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Psychometrics of the Missouri Student Survey: Examining Validity, Reliability and Consent

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PSYCHOMETRICS OF THE MISSOURI STUDENT SURVEY: EXAMINING VALIDITY, RELIABILITY AND CONSENT

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Abstract

Risk and protective factors for adolescent drug and alcohol abuse have gained prominence in the prevention field as a framework for prevention. Communities that Care® is the original survey that collected data on risk and protective factors in the adolescent community. The Missouri Student Survey is based upon the Communities that Care® survey and is administered to students across the state of Missouri every two years.

This study examines the reliability and validity of the Missouri Student Survey in a sample of 126,923 students from across the state of Missouri. In addition, this study also considers the question of active versus passive consent and its influence on the generalizability of the data. Examining these issues will help illuminate the strengths and weaknesses of the survey as well as present some options for increasing the data quality in subsequent administrations.

A confirmatory factor analysis revealed problems with the assumed factor structure of the survey (as shown in Appendix 1) so an exploratory factor analysis was performed to assess the possibility of an alternate factor structure. However, most of the original risk and protective factor scales demonstrated strong reliability and criterion-related predictive validity. An item analysis determined that students were less likely to complete the questions in the second half of the survey and a secondary analysis established that certain school districts were driving this pattern. Finally, an examination of the issue of active versus passive consent showed that passive consent indeed increased the participation rates as well as decreased the rates of students reporting using a fake drug. Evaluation of the effect of active or passive consent revealed mixed results for the number of risk factors reported.

Implications of these findings are that the underlying factor structure should be re-examined with the 2010 data set before reports are generated. However, passive consent appears to be

worthwhile and should be continued. Future directions and limitations of this study are discussed.

PSYCHOMETRICS OF THE MISSOURI STUDENT SURVEY: EXAMINING VALIDITY, RELIABILITY AND CONSENT

Underage drinking (consumption of alcohol before the legal age of 21) is a problem in the United States with large consequences. These consequences include increased risk of pregnancy and alcohol use during pregnancy (De Genna, Larkby, and Cornelius, 2007), increased suicidal ideation and attempts (Swahn and Bossarte, 2007), criminal activity (Swahn et al., 2007) and brain damage (White and Swartzwelder, 2004) (Zeigler et al., 2005). One study estimated that the total underage drinking cost to the United States was approximately $61.9 billion dollars in 2001 alone (Miller, Levy, Spicer, and Taylor, 2006).

Underage drinking also has the potential for long-lasting effects. Youth who begin drinking before age 14 are five times more likely to experience alcohol-related injury later in life while those who begin drinking before age 15 are four times more likely to develop alcohol dependence when compared to those who waited to begin drinking at age 21 (Jernigan, 2005). Approximately 54% of the youth in America have had at least one alcoholic drink in their lifetime. Twenty-nine percent have used alcohol in the last 30 days with 25% having 5 or more drinks in a single occasion (SAMHSA, 2006).

History of Alcohol Use and Prevention in the United States

Alcohol use, even in youth, was not always seen as a problem (Stolberg, 2006). During colonial times, alcohol consumption was seen as an essential part of good health. Alcohol was used as a medicine for a wide range of conditions – from muscle soreness and burns to colds and fever. The popular medicine laudanum was a combination of alcohol and opium. Into the 19th

century, alcohol was used as an anesthetic in surgery. However, while drinking was considered to be normal behavior, drunkenness was considered to be a sin from the time of the Puritans. The Connecticut Code of 1650 had severe consequences for drunkenness and other laws restricted the amount of alcohol a patron could be served at a single sitting (Stolberg, 2006).

Some early American physicians did suggest that alcohol should only be consumed in moderation but even that was relative – a bottle of wine a day was considered to be moderate enough. Beginning in the early 19th century, the temperance movement began as a call for more moderation. However, this quickly shifted into a total abstinence position. In 1851, the first political step was taken with the passage of the Maine Liquor Law which forbade the manufacture of alcohol within the state (Stolberg, 2006).

According to Stolberg (2006) as the focus shifted away from viewing alcohol as a health benefit and toward viewing it as a health problem, programs started appearing to treat those who were struggling with addiction. Treatments at this time were not effective and consisted of things like water bathing, cayenne pepper and realigning the rib bones. Asylums for inebriates began opening in the mid 1850s, although a local prison was often used when a medical setting was not available.

Congress approved a resolution to prohibit the manufacturing, sales, transportation and importation of alcohol in 1917. By 1919, 36 states had ratified a supporting amendment and the threshold was passed. Prohibition had begun. Alcohol was still legal with a doctor's prescription, or as part of religious rituals, but Prohibitionists saw the Prohibition as a way to cure all societal ills – without alcohol there would be no crime, no prostitution (and thus no venereal diseases), workers would be more productive and families stronger. By the early 1900s, alcoholism was

beginning to be seen as a mental disease and a person could be admitted into a psychiatric hospital for treatment (Stolberg, 2006).

Prohibition was never uniformly accepted in the United States and by 1930 the Republicans lost control of Congress. As the Democrats took control, The National Commission on Law Observance and Enforcement was formed to examine the issues around the prohibition. The Commission's report in 1931 recommended several changes and by February 1933, the 21st Amendment was approved by Congress. The amendment was ratified by the end of the year and Prohibition was repealed. While consumption of alcohol during the Prohibition was decreased by 30-40%, there was no significant increase of use after the repeal (Stolberg, 2006).

By the 1940s, alcoholism was being viewed more as a medical issue; alcoholics were responsible for close to half of the annual admissions at Bellevue Hospital in New York City. The criminal justice system was becoming increasingly more adept at identifying those with addictions and sending them into treatment. With the founding of Alcoholics Anonymous in 1935, there began to be a shift away from seeing alcoholism as a moral weakness and towards more of a medical model – alcoholism was a disease. Psychiatrists in the 1940s attempted to gain control of the treatment of alcoholism, reinforcing the shift from the moral to the secular sphere (Stolberg, 2006). Alcoholics were seen as having an increased vulnerability to alcohol that other 'normal' people did not have (Moore and Gerstein, 1981). The only solution for these people was seen as completely avoiding alcohol for the rest of their lives.

The public health model brought a competing perspective to the Prohibitionist views in the years after the Prohibition. This perspective held three principal tenets. The first was that the rates of alcohol-related problems in society in general were too high. The second was that the rates of alcohol-related problems are influenced by society in general. Finally, the third principal

was concluded from the first two – that the rates of alcohol related problems in society can be minimized by influencing society as a whole. Thus the public health model was brought into the realm of alcoholism and its treatment (Moore and Gerstein, 1981).

The Public Health Model

The public health model can be traced back to the time of Hippocrates. The basic principal of the model is that the focus of an intervention should be to either prevent or contain the spread of disease within a population, as opposed to treating individuals who were already sick. Health plagues throughout history has often forced officials to turn to this model as the best way to use limited resources. A particular example, often cited, is that of John Snow. In the early 1850s, cholera was rampant in London. By mapping the spread of the disease, he confirmed that the majority of cases were spread around a particular water pump. The simple solution was to remove the problematic pump handle thus stopping the individual problem of cholera by changing the environment in which people were catching the disease. The general population benefited, although some individual members (those who were already sick) did not (Runyan, DeVellis, DeVellis, and Hochbaum, 1982).

There are three levels of prevention within the model. Primary prevention is avoidance of the problem before it occurs. Secondary prevention focuses on the early detection and treatment of a problem, before it has a chance to spread. Tertiary prevention attempts to minimize the effect of the problem, after it has already occurred. In both secondary and tertiary prevention, the effort is focused on prevention of future problems instead of the treatment of problems that already exists (Runyan, DeVellis, DeVellis, and Hochbaum, 1982).

The model is a passive approach that de-emphasizes the individual's behaviors. In this respect, it is often easier for people to accept because it moves away from the 'blame the victim' mentality (Roberts, 1987). Another benefit is that while certain individuals may present the largest *ratio* of risk, they are a small group and thus do not represent the population which presents the largest *amount* of risk. For example, heavy drinkers are not involved in the majority of alcohol related crashes. The majority of alcohol related crashes are initiated by casual drinkers. While there are other contributing factors to why this may be so, the main reason is that there are so many more casual drinkers in the general population than there are heavy drinkers, so statistically they will be involved in more alcohol related crashes. By addressing the population as a whole, the risk is decreased for everyone (Holder, 2002).

In the field of substance abuse prevention, the public health model is being used in the shift away from classroom-based curriculum and towards more environmental strategies, those programs which attempt to change the environment in which the behavior occurs and thus reduce the overall amount of substance abuse. Examples of this are responsible beverage server training, compliance checks, public policy that limits the areas in which alcohol may be served and media messages which discourage risky drinking behaviors (Holder, 2001).

The Role of Government in Alcohol Abuse Prevention

The federal government first became involved with alcohol abuse prevention in the 1960s. Early in the decade, National Institute of Mental Health (NIMH) began giving out small grants related to preventing alcohol abuse. In 1966, the first government agency dedicated to the prevention of alcohol abuse was established by President Johnson, the National Center for Prevention and Treatment of Alcoholism (Mann, 1973). In 1970 this Center was elevated to

institute status and became the National Institute of Alcohol Abuse and Alcoholism (NIAAA) under the National Institute of Mental Health (NIMH) with the mission to "develop and conduct comprehensive health, education, research, and planning programs for the prevention and treatment of alcohol abuse and alcoholism and for the rehabilitation of alcohol abusers and alcoholics" (Hewitt, 1995).

NIMH separated from NIH in 1967. In 1972 National Institute on Drug Abuse (NIDA) was established "to lead the Nation in bringing the power of science to bear on drug abuse and addiction" under the direction of NIMH. In 1973, NIMH temporarily rejoined NIH, but by 1974 the Alcohol, Drug Abuse and Mental Health Administration (ADAMHA) was formed. This consisted of NIAAA, NIDA, and NIMH. In 1992, this was absorbed back into NIH and the service components of these organizations were given to the newly formed Substance Abuse and Mental Health Services Administration (SAMHSA) (NIMH, 2008).

The Center for Substance Abuse Prevention (CSAP, originally the Office for Substance Abuse Prevention) was established in 1986 with the mission of generating new knowledge about the impact and effectiveness of prevention efforts. CSAP provides funding for direct services to communities across the country and, in return, collects data on these efforts in order to develop a better framework for understanding substance abuse. The current framework is constructed around the concept of risk and protective factors for adolescent drug and alcohol abuse. See the "Risk and Protective Factors" section below for more details on this concept (Department of Health and Human Services, 1999). CSAP is currently a division of SAMHSA which awards millions of dollars per year in grants to stop underage drinking (SAMHSA, 2008). Most federal funding now comes with the stipulation that programming is evidenced based.

Evidence-Based Practices

As government became more involved in the prevention field, accountability to the taxpayers began to be of concern. By 1989, CSAP was requiring that a significant percentage of each grant award be put towards evaluating the outcomes of the programs and the grant itself. Programs and their evaluation were then submitted to a peer-review process (Department of Health and Human Services, 1999). This process reviewed the theory behind the program, the sampling strategy and other measures that were used in the evaluation, the fidelity of the intervention, the data analysis done including other hypotheses considered, the integrity of the program and then finally the utility of the program (Department of Health and Human Services, 2001). Programs which had well-documented implementation, with a rigorous evaluation showing consistent positive results were placed on a list of Model Programs. Later grant awards could specify that only programs on the Model Programs list could be funded. This was considered to be a way to ensure that taxpayer funds were being put towards programs which were likely to show positive outcomes (Department of Health and Human Services, 1999).

The model programs list was revamped in March 2007, and became the new National Registry of Evidence-based Programs and Practices (NREPP) list, housed in the Department of Health and Human Services' Substance Abuse and Mental Health Services Administration (SAMHSA). This list consisted of both prevention and treatment programs. One of the primary changes was that each program that was reviewed was assigned a score based upon the scientific evidence that supported the program's claim to be effective and upon the availability of implementation and training materials. Scores were listed for the programs but there was no recommended threshold describing an 'acceptable' score (NREPP, 2008). This was generally considered a recognition that community needs may vary. In order to be culturally responsive,

the government list would supply all the information that they could and then the communities would be allowed to decide how to balance that information with their needs.

Evidenced-based programs for substance abuse prevention are often designed to either decrease risk factors or increased protective factors. These factors will be discussed in more detail below.

Measurement Theory: Reliability and Validity

When doing research on substance abuse prevention, or any topic, careful attention has to be paid to the measurement tools that are being used. A poor quality tool will not only be unable to advance the study of the subject, it can actually hinder the study when it sends researchers down false paths. Measurement theory states that it is impossible to have any tool measure a construct perfectly; however, one should strive to have the best tool possible (Shadish, Cook and Campbell, 2002). To that end, reliability and validity testing allows researchers to determine the quality of the tool that is being used.

Reliability

Reliability is a gauge of how consistently the test is measuring, free from random error. High reliability indicates that there is little random error and that the test is consistently accurate in its measurements. There are several different ways to assess the reliability of a measure; internal consistency methods, test-retest and parallel-forms (Cohen and Swerdlik, 2002).

Measurement error is considered to be the difference between an obtained score and a ‘true score’. The concept of a true score is that there is a correct answer to all measurements, even if the imperfect tools cannot measure it. Some theories attempt to reach the true score by

averaging scores over repeated testings in a model called domain sampling. In this model, tests are developed from a homogeneous, infinitely large pool of test items. The correlation between any test score obtained in this method and the average test score is equal to the square root of the correlation between any two test scores obtained in this method. This is the reliability coefficient. The reliability coefficient can be used to estimate the ratio of the variance in the true scores to the variance in the obtained scores. This ratio can then be used to obtain Cronbach's coefficient alpha (α), a measure of reliability and an internal consistency method (Nunnally and Bernstein, 1994).

In test-retest, the same instrument is presented to a single subject pool in at least two different points in time. Reliability is quantified by the correlation between these two test scores. This method is useful when a trait is expected to be stable over time but not when a trait is expected to vary. Potential bias is introduced when the subject's first experience with the instrument influences their second experience (Cohen and Swerdlik, 2002).

Parallel-forms can be developed to reduce the test-retest bias. In this method, two similar instruments are developed that are designed to measure the same thing. These instruments are administered to a single subject pool. As in test-retest, the correlation between these two instruments provides an index of the reliability (Cohen and Swerdlik, 2002).

Both of these methods are effective ways to measure reliability. However they also require a great deal of time and effort. Internal consistency methods tend to be less time consuming and only require a single instrument to be developed. A split-half reliability estimate can be determined by dividing the instrument in two and using the two sets as parallel-forms. Or, in inter-item consistency, individual items can be compared to the test as a whole in order to determine reliability.

All of the above methods assume a quantitative instrument. For qualitative instruments, inter-scorer reliability is often used when scoring. In this method independent scorers rate the same item and the correlation between those scores determine the reliability (Cohen and Swerdlik, 2002).

To increase reliability, measurement error should be decreased. This is done by designing tests with easily understandable directions and clear wording of all items, consistently administering a test under the same conditions and decreasing the subjectivity of the scoring whenever possible (Nunnally and Bernstein, 1994).

Validity

A test can be reliable (consistently provide the same results) without being valid (measuring the desired construct) but cannot be valid without first being reliable. Once an instrument is determined to be reliable, the next step is to confirm the validity of the instrument. Three types of validity are; construct, content-related and criterion related (Cohen and Swerdlik, 2002).

In construct validity, the question becomes ‘is the construct being measured the one that the instrument purports to measure?’. This is an important question in psychology as the constructs tend to be abstract, latent and not directly observable. For example, an instrument designed to measure depression may be measuring anxiety instead. As the domain of the construct increases in size it becomes increasingly difficult to specify which variables belong to it (Nunnally and Bernstein, 1994). Construct validity testing attempts to specify the parameters of the domain, determine the extent to which the score measures the same thing and then determine the extent that the measures are consistent with how the construct was hypothesized.

Content-related validity refers to the domain of knowledge that is being measured. A single instrument typically cannot measure every item in the desired domain (for example – every possible multiplication problem) but should have a range of questions that represents the entire domain. Ideally a random sampling of all possible items would be administered but as that is often not practical, a pre-determined blueprint describing the sampling method is important in obtaining a high content-related validity (Nunnally and Bernstein, 1994).

Criterion-related validity attempts to correlate the instrument with an external criterion. In some cases this is an already established measure which has proven reliability and validity. However, criterion-related validity can also be established with a performance measure such as a job promotion or college GPA. This method is further divided into concurrent and predictive approaches. In the concurrent approach, the performance is measured at the same time as the instrument is administered. In the predictive approach, the instrument is administered and then used to predict a future performance measure (Dawis, 1998).

Risk and Protective Factors

In the last two decades, the dominant framework explaining why youth drink alcohol has been the Risk and Protective Factor model. This model suggests a variety of risk factors and several more additional protective factors that contribute to youth's drinking behavior.

Developing the model

By the mid 1980s it was understood that using community-wide programs to reduce health related risk factors could persuade people to change their behaviors, thus affecting their overall health. While these original programs focused on more traditional health issues, such as

heart and lung disease, it showed that it was possible to succeed in reducing risk by interventions at a community level (Hawkins and Catalano, 1992).

One of the original studies investigating specific risk factors for adolescent drug and alcohol abuse was that of Simcha-Fagan, Gersten and Langner (1986). This was a secondary study using a subsample drawn from a longitudinal study of child and adolescent mental health. In this study the researchers interviewed 1,034 Manhattan mothers of children 6 to 18 as well as the children themselves. These interviews were conducted from 1966 to 1967. A follow up was done approximately 5 years later with 71% (N=732) of the original sample being interviewed at Time II. These interviews assessed parental behavior, quality of the marital relationship, parent child relationship, child rearing practices and a comprehensive child behavior profile. The same questions were used in interviewing the child along with questions of adolescent role functioning, drug use (both legal and illegal) and antisocial behavior. While this study did not look at alcohol use individually, it was included in the category of "Drugs Other than Marijuana". This study found significant correlations between risk factors associated with socio-economic factors, problems within the nuclear family and certain individual risk factors such as conflict with parents, delinquency, anxiety and antisocial behaviors and the category of "Drugs Other than Marijuana" (Simcha-Fagan, Gersten, and Langner, 1986).

A second study (Kandel, Simcha-Fagan and Davies, 1986) examined a random sample of adolescents enrolled in 10^{th} and 11^{th} grade in the public schools of New York State in 1971-72. A second sample was selected for follow up nine years later. The sample included students who were absent from class during the original survey. This was considered to be important in that those students, who were originally truant and possibly the most at risk, were now adequately represented during the subsequent study. At follow-up the participants were re-interviewed.

These interviews consisted of mostly structured items with closed-end response choices. They also included two charts designed to reconstruct life and drug histories at monthly intervals. Participants who had less than ten lifetime uses of drugs were excluded from this history in order to reduce respondent burden. This study found several risk factors in adolescence that led to drug use in young adulthood. These risk factors were: prior drug use, parental drug use, family attachment, certain parenting styles, school attachment, church attachment, general delinquency in adolescence and periods of unemployment for the young adult.

Newcomb, Maddahian and Bentler (1986) surveyed 791 adolescents in 10^{th}-12^{th} grade of Los Angeles County schools as part of a larger longitudinal study. Data on risk factors were collected in year four with a follow up being done in year five to test factors for predictability. The same questions on frequency of drug use were given in both year four and year five. Risk factors were coded into a dichotomous variable of criterion met or criterion not met and then added together to form a single 'number of risk factors' score. A linear trend was found showing that the more risk factors a participant had, the higher frequency of substance abuse. Individual risk factors were found to vary in how highly they correlated with substance abuse. In increasing order of correlations (averaged between the time periods) the risk factors were: poor self esteem, psychology distress / pathology, poor academic achievement, low religiosity, poor relationship with parents, sensation seeking, early alcohol use, adult drug use, deviance and peer drug use.

David Hawkins, the researcher who would later become a leader in the development of the Risk and Protective Factor model, published his first paper outlining potential risk factors in 1986 (Hawkins, Lishner, Catalano, and Howard, 1986). In this literature review he cites a variety of risk factors and attempts to distinguish those which lead to adolescent drug abuse as opposed to the less harmful occasional drug use. He found several risk factors which were shown to lead

toward drug abuse. These included: family member's drug use, a genetic link (male only), certain maladaptive parenting styles, a prior pattern of antisocial behavior, poor school performance, low degree of commitment to education, drug use (real or perceived) among peers, attitudes toward drug use, early onset of use and a variety of personality factors. He also found that a positive family attachment or other bonds to a positive social order, in which a community rewards productive behavior and discourages negative behavior, can be protective factors discouraging drug abuse.

By 1992 the "Hawkins and Catalano Risk and Protective Model" was being translated into an approach for prevention. Hawkins, Catalano and Miller (1992) published a paper reviewing the risk factors and emphasizing the idea that prevention programs should focus on addressing the risk factors as a way of preventing drug abuse. Hawkins and Catalano also published the book *Communities that Care* in 1992, outlining the Risk and Protective Factor model. The book is still used as a manual for communities who wanted to address substance abuse at the community level. In *Communities that Care,* Hawkins and Catalano stress that decreasing risk factors and increasing protective factors is an effective method for reducing substance abuse.

Risk Factors

The Hawkins and Catalano Model divide risk factors into two broad categories. The first category is contextual factors that are present in the environment that surrounds the individual. The second category consists of the factors that are within the individual or their interpersonal environment (Hawkins, Catalano and Miller, 1992). See Table 1: Risk and Protective Factors for a comprehensive list of both types of Risk Factors. The more risk factors that a child is exposed

to, the more likely it is that the child will have problems with substance abuse in adolescence and beyond (Department of Health and Human Services, 1999).

Protective Factors

Protective factors are not merely the absence of risk factors. Protective factors are interactive processes by which an individual develops a resiliency against drug abuse (Hawkins, Catalano and Miller, 1992). Not all youth who are exposed to a high number of risk factors develop problems with substance abuse. The reason for this is the existence of protective factors in a child's life (Department of Health and Human Services, 1999).

Table 1:

Risk and Protective Factors

Risk Factors – Contextual	
Factors	Definitions[1]
Laws and Norms favorable towards behavior	When laws, tax rates, and community standards are favorable toward substance use or crime, or even if they are unclear, children are at higher risk.
Availability	In schools where children think that drugs are more available, a higher rate of drug use occurs.
Extreme economic deprivation	Children who live in these areas—and have behavior and adjustment problems early in life—are also more likely to have problems with drugs later on.
Neighborhood disorganization	Higher rates of drug problems, juvenile delinquency, and violence occur in communities or neighborhoods where people have little attachment to

	the community, where the rates of vandalism are high, and where there is low surveillance of public places.
Risk Factors - Individual	
Constitutional Factors	These factors appear to increase the risk that young people will abuse drugs, engage in delinquent behavior, and commit violence
Family alcohol and drug behavior and attitudes	Parental attitudes and behavior toward drugs, crime, and violence influence the attitudes and behavior of their children
Poor and inconsistent family management practices	Poor family management practices include lack of clear expectations for behavior, failure of parents to monitor their children (knowing where they are and who they are with), and excessively severe or inconsistent punishment.
Family conflict	Persistent, serious conflict between primary caregivers or between caregivers and children appears to increase children's risk for all of the problem behaviors.
Low bonding to family	Parent-child interactions characterized by lack of closeness and lack of maternal involvement in activities with children appear to be related to initiation of drug use.
Early and persistent problem behaviors	Young people, both girls and boys, who engage in these behaviors during early adolescence are at increased risk of drug abuse, juvenile delinquency, violence, school dropout, and teen pregnancy.
Academic failure	Beginning in the late elementary grades (grades 4-6), academic failure

	increases the risk of drug abuse, delinquency, violence, pregnancy, and school dropout.
Low degree of commitment to school	Those who do not have commitment to school are at higher risk for substance abuse, delinquency, teen pregnancy, and school dropout.
Friends Who Engage in the Problem Behavior	Young people who associate with peers who engage in problem behavior— delinquency, substance abuse, violent activity, sexual activity, or school dropout—are much more likely to engage in the same problem behavior.
Alienation and rebelliousness	Young people who feel they are not part of society, are not bound by rules, don't believe in trying to be successful or responsible, or who take an active rebellious stance toward society are at higher risk of drug abuse, delinquency, and school dropout.
Attitudes favorable to drug use	In middle school, as others they know participate in such activities, children's attitudes often shift toward greater acceptance of these behaviors. This acceptance places them at higher risk.
Early Initiation of the Problem Behavior	The earlier young people begin using drugs, committing crimes, engaging in violent activity, dropping out of school and becoming sexually active, the greater the likelihood that they will have problems with these behaviors later on.
Family history of problem behavior	If children are raised in a family with a history of addiction to alcohol or other drugs, the risk that the children themselves will have alcohol and other drug problems increases.

Protective Factors	
Individual Characteristics	These are characteristics children are born with and are difficult to change: a resilient temperament, a positive social orientation, and intelligence.
Bonding	Positive bonding makes up for many other disadvantages caused by other risk factors or environmental characteristics.
Healthy Beliefs and Clear Standards	The people with whom young people have bonds need to have healthy beliefs about substance use and other problem behaviors, as well as clear, positive standards for behavior.

[1]Family Policy Council (n.d.)

Communities that Care® – a Survey of Risk and Protective Factors

Once it was established that risk and protective factors should be one of the basic building blocks of prevention activities, it was necessary to develop a method for consistently measuring these factors. The Communities that Care® survey is a self-report survey that was developed to assess risk and protective factors in youth. It was also intended to help prioritize the most pertinent factors within a community that need to be addressed as part of a prevention project (Arthur et al., 2007).

Arthur et al. (2002) developed the survey using five independent steps. First a pool of 350 self-report questions was garnered from existing survey instruments. These items were hypothesized to measure twenty-one risk factors and eleven protective factors. Some questions were modified or new questions written, in order to ensure all factors were adequately covered.

Questions about drug use frequency were taken from the Monitoring the Future Survey in order to allow users of that survey to continue to compare trends.

The survey was cognitively pretested with a diverse group of twenty-five adolescents. The participants were asked to think out loud as they formulated their responses to the questions. The questions were distributed so that each was answered by five participants from different backgrounds and probes were used to determine how words were being interpreted. This process resulted in 98 items being determined to be too confusing or unclear and therefore these items were eliminated.

Next, the items were pilot tested using a sample of 1,097 students in 6^{th}-12^{th} grade in Oregon. The data from these pilot surveys were used to examine inter-item correlation and frequency distributions. Based on this data some items were either modified or eliminated due to being redundant or having little variance. This left a pool of questions containing 253 risk and protective factor items, 72 items measuring problem behaviors, 10 demographic questions and two questions that asked participants to self-report their truthfulness and the importance they placed on the survey questions.

This test was administered to a random sample of Oregon school children in 6^{th}, 8^{th} and 11^{th} grades. It was determined from the start that it was unlikely that the students would finish the entire test in the allotted time period so one of four 'start points' were randomly assigned to the students. This ensured that each question received sufficient responses. Each question was answered by more than 1,500 students. These data were analyzed for reliability and internal consistency of the scales. Scales were paired down by eliminating any items that could be dropped without influencing the internal consistency of the scale. Factor analyses were done on the remaining items to ensure that each construct had good factor structures. Five scales showed

two factors; however later examination of the eigenvalues showed that the second factor did not significantly contribute to the variance found indicating that a single factor was underlying each scale. Reliability testing using Cronbach's alpha was done on each of the scales and they were found to be sufficiently reliable. However, it is important to note that the researchers admit that the scales themselves contained a small number of items and using split-half reliability testing did leave the generalizability of the results in question. Finally Spearman correlations were calculated between the scales (as a dichotomous variable) and the demographic variables. These correlations were overall low, although they did show the expected patterns. Older youth reported more risk factors and youth in two-parent families reported lower levels of transition and mobility, family history of antisocial behavior and higher levels of family attachment than those youth in single-family homes or those youth living with adults other than parents.

Correlations were calculated to examine the relationship between risk and protective factors and substance abuse. Two patterns emerged in the data. First, the expected pattern was seen for all risk and protective factors. That is, youth who are high in risk factors show a positive relationship to problem behaviors and youth who are high in protective factors show a negative relationship to problem behaviors. The second pattern is that the scales in the Peer-Individual domain showed correlations of higher magnitude than those in the Family domain, Community domain or the School domain.

A second study (Glaser, Van Horn, Arthur, Hawkins, and Catalano, 2005) was done to replicate the reliability and validity testing done by Arthur et al. (2002). This study used 176, 464 students from Colorado, Illinois, Kansas, Maine, Oregon, Utah and Washington. Students were pulled from 6^{th}, 8^{th}, 10^{th} and 12^{th} grade and were split approximately evenly between genders and consisted of five ethnic groups. Results again showed that the survey was reliable across

different demographic categories. They also found consistent construct validity of the risk and protective factor scales.

As communities began to use the survey, some confusion arose around understanding the results. The results were originally reported as z-scores, scaled to a particular statewide sample. (Arthur et al., 2007). There was uncertainty as to both the meaning behind the score and how the community level data could be compared to the state level, given the dissimilarities of the sample sizes.. Arthur et al. (2007) worked to develop cutoff scores that would allow a survey to dichotomously score either that a youth either did or did not have a particular risk factor. These scores could indicate with reasonable accuracy that a youth was either involved in risky behaviors or not involved in risky behaviors. As with all cutoff points, as sensitivity (the ability to find all youth involved in risky behaviors) increased the specificity (the ability to exclude all youth who were not involved with risky behaviors) decreased, but Arthur et al. (2007) attempted to balance the cut point so that sensitivity and specificity were approximately equal.

Communities that Care® is currently owned by SAMHSA and, as such, is a publically available free document. It contains 139 questions that constitute 23 risk factor scales measuring 16 risk factors and 10 protective factor scales, each measuring one protective factor. (SAMSHA, n.d.).

The Missouri Student Survey

Based upon the Communities that Care® survey, the Missouri Student Survey is administered every two years to Missouri youth. The first Missouri Student Survey data were collected in early 2000 through a contract with the Research Triangle Institute by the Missouri Department of Mental Health Division of Alcohol and Drug Abuse (DMH ADA). The survey

was designed as part of Missouri's State Demand and Needs Assessment Studies: Alcohol and Other Drugs. It also served the purpose of gathering data on the nature, severity, and range of substance use and abuse among adolescents with the goal of focusing the state's prevention efforts. The survey was administered to over 10,000 Missouri students enrolled in grades 6, 8, 10, and12 in both public and private schools. The sample was a stratified random sample (that is, schools were first grouped into stratum and then the sample was randomly selected from each stratum) of all schools in the state. This 2000 survey used passive consent which resulted in a 97% participation rate (Greene and Rachal, 2001). Information on consent and the role that it plays in youth surveys is discussed in the next section.

In 2002, the Missouri Institute of Mental Health (MIMH) took over the data collection and analysis from the Research Triangle Institute. Students in 6^{th}, 8^{th}, 10^{th} and 12^{th} grades were randomly selected from Missouri's public schools. Schools were selected by first choosing all schools which had participated in 2000 and then randomly selecting a geographically stratified sample (similar to the stratified random sample from above, only stratum were selected by geographic region) from that pool. A total of 276 schools and over 12,000 students participated. However, in 2002, the system changed to active consent resulting in only a 36% participation rate from those originally selected in the random sampling (Evans, Novak, and Daltro, 2002).

The survey in 2004 shifted to become a joint effort by DMH ADA and the Department of Elementary and Secondary Education (DESE), with MIMH still leading the data collection and analysis efforts. The 2004 survey marked the shift from pen and paper based surveys to web based surveys through SmartTrack, a web-based survey administration service developed by Dream, Inc. All schools in Missouri were asked to participate at this point, with a focus on 9^{th} graders. Schools were asked to choose one other grade to participate but that choice was left up

to the school administration. Unfortunately, many schools chose not to participate or participated in such small numbers that the data could not be independently analyzed (due to confidentiality, any class reporting fewer than 50 participants are only analyzed as part of the state level data). Question wording was also changed slightly from the 2002 version in order to better fit the needs of DESE and ADA (Evans et al., 2005).

In 2006 the survey was again administered by SmartTrack. All school districts were asked to participate, surveying all 9th graders and two other grades of the school administrator's choice. Again, not all schools participated and some schools had very low rates of participation. Approximately 14% of the almost 500,000 eligible students in Missouri took this survey. The questions remained the same from the 2004 survey (Evans et al., 2006).

The most recent survey was administered in the spring of 2008, although the final report is not yet available (see Table 2 in Appendix for details on the questions and scales). It also had a very important shift in consent, with the state moving back to the passive consent of the original 2000 survey. While complete data is not yet available, reports from the communities involved in the Strategic Prevention Framework State Incentive Grant indicate that some schools continued to use active consent. Reasons for this included the late notice that schools received regarding this change and concern at the school administrator levels that parents might object to the passive consent procedure.

While the Missouri Student Survey is based upon solid research from earlier assessment instruments, there has not yet been any formal testing of reliability and validity of the survey itself. The survey has also been repeatedly changed from the original version and it is currently unknown what effect those changes have made upon the criterion-related validity and reliability of the survey.

Consent issues when surveying youth about sensitive issues

Surveying youth on drug use and other risk factors is a sensitive area. Parents may have strong feelings about their children participating in a survey covering such topics. Parents might worry about the legal risks that may arise from their child reporting illegal behavior. Obtaining informed parental consent before surveying is one way to address these concerns.

Informed consent refers to the process by which participants are fully informed of the risks and benefits of the research, possible alternative ways in which the benefits could be reached, and the ability of the researchers to keep their information either confidential or anonymous. Legally, participants under the age of 18 are not considered capable of giving informed consent. Thus parental consent must be obtained along with the verbal agreement of the youth participant (Hollmann and McNamara, 1999).

There are two main types of consent that can be obtained from parents or legal guardians. In active consent, a child can only be approached for participation in a study if a parent has already given their consent in writing (White, Hill, and Effendi, 2004). This method errs on the side of protecting the child by ensuring that everyone participating has parents who have been told and consented to their child being involved (Jason, Pokorny, and Katz, 2001). However, in passive consent a child may be approached so long as the parent has been notified and has not objected (White et al., 2004). This passive consent often means that a letter is sent home with a child that explains the details of the study to the parent(s). It is assumed that the child has delivered the letter, which has been read by the parent and thus the parent has been notified. This method often results in a higher response rate and a less biased sample (Jason et al., 2001).

Research indicates that there are three categories of parental response in active consent cases. These are consenting parents, non-responding parents and parents who refuse to allow

their children to participate (Baker, Yardley, and McCaul, 2001). When considering these three groups, findings were that there was no significant difference between the groups when examining various demographic characteristics, with the exception of employment status. When examining employment status, non-responding parents were more likely to report being employed. There were no statistically significant differences between groups in their perception of their children's involvement in the various deviant activities or on their level of comfort with the original study's research topics. The main difference found was that refusing parents reported a lower perception of importance in a variety of areas of research as well as of importance of research in general. Baker et al. (2001) concluded from this that non-responding parents are typically very similar to consenting parents and not similar to parents who refuse to participate. They use this argument to suggest that passive consent should be used, as the non-responders were likely to consent if they had responded. While this argument is not definitive, it does suggest an avenue for future research.

Ellickson and Hawes (1989) found that letters mailed home almost guaranteed that the parents received the information. However mailing the letters home did not decrease the number of non-responders. When the non-responders were contacted by phone, 87% of them said that they did receive and read the materials. Of the 13% who did not remember seeing the materials, they all reported that the school had mailed the consent packet to the correct address. This indicates that the mail may have been accidently discarded before opening. This study did eventually get an 86% response rate with their active consent but that required extensive follow up. The researchers estimated that it cost $25 (not adjusted for inflation) and 25 minutes per family to obtain their higher rate. Tiggs (2003) found similar rates with 30-60% of students participating in active consent while 93-100% of students participated in surveys with passive

consent. Again, they found that follow up increased the rates of students participating under active consent. However, they also found a substantial cost of $8-$32 per student for the necessary follow up.

When researchers examine the other side of the issue, the youth characteristics, they do find multiple differences in those youth responding under active consent and those youth responding under passive consent. One study (Dent, Galaif, Sussman, and Stacy, 1993) found that the participant group in active consent tended to contain fewer minorities, fewer youth who were dissatisfied with school, fewer youth who reported parents of lower education levels and few cigarette smokers. The children of non-responders were more likely to live in a single parent home, more likely to report risk-taking behaviors, more likely to report lower self-esteem and lower in concern about health and assertiveness. This list of characteristics includes multiple risk factors and a distinct lack of protective factors, indicating that the youth who are not being surveyed are those youth who are most at risk.

Henry, Smith and Hopkins (2002) found that a sample of rural youth in Pennsylvania showed similar characteristics. Those youth who did obtain active consent were more likely to be of higher academic standing, have missed fewer days of school, and were less likely to participate in the special education program at their school as compared to students who did not return a parental consent form. Children of refusing parents did not differ significantly from those of consenting parents. Consistent with the results found by Dent et al. (1993), described in the previous paragraph, those being surveyed appear to be at less risk for substance abuse in the first place.

Another study examined the smoking behavior of youth in an urban area of Southern California (Unger et al., 2004). They found that under active consent procedures, the sample had

fewer African Americans, fewer males, fewer students who were currently doing poorly in school and fewer students who were currently involved in risky behavior. Students with poor grades were the least likely to return consent forms. In an interesting twist, the researchers did find that children of non-responders were less likely to complete the survey due to being absent from school, out of class or the child themselves refused permission. The conclusion drawn was that this reinforces the thought that those students who are out of class for whatever reason are the students at most risk for substance abuse due to their low bonding to school.

Finally, a study that examined the substance abuse behavior of students in Northern and Central Illinois (Pokorny, Jason, Schoeny, Townsend, and Curie, 2001) found that students surveyed under active consent were more likely to be female and younger than those surveyed under passive consent. They were also less likely to report lifetime use of tobacco, but there was no difference found with alcohol or other drugs. Results are not directly comparable to the studies above as follow up was done to increase rates of active consent.

In a study designed to focus on the question of active versus passive consent in reporting of risky behavior, Frissell et al. (2004) showed that youth reporting under active consent reported less lifetime use and less risky use. This reinforces the conclusion that those who are participating under active consent are not the ones engaging in substance abuse. They also found that participation in general was approximately doubled under situations of passive consent. Another study (White et al., 2004) found that youth in the 12-15 year old passive consent group was significantly more likely to report having ever used ecstasy, having used ecstasy in the previous month, and used cannabis in the previous month. In the 16-17 year old passive consent group, the researchers found a significantly higher rate of reported drinking of alcohol in the last week.

Summary

Alcohol use, once considered to have little societal impact, is increasingly seen as a problem with a large cost to the United States. The public health model suggests that we, as a society, should focus on reducing the overall drinking of the entire population rather than focusing on those with the riskiest behavior. Governmental support, in the form of grants, is used to spread evidence-based programming in the United States.

The Risk and Protective Factor model suggests that there are individual-level risk and protective factors that influence the substance abuse behaviors of both the individuals and their communities. The Communities that Care® survey was developed to help measure those factors. This survey has had extensive reliability and validity testing and is considered to show strong psychometric properties. The Missouri Student Survey was originally modeled after the Communities that Care® survey but has been modified in several ways since its inception and has little psychometric testing.

Because minors cannot give informed consent, parents must become involved in any underage student research. Parents are not the captive audience that their children are however, which leads to difficulties in obtaining the needed consent. Arguments have been made that passive consent procedures are the best way of handling this situation. Parents who do not return their consent appear to be more similar to consenting parents than refusal parents. Youth who are surveyed under passive consent also appear to be the more high risk group that researchers are attempting to target.

Methods and Results

The purpose of this study is to explore the usefulness of the Missouri Student Survey to state and local policy makers, examining the data from it in terms of its validity, reliability and ability to generalize to the larger population of Missouri. With the prevention movement's shift toward more scientific, data-driven decision making, this data source has become one of the most widely used in the state. It is often said by those in the prevention field that any data are better than no data, but this study attempts to shed light on data quality. I will examine the relationship between the MSS and the risk and protective factor scales, reliability, criterion-related validity and finally explore the role that consent plays in obtaining a truly representative sample of Missouri's youth. Each of these analyses will help illuminate the strengths and limitations of the MSS and determine how trustworthy the data are for purposes of strategic prevention planning.

All statistical analyses were done in SPSS 16 with the exception of Analysis 1, which was done in AMOS. Data sets were obtained from the Missouri Institute of Mental Health. Permission to access and analyze these data sets was obtained from the director of the Children and Family Division of MIMH and the Prevention Director, Department of Mental Health, Division of Alcohol and Drug Abuse.

Since age is recognized as an important factor in youth alcohol use (Masten, Faden, Zucker and Spear, 2008), analyses pertaining to consumption will be stratified in 6^{th} graders (N=17,065), 9^{th} graders (N=39,324) and 12^{th} graders (N=5,916). This will permit an investigation into age-related changes. These three grades were selected because they were the youngest grade in the survey, the middle grade in the survey and the oldest grade in the survey.

Participants

The 2008 Missouri Student Survey sampled 126,923 students from across the state of Missouri. They were sampled from grades 6 through 12 and the average age was 14.3. The grade breakdown was 13.6% 6th graders, 10.5% 7th graders, 20.0% 8th graders, 31.3% 9th graders, 12.4% 10th graders, 7.6% 11th graders and 4.6% 12th graders. There was an almost equal distribution of males and females (49.9% verses 50.1%) represented in the sample. The racial distribution was 81.0% Non-Hispanic White, 14.2% Non-Hispanic Black, 6.3% Hispanic / Latino, 2.0% Non-Hispanic Asian, 2.0% Non-Hispanic American Indian / Alaskan Native and 0.9% Native Hawaiian or Other Pacific Islander. Youth self reported their grades over the last year; 38.9% Mostly A's, 34.2% Mostly B's, 19.8% Mostly C's, 4.7% Mostly D's and 2.4% Mostly F's.

Across the state, the overall participation rate was 14.2%. For SPF SIG communities using active consent, the participation rate was 6.2%. For SPF SIG communities using passive consent, the participation rate was 22.8%.

Instrument

The Missouri Student survey is a 116 item instrument administered in a web-based form by SmartTrack, a web-based survey administration service developed by Dream, Inc.. Skipping questions was allowed. The survey uses the Risk and Protective Factor model discussed above. Questions were taken from the Communities that Care® survey and then jointly modified by the Missouri Department of Elementary and Secondary Education and the Missouri Department of Mental Health with the assistance of the Missouri Institute of Mental Health.

Questions are designed to assess the risk and protective factors as well as lifetime use and 30-day use.

Procedure

All of Missouri's 524 school districts were asked to survey their 9th grade students, plus one other grade between 6th and 12th grades. At the statewide level, active consent was not required. Instead students were given a letter from their school, developed by the Missouri Department of Elementary and Secondary Education, to take to their parents. This letter explained the survey. Parents were told to contact the school if they did not want their child to participate. The children of those parents who contacted the school were not surveyed but all other youth in the chosen grade level who attended class on the day of administration were given the option of taking the survey. Youth who chose not to participate did not take the survey. It is unknown how many parents and students chose to opt out of the survey. The surveys were anonymous and all results were electronically inputted directly into the database upon survey completion.

Some local schools did choose to continue to require active consent. In the known SPF SIG sample, 22.9% of the schools chose to continue with active consent. The statewide percentage is unknown. In the situation where active consent was continued, a consent form was developed by the local schools and given to the parents. Parents were required to sign the form and return it to the school in order for their youth to be eligible to take the survey. Youth whose parent's consented to the survey were then eligible for participation; however they were still given the opportunity to decline to participate.

Data Cleaning Procedures

The survey includes two questions designed to measure honesty. In the first question, the youth are asked about both lifetime and 30-day use of a fake drug (derbisol), a drug that doesn't exist with a name invented by the developers of the survey. Youth who answer 'yes' to either of these questions were assumed to have answered the survey dishonestly and were discarded as part of the cleaning process. The second question asked students to self report on their honesty on a 5 point scale from 'I was very honest' to 'I was not honest at all'. Students who answered 'once in a while' or 'not honest at all' were also discarded. A total of 11,803 cases were lost by this data cleaning; N=7245 from the honesty question, N = 2903 from lifetime use of the fake drug and N = 2554 from 30 day use of the fake drug (more than 100% reported as some students answered dishonestly on multiple questions). For the first ten hypotheses, the cleaned data set were used. For the final two hypotheses, students who answered 'yes' to the fake drug questions or indicated that they were dishonest were included in the data set.

Data were also recoded for those students who answered questions inconsistently (for example answering "no" to lifetime use but "yes" to 30 day use). All answers were recoded to be consistent with the most specific answer (in this case, lifetime use was changed to "yes" to reflect the more specific answer that the student had used in the last 30 days). This was done by MIMH staff prior to data analysis.

Research Questions, Hypotheses, Statistics and Results

Analysis 1: Factor analysis

Factor analysis examines the relationship between a set of questions within a measure. In exploratory factor analysis the goal is to determine an underlying factor model by using an existing data set to infer a model through inductive reasoning. This is done by examining three types of variance components within the data; common variance which is shared among all of the variables, specific variance which does not correlate with any other variable and error variance which is the result of random variation. Random variation is the type of variance discussed in the Reliability and Validity section above as inherent in all measurement. Exploratory factor analysis arrives at the underlying factor model by maximizing the amount of common variance. In confirmatory factor analysis, the model is determined *a priori* and then evaluated for its goodness of fit to the data. There are considered to be two sources of variance in confirmatory factor analysis; variance from latent constructs or factors and variance from measurement error due to random error and unmeasured factors. The difference between the model determined *a priori* and the actual model as determined by the data is called a fitted residual; the smaller the fitted residuals, the better the goodness of fit (Bryant and Yarnold, 1995).

Research question – Does the survey accurately measure the risk and protective factors as predicted by the Hawkins and Catalano Risk and Protective Model?

To address this question, the following hypothesis was tested:

Hypothesis 1: The MSS accurately measures the identified risk and protective factors as predicted by Hawkins and Catalano Risk and Protective Model and indentified in Table 2.

In order to test Hypothesis 1, a confirmatory factor analysis using the Maximum Likelihood estimator was conducted to confirm the expected scales as predicted by the Hawkins and Catalano's research. This test provided information on construct validity.

The Comparative Fit Index(CFI) score was used as a measure of model fit. CFI indicates the percentage to which data covariance can be reproduced by the hypothesized model. A score above 0.90 is considered to be an acceptable fit (Reinard, 2006). Chi-Square was not used because it produces biased results when used with large data sets in Confirmatory Factor Analysis (Reinard, 2006). Root Mean Square Error of Approximation(RMSEA) was also examined. RMSEA is a parsimony-adjusted index that takes into consideration the complexity of the model and the error that can result from that complexity. RMSEA under 0.05 is considered to show acceptable fit (Kline, 2005).

Models that did not show acceptable fit had individual items dropped and the analysis was repeated to determine if one question was causing the poor fit. If this did not produce a model with acceptable fit, the CFA for that particular scale was dropped. The CFA, detailed below, did not produce many confirmed scales. Therefore, this analysis was followed-up by examining the data with an Exploratory Factor Analysis (EFA).

Analysis 1: Results

For the first analysis, all scales were modeled using AMOS. Scales with a CFI over 0.90 and RMSEA under 0.05 were considered to be confirmed. Only one scale was confirmed exactly

as predicted in Table 2. This was the protective factor scale of Opportunities for School Involvement CFI = 0.982, RMSEA = 0.044. See Appendix 3 for the models that were examined.

Table 3:

Scales in Original CFA

Scale	CFI	RMSEA
Rebelliousness	0.98	0.077
Antisocial Attitudes	0.98	0.077
Drug Use Attitudes	0.77	0.393
Perceived Risk of Drug Use	0.90	0.155
Peer Rewards for Antisocial Involvement	0.98	0.152
Parental Attitudes toward Antisocial Behavior	1.00	0.363
Parental Attitudes toward Drugs	1.00	0.409
Family Management/Supervision	0.97	0.073
Family Conflict	N/A	0.290
Family History of Antisocial Behavior	0.96	0.130
Opportunities for Parental Involvement	1.00	0.400
Rewards for Parental Involvement	N/A	0.513
Academic Performance	N/A	0.335
School Commitment	0.90	0.134
Opportunities for School Involvement	0.98	0.044
Rewards for School Involvement	1.00	0.318
Drug Use Laws	1.00	0.522
Drug Availability	0.95	0.140
Drug Use Norms	0.67	0.301
Community Disorganization	0.97	0.109
Neighborhood Attachment	N/A	0.495
Opportunities for Community Involvement	0.97	0.092
Rewards for Community Involvement	0.99	0.092

N/ A – Scales with only two factors did not produce a CFI score for the default model.

Because only one scale out of the possible 23 was confirmed, the decision was made to explore the data further by systematically dropping one question at a time from the model and then recomputing the statistics. This was done for each of the questions within a scale so that if a scale had 5 items, the first item would be dropped, the statistics recomputed, the CFI and RMSEA noted and then the first item was added back in and the second item would be dropped

for the process to repeat. This was continued until the model had been tested with each individual item removed. In the case where a scale was confirmed by more than one model during this exploratory phase, the model with the best CFI and RMSEA score is reported below.

Five additional scales were confirmed in this manner:

Table 4:

Scales Modified to Achieve Fit

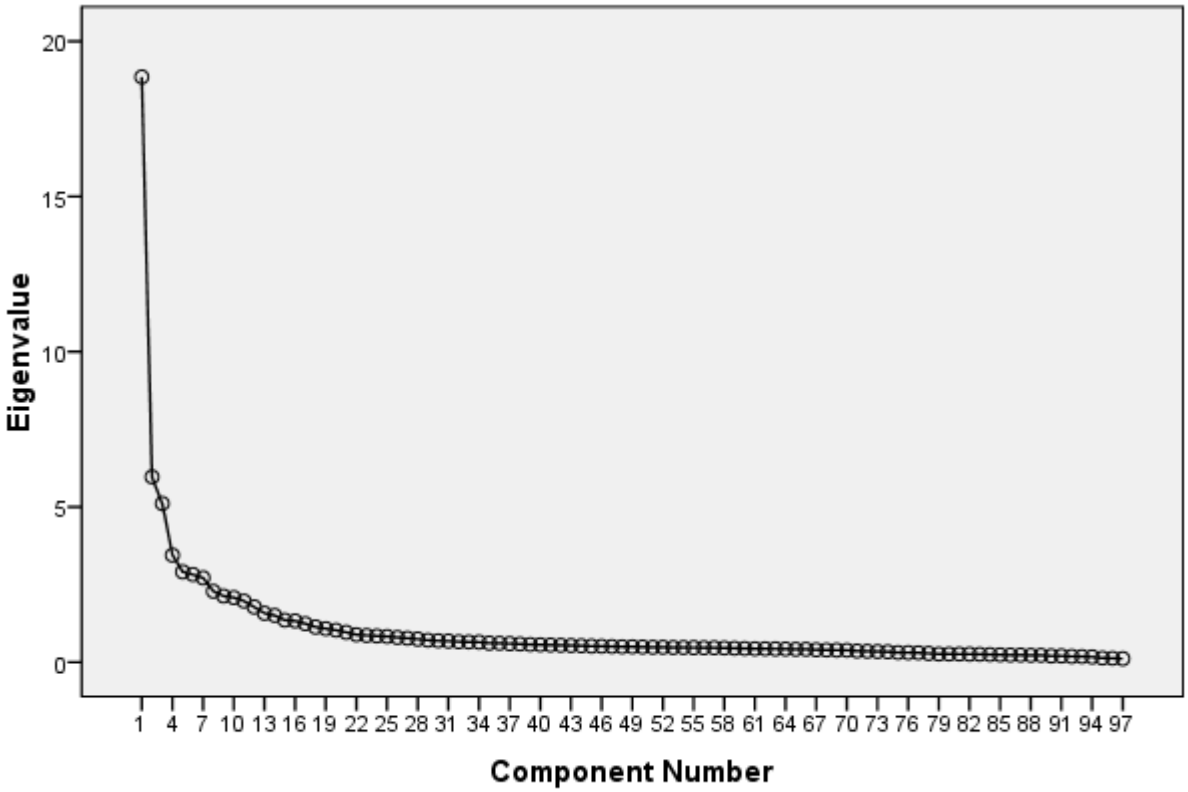
Scale	Question deleted	CFI	RMSEA
Rebelliousness	33	1.00	0.037
Antisocial Attitudes	24c	1.00	0.045
School commitment	21a	0.99	0.046
Community Disorganization	85c	1.00	0.028
Opportunities for Community Involvement	88e	1.00	0.014

All other scales did not show an appropriate measure of fit even when the models were adjusted using this procedure. The scales were clearly not as predicted by the Hawkins and Catalano Risk and Protective Model and indentified in Table 2. Therefore, an EFA was run on all questions to determine the underlying factor structure present in this large data set.

For the Exploratory Factor Analysis, the Kaiser-Meyer-Olkin (KMO) value was 0.949, well above the cutoff of 0.6 and Bartlett's Test of Sphericity was significant (x^2(df =4656) = 5,929,644.0, $p < .000$). These measures indicate that there is sufficient correlation between the items to do an EFA. Examining the total variance explained, 20 components had an eigenvalue above 1; however, the scree plot (see Graph 1) shows a significant drop after the 1st component, the 3rd component and a smaller one after the 4th component. As using even the 4th component of the scree plot only explained a total of 34.4% of the variance, the decision was made to retain the top 20 components that explained a total of 64.2% of the variance.

Figure 1

Scree Plot of Components in the EFA



The EFA was done using the Varimax rotation after an examination of the correlation between factors in the Oblimin rotation revealed low levels of correlation between the components. Results are shown in Table 5 below. While 20 components were requested, the 20th component did not have any item loading on it that did not already have a higher loading on another component, therefore only 19 components are shown.

Table 5:

Components, Scales and Factor Loading from EFA

Component	% Variance Accounted	Scales as show in Table 2 that Contribute to this Component	Quest.	Factor Load.	Quest.	Factor Load.	Quest.	Factor Load.	Quest.	Factor Load.
1	6.51	Perceived Risk of Drug Use	35.h	. 91	35.g	. 91	35.f	. 91	35.j	. 89
			35.e	. 87	35.i	. 73	35.a	. 69	35.c	. 62
			35.d	. 53						
2	6.02	Opportunities for Parental Involv.,	105	. 68	97	. 67	102	. 66	106	. 66
		Family Management and Rewards	95	. 65	109	. 65	107	. 63	104	. 62
		for Parental Involv.	99	. 62	103	. 62	93	. 62		
3	5.06	Antisocial Attitude, Rebelliousness	29	. 68	34	. 66	28	. 63	25	. 60
		and Family Management	33	. 59	24.a	. 53	24.b	. 52	26	. 49
			24.c	. 47	24.d	. 44	27	-. 41		
4	3.92	Family History	92.b	. 87	92.c	. 87	92.d	. 85	92.e	. 83
			92.a	. 81						

Component	% Variance Accounted	Scales as show in Table 2 that Contribute to this Component	Quest.	Factor Load.	Quest.	Factor Load.	Quest.	Factor Load.	Quest.	Factor Load.
5	3.81	Parental Attitudes toward Antisocial Behavior and Parental Attitudes toward Drugs	91.e	. 75	91.d	. 75	91.c	. 73	91.b	. 71
			91.a	. 64	91.f	. 57				
6	3.70	Opportunities for School Involv.	11	. 67	13	. 67	15	. 63	17	. 61
		and Reward for School Involv.	14	. 59	12	. 52	9	. 51	10	. 48
7	3.45	Drug Norms and Family History	80.b	. 83	80. a	. 81	80. c	. 80	80. d	. 61
			94	. 34						
8	3.22	Reward for Community Involve.	87	. 78	82	. 73	90	. 73	84	. 73
9	3.20	Drug Availability	71	. 72	72	. 72	74	. 70	77	. 63
			76	. 58						
10	3.05	Opportunities for Community Involv.	88.e	. 78	88.c	. 77	88.b	. 77	88.d	. 72
			88.a	. 67						
11	2.97	Peer Reward for Antisocial Involv.	32.a	. 86	32.c	. 82	32.b	. 79	32.d	. 74
12	2.78	Drug Use Attitudes	24.h	. 87	24.i	. 86	24.g	. 57		

Component	% Variance Accounted	Scales as show in Table 2 that Contribute to this Component	Quest.	Factor Load.	Quest.	Factor Load.	Quest.	Factor Load.	Quest.	Factor Load.
13	2.78	School Commitment	21.a	-. 73	21.b	. 71	19	. 61	18	-. 57
			20	. 56						
14	2.55	Drug Use Laws	75	. 85	78	. 83	73	. 81		
15	2.38	Drug Norms	79.b	. 82	79.c	. 82	79.a	. 73		
16	2.01	Family Conflict	96	. 74	108	. 70				
17	1.99	Perceived Risk of Drug Use and Drug Use Attitudes	35.b	-. 53	24.e	. 46	24.f	. 45		
18	1.86	Academic Performance and School Commitment	7	. 79	16	. 77	21.c	. 43		
19	1.52	Neighborhood Attachment	81	. 71	83	. 69				

Rotation converged in 14 iterations.

Analysis 2: Reliability

Cronbach's alpha is a special measure of the inter-item consistency of items in a questionnaire designed to work with items that are continuously scored (as opposed to dichotomous scoring) (Cohen and Swerdlik, 2002). Cronbach's alpha is computed by correlating the score for each item with the total scale score for each individual and comparing that to the variability found for all individual item scores. The goal for this statistical analysis is to test a scale's consistency in representing a single underlying construct (Salkind, 2007).

Research question - Do the items within each scale reliably measure the same underlying constructs?

To address this question, the following hypothesis was tested:

Hypothesis 2: The scales (as shown in Table 2) will show strong inter-item consistency.

Cronbach's alpha was computed for each scale confirmed by Analysis 1. Alpha values above 0.7 were considered to show acceptable reliability (Pallant, 2005). Individual items within each scale were examined to see if Cronbach's alpha could be increased be deleting them. No such items were found.

Analysis 2: Results

All scales which had been confirmed in the above CFA, with the exception of Opportunities for School Involvement, showed acceptable reliability when examining Cronbach's alpha. Acceptable reliability was scored as 0.7 or above. Excluding items from the Opportunities for School Involvement scale did not increase the reliability of the scale. Two

additional scales did not show strong reliability. As they both had only two items, questions could not be removed to improve reliability.

Table 6:

Cronbach's Alpha Scores for Currently Reported Scales as shown in Table 2

Scale	N Items in Scale	Cronbach's alpha
Rebelliousness[1]	5	0.75*
Perceived Risk of Drug Use	10	0.86*
Antisocial Attitudes[1]	5	0.76*
Drug Use Attitudes	5	0.86*
Peer Rewards for Antisocial Involvement	4	0.86*
Family Management/Supervision	7	0.83*
Family Conflict	2	0.65
Family History of Antisocial Behavior	6	0.86*
Parental Attitudes toward Drugs	3	0.80*
Parental Attitudes toward Antisocial Behavior	3	0.75*
Opportunities for Parental Involvement	3	0.80*
Rewards for Parental Involvement	2	0.85*
Academic Performance	2	0.69
School commitment[1]	6	0.74*
Opportunities for School Involvement[1]	5	0.64
Rewards for School Involvement	3	0.72*
Neighborhood Attachment	2	0.84*

Community Disorganization[1]	5	0.75*
Drug Use Norms	7	0.84*
Drug Use Laws	3	0.88*
Drug Availability	5	0.83*
Opportunities for Community Involvement[1]	5	0.75*
Rewards for Community Involvement	4	0.84*

*Cronbach's alpha coefficient > 0.7 [1] Scales also showing validity

As the EFA provided an alternative scale system, a reliability analysis was done for those scales as well. All scales that could be tested showed strong reliability with the exception of 16 and 18. Component 17 could not be analyzed for reliability as there was a negative covariance among the items, violating the model's assumption. This was not due to reverse scoring.

Table 7:

Cronbach's Alpha Scores for EFA Scales

Component Number	N Items in Scale	Cronbach's alpha
1	9	0.93*
2	11	0.90*
3	11	0.82*
4	5	0.91*
5	6	0.85*
6	8	0.77*
7	5	0.83*
8	4	0.84*

9	5	0.83*
10	6	0.81*
11	4	0.86*
12	3	0.82*
13	5	0.77*
14	3	0.88*
15	3	0.86*
16	2	0.65
17	3	N/A
18	3	0.66
19	2	0.84*

*Cronbach's alpha coefficient > 0.7

Analysis 3: Criterion-Related Predictive Validity

Multivariate analysis of variance (MANOVA) is a statistical technique that examines the effects of independent variables on several dependent variables. MANOVA is different from ANOVAs in that it is designed to test multiple dependent variables at one time, with the assumption that those variables are correlated. This testing of multiple dependent variables at once decreases the likelihood of a Type I error (that is, a false rejection of the null hypothesis) by taking into account the correlations between the dependent variables. Like an ANOVA, MANOVAs can test for the effects of multiple independent variables as well, testing for both the significance of each independent variable (main effects) as well as interactions between the independent variables (Weinfurt, 1995). MANOVAs are used when the design involves one or

more categorical independent variables and two or more continuous dependent variables (Grimm and Yarnold, 1995).

Regression is similar to MANOVA however, in regression the independent variables can be continuous. The goal of regression is to compute the relationship between the variables with a regression line. Regression line direction and slope indicates the type and strength of the relationship (Johnson, 2006).

Both MANOVA and Regression assume mid-range inter-correlations between the independent variables, high inter-correlations causes an error with multicollinearity. The data set was examined and a high degree of inter-correlations among most of the variables was found (see Tables 16 and 17 below). In addition, Box's Test of Equality of Covariance Matrices had a significant value ($p<.001$), indicating that that the assumption of homogeneity of variance has been violated and Levene's Test for Equality of Error Variances show significant values ($p>.05$) for all but two of the variables (School Rewards and Opportunity for Community Involvement), indicating that the assumption of equality of variance had been violated for those variables. Therefore, scales were collapsed into domain level risk scales and domain level protective scales, resulting in a total of 6 scales; Individual Risk Factor Domain scale, Family Risk Factor Domain scale, Family Protective Factor Domain scale, School Protective Factor Domain scale, Community Risk Factor Domain scale and Community Protective Factor Domain scale. The scales are also shown in Table 2 found Appendix 1. Note there were no Individual Protective Factor items to develop into a scale nor was there any School Risk Factor items to develop into a scale. Reliability information is reported in Table 8 below:

Table 8:

Cronbach's Alpha Scores

Scale	N Items in Scale	Cronbach's alpha
Individual Risk Factor Domain	29	0.71*
Family Risk Factor Domain	21	0.60
Family Protective Factor Domain	5	0.86*
School Protective Factor Domain	10	0.75*
Community Risk Factor Domain	9	0.62
Community Protective Factor Domain	22	0.78*

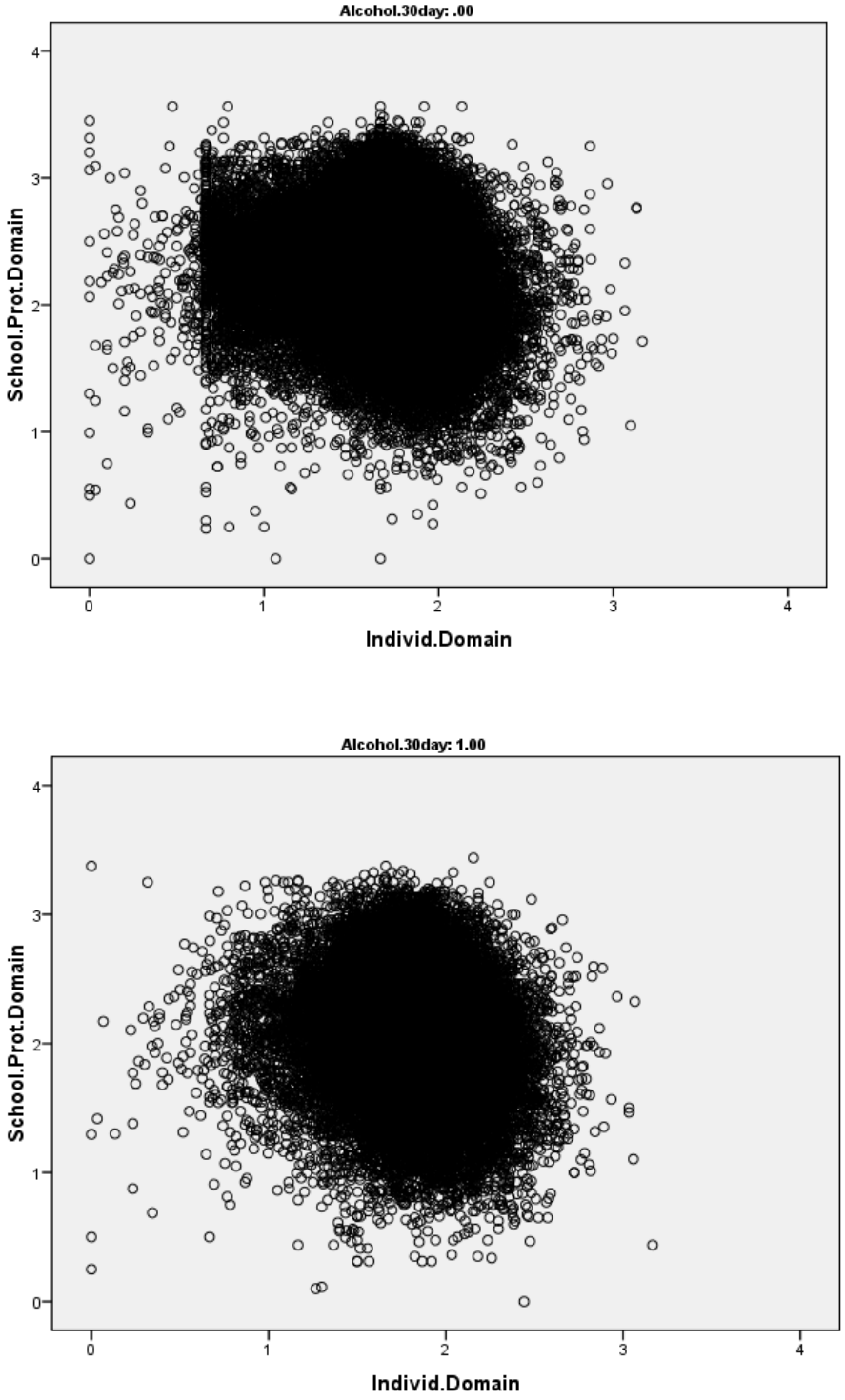
*Cronbach's alpha coefficient > 0.7

As there was no single item that could be deleted to move the Alpha value above 0.7, no modifications were made.

These new scales were then tested to see if they met the assumptions for a MANOVA. Unfortunately, these scales showed very little correlation with each other (see Table 17 below) and there was no linear relationship between variables as shown in the example scatterplots below:

Figure 2:

Scatter Plots Showing the Relationship between Two Domain Scales & 30 Day Use



Therefore, the MANOVA analyses were changed to an independent samples t-test. An independent samples t-test compares the mean score on a continuous variable for two different groups of subjects (Pallant, 2005). By running individual level t-tests, there is an increased likelihood that a false positive could occur simply by chance. A Bonferroni adjustment can be used in cases where a large amount of t-tests give rise to concerns about a false positive. This adjustment takes the accepted alpha level, in this case 0.05, and divides it among all the tests. By using this more stringent alpha level, the chance of a false positive is again decreased to an acceptable level (Pallant, 2005).

As there are no statistical tests that would be an appropriate substitution for the Regression, this set of analyses was dropped.

Research question - Do the items measuring risk and protective factors actually predict 30 day alcohol use as suggested by the Risk and Protective Factor Framework?

To address this question, the following hypothesis was tested:

Hypothesis 3: Students reporting having risk factors and not having the protective factors will answer "0"or "none" when asked about 30 day alcohol use.

Research question - Do the items measuring risk and protective factors predict lifetime use as suggested by the Risk and Protective Factor Framework?

To address this question, the following hypothesis was tested:

Hypothesis 4: The students reporting that they have risk factors and do not have the protective factor scales will answer "no" when asked about lifetime alcohol use.

Scales were coded into a single continuous variable indicating the amount of risk or protective factor each individual self-reported. Summing each of the items in a scale resulted in a cumulative score indicating the strength of each risk or protective factor, ranging from 0 to 3.5. Using these scale scores, correlations were calculated to test for a relationship between this variable and 30 day drug use. It was hypothesized that there would be a positive correlation between the presence of risk factors and 30 day use and a negative correlation between presence of protective factors and 30 day use. As some items are reverse scored, each item was individually examined to determine the actual expected direction of the correlation. Correlations were as expected (see Table 9) so analysis continued.

Table 9:

Correlations between scales and use

		Lifetime Use	30 day Use
Indiv. Domain	Pearson Correlation	0.25*	0.21*
	Sig. (2-tailed)	.000	.000
	N	111,544	111,452
Fam. Risk. Domain	Pearson Correlation	0.19*	0.17*
	Sig. (2-tailed)	.000	.000
	N	109,201	109,119
Fam. Prot. Domain	Pearson Correlation	-0.21*	-0.19*
	Sig. (2-tailed)	.000	.000
	N	111,514	111,421
Sch. Prot. Domain	Pearson Correlation	-0.17*	-0.18*
	Sig. (2-tailed)	.000	.000
	N	111,642	111,555
Comm. Prot. Domain	Pearson Correlation	-0.14*	-0.11*
	Sig. (2-tailed)	.000	.000
	N	110,351	110,262
Comm. Risk. Domain	Pearson Correlation	0.37*	0.38*
	Sig. (2-tailed)	.000	.000
	N	109,755	109,671

* Correlation is significant at the 0.01 level (2-tailed).

Thirty day and lifetime use was coded into a dichotomous variable and used as the independent variables in an independent samples t-test. The first groups consisted of those answering "yes" to 30 day and lifetime use, respectively. The second groups consisted of those answering "no" to those questions. The continuous variable coded above was used as the dependent variable. The cutoff value of p=.05 was used to determine significance.

Research question - Do the risk and protective factor scale items discriminate between those students who answer "yes" to the 30 day use question and those who answer "no" to the 30 day use question?

To address this question, the following hypothesis was tested:

Hypothesis 5: Those individuals reporting lifetime use will score higher on risk factor scales and lower on protective factor scales.

Research question - Do the risk and protective factor scale items discriminate between those students who answer "yes" to the lifetime use question and those who answer "no" to the lifetime use question?

To address this question, the following hypothesis was to be tested:

Hypothesis 6: Those individuals reporting lifetime use will score higher on risk factor scales and lower on protective factor scales.

Due to issues within the data set, these analyses were not run. See above for details.

Analysis 3: Results

Using the Bonferroni adjustment, the cutoff value for significance for all analyses in this section is $p = .001$ (.05/36)

Hypothesis 3

In all cases increased amounts of risk factors and decreased amount of protective factors were associated with 30 day use for students in 6th grade as shown by an independent t-test with $p < .05$ with the exception of the Community Protective Factor Domain. In all cases, Levene's Test for Equality of Variances was significant at the $p < .05$ so the equal variances not assumed numbers are reported.

Table 10:

Independent t-test for 30 day use in 6th graders

Scale	DF	*t* Value	*p* Value
Individual Risk Factor Domain	1,918	8.9	.000*
Family Risk Factor Domain	1,800	20.5	.000*
Family Protective Factor Domain	1,838	20.4	.000*
School Protective Factor Domain	1,897	19.3	.000*
Community Risk Factor Domain	1,800	12.4	.000*
Community Protective Factor Domain	1,901	0.5	.592

*$p < .001$ (cutoff value determined by Bonferroni correction

In all cases increased amounts of risk factors and decreased amount of protective factors were associated with 30 day use for students in 9th grade as shown by an independent t-test with $p < .05$ with the exception of the Community Protective Factor Domain. In all cases, Levene's

Test for Equality of Variances was significant at the $p < .05$ so the equal variances not assumed numbers are reported.

Table 11: *Independent t-test for 30 day use in 9th graders*

Scale	DF	*t* Value	*p* Value
Individual Risk Factor Domain	27,732	27.4	.000*
Family Risk Factor Domain	26,233	55.8	.000*
Family Protective Factor Domain	27,167	40.1	.000*
School Protective Factor Domain	26,396	46.2	.000*
Community Risk Factor Domain	24,755	43.8	.000*
Community Protective Factor Domain	26,870	1.7	.099

*$p < .001$ (cutoff value determined by Bonferroni correction

In all cases increased amounts of risk factors and decreased amount of protective factors were associated with 30 day use for students in 12th grade as shown by an independent t-test with $p < .05$ with the exception of the Community Protective Factor Domain. In all cases, Levene's Test for Equality of Variances was not significant at the $p < .05$ so the equal variances assumed numbers are reported..

Table 12:

Independent t-test for 30 day use in 12th graders Graders

Scale	DF	*t* Value	*p* Value
Individual Risk Factor Domain	5174	11.6	.000*
Family Risk Factor Domain	5152	18.8	.000*
Family Protective Factor Domain	5170	8.5	.000*

School Protective Factor Domain	5220	12.3	.000*
Community Risk Factor Domain	5161	17.2	.000*
Community Protective Factor Domain	5155	1.9	.057

*p< .001 (cutoff value determined by Bonferroni correction

Hypothesis 4

In all cases increased amounts of risk factors and decreased amount of protective factors were associated with lifetime use for students in 6thgrade as shown by an independent t-test with p< .05. In all cases, Levene's Test for Equality of Variances was significant at the p< .05 so the equal variances not assumed numbers are reported.

Table 13:

Independent t-test for 30 day use in 6thgraders

Scale	DF	*t* Value	*p* Value
Individual Risk Factor Domain	11,569	17.9	.000*
Family Risk Factor Domain	10,210	26.2	.000*
Family Protective Factor Domain	9,839	26.6	.000*
School Protective Factor Domain	10,646	24.0	.000*
Community Risk Factor Domain	9,617	8.7	.000*
Community Protective Factor Domain	10,931	3.6	.000*

*p< .001 (cutoff value determined by Bonferroni correction

In all cases increased amounts of risk factors and decreased amount of protective factors were associated with lifetime use for students in 9thgrade as shown by an independent t-test with

p< .05. In all cases, Levene's Test for Equality of Variances was significant at the *p*< .05 so the equal variances not assumed numbers are reported.

Table 14:

Independent t-test for 30 day use in 9th graders

Scale	DF	*t* Value	*p* Value
Individual Risk Factor Domain	19,523	28.6	.000*
Family Risk Factor Domain	22,008	55.0	.000*
Family Protective Factor Domain	20,968	38.9	.000*
School Protective Factor Domain	21,294	40.3	.000*
Community Risk Factor Domain	22,396	34.3	.000*
Community Protective Factor Domain	20,297	4.7	.000*

**p*< .001 (cutoff value determined by Bonferroni correction

In all cases increased amounts of risk factors and decreased amount of protective factors were associated with lifetime use for students in 9th grade as shown by an independent t-test with *p*< .05. In all but one case, Levene's Test for Equality of Variances was not significant at the *p*< .05 so the Equal variances assumed numbers are reported. The Family Risk Factor Domain scale showed a significant Levene's Test for Equality of Variances value so the equal variances not assumed numbers are reported.

Table 15:

Independent t-test for 30 day use in 12th graders

Scale	DF	*t* Value	*p* Value
Individual Risk Factor Domain	1549	10.6	.000*

Family Risk Factor Domain	1781	18.9	.000*
Family Protective Factor Domain	1728	8.4	.000*
School Protective Factor Domain	1683	9.1	.000*
Community Risk Factor Domain	1727	14.9	.000*
Community Protective Factor Domain	1702	2.3	.022

*p< .001 (cutoff value determined by Bonferroni correction

Hypotheses 5 and 6 were not examined, as discussed above in the Methods section. Inter-scale correlation is reported below.

Table 16:

Inter-scale correlations

		Anti Attitudes	Drug Attitudes	Risk Drugs	Rewards Antisoc	Fam Manage	Fam Resp	Fam Conflict	Fam History	Fam Att Drugs	Fam Att Anti	Fam Opp
Anti Attitudes	Pearson Correlation	1.000	.638**	-.267**	-.303**	-.384**	-.413**	.246**	.201**	.365**	.490**	-.320**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,969	114,939	114,774	114,736	112,432	112,616	112,162	112,384	113,539	113,529	112,817
Drug Attitudes	Pearson Correlation	.638**	1.000	-.345**	-.349**	-.379**	-.428**	.205**	.245**	.500**	.406**	-.287**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,939	114,949	114,761	114,719	112,415	112,602	112,147	112,370	113,522	113,512	112,801
Risk Minor	Pearson Correlation	-.369**	-.476**	.883**	.223**	.338**	.361**	-.117**	-.156**	-.336**	-.291**	.234**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,840	114,822	114,875	114,728	112,430	112,622	112,166	112,387	113,535	113,525	112,818
Risk Major	Pearson Correlation	-.152**	-.197**	.938**	.096**	.230**	.205**	-.025**	-.014**	-.118**	-.139**	.153**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,701	114,690	114,807	114,597	112,309	112,508	112,049	112,272	113,410	113,400	112,696
Risk Drugs ALL	Pearson Correlation	-.267**	-.345**	1.000	.164**	.302**	.297**	-.071**	-.082**	-.231**	-.223**	.205**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	114,774	114,761	114,882	114,665	112,377	112,572	112,117	112,337	113,479	113,469	112,764
Rewards Antisocial	Pearson Correlation	-.303**	-.349**	.164**	1.000	.202**	.255**	-.163**	-.150**	-.232**	-.232**	.177**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	114,736	114,719	114,665	114,858	112,340	112,532	112,075	112,278	113,425	113,414	112,725
Fam Manage	Pearson Correlation	-.384**	-.379**	.302**	.202**	1.000	.665**	-.141**	-.150**	-.370**	-.373**	.621**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	112,432	112,415	112,377	112,340	112,559	111,907	112,194	111,466	112,316	112,313	112,221

		Anti Attitudes	Drug Attitudes	Risk Drugs	Rewards Antisoc	Fam Manage	Fam Resp	Fam Conflict	Fam History	Fam Att Drugs	Fam Att Anti	Fam Opp
Fam Response	Pearson Correlation	-.413**	-.428**	.297**	.255**	.665**	1.000	-.159**	-.177**	-.345**	-.348**	.486**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	112,616	112,602	112,572	112,532	111,907	112,745	111,630	111,548	112,506	112,503	112,200
Fam Conflict	Pearson Correlation	.246**	.205**	-.071**	-.163**	-.141**	-.159**	1.000	.187**	.158**	.201**	-.322**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	112,162	112,147	112,117	112,075	112,194	111,630	112,289	111,225	112,046	112,043	111,958
Fam History	Pearson Correlation	.201**	.245**	-.082**	-.150**	-.150**	-.177**	.187**	1.000	.241**	.210**	-.138**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	112,384	112,370	112,337	112,278	111,466	111,548	111,225	112,488	112,447	112,442	111,692
Fam Att Drugs	Pearson Correlation	.365**	.500**	-.231**	-.232**	-.370**	-.345**	.158**	.241**	1.000	.660**	-.214**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	113,539	113,522	113,479	113,425	112,316	112,506	112,046	112,447	113,648	113,629	112,654
Fam Att Anti	Pearson Correlation	.490**	.406**	-.223**	-.232**	-.373**	-.348**	.201**	.210**	.660**	1.000	-.251**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	113,529	113,512	113,469	113,414	112,313	112,503	112,043	112,442	113,629	113,638	112,651
Fam Opp	Pearson Correlation	-.320**	-.287**	.205**	.177**	.621**	.486**	-.322**	-.138**	-.214**	-.251**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	112,817	112,801	112,764	112,725	112,221	112,200	111,958	111,692	112,654	112,651	112,951
Fam Rewards	Pearson Correlation	-.314**	-.280**	.203**	.159**	.561**	.440**	-.297**	-.119**	-.230**	-.258**	.705**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,135	112,121	112,095	112,050	111,647	112,061	111,381	111,127	112,053	112,048	112,195
Sch Commit	Pearson Correlation	-.306**	-.281**	.180**	.139**	.304**	.267**	-.104**	-.094**	-.188**	-.194**	.273**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,341	114,320	114,235	114,203	111,929	112,103	111,660	111,896	113,021	113,011	112,307

		Anti Attitudes	Drug Attitudes	Risk Drugs	Rewards Antisoc	Fam Manage	Fam Resp	Fam Conflict	Fam History	Fam Att Drugs	Fam Att Anti	Fam Opp
Sch Opp	Pearson Correlation	-.260**	-.220**	.138**	.135**	.292**	.230**	-.111**	-.089**	-.153**	-.176**	.327**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,657	114,640	114,572	114,547	112,270	112,451	112,009	112,200	113,349	113,337	112,660
Sch Rewards	Pearson Correlation	-.277**	-.227**	.081**	.145**	.260**	.242**	-.141**	-.107**	-.151**	-.175**	.330**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,714	114,696	114,629	114,606	112,322	112,505	112,053	112,251	113,402	113,390	112,712
Comm Attach	Pearson Correlation	-.135**	-.127**	.128**	.082**	.275**	.220**	-.118**	-.080**	-.089**	-.106**	.287**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	113,398	113,379	113,346	113,301	111,850	112,037	111,584	111,783	112,877	112,866	112,201
Comm Disorg	Pearson Correlation	.254**	.228**	-.128**	-.204**	-.199**	-.217**	.229**	.170**	.217**	.275**	-.188**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	113,669	113,654	113,610	113,555	112,095	112,291	111,837	112,082	113,194	113,184	112,456
Comm Norms	Pearson Correlation	.349**	.429**	-.180**	-.253**	-.280**	-.303**	.183**	.210**	.488**	.398**	-.211**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	113,912	113,894	113,839	113,789	112,087	112,275	111,824	112,063	113,189	113,179	112,438
Comm Laws	Pearson Correlation	-.299**	-.308**	.151**	.239**	.301**	.399**	-.178**	-.168**	-.236**	-.223**	.285**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114,071	114,053	114,007	113,973	112,134	112,367	111,883	112,080	113,179	113,169	112,493
Comm Avail	Pearson Correlation	.416**	.491**	-.140**	-.356**	-.292**	-.433**	.278**	.274**	.395**	.345**	-.257**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	113,159	113,144	113,105	113,074	111,297	111,596	111,062	111,252	112,320	112,309	111,646
Comm Opp	Pearson Correlation	.100**	.073**	-.123**	-.039**	-.137**	-.111**	.064**	.065**	.061**	.101**	-.157**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	111,642	111,625	111,609	111,541	110,333	110,522	110,103	110,369	111,353	111,343	110,651

		Anti Attitudes	Drug Attitudes	Risk Drugs	Rewards Antisoc	Fam Manage	Fam Resp	Fam Conflict	Fam History	Fam Att Drugs	Fam Att Anti	Fam Opp
Comm Rewards	Pearson Correlation	-.255**	-.217**	.129**	.134**	.349**	.303**	-.183**	-.127**	-.141**	-.178**	.409**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	113,494	113,476	113,442	113,397	112,125	112,320	111,867	112,055	113,154	113,144	112,464

** Correlation is significant at the 0 01 level (2-tailed)

Table 17:

Inter-scale correlations continued

		Fam Rewards	Sch Commit	Sch Opp	Sch Rewards	Comm Attach	Comm Disorg	Comm Norms	Comm Laws	Comm Avail	Comm Opp	Comm Rewards
Anti Attitudes	Pearson Correlation	-.314**	-.306**	-.260**	-.277**	-.135**	.254**	.349**	-.299**	.416**	.100**	-.255**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,135	114,341	114,657	114,714	113,398	113,669	113,912	114,071	113,159	111,642	113,494
Drug Attitudes	Pearson Correlation	-.280**	-.281**	-.220**	-.227**	-.127**	.228**	.429**	-.308**	.491**	.073**	-.217**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,121	114,320	114,640	114,696	113,379	113,654	113,894	114,053	113,144	111,625	113,476
Risk Drugs	Pearson Correlation	.203**	.180**	.138**	.081**	.128**	-.128**	-.180**	.151**	-.140**	-.123**	.129**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,095	114,235	114,572	114,629	113,346	113,610	113,839	114,007	113,105	111,609	113,442
Rewards Antisocial	Pearson Correlation	.159**	.139**	.135**	.145**	.082**	-.204**	-.253**	.239**	-.356**	-.039**	.134**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,050	114,203	114,547	114,606	113,301	113,555	113,789	113,973	113,074	111,541	113,397

		Fam Rewards	Sch Commit	Sch Opp	Sch Rewards	Comm Attach	Comm Disorg	Comm Norms	Comm Laws	Comm Avail	Comm Opp	Comm Rewards
Fam Manage	Pearson Correlation	.561**	.304**	.292**	.260**	.275**	-.199**	-.280**	.301**	-.292**	-.137**	.349**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	111,647	111,929	112,270	112,322	111,850	112,095	112,087	112,134	111,297	110,333	112,125
Fam Response	Pearson Correlation	.440**	.267**	.230**	.242**	.220**	-.217**	-.303**	.399**	-.433**	-.111**	.303**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,061	112,103	112,451	112,505	112,037	112,291	112,275	112,367	111,596	110,522	112,320
Fam Conflict	Pearson Correlation	-.297**	-.104**	-.111**	-.141**	-.118**	.229**	.183**	-.178**	.278**	.064**	-.183**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	111,381	111,660	112,009	112,053	111,584	111,837	111,824	111,883	111,062	110,103	111,867
Fam History	Pearson Correlation	-.119**	-.094**	-.089**	-.107**	-.080**	.170**	.210**	-.168**	.274**	.065**	-.127**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	111,127	111,896	112,200	112,251	111,783	112,082	112,063	112,080	111,252	110,369	112,055
Fam Att Drugs	Pearson Correlation	-.230**	-.188**	-.153**	-.151**	-.089**	.217**	.488**	-.236**	.395**	.061**	-.141**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,053	113,021	113,349	113,402	112,877	113,194	113,189	113,179	112,320	111,353	113,154
Fam Att Anti	Pearson Correlation	-.258**	-.194**	-.176**	-.175**	-.106**	.275**	.398**	-.223**	.345**	.101**	-.178**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,048	113,011	113,337	113,390	112,866	113,184	113,179	113,169	112,309	111,343	113,144
Fam Opp	Pearson Correlation	.705**	.273**	.327**	.330**	.287**	-.188**	-.211**	.285**	-.257**	-.157**	.409**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,195	112,307	112,660	112,712	112,201	112,456	112,438	112,493	111,646	110,651	112,464

		Fam Rewards	Sch Commit	Sch Opp	Sch Rewards	Comm Attach	Comm Disorg	Comm Norms	Comm Laws	Comm Avail	Comm Opp	Comm Rewards
Fam Rewards	Pearson Correlation	1.000	.300**	.307**	.376**	.251**	-.179**	-.210**	.252**	-.247**	-.161**	.397**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	112,260	111,632	111,976	112,026	111,594	111,833	111,816	111,861	111,048	110,082	111,863
Sch Commit	Pearson Correlation	.300**	1.000	.316**	.295**	.141**	-.097**	-.167**	.185**	-.211**	-.088**	.214**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	111,632	114,431	114,123	114,182	112,890	113,159	113,403	113,545	112,645	111,165	112,975
Sch Opp	Pearson Correlation	.307**	.316**	1.000	.558**	.192**	-.138**	-.157**	.192**	-.172**	-.186**	.293**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	111,976	114,123	114,799	114,773	113,240	113,477	113,710	113,906	112,993	111,468	113,338
Sch Rewards	Pearson Correlation	.376**	.295**	.558**	1.000	.160**	-.111**	-.165**	.260**	-.249**	-.121**	.340**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	112,026	114,182	114,773	114,859	113,292	113,527	113,767	113,962	113,044	111,510	113,388
Comm Attach	Pearson Correlation	.251**	.141**	.192**	.160**	1.000	-.217**	-.141**	.196**	-.108**	-.156**	.506**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	111,594	112,890	113,240	113,292	113,534	113,177	113,168	113,115	112,275	111,031	112,946
Comm Disorg	Pearson Correlation	-.179**	-.097**	-.138**	-.111**	-.217**	1.000	.345**	-.206**	.287**	.154**	-.182**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	111,833	113,159	113,477	113,527	113,177	113,775	113,372	113,325	112,477	111,370	113,204
Comm Norms	Pearson Correlation	-.210**	-.167**	-.157**	-.165**	-.141**	.345**	1.000	-.304**	.423**	.087**	-.189**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	111,816	113,403	113,710	113,767	113,168	113,372	114,014	113,566	112,695	111,318	113,155

		Fam Rewards	Sch Commit	Sch Opp	Sch Rewards	Comm Attach	Comm Disorg	Comm Norms	Comm Laws	Comm Avail	Comm Opp	Comm Rewards
Comm Laws	Pearson Correlation	.252**	.185**	.192**	.260**	.196**	-.206**	-.304**	1.000	-.416**	-.081**	.314**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	111,861	113,545	113,906	113,962	113,115	113,325	113,566	114,208	113,153	111,359	113,225
Comm Avail	Pearson Correlation	-.247**	-.211**	-.172**	-.249**	-.108**	.287**	.423**	-.416**	1.000	.013**	-.200**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	111,048	112,645	112,993	113,044	112,275	112,477	112,695	113,153	113,286	110,571	112,367
Comm Opp	Pearson Correlation	-.161**	-.088**	-.186**	-.121**	-.156**	.154**	.087**	-.081**	.013**	1.000	-.218**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	110,082	111,165	111,468	111,510	111,031	111,370	111,318	111,359	110,571	111,738	111,609
Comm Rewards	Pearson Correlation	.397**	.214**	.293**	.340**	.506**	-.182**	-.189**	.314**	-.200**	-.218**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	111,863	112,975	113,338	113,388	112,946	113,204	113,155	113,225	112,367	111,609	113,630

** Correlation is significant at the 0 01 level (2-tailed)

Table 18:

Inter-scale correlations of Domain Scales

		Individ. Domain	Fam. Domain	School.Prot. Domain	Family.Prot. Domain	Comm.Prot. Domain	Comm. Domain
Individ.Domain	Pearson Correlation	1.00	0.15	-0.17	-0.13	-0.06	0.12
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000
	N	113308	109643	112056	110601	110107	110134
Fam.Domain	Pearson Correlation	0.15	1.00	-0.19	-0.17	0.00	0.28
	Sig. (2-tailed)	0.000		0.000	0.000	0.154	0.000
	N	109643	111109	109902	110303	109071	108958
School.Prot. Domain	Pearson Correlation	-0.17	-0.19	1.00	0.47	-0.04	-0.06
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000
	N	112056	109902	113669	110883	110404	110418
Family.Prot. Domain	Pearson Correlation	-0.13	-0.17	0.47	1.00	0.04	-0.02
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
	N	110601	110303	110883	112195	109955	109857
Comm.Prot. Domain	Pearson Correlation	-0.06	0.00	-0.04	0.04	1.00	0.06
	Sig. (2-tailed)	0.000	0.154	0.000	0.000		0.000
	N	110107	109071	110404	109955	111609	109478
Comm. Domain	Pearson Correlation	0.12	0.28	-0.06	-0.02	0.06	1.00
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	N	110134	108958	110418	109857	109478	111604

Analysis 4: Item analysis

In timed tests, the test taker will often not be able to answer all questions. While the Missouri Student Survey is not designed to be speeded (that is, an emphasis on answering the most questions within a given amount of time), some communities are reporting that their students are not able to complete the entire survey within the class period. Item analysis should show that each question has an equal likelihood of being answered if time is not a factor.

Research question - Does each item on the survey have an equal opportunity to be answered?

To address this question, the following hypothesis was tested:

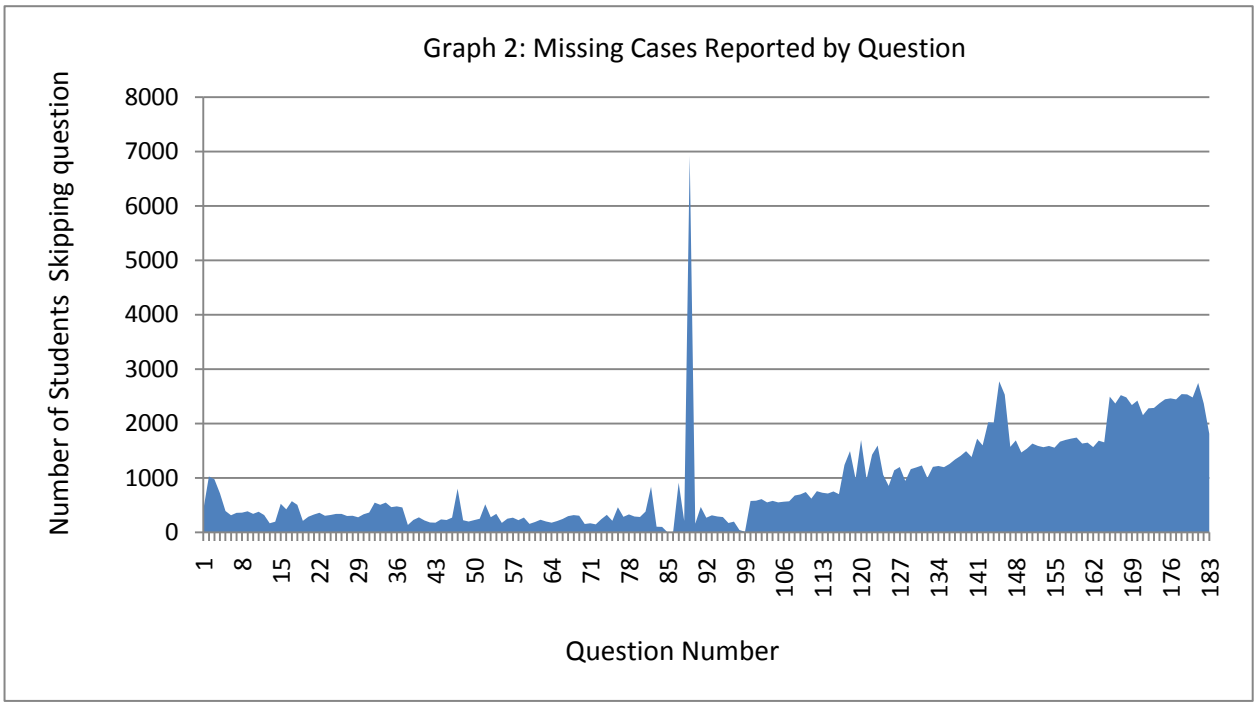
Hypothesis 7: A lack of sufficient time to complete the survey will be shown when students are less likely to complete items in the latter half of the survey.

The data set was divided in half and a paired samples t-test was run to determine if there were significantly more missing answers in the second half of the survey. This item analysis showed that certain questions were less likely to be answered, specifically those questions at the end of the survey. Therefore, the data set was divided by school district and a secondary analysis was performed to examine if all schools show this pattern or only select schools.

Analysis 4: Results

Hypothesis 7

There were significantly more missed questions in the second half of the survey compared to the first half $t(115,119) = 45.526$, $p = .000$.



As there was a significant difference found in the overall data set, a secondary analysis determined which schools showed significantly more missed questions in the second half of the survey. A total of 114 schools showed this pattern as indicated by a paired samples t-test with $p<$ .05. See Appendix 2 for the list of schools.

Analysis 5: Active versus passive consent

Chi-Square is a nonparametric test, meaning that it does not follow the same underlying assumptions (normally distributed, homogeneous and representative sample size) as all of the previously discussed statistics. In a one sample chi-square, also known as the goodness of fit test, the goal is to compute the numbers expected by chance and then test to see if the observed data set is significantly different from the numbers expected by chance (Salkind, 2007).This test is done with one dimensional data sets. In a chi-square test for independence, the goal is to examine the relationship between two categorical variables and discover if the differences between groups are due to chance or if there is a significant difference between the groups (Johnson, 2006).

Research question - Does the use of passive consent increase the participation in the Missouri Student survey?

To address this question, the following hypotheses were tested:

Hypothesis 8: The 2006 Missouri Student survey will have lower numbers of respondents than the 2008 Missouri Student survey due to the use of active consent.

Hypothesis 9: Schools using passive consent in 2008 will have a higher ratio of student participation than those using active consent.

Research question - Is the use of passive consent associated with an increased number of participants reporting risk factors?

To address this question, the following hypotheses were tested:

Hypothesis 10: The 2006 Missouri Student survey will have lower numbers of respondents reporting risk factors than the 2008 Missouri Student survey.

Hypothesis 11: Schools using passive consent in 2008 will have a higher ratio of student reporting risk factors than those using active consent.

Hypothesis 8 was tested by a chi-square goodness of fit test. Hypothesis 9 was tested by an independent samples t-test.

Hypotheses 10 and 11 were tested by a chi-square test for independence. As neither SmartTrack nor DESE kept records of which schools used active consent and which schools used passive consent in 2008 A convenience sample of SPF SIG communities was used as consent status was able to be obtained through contact with the project directors. The data were re-coded into dichotomous variables to indicate the absence or presence of each risk factor; answering yes

to any of the questions in the scale indicates that particular factor is present. This re-coding was used to determine if an increased number of participants reported risk factors under the conditions of passive consent.

Research question - Is the use of passive consent associated with an increased number of participants who do not accurately and honestly complete the survey?

To address this question, the following hypotheses were tested:

Hypothesis 12: The 2006 Missouri Student survey will have higher numbers of respondents answering 'yes' to the fake drug questions and 'no' to the "Did you answer this survey honestly?" question than the 2008 Missouri Student survey.

Hypothesis 13: Schools using passive consent in 2008 will have higher numbers of respondents answering 'yes' to the fake drug questions and 'no' to the "Did you answer this survey honestly?" question than those using active consent.

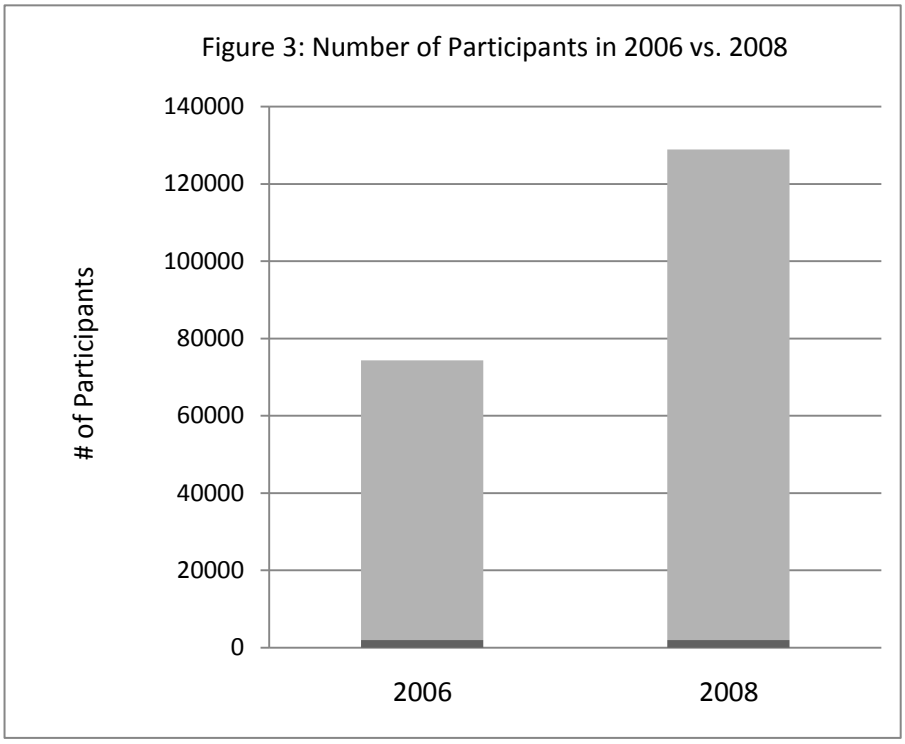
Active versus passive consent was coded as a dichotomous variable. This variable was used in two separate chi-square tests of independence. Students answering any amount over 0 to the fake drug question were coded as 'yes' they took the fake drug. Students answering 0 to the amount of times that they have taken the fake drug were coded as 'no'. Students answering "I was honest some of the time", "I was honest once in a while" or "I was not honest at all" were coded as answering "no" to the question of "Did you answer this survey honestly?". The first chi-square test of independence examined the relationship between the presence of dishonest answers in the 2006 data set and the presence of dishonest answers in those schools reporting use of passive consent in the 2008 data set. The second examined the relationship between those

schools who used active consent and those schools who used passive consent in the 2008 data set.

Analysis 5: Results

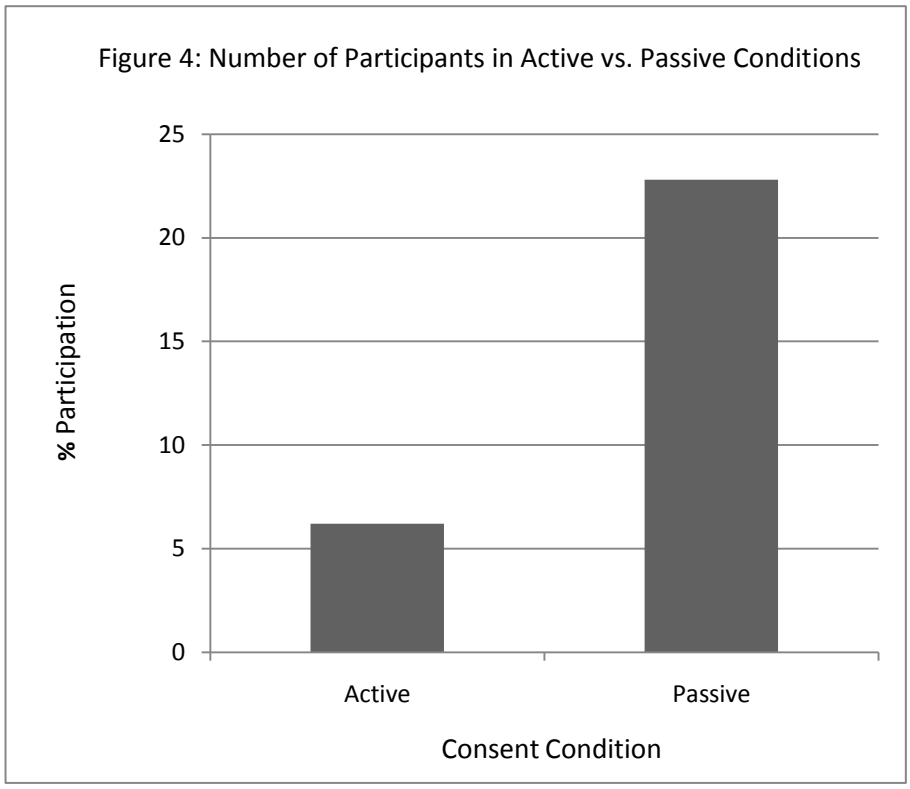
Hypothesis 8

According to a chi-square goodness of fit test, there was a statistically significant increase in the number of participants from 2006 to 2008, x^2(df =1, N = 199,242.0) = 14,960.0, p = .000.



Hypothesis 9

Using an independent samples t-test, it was determined that there was a significantly higher percentage of students in the schools using passive consent who participated in the survey compared to those schools using active consent, t(41) = 2.694, p = .010.



Hypothesis 10

Students surveyed in 2008, which was primarily passive consent, reported significantly more than expected counts of 9 risk factors according to a chi-square test of independence. Students surveyed in 2006, which was entirely active consent, reported significantly more than expected counts of 4 risk factors according to a chi-square test of independence. There was no significant difference between the groups in the amount of Community Disorganization or Drug Use Laws risk factors. See Table 19 for specific chi-square statistics for each factor.

Hypothesis 11

Students surveyed in the active consent condition, reported significantly more than expected counts of 9 risk factors according to a chi-square test of independence. There was no

significant difference between the groups in the remaining 6 risk factors. There were no risk factors in which the students in the passive consent condition reported significantly more cases than expected according to a chi-square test of independence. See Table 19 for specific chi-square statistics for each factor.

Table 19:

Summary and Comparison of Hypotheses 10 and 11

Risk Factor	df	N	x^2	*p*
Risk Factors that were Reported Significantly More Than Expected in Both Active Consent Conditions				
Perceived Risk of Drug Use	1	180,771	87.2	.000
Family Management	1	175,015	55,300.0	.000
Neighborhood Attachment	1	178,676	42,600.0	.000
Risk Factors that were Reported Significantly More Than Expected in Both Passive Consent Conditions				
None				
Risk Factors that were Reported Significantly More Than Expected in One Active Consent Condition				
Family History of Antisocial Behavior	1	177,152	70,320.0	.000[1]
Drug Use Attitudes	1	21,211	43.1	.000[2]*
Family Conflict	1	20,816	13.8	.000[2]*
Drug Use Norms	1	21,078	94.0	.000[2]*
Drug Availability	1	20,842	45.0	.000[2]*
Drug Use Laws	1	20,996	131.2	.000[2]

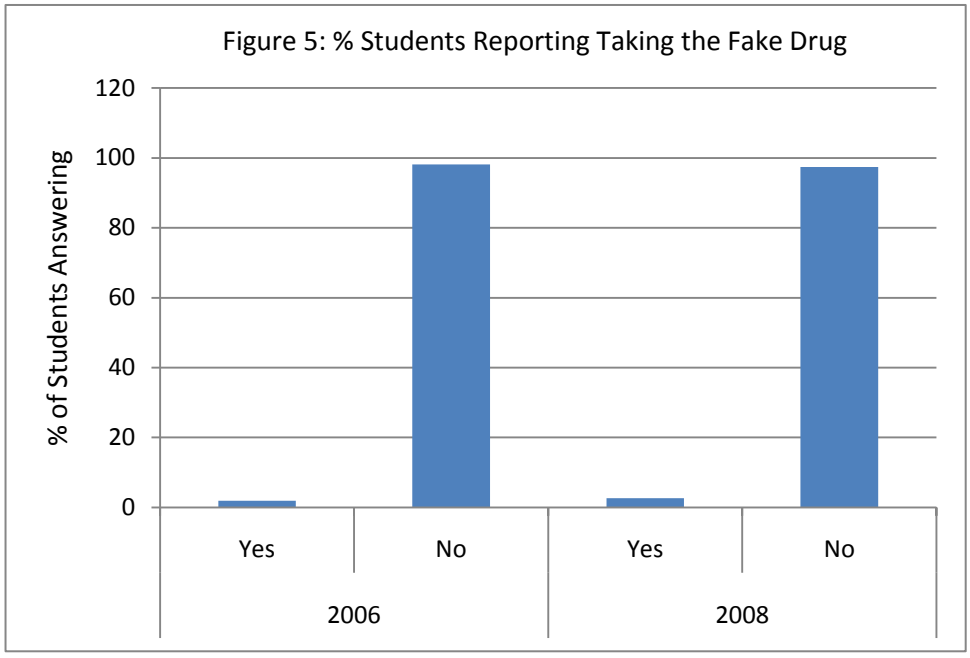
Community Disorganization	1	20,985	1,154.0	.000[2]
Risk Factors that were Reported Significantly More Than Expected in One Passive Consent Condition				
Rebelliousness	1	179,438	38,600.0	.000[1]
Antisocial Attitudes	1	181,107	171.8	.000[1]
Drug Use Attitudes	1	180,995	53.9	.000[1]*
Peer Rewards for Antisocial Involvement	1	180,908	67,910.0	.000[1]
Family Conflict	1	176,971	88.5	.000[1]*
Parental Attitudes Towards Drugs	1	178,547	19.4	.000[1]
Parental Attitudes Toward Antisocial Behavior	1	178,451	139.6	.000[1]
Drug Use Norms	1	179,252	9.0	.003[1]*
Drug Availability	1	178,451	5.7	.017[1]*
Risk Factors that Did Not Report Significantly More Than Expected in Either Condition				
None				

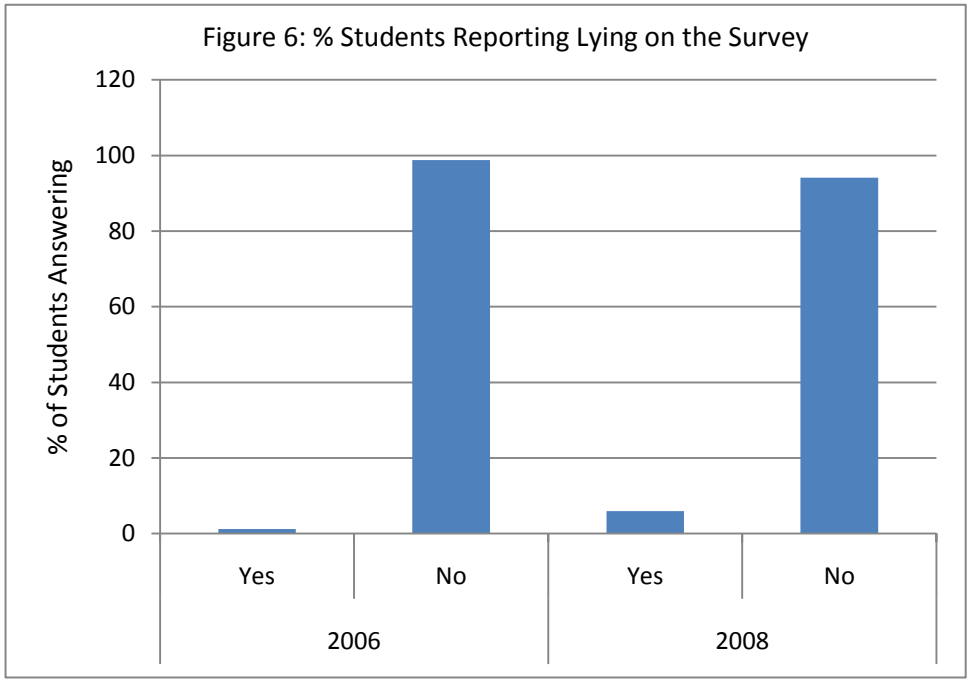
[1] Result from comparison of 2006 vs. 2008 [2] Result from comparison of active vs. passive in 2008 * Risk Factors that showed significantly more cases than expected in both active and passive consent conditions (contradictory results)

Hypothesis 12

There were significantly more students reporting taking the fake drug than would be expected in the 2008 condition compared to the 2006 condition, x^2(df =1, N = 92,097) = 37.1, p = .000.

There were statistically significantly more participants reporting lying than would be expected in the 2008 condition compared to the 2006 condition, x^2(df =1, N = 91,112) = 1,608.0, p = .000.

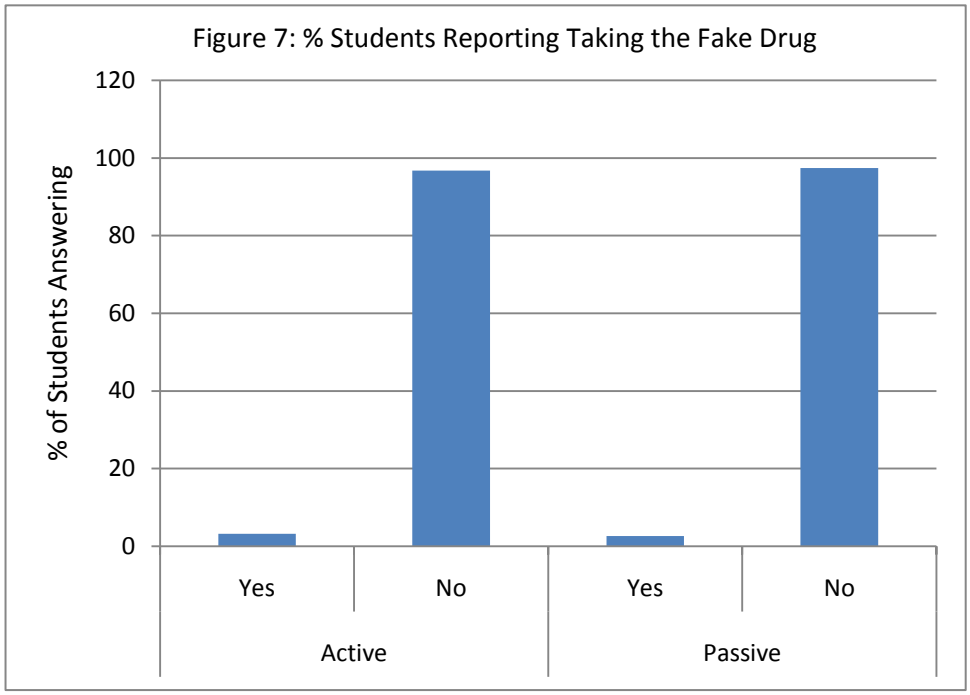


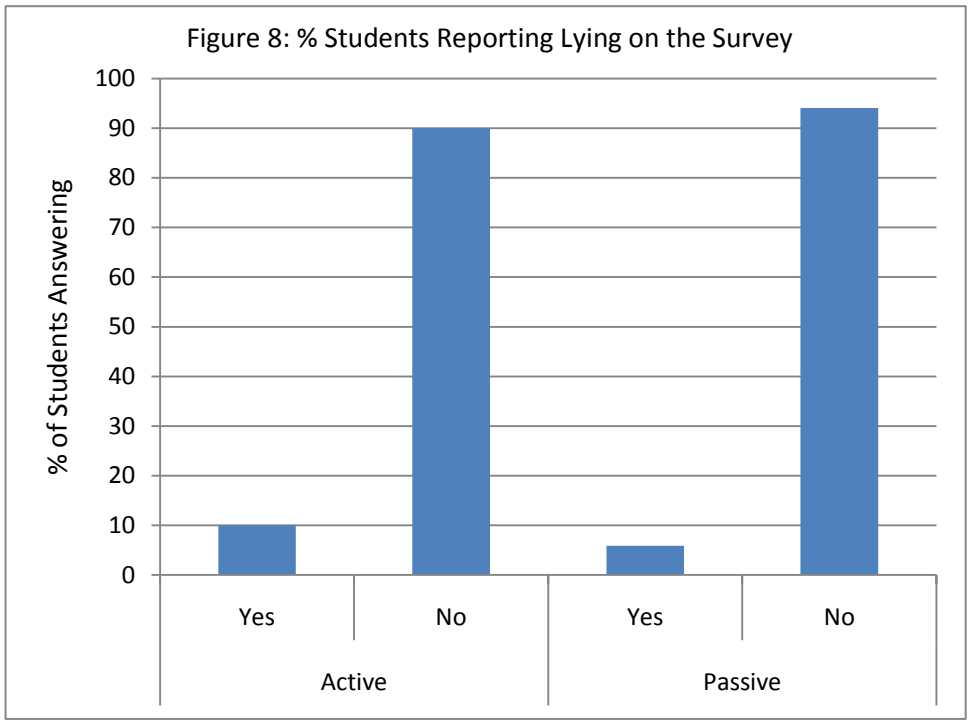


Hypothesis 13

Although there were slightly more students reporting taking the fake drug in the active consent condition, the difference was not significant x^2 (df =1, N = 25,787) = 3.2, p = .074.

There were statistically significantly more participants reporting lying than would be expected in the active consent condition as compared to the passive consent condition, x^2(df =1, N = 25,629) = 73.9, p = .000.





Discussion

Analysis 1: Factor analysis

Research question - Does the survey accurately measure the risk and protective factors as assumed (see Table 2)?

While there was sufficient theory behind the Missouri Student Survey scales, as reported in Table 2, to justify conducting a confirmatory factor analysis, the results indicate that the small changes made to the questions over the years have been sufficient to invalidate most of the scales. Six scales were confirmed, 5 of them with modifications, leaving a total of 17 scales which were not confirmed by the data. This means that 17 of the 23 (74%) scales were not valid as predicted by Table 2. The implication is that the scales are not measuring the underlying constructs that they purport to measure.

However, the EFA showed a scale system that was at least similar to the scales proposed in Table 2. The difference perhaps is that the CFA had stricter standards to confirm and indeed, if the requirements had been relaxed to allow a RMSEA of 0.07 or 0.08 to be sufficient, many of the scales would have confirmed in the CFA as the CFI's were consistently above this cut-off. The EFA scales generated did seem to have face validity when compared with the scales in Table 2. Scales that contained items from multiple scales shown on Table 2, contained those that made inherent sense to be placed together. For example, the combination of Opportunities for Parental Involvement, Family Management and Rewards for Family Involvement into a single scale could easily be tapping into a broader concept of "Parental Involvement in their Child's Life" while the combination of Perceived Risk of Drug Use and Drug Use Attitudes seems to fit together well, with the perceived risk influencing the overall attitude. There were no scale combinations that did not show a strong degree of face validity.

The findings suggest that there should be concerns about the scales that have been used in the past for generating the MSS report. Therefore, the 2010 data set should be subjected to a CFA as a first step of the 2010 report, using the data generated from the EFA shown above. This will ensure that future reporting is done using valid scales. If desired, items from the confirmed scales of the 2008 data set can be excluded from this analysis, with the exception of the Opportunities for School Involvement scale as noted below in *Analysis 2: Reliability*.

If it is found that there should be new scales with the 2010 data set, this will pose challenges for organizations that have been using the MSS as baseline data for their projects. Changing the scales will break the continuity of the data and make comparing the data between years difficult. It will be impossible to determine if differences can be attributed to local projects or if it is an artifact of the change. However, as the current scales are not valid, it is difficult to

continue to argue for the use of these data to claim a direct link between implementation of interventions and a reduction in risk factors or an increase of protection factors. Therefore, revised scales must be developed so that meaningful claims can be made in the future.

While this analysis does provide areas of concern for the MSS, it does not reflect upon the actual Risk and Protective factor model as outlined by Hawkins and Catalano. The problem in the MSS seems to have arose from the modifications made by the state from the original survey, not from a deficit in the Communities that Care® survey. A return to the questions as designed by Hawkins and Catalano would provide an alternate solution to the problems with the survey, although it would not solve the issue of the questions not being specific to the needs of the state.

Analysis 2: Reliability

Research question - Do the items within each scale reliably measure the same underlying constructs?

Almost all scales showed strong reliability as indicated by alpha values above 0.7.This means that there is little random error causing variance in the survey. However, in light of the recommendation above to do further factor analysis testing on the 2010 data set, this issue will have to be revisited when the new scales are confirmed. Given that validity is meaningless without reliability, the Opportunities for School Involvement scale should also be revisited with the 2010 data set as it did not show acceptable reliability.

Analysis 3: Criterion-Related Predictive Validity

Research question - Do the items measuring risk and protective factors actually predict 30 day alcohol use as suggested by the Risk and Protective Factor Framework?

Research question - Do the items measuring risk and protective factors predict lifetime use as suggested by the Risk and Protective Factor Framework?

Research question - Do the risk and protective factor scale items discriminate between those students who answer "yes" to the 30 day use question and those who answer "no" to the 30 day use question?

Research question - Do the risk and protective factor scale items discriminate between those students who answer "yes" to the lifetime use question and those who answer "no" to the lifetime use question?

The risk and protective factor scales in the MSS showed remarkable predictive validity for both 30 day and lifetime use. That is, an answer indicating that a student was experiencing a particular risk factor meant that the same student was likely to report both 30 day and lifetime use. The opposite was true for students reporting that they were experiencing a protective factor, as they were less likely to report either type of use. These analyses were separated by grade because consumption patterns shift as students get older. For all grades, the Community Protective factor did not predict 30-day use as expected, although it did show the expected pattern for lifetime use for 6^{th} and 9^{th} grade. This seems to indicate that the Community Protective factor is not as strong in influencing students' drinking patterns as expected.

Results from analyses 2 and 3 show that there is strong reliability and predictive validity within the current scale structure, which had been previously rejected in analysis 1. This indicates that the survey is consistently measuring some constructs that can predict alcohol use in

students. The results are slightly muddied by the fact that the scales in the predictive validity had to be collapsed into domain levels scales, this might be allowing some of the scales without sufficient construct validity to obtain enough power to reach significance. In addition to the EFA recommended above, individual level t-tests are recommended for both the 2008 and 2010 data set. While the possibility of false positives is a concern, multiple rounds of testing should weed out positives that are the result of only random variation.

The issue with multicollinearity disrupting the planned analyses did cause some difficulty with this research and some analyses were unable to be run. However, it does not seem to be as much of an issue for the MSS itself. It makes theoretical sense that the risk and protective factor questions would be highly correlated and so it does not raise any concerns that high correlations were found in the data set.

Analysis 4: Item analysis

Research question - Does each item on the survey have an equal opportunity to be answered?

Out of 417 school districts, 114 (27%) showed a significant difference between the numbers of missing items on the first half of the survey as compared to the second half of the survey. This discrepancy between the amount of missing items in the first and second half of the survey seems to indicate that the students are not being given sufficient time to complete the survey. While it could also be an artifact of fatigue, one would expect that more than 27% of the schools would show this pattern if that was the case. As it only effects approximately a fourth of the schools, it seems as if there is something about the schools rather than the item itself causing this spike.

The full list of the schools in which students were unable to complete the survey can be found in Appendix 2.This information will be reported to DESE so that they may follow up to ensure that survey protocol is being followed and, if so, consider changing the protocol to reflect the additional time needed. These schools should be targeted for training in the proper way to administer the survey.

Question 88 stood out as having an unusually high number of missing answers. This question asks a short series of questions about community based activities available to students. While almost 7,000 students skipping the questions is high as an absolute number, this spike reflects slightly less than a 6% skip rate, indicating that it is not likely to be a systemic problem. Therefore, students must be choosing to skip this set of questions in greater numbers than any other questions. Further investigation should be done, perhaps in the form of focus groups, to discover why this question is being avoided.

Analysis 5: Active versus passive consent

Research question - Does the use of passive consent increase the participation in the Missouri Student survey?

Research question - Is the use of passive consent associated with an increased number of participants reporting risk factors?

Research question - Is the use of passive consent associated with an increased number of participants who do not accurately and honestly complete the survey?

It is clear from the data that passive consent does result in greater participation in the survey. While there may be other reasons that the number of survey participants have grown from year to year, the showing of a higher rate (22.8%) of participation in SPF SIG schools using

passive consent, compared to those that still required active consent (6.2%) in 2008 makes a strong argument that passive consent is a key element to increasing participation.

There is not such a clear answer on the question of whether passive consent alters the participant characteristics in such a way as to increase the average number of risk factors reported by the participants. One issue to note here is that the SPF SIG communities were used as a convenience sample. These communities have been the target of increased prevention services beginning in the spring and summer of 2007. As such, there may have been a decrease in the risk factors which would make the data more difficult to interpret when comparing the active verses passive conditions in the 2008 data set.

There were three risk factors which consistently showed statistically significant increases under the active consent condition. These were Perceived Risk of Drug Use, Family Management and Neighborhood Attachment. Three others were statistically significant under the active consent condition in one case but did not reach statistical significance in the other. The first was examining the comparison between 2006 and 2008 while the latter two showed statistically significant differences when looking at the active verses passive condition in 2008. These were Family History of Antisocial Behavior, Community Disorganization and Drug Use Laws. With the exception of Perceived Risk, these factors all revolve around the bigger picture of the student's environment. It is possible that parents who are not involved in the problem behavior themselves, but are aware that their child is surrounded by family and community that is involved in the problem behavior, would be more likely to sign the active consent form in an effort to help the community gather the data that it needs to address the problem. An environment that condones or even endorses the problem behavior could perhaps influence even

the Perceived Risk factor, after all, a student who is surrounded by people who engage in the behavior on a regular basis would be less likely to think it problematic.

Students reported significantly higher amounts of five risk factors under the passive condition when making comparisons between 2006 and 2008.These were: Rebelliousness, Antisocial Attitudes, Peer Rewards for Antisocial Involvement, Parental Attitudes Towards Drugs and Parental Attitudes Toward Antisocial Behavior. This seems to indicate that passive consent increases the amount of risk factors reported from the individual domain, reflecting the prior literature that suggest those students who are at the most risk are the ones likely to be lost when using active consent. Children exhibiting rebelliousness for example, may not be the children that take the letter from the principal home to be signed by their parent. The other risk factors that increase under passive conditions are ones that might influence parental decision making around allowing their child to participate in a survey that asks questions about drug use and other antisocial behavior. It is possible that parents who are permissive towards drug use and other antisocial behavior would be ones that would make a decision not to return a signed consent form, fearing that their child's answers would result in more scrutiny from school officials. However, a parent that wanted to avoid notice would also possibly rather risk their child's survey being examined than risk drawing scrutiny by actively refusing to allow their child to participate.

There were four risk factors which showed statistically significant increased average number of risk factors presented by the participants under the active consent condition in one case (the active vs. passive in 2008) and increased average number of risk factors presented by the participants under the passive consent condition in the other (the 2006 vs. 2008 comparisons). These were Drug Use Attitudes, Family Conflict, Drug Use Norms and Drug

Availability. This contradictory finding may be due to differences in the schools which chose to stay with active consent even when it was no longer required. Schools which were active in prevention in 2008 would have understood the need for the increased data provided by the larger samples obtained under passive consent and thus been more likely to switch. They also would have been more likely to have been taking a proactive role in decreasing their student's risk factors through a variety of evidenced based school programs.

Finally, the results suggest honesty could be a concern when using passive consent. Results were mixed indicating that this is an issue that should be followed closely in future implementations of the survey.

Summary

The Missouri Student Survey is one of the most important tools for prevention in Missouri. It's large sample size and consistent administration since 2000 allows people at both state and community levels to have data for use in grant applications, developing policies, program planning, decision making and prevention evaluation.

Results from the analyses show that there is strong reliability and predictive validity within the current scale structure. The data being obtained does appear to have some value in the planning and implementation of prevention in Missouri.

However, the survey has some areas that need to be revisited in order to improve the data quality and trustworthiness of the results. Factor analysis shows that the scales are questionable. It may be that these scales should be allowed to remain as is but serious thought should be given before that decision is made. Additional factor analysis with the 2010 data set would offer decision makers more information to assist in making this decision. Also, the surveys are being

implemented across the state yet some schools are not allowing sufficient time for them to be properly administered. If the resources are already being spent to allow for data collection, slightly longer amounts of time should be allocated to ensure that the survey provides all the information that it can.

The review of the effect of the consent procedures indicate that passive consent helps obtain a larger sample of more honest answers. The question of generalizability was not completely answered with these results as some risk factors were actually less present in the case of passive consent. However, this was not true of the majority of risk factors and the overall conclusion is that passive consent should be kept for the Missouri Student Survey.

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Appendix 1

Table 2:

The Missouri Student Survey 2008

Domain	Type of Question	Question #s
	Demographics	1-6, 89
	Consumption rates / lifetime use	23, 36-62
	Questions about survey itself or honesty questions	63-64, 65-70, 115-116
Risk and Protective Factor Scales		
Individual	Rebelliousness	25-26, 28, 33-34
	Antisocial Attitudes	24 (a-d), 29
	Drug Use Attitudes	24 (e-i)
	Perceived Risk of Drug Use	35 (a-j)
	Peer Rewards for Antisocial Involvement	32 (a-d)
Family	Parental Attitudes toward Antisocial Behavior	91 (d-f)
	Parental Attitudes toward Drugs	91 (a-c)
	Family Management/Supervision	27, 93, 95, 97, 99, 107, 109
	Family Conflict	96, 108
	Family History of Antisocial Behavior	92 (a-e), 94
	Opportunities for Parental Involvement*	103, 105-106
	Rewards for Parental Involvement*	102, 104
School	Academic Performance*	7, 16
	School Commitment*	18-20, 21 (a-c)
	Opportunities for School Involvement*	9-10, 12-13, 17

	Rewards for School Involvement*	11, 14, 15
Community	Drug Use Laws	73, 75, 78
	Drug Availability	71-72, 74, 76-77
	Drug Use Norms	79 (a-c), 80 (a-d)
	Community Disorganization	85 (a-d), 86
	Neighborhood Attachment	81, 83
	Opportunities for Community Involvement*	88 (a-e)
	Rewards for Community Involvement*	82, 84, 87, 90

* Indicates a protective factor

Appendix 2

Table 4:

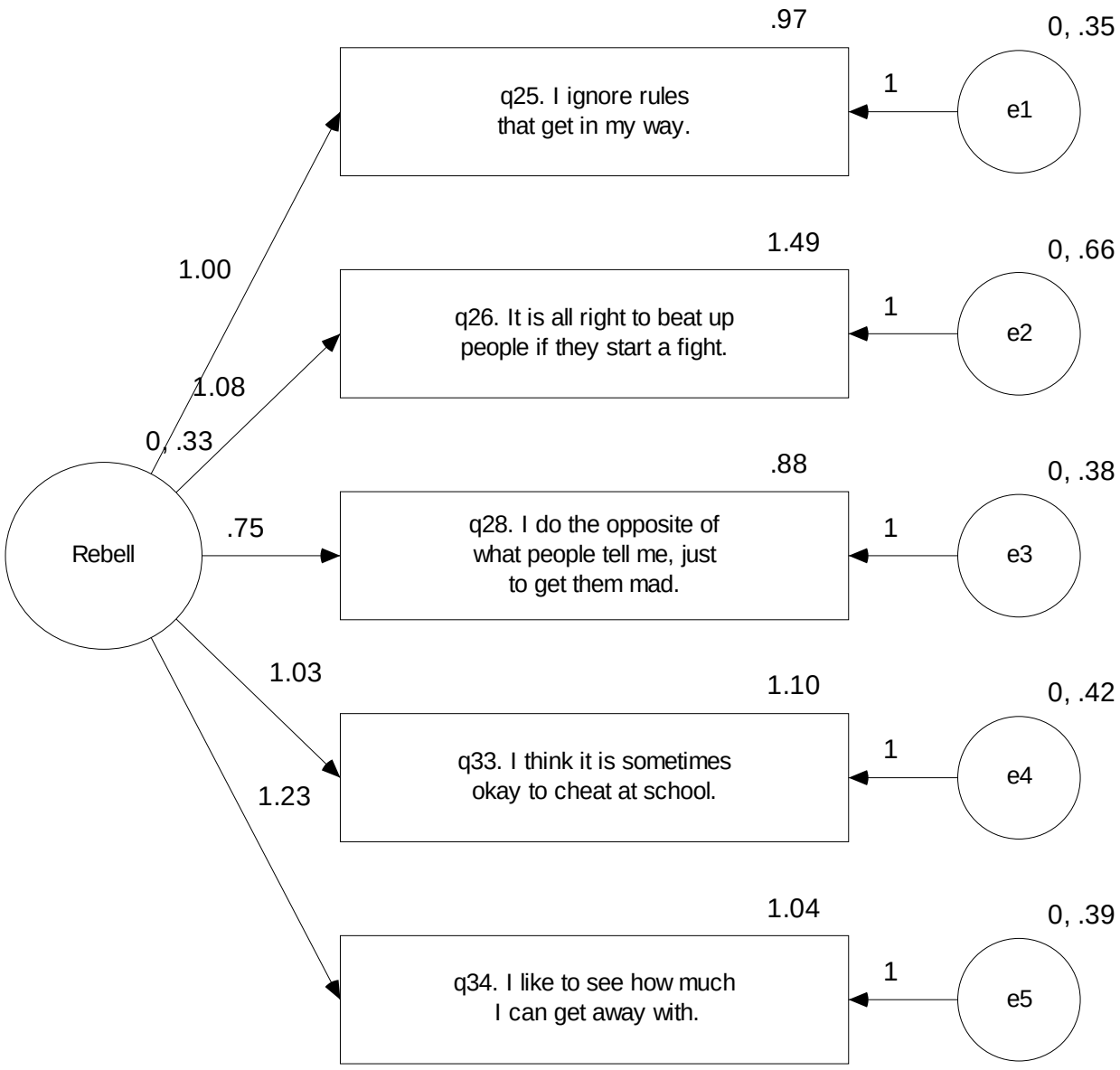
School districts showing significantly more missed questions in the second half of the survey as compared to the first half of the survey, at p=.05 level.

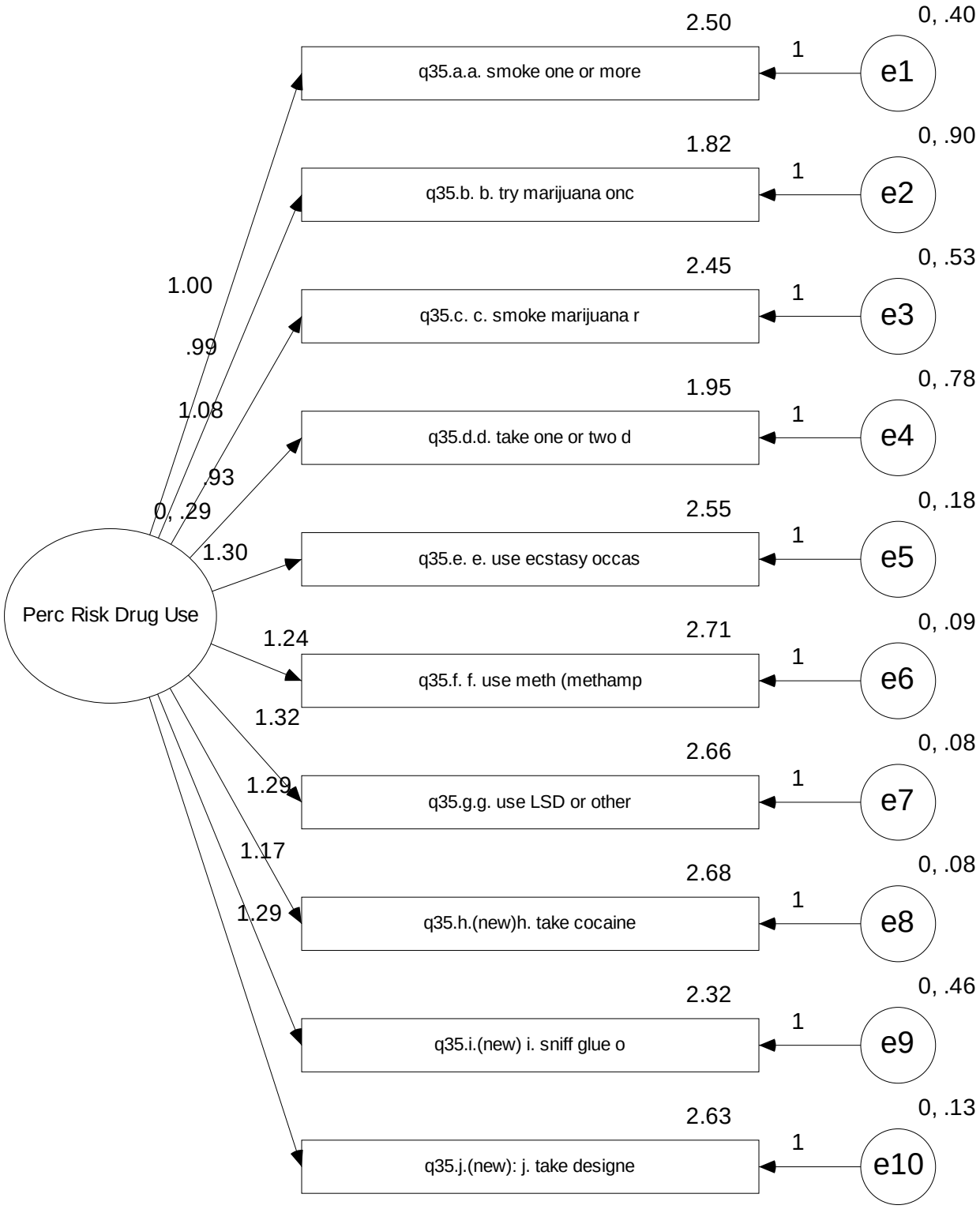
Adair R-II	Affton	Aurora
Bayless	Belton	Blue Eye
Blue Springs	Booneville	Bowling Greene
Bunker	Cameron	Cape Girardeau
Carl Junction	Center	Clayton
Clearwater	Clinton	Columbia
Crawford	Dallas	Dent-Phelps
Dexter	East Carter	Excelsior Springs
Fair Grove	Farmington	Festus
Fort Osage	Fox	Francis Howell
Ft. Zumwalt	Fulton	Grain Valley
Greenfield	Hancock Place	Hannibal
Hazelwood	Higbee	Hillsboro
Hollister	Howell Valley	Independence
Jackson	Jefferson City	Jefferson Co
Joplin	Kansas City	Kennett
Kingsville	Kirkwood	Lamar
Laquey	Lebanon	Liberty
Licking	Lindbergh	Macon

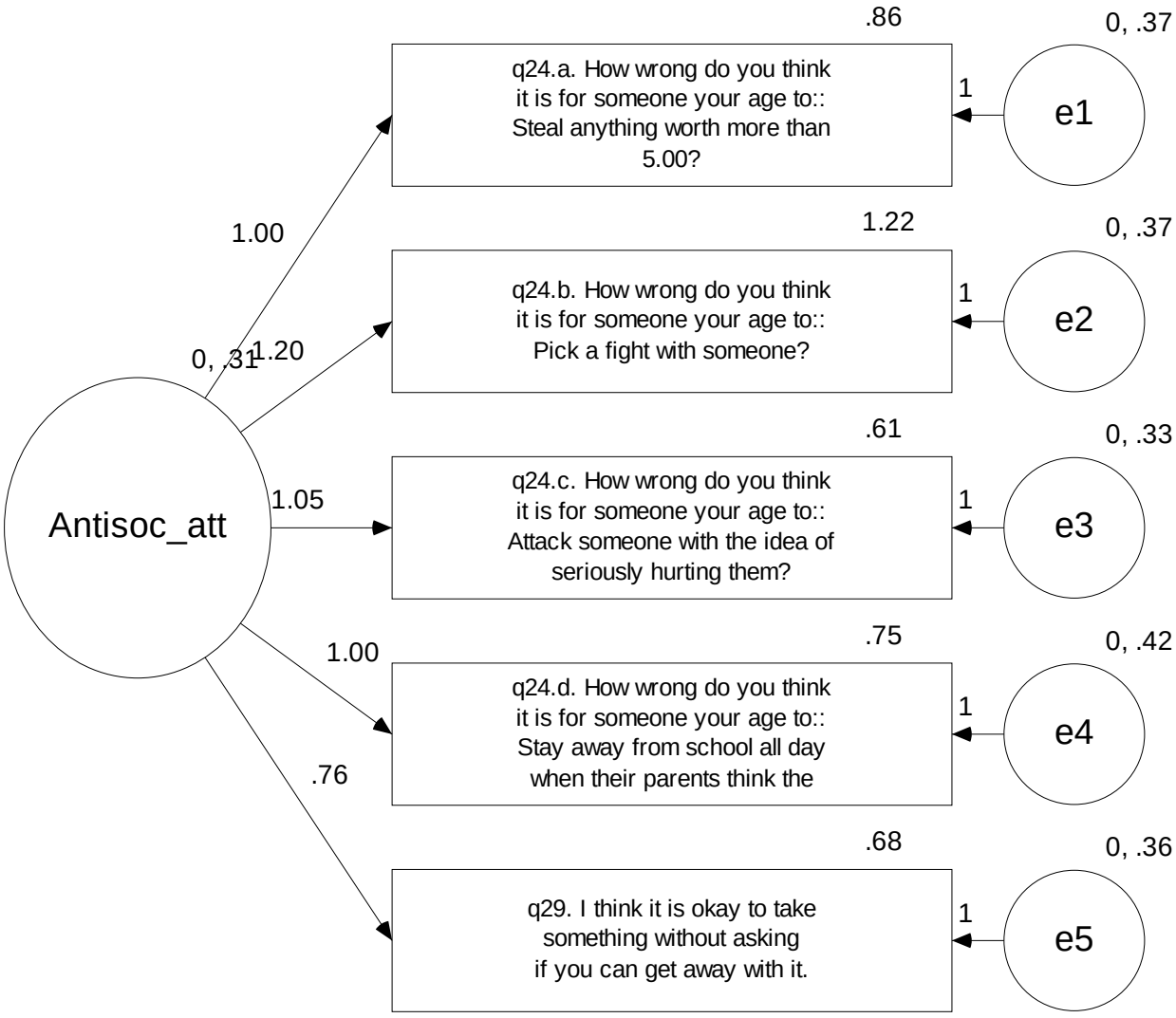
Maryville	Mehville	Meramec Valley
Milan	MO Charter Schools	Moniteau
Monroe City	Mt. Vernon	Neosho
Newburg	Nixa	Nodaway-Holt
Normandy	North Callaway	North Kansas City
Northwest	Oak Grove	Odessa
Osage R-II	Osceola	Palmyra
Park Hill	Parkway	Pettis R-V
Platte	Pleasant Hill	Poplar Bluff
Raymore-Peculiar	Reeds Spring	Republic
Richmond	Ritenour	Riverview Gardens
Rolla	Sarcoxie	School of the Osage
Sedalia	Seneca	Sikeston
Southwest	Springfield	St. Charles R-V
St. Clair	St. James	St. Joseph
St. Louis City	Steelville	Strafford
Union	University City	Webster Groves
Wellston	Wentzville	West Platte
Wheatland	Willard	Windsor

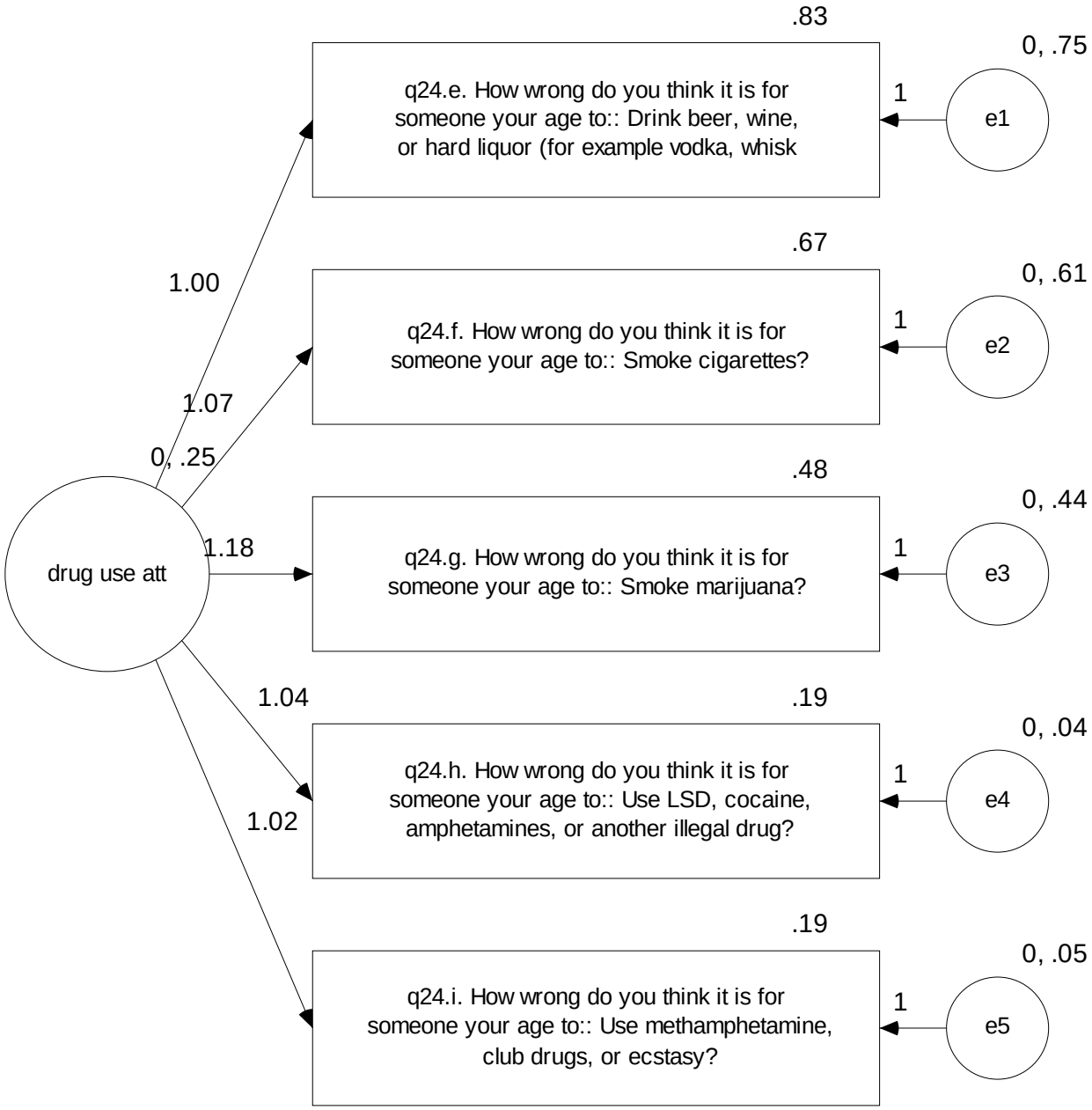
Appendix 3

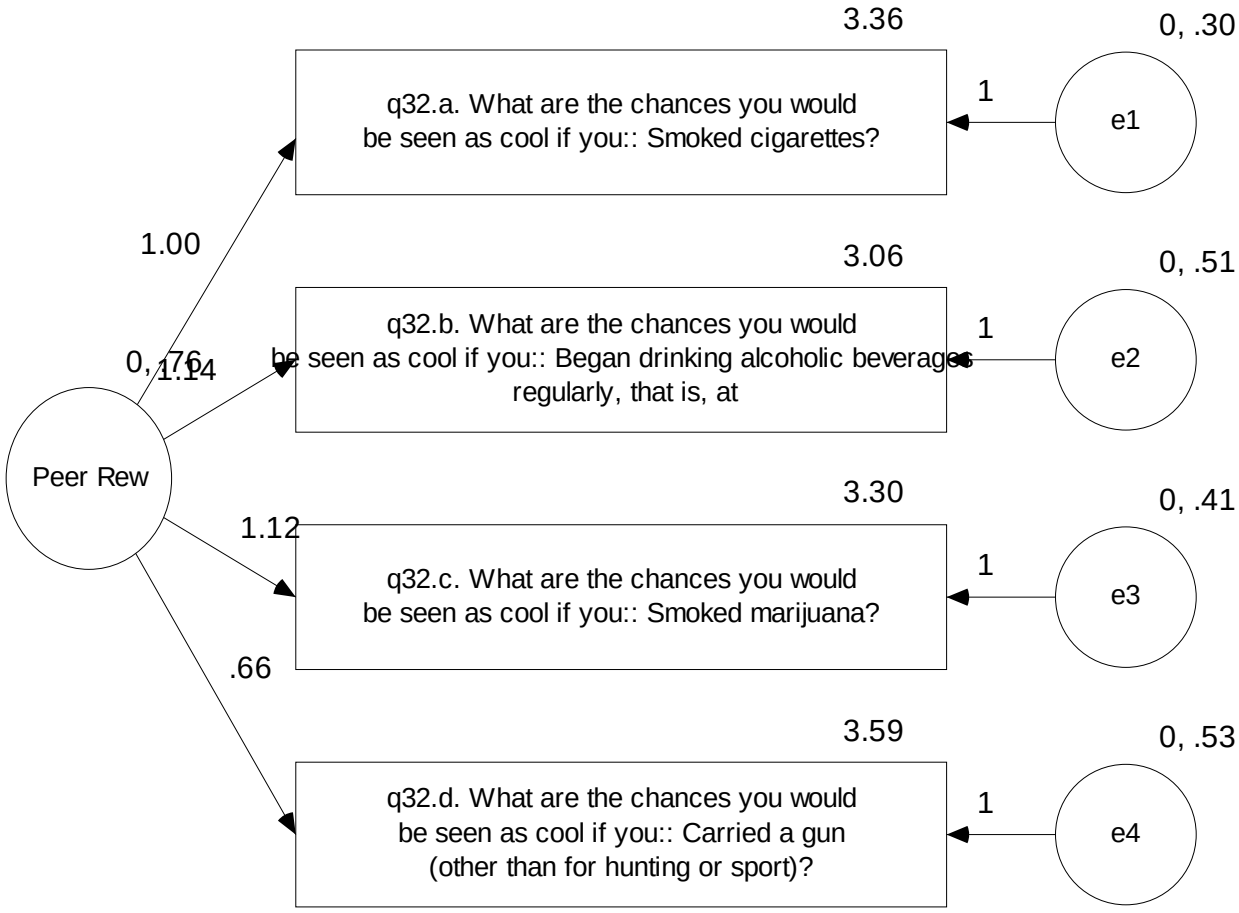
SEM models used in CFA. Scales with only two items did not generate factor loadings but the models are included below.

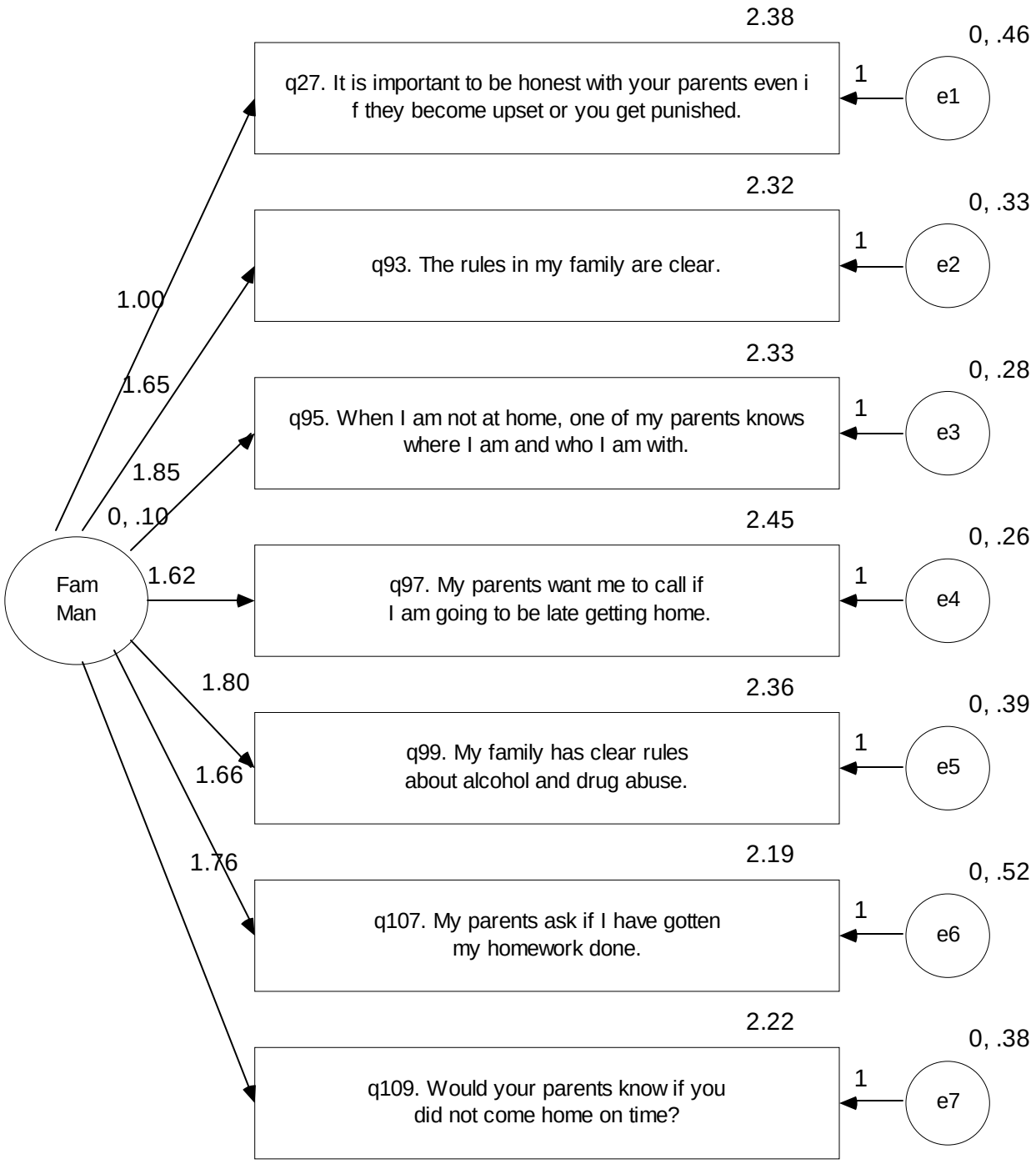


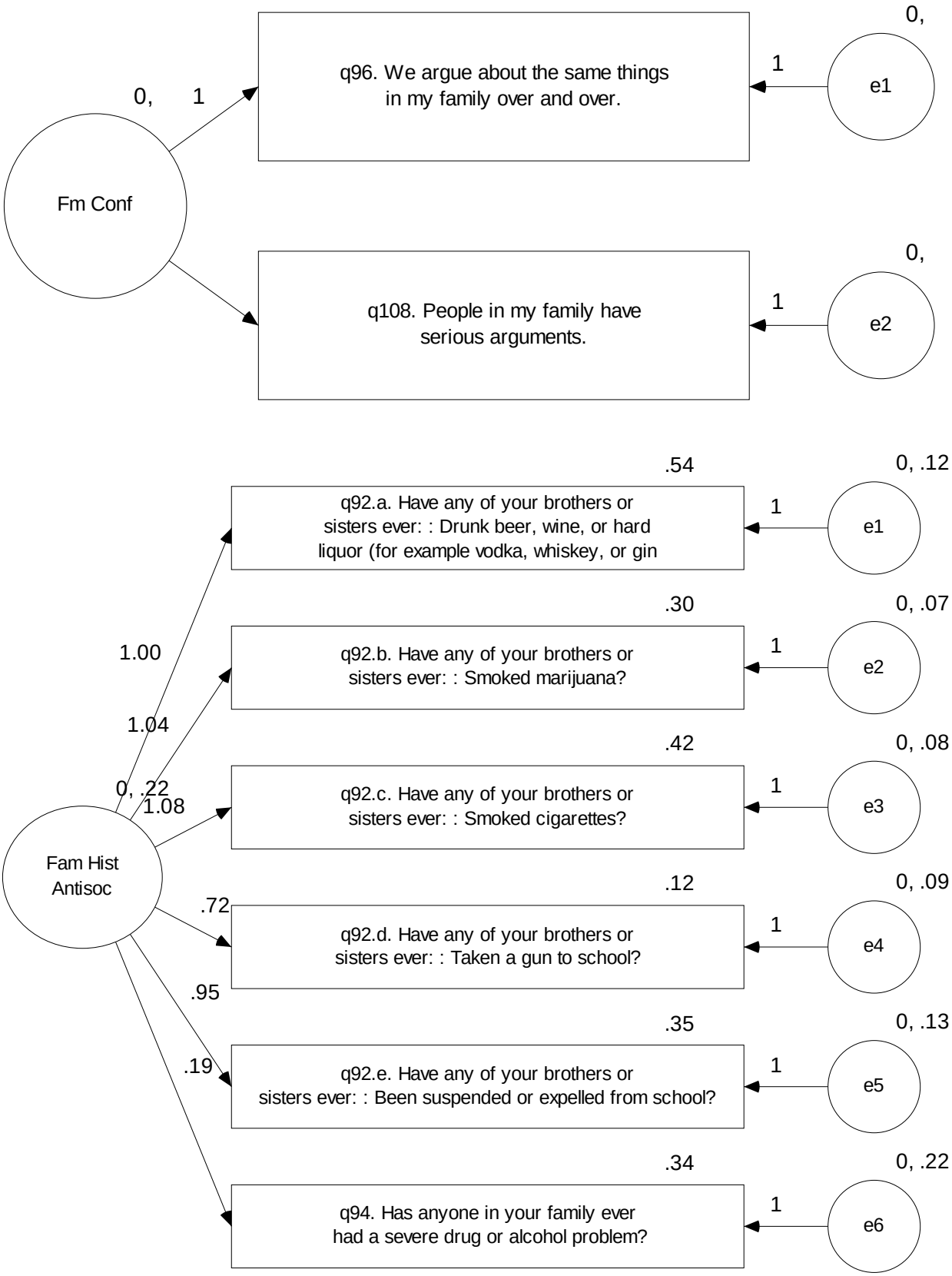

Perc Risk Drug Use
1.00
.99
1.08
.93
0, .29
1.30
1.24
1.32
1.29
1.17
1.29
q35.a.a. smoke one or more
q35.b. b. try marijuana onc
q35.c. c. smoke marijuana r
q35.d.d. take one or two d
q35.e. e. use ecstasy occas
q35.f. f. use meth (methamp
q35.g.g. use LSD or other
q35.h.(new)h. take cocaine
q35.i.(new) i. sniff glue o
q35.j.(new): j. take designe
2.50
1.82
2.45
1.95
2.55
2.71
2.66
2.68
2.32
2.63
1
e1
e2
e3
e4
e5
e6
e7
e8
e9
e10
0, .40
0, .90
0, .53
0, .78
0, .18
0, .09
0, .08
0, .08
0, .46
0, .13

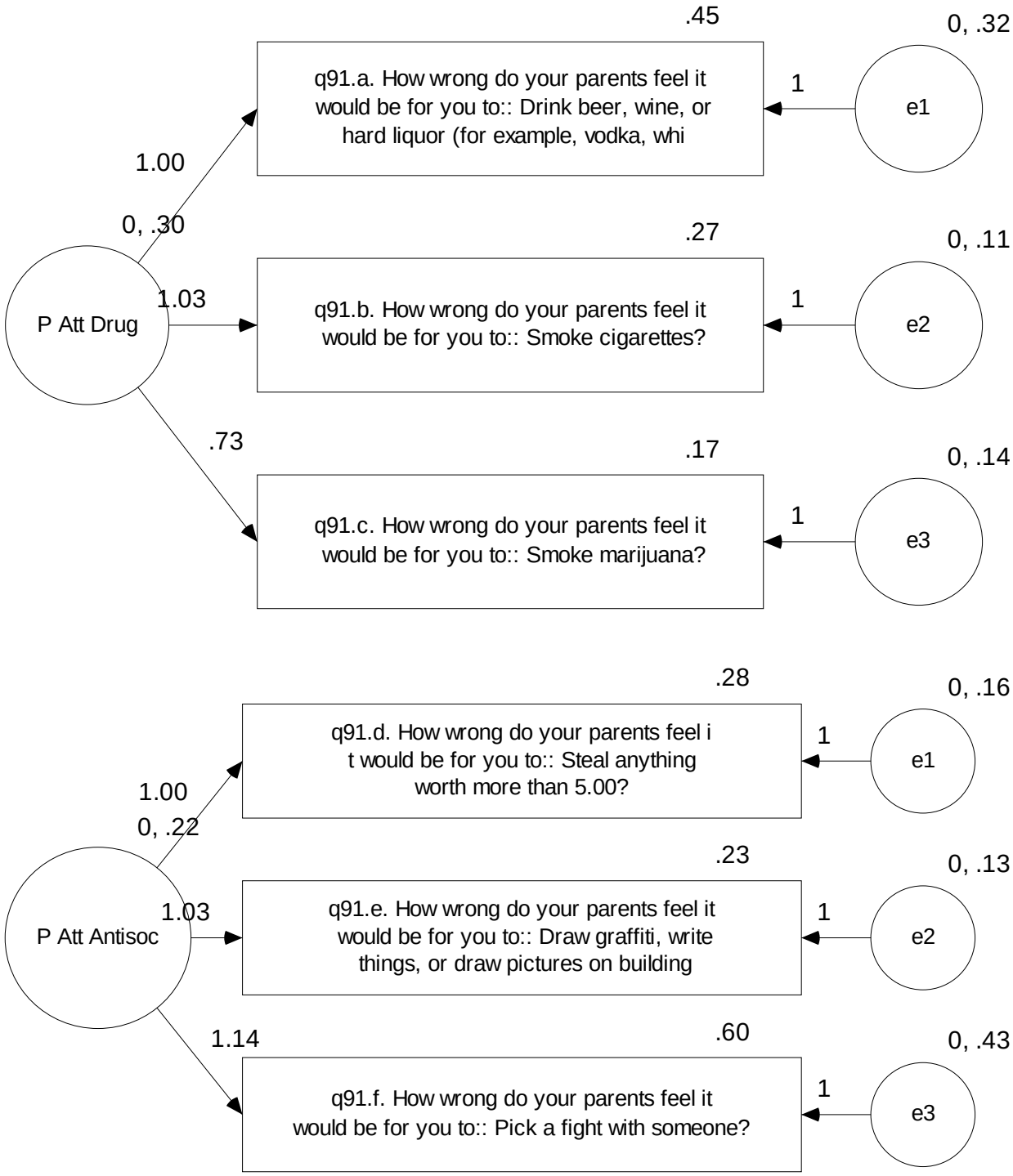

.86
0, .37
q24.a. How wrong do you think it is for someone your age to:: Steal anything worth more than 5.00?
1
e1
1.00
1.22
0, .37
q24.b. How wrong do you think it is for someone your age to:: Pick a fight with someone?
1
e2
0, .31
1.20
.61
0, .33
Antisoc_att
1.05
q24.c. How wrong do you think it is for someone your age to:: Attack someone with the idea of seriously hurting them?
1
e3
.75
0, .42
1.00
q24.d. How wrong do you think it is for someone your age to:: Stay away from school all day when their parents think the
1
e4
.76
.68
0, .36
q29. I think it is okay to take something without asking if you can get away with it.
1
e5

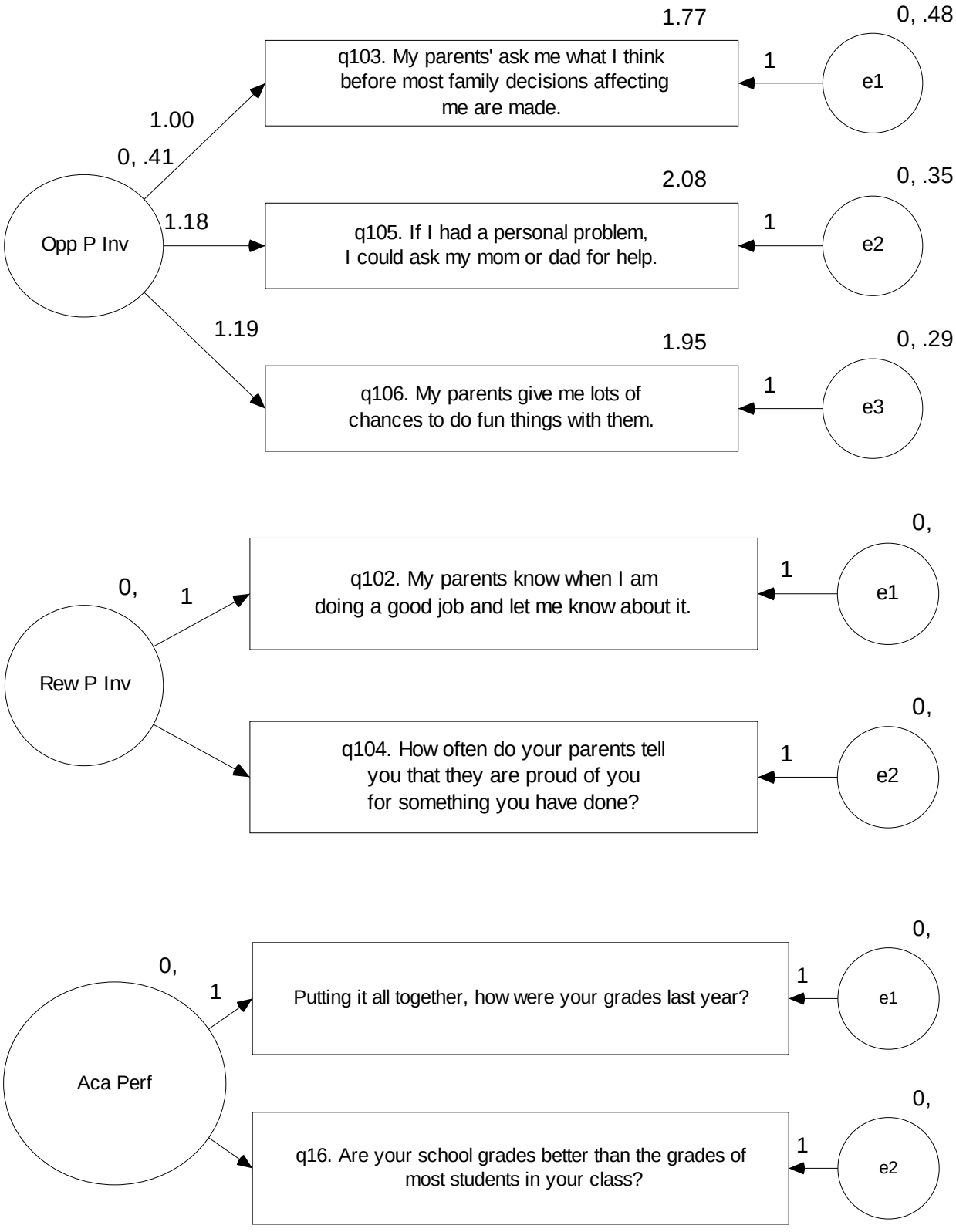

.83
0, .75
q24.e. How wrong do you think it is for someone your age to:: Drink beer, wine, or hard liquor (for example vodka, whisk
1
e1
1.00
.67
0, .61
q24.f. How wrong do you think it is for someone your age to:: Smoke cigarettes?
1
e2
1.07
0, .25
.48
0, .44
drug use att
1.18
q24.g. How wrong do you think it is for someone your age to:: Smoke marijuana?
1
e3
1.04
.19
0, .04
q24.h. How wrong do you think it is for someone your age to:: Use LSD, cocaine, amphetamines, or another illegal drug?
1
e4
1.02
.19
0, .05
q24.i. How wrong do you think it is for someone your age to:: Use methamphetamine, club drugs, or ecstasy?
1
e5

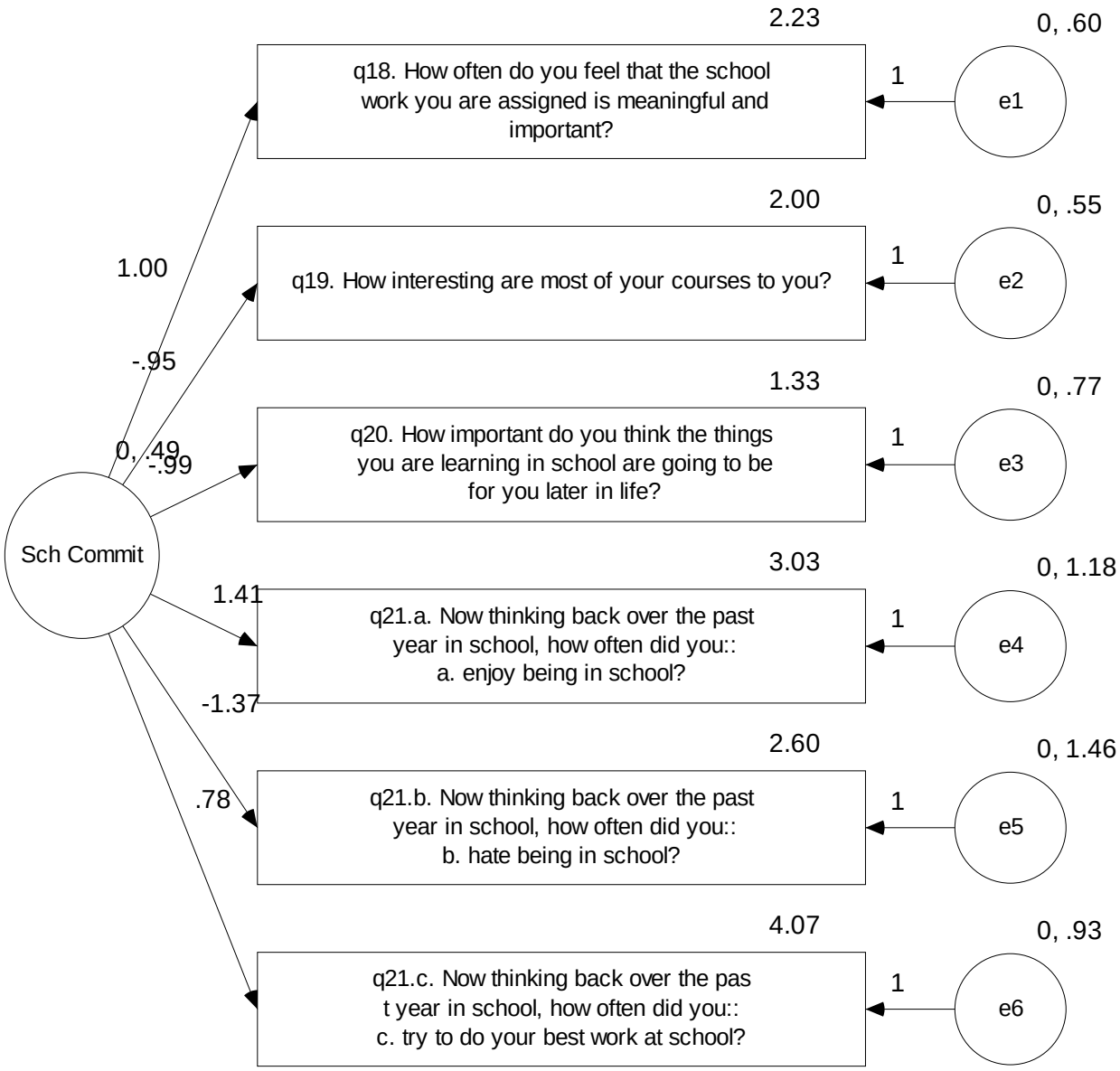

3.36
0, .30
q32.a. What are the chances you would be seen as cool if you:: Smoked cigarettes?
1
e1
1.00
3.06
0, .51
q32.b. What are the chances you would be seen as cool if you:: Began drinking alcoholic beverages regularly, that is, at
1
e2
0, 1.14
Peer Rew
3.30
0, .41
1.12
q32.c. What are the chances you would be seen as cool if you:: Smoked marijuana?
1
e3
.66
3.59
0, .53
q32.d. What are the chances you would be seen as cool if you:: Carried a gun (other than for hunting or sport)?
1
e4

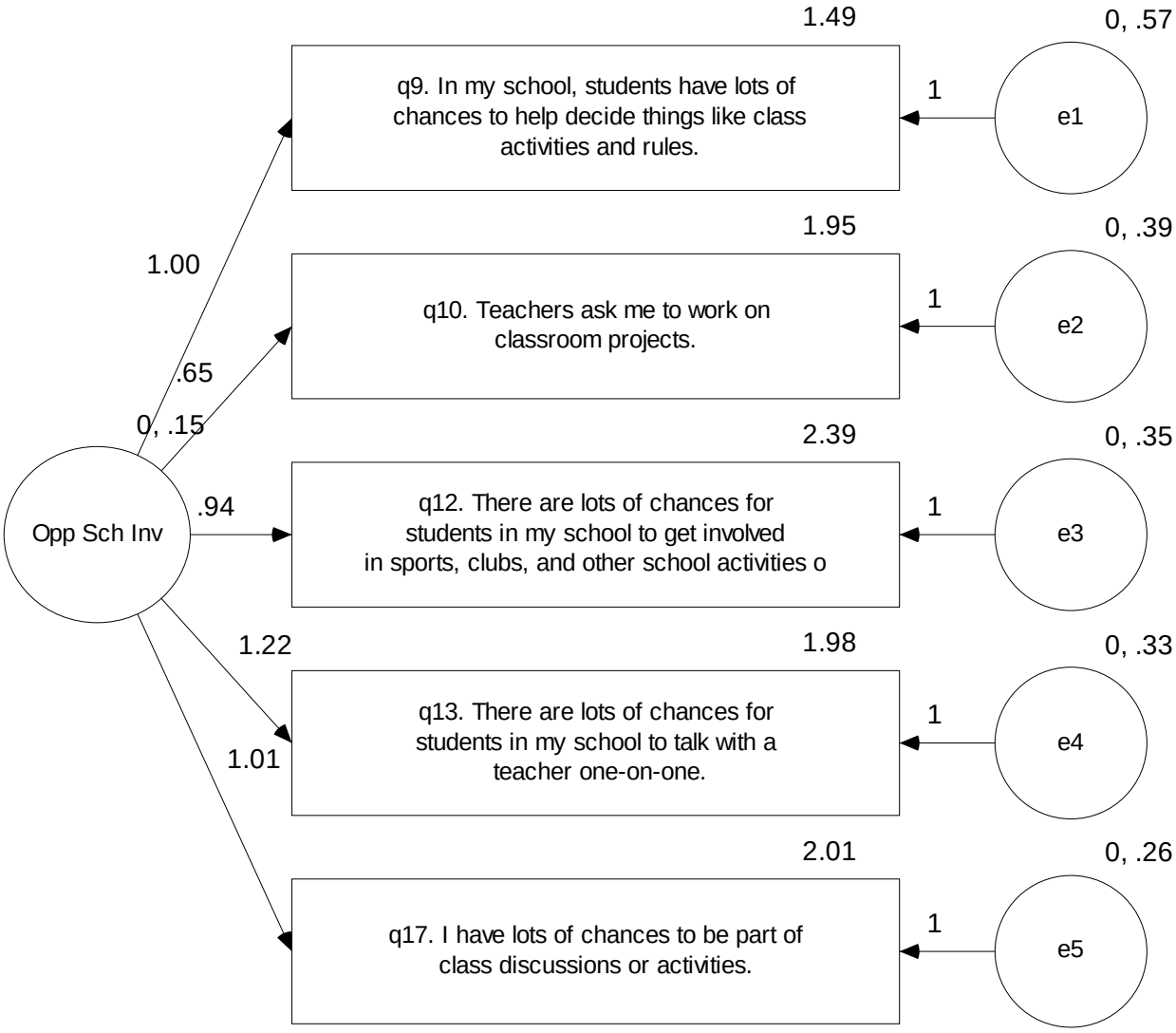

Fam
Man
1.00
1.65
1.85
0, .10
1.62
1.80
1.66
1.76
2.38
q27. It is important to be honest with your parents even i f they become upset or you get punished.
1
e1
0, .46
2.32
q93. The rules in my family are clear.
1
e2
0, .33
2.33
q95. When I am not at home, one of my parents knows where I am and who I am with.
1
e3
0, .28
2.45
q97. My parents want me to call if I am going to be late getting home.
1
e4
0, .26
2.36
q99. My family has clear rules about alcohol and drug abuse.
1
e5
0, .39
2.19
q107. My parents ask if I have gotten my homework done.
1
e6
0, .52
2.22
q109. Would your parents know if you did not come home on time?
1
e7
0, .38

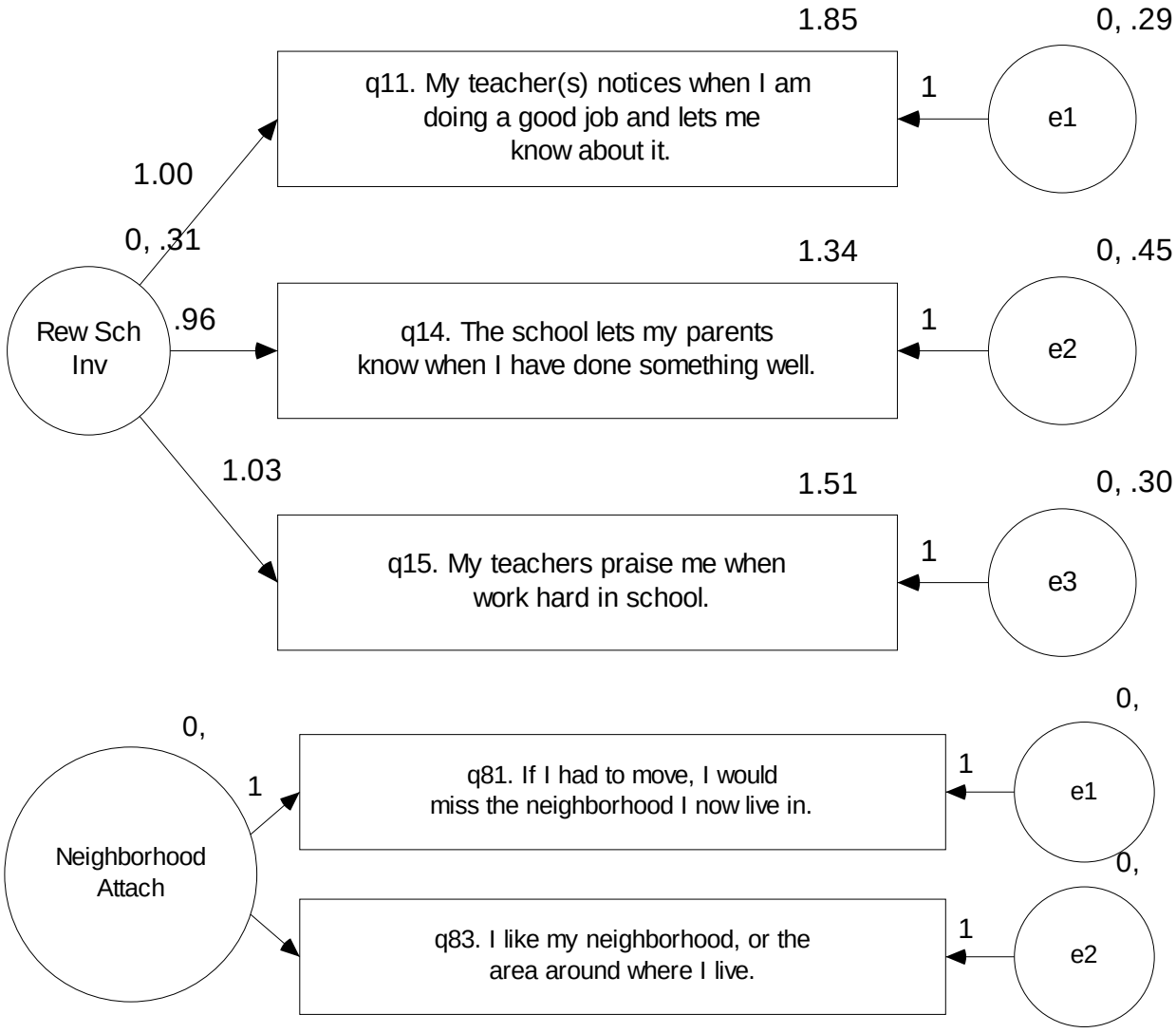

Fm Conf
0,
1
q96. We argue about the same things in my family over and over.
1
e1
0,
q108. People in my family have serious arguments.
1
e2
0,
Fam Hist Antisoc
0, .22
1.00
1.04
1.08
.72
.95
.19
.54
q92.a. Have any of your brothers or sisters ever: : Drunk beer, wine, or hard liquor (for example vodka, whiskey, or gin
1
e1
0, .12
.30
q92.b. Have any of your brothers or sisters ever: : Smoked marijuana?
1
e2
0, .07
.42
q92.c. Have any of your brothers or sisters ever: : Smoked cigarettes?
1
e3
0, .08
.12
q92.d. Have any of your brothers or sisters ever: : Taken a gun to school?
1
e4
0, .09
.35
q92.e. Have any of your brothers or sisters ever: : Been suspended or expelled from school?
1
e5
0, .13
.34
q94. Has anyone in your family ever had a severe drug or alcohol problem?
1
e6
0, .22

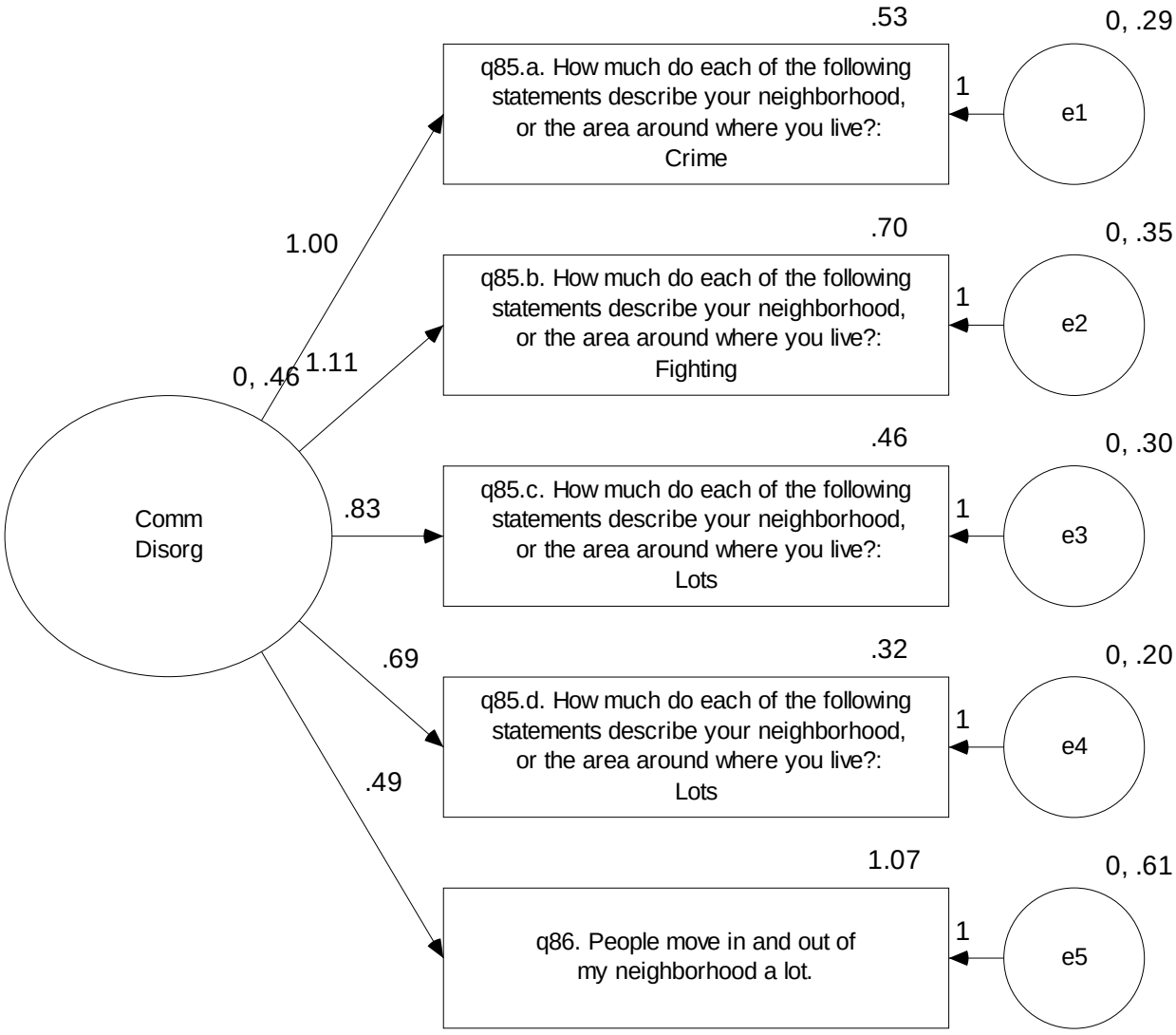

.45
0, .32
q91.a. How wrong do your parents feel it would be for you to:: Drink beer, wine, or hard liquor (for example, vodka, whi
1
e1
1.00
0, .30
.27
0, .11
P Att Drug
1.03
q91.b. How wrong do your parents feel it would be for you to:: Smoke cigarettes?
1
e2
.73
.17
0, .14
q91.c. How wrong do your parents feel it would be for you to:: Smoke marijuana?
1
e3
.28
0, .16
q91.d. How wrong do your parents feel i t would be for you to:: Steal anything worth more than 5.00?
1
e1
1.00
0, .22
.23
0, .13
P Att Antisoc
1.03
q91.e. How wrong do your parents feel it would be for you to:: Draw graffiti, write things, or draw pictures on building
1
e2
1.14
.60
0, .43
q91.f. How wrong do your parents feel it would be for you to:: Pick a fight with someone?
1
e3

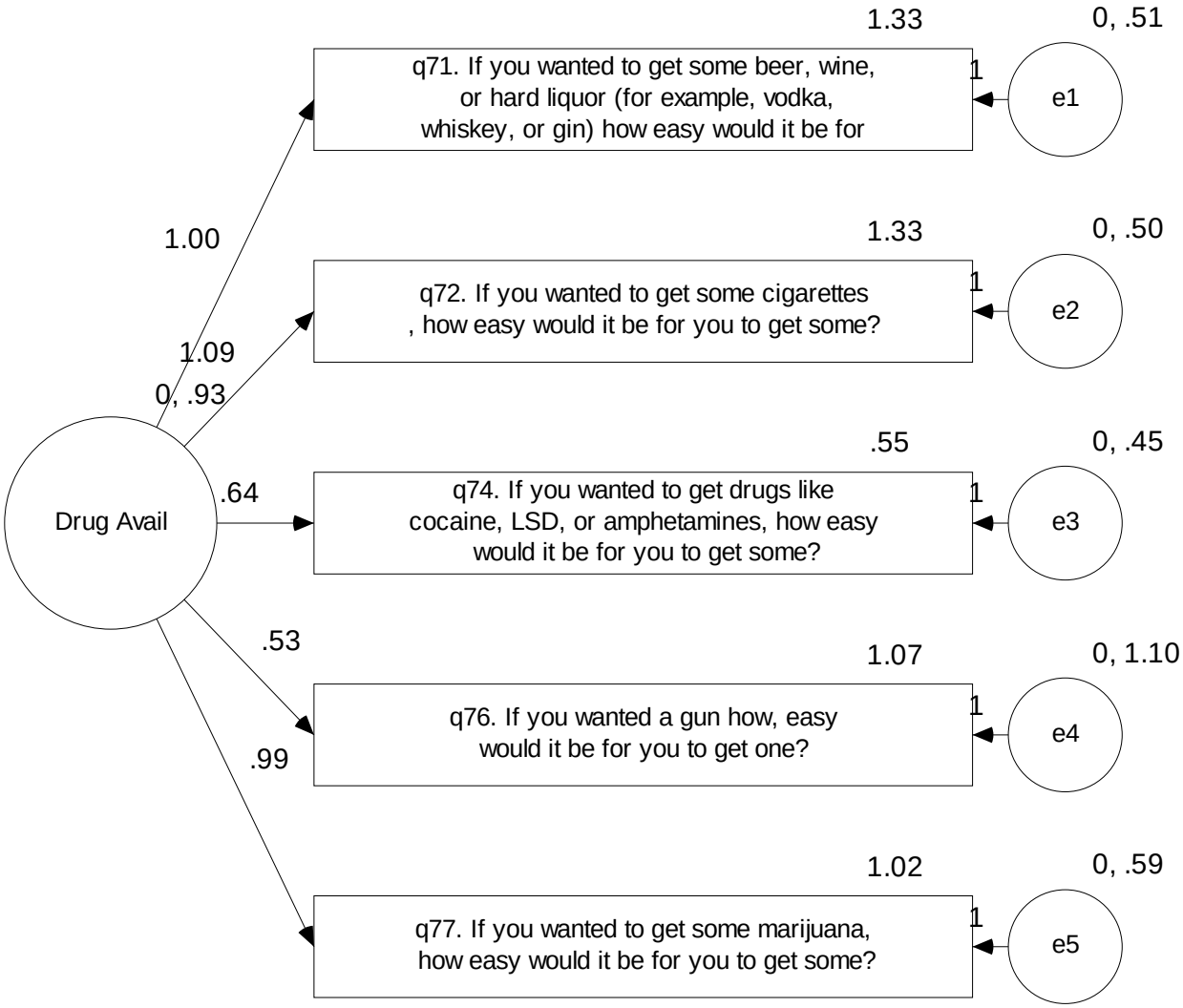

1.77
0, .48
q103. My parents' ask me what I think before most family decisions affecting me are made.
1
e1
1.00
0, .41
Opp P Inv
2.08
0, .35
1.18
q105. If I had a personal problem, I could ask my mom or dad for help.
1
e2
1.19
1.95
0, .29
q106. My parents give me lots of chances to do fun things with them.
1
e3
0,
0,
1
q102. My parents know when I am doing a good job and let me know about it.
1
e1
Rew P Inv
0,
q104. How often do your parents tell you that they are proud of you for something you have done?
1
e2
0,
0,
1
Putting it all together, how were your grades last year?
1
e1
Aca Perf
0,
q16. Are your school grades better than the grades of most students in your class?
1
e2

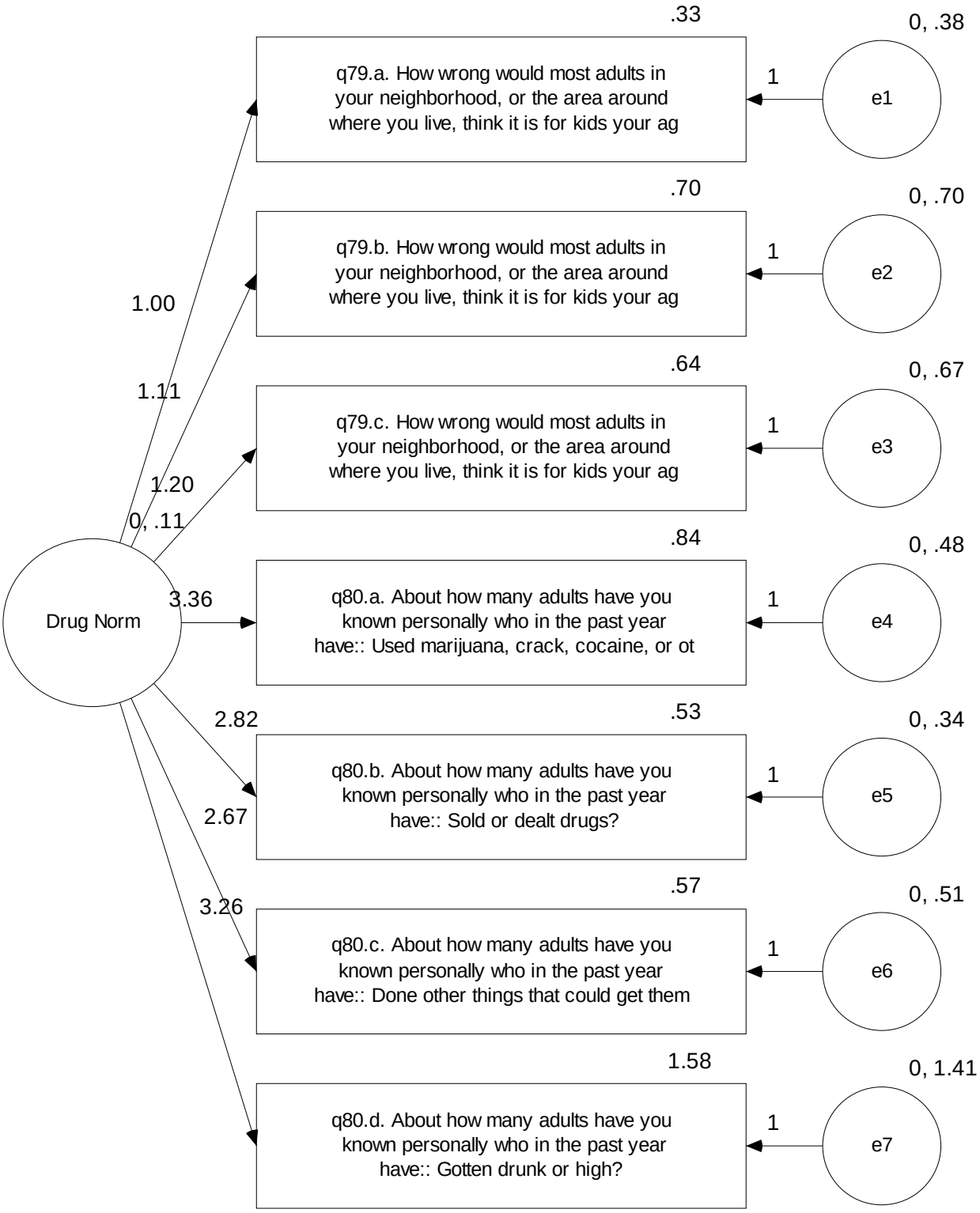

Sch Commit
1.00
-.95
0, .49
-.99
1.41
-1.37
.78
2.23
q18. How often do you feel that the school work you are assigned is meaningful and important?
1
e1
0, .60
2.00
q19. How interesting are most of your courses to you?
1
e2
0, .55
1.33
q20. How important do you think the things you are learning in school are going to be for you later in life?
1
e3
0, .77
3.03
q21.a. Now thinking back over the past year in school, how often did you:: a. enjoy being in school?
1
e4
0, 1.18
2.60
q21.b. Now thinking back over the past year in school, how often did you:: b. hate being in school?
1
e5
0, 1.46
4.07
q21.c. Now thinking back over the pas t year in school, how often did you:: c. try to do your best work at school?
1
e6
0, .93

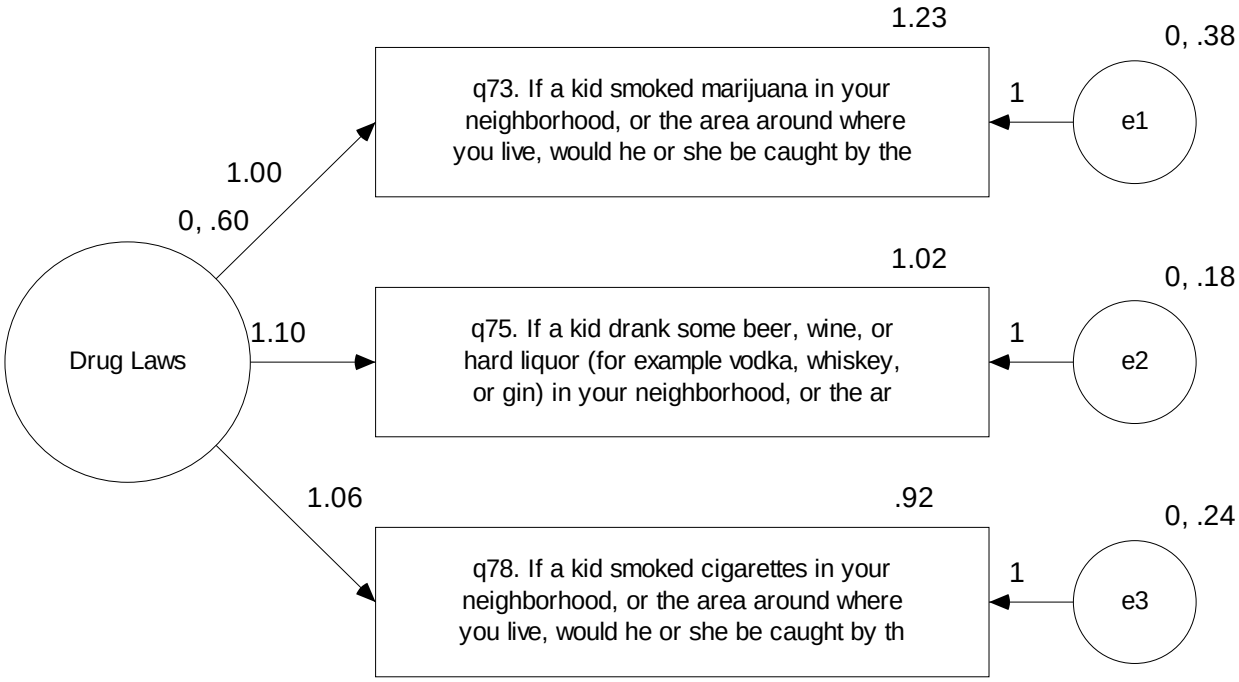

1.49
0, .57
q9. In my school, students have lots of chances to help decide things like class activities and rules.
1
e1
1.95
0, .39
q10. Teachers ask me to work on classroom projects.
1
e2
2.39
0, .35
q12. There are lots of chances for students in my school to get involved in sports, clubs, and other school activities o
1
e3
1.98
0, .33
q13. There are lots of chances for students in my school to talk with a teacher one-on-one.
1
e4
2.01
0, .26
q17. I have lots of chances to be part of class discussions or activities.
1
e5
Opp Sch Inv
1.00
.65
0, .15
.94
1.22
1.01

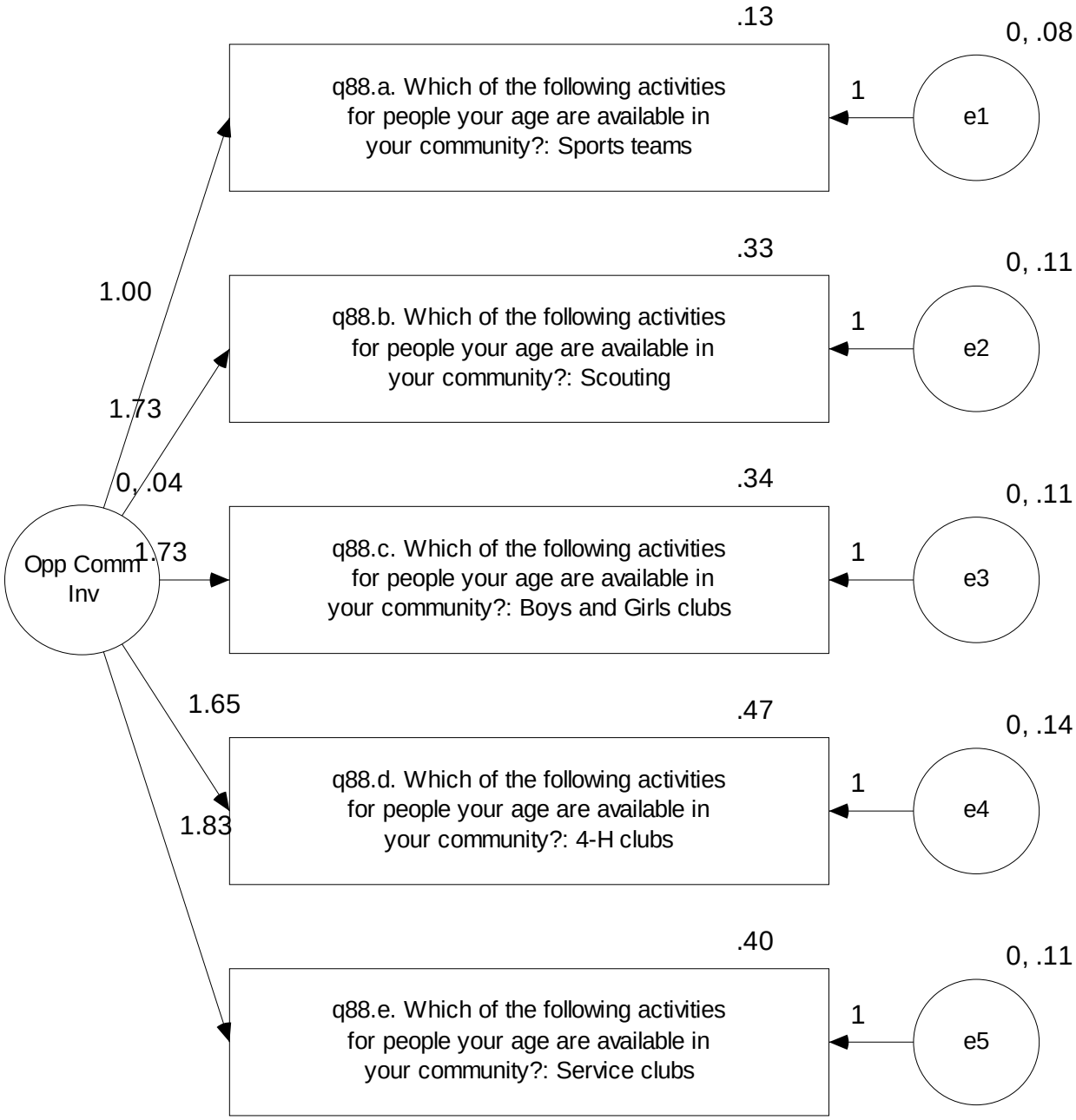

1.85
0, .29
q11. My teacher(s) notices when I am doing a good job and lets me know about it.
1
e1
1.00
0, .31
1.34
0, .45
Rew Sch Inv
.96
q14. The school lets my parents know when I have done something well.
1
e2
1.03
1.51
0, .30
q15. My teachers praise me when work hard in school.
1
e3
0,
0,
Neighborhood Attach
1
q81. If I had to move, I would miss the neighborhood I now live in.
1
e1
0,
q83. I like my neighborhood, or the area around where I live.
1
e2

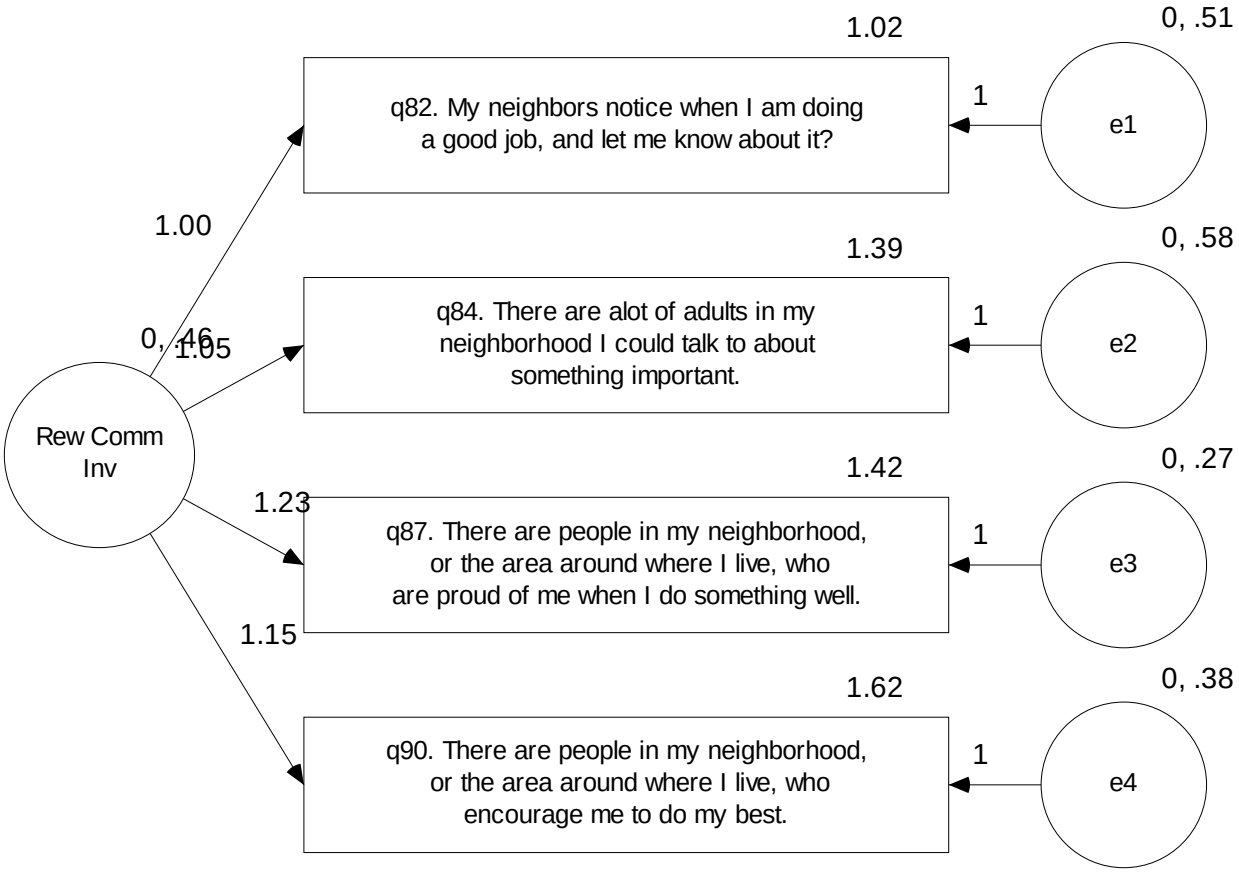

.53
0, .29
q85.a. How much do each of the following statements describe your neighborhood, or the area around where you live?: Crime
1
e1
1.00
.70
0, .35
q85.b. How much do each of the following statements describe your neighborhood, or the area around where you live?: Fighting
1
e2
0, .46
1.11
.46
0, .30
Comm Disorg
.83
q85.c. How much do each of the following statements describe your neighborhood, or the area around where you live?: Lots
1
e3
.69
.32
0, .20
q85.d. How much do each of the following statements describe your neighborhood, or the area around where you live?: Lots
1
e4
.49
1.07
0, .61
q86. People move in and out of my neighborhood a lot.
1
e5


1.33
0, .51
q71. If you wanted to get some beer, wine, or hard liquor (for example, vodka, whiskey, or gin) how easy would it be for
1
e1
1.00
1.33
0, .50
q72. If you wanted to get some cigarettes , how easy would it be for you to get some?
1
e2
1.09
0, .93
.55
0, .45
Drug Avail
.64
q74. If you wanted to get drugs like cocaine, LSD, or amphetamines, how easy would it be for you to get some?
1
e3
.53
1.07
0, 1.10
q76. If you wanted a gun how, easy would it be for you to get one?
1
e4
.99
1.02
0, .59
q77. If you wanted to get some marijuana, how easy would it be for you to get some?
1
e5


Drug Norm
1.00
1.11
1.20
0, .11
3.36
2.82
2.67
3.26
1.58
.33
.70
.64
.84
.53
.57
q79.a. How wrong would most adults in your neighborhood, or the area around where you live, think it is for kids your ag
q79.b. How wrong would most adults in your neighborhood, or the area around where you live, think it is for kids your ag
q79.c. How wrong would most adults in your neighborhood, or the area around where you live, think it is for kids your ag
q80.a. About how many adults have you known personally who in the past year have:: Used marijuana, crack, cocaine, or ot
q80.b. About how many adults have you known personally who in the past year have:: Sold or dealt drugs?
q80.c. About how many adults have you known personally who in the past year have:: Done other things that could get them
q80.d. About how many adults have you known personally who in the past year have:: Gotten drunk or high?
1
1
1
1
1
1
1
e1
e2
e3
e4
e5
e6
e7
0, .38
0, .70
0, .67
0, .48
0, .34
0, .51
0, 1.41


1.23
0, .38
q73. If a kid smoked marijuana in your neighborhood, or the area around where you live, would he or she be caught by the
1
e1
1.00
0, .60
1.02
0, .18
Drug Laws
1.10
q75. If a kid drank some beer, wine, or hard liquor (for example vodka, whiskey, or gin) in your neighborhood, or the ar
1
e2
1.06
.92
0, .24
q78. If a kid smoked cigarettes in your neighborhood, or the area around where you live, would he or she be caught by th
1
e3


.13
0, .08
q88.a. Which of the following activities for people your age are available in your community?: Sports teams
1
e1
1.00
.33
0, .11
q88.b. Which of the following activities for people your age are available in your community?: Scouting
1
e2
1.73
0, .04
.34
0, .11
Opp Comm Inv
1.73
q88.c. Which of the following activities for people your age are available in your community?: Boys and Girls clubs
1
e3
1.65
.47
0, .14
q88.d. Which of the following activities for people your age are available in your community?: 4-H clubs
1
e4
1.83
.40
0, .11
q88.e. Which of the following activities for people your age are available in your community?: Service clubs
1
e5


Rew Comm Inv
1.00
0, .46
1.05
1.23
1.15
1.02
q82. My neighbors notice when I am doing a good job, and let me know about it?
1
e1
0, .51
1.39
q84. There are alot of adults in my neighborhood I could talk to about something important.
1
e2
0, .58
1.42
q87. There are people in my neighborhood, or the area around where I live, who are proud of me when I do something well.
1
e3
0, .27
1.62
q90. There are people in my neighborhood, or the area around where I live, who encourage me to do my best.
1
e4
0, .38