 = not at all 2 = 1-2 times 3 = 3-5 times 4 = 6 or more
Grade of First Use	Two Composite Variables from Question 43.	Summation of responses from each stem for each of the two variables independently
Gateway Drugs	Stems: a. smoke your first cigarette b. smoke cigarettes daily c. smokeless tobacco d. try alcohol e. get drunk f. try marijuana p. try inhalants	1 = never 2 = grade 12 3 = grade 11 4 = grade 10 5 = grade 9 6 = grade 8 7 = grade 7 8 = grade 6 9 = grade 5 or below
Hard Drugs	Stems: g. try LSD h. other psychedelic i. try amphetamines j. try barbituates k. try tranquilizers l. try crack cocaine	m. try other cocaine n. try herion o. try other narotic q. try steriods r. injecting some drug

Appendix C
Human Subjects Institutional Review Board
Letter of Approval



WESTERN MICHIGAN UNIVERSITY

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Date: April 8, 1993

To: Eric Johnson

From: M. Michele Burnette, Chair *MMB, JKL*

Re: HSIRB Project Number 93-04-09

This letter will serve as confirmation that your research project entitled "Prediction of adolescent substance use patterns: Toward a multidimensional sociogenic adolescent substance use model" has been **approved** under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board apologizes for the misunderstanding with respect to the appropriate categorization of your protocol and any delay this may have caused you. The Board also wishes you success in the pursuit of your research goals.

Approval Termination: April 14, 1994

xc: Robin, SOC

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