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AN EVALUATION OF SOCIAL CAPITAL'S EFFECT ON DEPRESSION AMONG ADOLESCENTS

by

Ezechukwu Awgu

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Submitted to the
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Advisor: Stephen Magura, Ph.D.

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AN EVALUATION OF SOCIAL CAPITAL'S EFFECT ON DEPRESSION AMONG ADOLESCENTS

Ezechukwu Awgu, Ph.D.

Western Michigan University, 2012

Mental illness has been described as a "global burden of disease," and depression accounts for a large part of the burden (Aslund, Starrin, Nilsson, 2010). In 2009, 35.7 percent of the adolescent population in the United States who reported past-year symptoms of a major depressive episode, for example, feelings of sadness, discouragement, loss of feelings of self-worth, and loss of interest in social activities, also used illicit drugs including marijuana, inhalants, hallucinogens, cocaine, heroin, and prescription-type psychotherapeutics for non-medical purposes (SAMHSA, 2009, APA, 1994). Additionally, substance abuse due to alcoholism was among the major causes of death for adolescents aged 12 to 17 (National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), 2004; Burnner, Marmot, 1999).

Studies of mental illness in adolescents indicate that there is significant association between social isolation, or lack of social capital, substance abuse, and depressive symptomatology (Fitzpatrick, Wright, Piko, LaGory, 2005; Winstanley, Steinwachs, Ensminger, Latkin, Sttitzer, and Olsen, 2008). Youths' social capital defined as his or her relationships with the family, peers, friends, and community; trust, care, empathy, and norms of reciprocity (Putman, 2000), may be vital for predicting substance abuse and depression. On the other hand, social capital may be a source of protection

from threats of substance abuse and depression in adolescents (Fitzpatrick, et al, 2005; Henry, 2004).

This dissertation research utilized cross-sectional data from the National Survey of Drug Use and Health (NSDUH) (2009) to examine theoretical constructs such as youth social capital, depression, and substance abuse. It utilized structural equation modeling (SEM) to investigate whether youth social structural and cognitive social capital predicted the likelihood of substance abuse and depression in adolescents. The findings indicated that youth structural and cognitive social capital seems to associate with substance abuse and depression. In combination with youth structural and cognitive social capital, substance abuse also seemed to co-exist with depression. Also, substance abuse appears to transmit causal effects or partially mediates the association between youth structural/cognitive social capital and depression in the sample of adolescents studied. The implications of the study for evaluation research, theory, practice, and policy are considered and discussed

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PREFACE

There has been an upsurge in research to understand risk factors that predict health outcomes such as substance abuse and depression in adolescents (Lin and Dembo, 2008; Aslund, Strrin, Nilsson, 2010). Multidisciplinary inquiries into psychosocial factors that influence these health outcomes in adolescents have shed light on the roles of youths' social capital. In theory, two components of social capital, structural and cognitive, have been identified. Thus, the analyses of social capital and its components consist of an assessment of individual's access to or perceptions of it.

An empirical determination of associations among youth social capital, substance abuse; and depression (mental illness) must be comprised of evidence of quality of research, for example, study design, clear statements of research questions, methods of data analysis to address the research questions, logical interpretation of results, and applicability of the findings to public health policy with respect to mental illness (Almedom, 2005).

This dissertation research is intended to: (a) undertake a review of literature on youth social capital, substance abuse and depression in adolescents; (b) examine whether the prevalence of substance abuse and depression is due to lack thereof of youth social capital; (c) assess the factorial validity of youth experience variables (measure of youth social capital), to determine whether youth experience variables consist of

multidimensional components of social capital; (d) assess the validity of indicators of substance abuse and symptoms of depression; (e) demonstrate whether youth structural and cognitive social capital can predict substance abuse and depression; (f) determine the nature of associations among youth cognitive social capital, substance abuse and depression; (g) determine whether the association between youth cognitive social capital, substance abuse, and depression is the same for males and females; (h) provide interpretations of findings with respect to public health interventions; and; (j) propose areas of future research or improvements to existing methods or procedures.

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CHAPTER 1

INTRODUCTION

The knowledge of association of cumulative youth social experiences with psychological functioning and health in adolescents is essential in public health in order to develop programs that help to reduce and prevent factors that lead to future prevalence of adverse health outcomes such as substance abuse and depression (Substance Abuse and Mental Health Services Administration (SAMHSA), 2009; Hawkins, Catalano, and Miller, 1992). The cumulative youth experiences consist of assessment of social relationships with peers, family, neighbors, and membership or participation in social activities or organizations (SAMHSA, 2009). There is substantial evidence that positive youth social experiences increase their self-worth and esteem, confidence, and buffer the effects of health stressors (McMahon, Felix, Nagarajan, 2011; Cohen and Willis, 1985). Also, positive youth social experiences consist of sources of protection and moderation for appropriate health norms, values, and behaviors, and could facilitate access to health resources (Hawe and Shiell, 2000; Winstanley, Steinwachs, Ensminger, Latkin, Sttitzer, and Olsen, 2008). On the other hand, youth social experiences could be risk factors for adverse health outcomes, for example, negative peer and family influences (e.g., parents that suffer from physical and mental sicknesses), and neighborhood characteristics (such as violence and crime) (Cohen, 1988; Winstanley, et al., 2008; Sampson, Raudenbush, and Earls, 1997).

The youth experience construct in the National Survey of Drug Use and Health (NSDUH) 2009, a survey of a civilian, noninstitutionalized population for estimates of

prevalence of mental illness is utilized in this study to measure youth social capital. Youth social experiences are operationalized with the same factors that encompass the theoretical construct of social capital, for example, individual's membership in social activities or organizations, associations with family and, friends, trust, care, empathy, and norms of reciprocity (Putman, 1993; 2000; Szreter and Woodcock, 2004). These social capital factors have been used in studies to investigate several health outcomes such as adolescents' alcohol and drug use and access to treatment (Winstanley at al. 2008), exposure to depressive symptomology and violence (Fitzpatrick, Wright, Piko, LaGory, 2005), psychological distress (Phongsavan, Chey, Bauman, Brooks, Silove, 2006), depression, musculoskeletal pain, and psychosomatic symptoms (Aslund, Strrin, Nilsson, 2010). Even though these studies have shown evidence of association of social capital with health outcomes, the emphases have been on adolescents' or adults' physical health and structural social capital (i.e. quantity of individual's membership in activities, an individual level analysis). Less attention have been given to studies on adolescents' mental illness (Aslund, et al. 2010) and cognitive social capital (youth interactions with peers, friends, and family, a group level analysis) (Ferlander, 2007). Also, these studies are not explicit regarding the nature of association between social capital and health outcomes, for example, the mechanisms or processes by which social capital associates with health outcomes (Thoits, 2011). Thus, there is need for research to address these issues to better understand the association of social capital, substance abuse, and depression in adolescents.

The subject matter of this dissertation is to examine the extent to which exposure to variations in the quantity and quality of social capital affects substance abuse and

depression in adolescents aged 12 to 17; the processes or mechanisms through which social capital influences substance abuse and depression; and the implications this might hold for future directions of evaluation research related to adolescents' mental illness. First, it is important to understand what constitutes social capital and how it may associate with adolescents' health outcomes.

Definition of Social Capital and its Components

Social capital is defined as associations between individuals or groups. It includes such things as memberships, trust, care, and norms of reciprocity in social networks (Putman, 2000; Portes, 1998; Bourdieu and Wacquant, 1992; Ferlander, 2007). It is comprised of two components: structural and cognitive, which are measured as distinct concepts and are independent concepts with different patterns of correlations with other constructs and variables indicating discriminant validity of the concepts (De Silva, Harpham, Tuan, Bartolini, Penny, and Huttly, 2006). Thus, an evaluation of social capital or its components involves an assessment of its availability and individual's access to it (Ferlander, 2007).

Structural Social Capital

Structural social capital consists of participation or membership and benefits of membership in social networks such as exchange of information, opportunities, and access to health resources (Portes, 1988; Folland, 2007; Szreter and Woodlcock, 2004). Structural social capital is measured by the quantity, intensity, or frequency of participation in the social networks. For example, participation or membership in a church, a school, boy/girl scouts, a youth center, and volunteer work. Structural social

capital is measured by asking if, for example, “During the last 12 months, have you participated in in youth social activities such as a church group, a school grade etc. (Winstanley at al., 2008; Harpham, Grant, and Thomas, 2002). The items are binary scored (1“yes” and 0 “no”), and a high score of participation indicates more quantity of structural social

Cognitive Social Capital

Cognitive social capital is comprised of trust, care, and norms of reciprocity including emotional sustaining behaviors, for example, showing of understanding in situations of stressors and helplessness in individuals; expressions of concern and care for individual’s well-being; social monitoring of individual life styles, health behaviors, and choices; paying attention to issues of worries; and displays of empathy and sympathy. Cognitive social capital is measured by things including emotional support, for example, enabling people to feel things, and instrumental support, such as enabling people to know things (Harpham, Grant, and Thomas, 2002; Cohen and Wills, 1985). In this study, it is measured by asking respondents, for example, “How the youth thinks close friends or parents feel about youth trying marijuana/ hash monthly”; “whether teachers or parents tell youths of proud things they did in the past” (SAMHDA, 2009). The items are binary scored (1“yes” 0 “no”), and indicate the degree or quality of youths’ feelings or perceptions of relationships with parents, friends, or peers

A Theoretical Framework of Association of Social Capital and Health

Social capital associates with psychological functioning and health through diverse processes that influence health outcomes. These include such things as social influence and comparison with members in the social network. For example, youths in

social networks receive normative and behavioral guidance, evaluate the appropriateness of their health behaviors, values, and choices against standards of reference groups or similar others in social networks (Stroebe and Stroebe, 1996; Thoits, 2011). Additionally, individual participation and membership in organizations provide them with opportunities for self-evaluation. This increases feelings of worthiness and competence, improvement in self-esteem or self-worth, and confidence. Additionally, health outcomes such as self-worth and esteem have been associated with lowering the symptoms of anxiety, depression, and distress, and relate positively with life satisfaction and happiness (Rosenberg, Schooler, Schoenbach, and Rosenberg, 1995; Taylor and Stanton, 2007; Thoits, 2003; 2011). It has been suggested that self-esteem influences a variety of an individual's social ties and relationships and improves role relationships and mental health (Thoits, 2011). Also, through social control, families, friends, and neighbors observe behavior changes in youths, and are able to address adverse health choices and behaviors. Thus, through successful regulations (by family, friends, and community, e.g., schools and churches) of risky behaviors, health outcomes such as distress, anxiety, and depression may be averted (Cohen, 1988; House et al., 1988; Uchino, 2004).

The National Survey of Drug Use and Health (NSDUH)

The National Survey of Drug Use and Health (NSDUH) is an annual survey pertaining to mental health among the civilian, noninstitutionalized population aged 12 to 17 and older of the United States. The survey is conducted by the Federal Government beginning in 1971. The survey approach is by face-to-face interviews with a representative sample of the population at the respondent's place of residence (SAMHSA, 2009). The NSDUH survey provides a primary source of statistical

information on the use of illicit drugs, alcohol, and tobacco. The data collection is sponsored by the Substance Abuse and Mental Health Service Administration (SAMHSA), U.S Department of Health and Human Services, and is planned and managed by SAMHSA's Center for Behavioral Health Statistics and Quality (CBHSO), formerly referred to as the Office of Applied Studies, QAS). The data collection and analysis are conducted under the contract with RTI International, Research Triangle Park, North Carolina.

The Problem

In the United States, chronic diseases resulting from substance abuse and depression constitute serious public health issues and one of the major causes of death for adolescents aged 12 to 17 (National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), 2004; Burnner, Marmot, 1999; Wilkinson, 2001). In 2009, a report by the Substance Abuse and Mental Health Service Administration (SAMHSA) (2009) shows that 2.0 million, consisting of 35.7 percent of the youth population experienced past-year symptoms of a major depressive episode, for example, sadness, discouragement, loss of feelings of self-worth, and loss of interest in social activities. Likewise, the report shows that these youths used illicit drugs e.g., marijuana, inhalants, hallucinogens, cocaine, and heroin, and prescription-type psychotherapeutics for non-medical purposes (SAMHSA, 2009, APA, 1994).

The patterns of treatment and intervention strategies for mental illness, especially depression, predominantly consist of psychotherapeutic medications (SAMHSA, 2009; Mark, et al, 2007). The problems of unmet health needs poor quality of care; for example, prescribed treatment types, and growing prevalence rates of substance abuse and

depression among youths have given rise to concerns regarding utility and validity of treatments (SAMHSA, 2009; 2004). Thus, highlight the need to examine other treatment strategies such as improvement in youth social capital through increasing positive relationships and interactions with parents, caregivers, peers, and friends (SAMHSA, 2004).

In this dissertation, I propose that integrating a social capital framework in evaluation research of mental illness will provide insights on social factors that influence and moderate substance abuse and depression in adolescents. Additionally, the framework of social capital will provide knowledge on protection against the onset of risky health behaviors and guide health providers on how to manage the challenges of substance abuse and depressive conditions (O' Leary, 1988; Fitzptrick, et al., 2005).

Structural equation modeling (SEM) is used to analyze self-report data of the National Survey on Drug Use and Health (NSDUH) (2009) to determine the extent to which quantity and quality of social capital associate with substance abuse and depression in adolescents'. Also, the SEM statistic is used to examine the nature of association between substance abuse and depression in combination with youth social capital.

Purpose of the Study

This dissertation utilizes self-report youth social experiences (youth social capital) to examine the association among social capital, substance abuse, and depression in adolescents. For the purpose of this research, social capital is seen as memberships and feelings or perceptions that influence adolescents' health outcomes. This clarification is vital for understanding whether variations in quality and quantity of social capital can

predict risks of exposure to substance abuse and depression in adolescents in the United States.

This study is aimed at adolescents because this population is more susceptible to variations in social capital as a result of peer pressure, family, and neighborhood influences, which increases sensitivity and vulnerability to adverse health outcomes such as substance abuse and depression (Aslund, et al. 2010). Also, mental illness in adolescents closely approximates those of the adults (Fitzpatrick, et al., 2005), and health behaviors, such as smoking and alcoholism, which associate with health in adults begin in adolescence (SAMHDA, 2009). Thus, knowledge of youth social capital and the process by which it influences health outcomes may provide guides for implementing health programs that may reduce future rates of prevalence of substance abuse and major depressive episodes (MDE) (depression) in adolescents.

Positive or high levels of social capital are associated with lowering depressive stressors and are a focal determinant of depression (Fitzpatrick, 1998; Fitzpatrick, et al, 2000). Also, youth who reported high or positive levels of social capital have been found to have lower odds of alcohol and drug abuse than youths' who reported negative or lower levels of social capital (Winstanley, et al. 2008). However, the causal relationships among social capital, substance abuse, and depression are not clear (Fitzpatrick, et al., (2005). For example, whether youth who have low levels of social capital abuse substances, which has a direct causative effect to symptoms of MDE (depression), or whether youths who lack social capital abuse substances and experience depression simultaneously. Using retrospective cross-sectional data from the National Survey of

Drug Use and Health (NSDUH) (2009), this study examines the nature of association among social capital, substance abuse, and depression.

Exploring the potential pathways through which social capital associates with depression is important for understanding individual risk factors that influence rates of prevalence in adolescents in the United States. This research examines whether youth social capital directly associates with depression, or indirectly through substance abuse, or whether substance abuse may co-occur with depression. This study hypothesizes that, in the presence of youth social capital, it is plausible that substance abuse and depression may co-occur in adolescents. The knowledge of the nature of the relationship among social capital, substance abuse, and depression may be essential for developing evaluating mechanisms and intervention strategies aimed at improving social capital in order to reduce substance abuse and the symptoms of major depressive episodes in adolescents.

The models and theories of depression and substance abuse in adolescents emphasize genetics and an individual's risk factors (Bandura, 2004). This dissertation extends this model and proposes that youth social capital consisting of cumulative youth experiences may predict substance abuse and depression in adolescents. This framework may provide a broad and multivariate approach for examining health outcomes such as substance abuse and depression in youths. The framework of youth social capital may provide researchers and evaluators with knowledge of risk factors and strategies that can be explored to implement sustainable health programs to improve adolescents' wellbeing.

The theoretical themes of reference utilized in the analysis and interpretation of this data are derived from social science and public health literature. The typology

literature-social capital is traced form Bourdieu (1986), Coleman (1988), and Putman (2000) among others. The topics regarding determinants of health have received much recent attention, for example, Wilkinson (1996), Brunner and Marmot (1999), and Lynch, Smith, Kaplan, House (2000). The model depicting the relationships among social capital, substance abuse, and depression is presented in the proceeding chapters.

Objectives of the Study

This dissertation is aimed at the following objectives: to determine whether youth structural and cognitive social capital are causative predictors of substance abuse, for example, marijuana and alcohol drinking; and major depressive episodes (MDE), including discouragement, loss of feelings of self-worth, and loss of interest in social activities, recurrent thoughts of death, or suicide ideation (NSDUH, 2009) (see Figure 1).

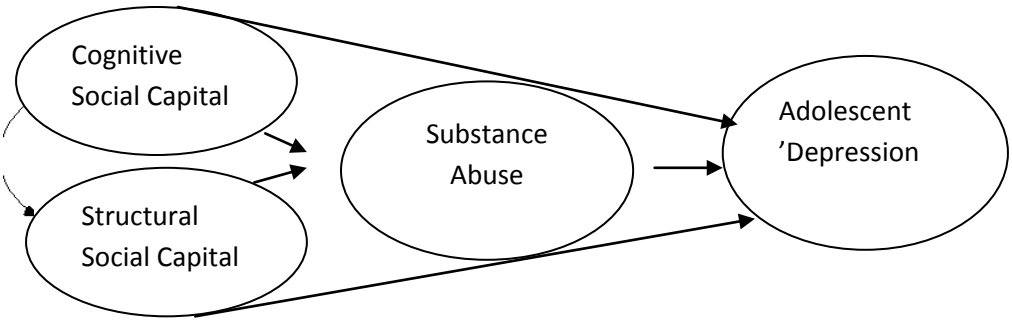

Figure 1. Schematic Network of Interrelationships among the Variables

In specific terms, the study is intended to determine: (a) whether there is an association between youth structural and cognitive social capital and substance abuse; (b) whether there is an association between youth structural and cognitive social capital and

depression; (c) the nature of association among youth structural and cognitive social capital, substance abuse, and depression, for example, whether youth structural and cognitive social capitals is directly associated with depression ($X_i \rightarrow Y_i$), or whether substance abuse mediates the association between youth structural and cognitive social capital and depression ($X_i \rightarrow M_i \rightarrow Y_i$); and (d) whether substance abuse and depression co-occur in adolescents

The Contributions and Significance of the Study

How will this dissertation contribute to the understanding of the problem under study and in general evaluation theory, method, and practice? It will contribute to research by addressing social factors that shape adolescents' behaviors resulting in health conditions such as substance abuse and depression, and related programs that can be used to prevent onset substance abuse and depression in adolescents (Donaldson and Lipsey, 2008). This study utilizes the diagnostic instruments of the National Survey of Drug Use and Health (NSDUH) to evaluate the risks of depression (the dependent variable), defined as past year (PY) major depressive episodes and past year substance abuse (the mediator variable) (*DSM-IV*, APA, 1994; SAMHSA, 2009).

Previous studies, for example, Fitzpatrick, et al. (2005) examine depressive symptomatology, exposure to violence and the role of social capital; Winstanley, et.al. (2008) examines the association between social capital and adolescents' alcohol and drug use and access to treatment, and Aslund, et al. (2010) examines social capital in relation to depression, musculoskeletal pain, and psychosomatic symptoms. These studies focus on (a) adolescent physical health; (b) structural social capita; i.e., individual membership and participation in social events, such as church, volunteer work, school clubs, boy/girl

scouts etc. (Winstanley, et.al. 2008); (c) neighborhood social capital, consisting of items, for example, whether “one feels afraid in one’s neighborhood,” “youth involvement in street fights,” and “high rate of crime,” etc. (Winstanley, et.al. 2008). (c) Generalized social trust and human capital, including things like: “most people try to be helpful,” “most people care about themselves,” and “take advantage of others,” “improved self-esteem,” and “school grades” (Sampson, Raudenbush, Earls, 1997; Harpham, 2002). A psychometric validation or the internal validity of these components of social capital are not conducted and the variables are not distinguished in terms of theoretical components of social capital, which consists of cognitive and structural (De Silva, et al., 2006).

This study focuses on adolescents’ mental illnesses and utilizes the confirmatory factor analysis (CFA) to assess the factorial validity of youth experience variables in the NSDUH; distinguish the items in terms of theoretical components, structural and cognitive social capital; differentiate and classify youth social capital variables in terms of individual characteristics, e.g., quantity of membership in social events, or structural social capital, and group level characteristics, e.g., youth perceptions of peers, friends, and parents, or cognitive social capital. The associations of structural and cognitive social capital variables with substance abuse and depression in adolescents may provide an understanding of individual and group factors that impact health in adolescents. This knowledge could be vital for designing interventions aimed at changing individual behaviors and creating settings that protect against youths’ health risks (Zimmerman and Arunkumar, 1994).

The hypothesized association between social capital and health outcomes has largely focused on structural social capital (Aslund, Starrin and Nilsson, 2010;

Winstanley et.al. 2008). Limited empirical research has examined the association between youth cognitive social capital and mental illness in adolescents. This has resulted in lack of clarity on which component of social capital, structural or cognitive, has a stronger impact on health (Cattell, 2001; Hawe and Shiell, 2000). This study will fill this gap; it utilizes SEM to examine that association among youth cognitive and structural social capital, substance abuse, and depression. This study hypothesizes that cognitive as well as structural social capital may associate with substance abuse and depression. The knowledge of the relative impact of cognitive and structural social capital on depression may provide evaluators, policy makers, and mental health providers' information regarding structural and cognitive social interactions that influence mental illness in adolescents.

Several studies, such as, Kawachi and Berkman (2000), Wilkinson (1996), Lynch and Smith (2002), Aslund, Starrin and Nilsson (2010), and House, et al. (1988) that examine the association between social capital and health involve epidemiology research. There is little or no evaluation research on social capital and adolescent mental illness. It is suggested that mental illness interventions, processes and outcomes can be influenced by structural and cognitive social capital such as membership, trust, perceptions, care, fairness, and confidence by program beneficiaries in service providers, and institutions (Hawe and Shell, 2000).

Regarding theoretical development, this study may make contributions to evaluation literature; it will show that social capital is a social science theory that may help researchers and evaluators to understand social factors that impact adolescents' mental illnesses. This may be necessary for the understanding of the etiology of

adolescents' mental illnesses, for example, how substance abuse and depressive behaviors begin. Thus, this knowledge may help in developing and designing intervention strategies for addressing mental illness in adolescents (Donaldson and Lipsey, 2008).

The concept of social capital has been applied in numerous fields of study, for example, psychology, education, economics, epidemiology, and sociology, political science (Cattell, 2001; Putman, 2000; Wilkinson, 1996; Lynch and Smith, 2002; Coleman, 1988). The diverse application of the concept may result in definitional and operational incongruities, thereby inhibiting theoretical advancement in new fields such as evaluation. This study will provide evaluators with operational definitions of the concept, and its various forms.

Assumptions, Limitations, and Strengths of the Study

Assumptions

a. The data is the National Survey on Drug Use and Health (NSDUH, 2009) formerly called the National Household Survey on Drug Abuse (NHSDA). The data is based on the Inter-University Consortium for Political and Social Research (ICPSR) and published on the Substance Abuse and Mental Health Services Administration (SAMHSA) website. The survey provides accurate, reliable, and valid data on youth experiences, patterns of illicit substance dependence and abuse, depression, health insurance, and treatment utilization (Harris and Edlund, 2005).
b. The NSDUH survey uses computer-assisted personnel interviewing (CAPI) and audio computer-assisted audio self-interviewing (ACASI) methodology for data

collection. The Protection of Human Subjects in data collection was approved by Research Triangle Institute (RTI) International.

c. The survey questions on substance dependence and abuse, and depression are based on the Diagnostic and Statistical Manual of Mental Disorder (*DSM-IV*) that allowed diagnostic criteria to be applied. These items are valid measures of the variables and constructs in mental illness.

d. The *DSM-1V* is a scientific, rigorous, and reliable diagnostic criterion for conditions of major depressive disorders and social phobias (Stein, Philips, Bolton, Fulford, Sadler, & Kendler, 2010).

Limitations

a. The study is based on a cross-sectional data, and, as a result, assumes a certain causal direction of association among social capital, substance abuse, and adolescents' depression. This association could be reversed as cross-sectional data does not allow an understanding of a causal direction.

Strengths

Access to a large sample size of cross-sectional data N = 17,705 of youths aged 12 to 17 is important. This allowed the researcher to examine patterns of substance abuse and depression in the youths.

The Relevance of Social Capital in Evaluation of Mental Illness Interventions

Social learning theory and social cognitive theory (Bandura, 1997; 2004) can be regarded as integral aspects of social capital. Social learning theory focuses on self-efficacy, the belief in individuals' competency to succeed in self-determined tasks or behavior (Bandura, 1997). The social cognitive theory examines determinants and

mechanisms in which health promotion and disease prevention programs work, focusing on an individual's knowledge of health risk, and benefits of different health practices, the perceived self-efficacy that individuals' can exercise control over health habits, the outcome expectations of costs and benefits of health habits, and the health goals people set for themselves (Bandura, 2004).

Social programs that have been developed based on social learning and social cognitive models include: smoking prevention (Evans, Rozelle, Mittlemark, Hansen, Bane, and Havis, 1978), and, school-based approaches that altered schools' or classrooms' instructional styles (Hawkins, Catalano, Kosterman, Aboot, and Hill, 1999; Sloboda, et al., 2009). These interventions target an individual's attitudes, perceptions, behaviors, and skills that increase resistance form substance dependence and abuse (Botvin and Griffin, 2003; Oetting and Lynch, 2003; Sloboda, et al., 2009). However, these have been described as single-channel (for example, targeted only at schools) programs, which have a limited impact and scope and, for the most part, do not work long term in addressing health outcomes in adolescent populations (Sloboda, Cottler, Hawkins, Pentz, 2009).

Unlike the social learning and cognitive theories, social capital encompasses individual, group, and community determinants of health (Putman, 2000; Cohen and Wills, 1985). It includes group social interactions, organizational strategies, resources, and assistance in networks, protection mechanisms, program dissemination, and sustainability plans (Sloboda, et al., 2009). These frameworks can offer ways by which health conditions, for example, substance abuse and depression can be evaluated by: providing knowledge of social factors that influence adolescents' propensity to adopt

risky health life styles and; increasing in affective changes, for example, health knowledge and status, empowerment, self-worth and esteem, and feelings of worth and value, which can impact intervention processes and outcomes (Hawe and Shiell, 2000; Folland, 2007). Additionally, social capital variables, including feelings and perceptions of trust and encouragement, can facilitate understanding adolescents' risky health behaviors, choices, and values; and promote dialogues, changes in their sense of value; and problem analysis in evaluation study (Phelps, 2000; Folland, 2007).

Thus, programs that have been implemented which have elements of social capital include: Skills, Opportunity, and Recognition (SOAR) (Hawkin, Catalano, and Arthur, 2005), and the Midwestern Prevention Projects (Riggs and Pentz, in press). These programs have had long-term effects beyond the issues examined in this study. These included reduction in violence and crime, obesity, and teenage pregnancies (Sloboda, et al., 2009).

Definition of Terms

Substance dependence, or dependence on illicit drugs or alcohol, is defined in terms of meeting three out of seven dependence criteria (for substances that also included questions that measure a withdrawal criterion) or three out of six dependence criteria (for substances that did not include withdrawal questions) for that substance, based on criteria in the *DSM-IV)*, 4th Edition, (APA, 1994; SAMHSA, 2009).

Illicit drugs are comprised of marijuana or hashish, cocaine, (including crack), inhalants, hallucinogens (including phencyclidine (PCP), lysergic acid diethylamide (LSD), ecstasy (MDMA), heroine, or prescription-type psychotherapeutics used nonmedically, for example, stimulants, sedatives, tranquilizers, and pain relievers. Illicit

drug use refers to the use of any of the outlined drugs based on response to questions that assess use (*DSM-IV*), 4th Edition, (APA, 1994; SAMHSA, 2009).

A major depressive episode (MDE) is defined in terms of a person who having had at least five or more of the nine symptoms within a two week period in his or her lifetime at least, one of which the symptoms is as expressed in the *DSM-IV*, 4th Edition (APA, 1994; SAMHSA, 2009).

Prevalence is a general term for describing estimates of occurrence including lifetime, past year, substance dependence, or use, or other behaviors of interest within a given period.

Psychotherapeutic drugs are defined as prescription-type medications that have legitimate medical uses, for example, pain relievers, tranquilizers, stimulants, and sedatives. However, for the purpose of this study, it is measured as the use of the drugs without legitimate prescription to the respondent. Or the use of the drugs just for the experiences or feelings derived from using the drugs (SAMHSA, 2009).

Cross-sectional data consists of data collected at a given period (e.g., within one year).

Nature of the Study

This study utilizes the quantitative method involving structural equation modeling (SEM) to analyze cross-sectional data from the National Survey of Drug Use and Health (NSUDH) (2009) of US population of youths 12 to 17 years, the targeted population. The sample frame consists of people living in noninstitutionalized quarters in the United States, including adolescents N=17,705, selected based on probability or random sampling method.

The data collection is based on computer-assisted personal interviewing (CAPI), in which the interviewer read the questions to the respondent, and audio computer-assisted self-interviewing (ACASI) (SAMHSA, 2009). The interview consists of core and noncore questions; the core questions are interviewer-administered demographic items, and self-administered questions regarding the use of tobacco, alcohol, marijuana, cocaine, crack, heroin, hallucinogens, inhalants, pain relievers, tranquilizers, stimulants, and sedatives. The noncore questions are self-administered and deal with questions regarding mental health utilization and services (SAMHSA, 2009).

This study examines the association among youth social capital, substance abuse, and depression in adolescents. Youth social capital is measured by youth experiences, which are operationalized by items such as: (a)"number of school based activities participated in the past 12 months"; (b) "number of community based activities participated in the past 12 months"; (c)"parents' check if homework was done in the past year"; (d) "parents' help with homework in the past year" etc. Depression is measured by items, for example: (a) "sad/empty/depressed most of day or discouraged"; (b) "lost interest or pleasure in most things"; (c) "changes in appetite or weight" etc. Substance abuse is measured by questions relating to dependence or abuse of illicit drugs, or alcohol, for example: (a) "alcohol cause serious problems at home /work/ school past 12 months"; (b) "drink alcohol and do dangerous activities past 12 months"; (c) "drink alcohol cause problems with law past 12 months." Additionally, this study examines whether social capital directly associates with depression, or indirectly through substance abuse, and whether substance abuse and depression co-occur in combination with levels of youth social capital.

Summary

The literature regarding risk factors that associate with adolescent mental illness is reviewed in an attempt to understand the etiology of substance abuse and depression, and the methodological developments in the recent years. Particular attention is paid to studies that examine the relationships between social capital and mental illness. The findings show that most studies focus on adult and adolescents' physical illness and structural social capital, for example, participation in social activities and neighborhood environment.

Additionally, studies on depression are mainly descriptive and theoretical, and examine the impact of risk factors, such as self-esteem and self-control, on negative views or expectations defined as depression. This study built on these foundations and examines the association between youth cognitive and structural social capital, substance abuse, and depression in adolescents. Also, the literature on the pathways of association between social capital, substance abuse and depression is reviewed. The pathways by which social capital associate with depression is explored in this study by investigating whether substance abuse mediates the association between youth cognitive and structural social capital and depression, and whether substance abuse and depression co-occur in adolescents.

Chapter 2 provides a review of literature relating to the topic and variables in the study, including: (a) the origin of social capital, its applications and related theories (b) the theory of social capital and how it is vital to health (c) what constitutes mental illness and its prevalence in adolescents (e) public policy to improve social capital and reduce the prevalence of adolescent mental illness (f) the need for social capital theory in

evaluation. The literature review to a large extent focuses on studies concerning social capital and mental illness and evaluation studies on social capital and public health.

To the knowledge of this researcher, few evaluation research studies have been conducted concerning social capital and mental illness in adolescents. Apparently, not much research has examined the relative impact of structural or cognitive capital on adolescents' mental illness. Researchers have emphasized the need to investigate youths' social capital and adolescents' mental illness, the mechanism by which youth social capital associates with health, and which components of social capital, structural or cognitive has more impact on health. Chapter two is used to demonstrate that social capital should be further researched, because it may be vital for understanding social factors that predict substance abuse and depression in adolescents; and may provide a framework for future evaluation studies.

The study's methodology is described in chapter three; it includes the data and sources, strategies to determine the validity and reliability of data, and the data analysis methods.

CHAPTER II

LITERATURE REVIEW

Organization of the Chapter

The literature review consists of a review of: the origin of social capital, its applications, and related theories; types of social capital and relationships with health; what constitutes mental illness and its prevalence in youths; empirical studies on the association of social capital and mental illness; policies to improve social capital and to reduce the prevalence of mental illness in adolescents; and the need for social capital theory in evaluation. These topics are reviewed later in this section.

Section one consists of a review of the origin and development of social capital and its applications. Theories and models relating to social capital are examined to illustrate how social factors, for example, association among friends, family and neighbors buffer illnesses such as substance abuse and depression.

Section two examines types of social capital, for example, bonding, bridging, and linking. The section demonstrates how social ties influence health and explores whether social capital can be a medium for health information and health promotion.

Section three examines what constitutes mental illness and its prevalence in the youth population, and how mental illness is diagnosed, the consequences, and growing prevalence of mental illness in adolescents.

Section four examines current empirical research relating to the relationships between social capital and mental illness. The topics reviewed include: (a) the association between social capital and depression, (b) the association between social capital and

substance abuse, and (c) the association between substance abuse and depression. Also, the section demonstrates gaps in the literature on studies of mental illness in adolescents.

Section five explores public policy to address mental illness and how a social capital framework may be used to improve policies to reduce mental illness in adolescents.

Section six addresses the need for incorporating the social capital concept in the field of evaluation; and the need for further research in evaluation is discussed.

Description of the Literature Search

Social capital is first utilized in the field of sociology in the 19th century (Portes, 1998). Recent use of the concept is found in Bourdieu (1986), Coleman (1988), and Putman (1993; 2000). The concept is used in these studies to examine individual's social class, rational choices and utility maximization, the availability of resources, and the presence or absence of economic norms of cooperation in a market economy (Swain, 2000; Macinko and Starfield, 2001). The upsurge in research associating social capital and health, wellbeing, and youths' health behaviors and choices gained large attention in the 1990s (Wilkinson, 1997; Kawachi, Kennedy, Lochner, and Prothrow-Smith, 1997; Kawachi, Kennedy, and Glass, 1997; Brunner and Marmot, 1999; House, Landis, and Umberson, 1998; Winstanley, et al., 2008; Fitzpatrick, et al., 2005; and Aslund, et al., 2010)

The literature published during the early 1990s is reviewed to improve understanding of the origin and development of the construct and its impacts on health, and to show how social capital impacts substance abuse and depression in adolescents. The literature review indicates that mental illness may be influenced by social capital.

Also, positive levels of social capital can reduce the likelihood of symptoms of major depressive episodes (MDE) (Fitzpatrick, Wright, Piko, and LaGory, 2005; House, Landis, and Umberson, 1988).

A computerized search of published research materials was conducted using sources, for example, MEDLINE, PubMed, Psych Info, Science and Social science Citation Index, JSTOR, World Cat, Online file [Infotrac], Academic Sources, ProQuest, Inter-American initiative on social capital, Sociological Abstract, ethics, and development-document library publications from the 1990s through June 2011. Different concepts have been used to describe social capital, health, and mental illness. Keywords and titles used to search for mental illness include: depression, substance use and dependence, mental disorder, stress, depression, psychotic disorder of dysfunction, and co-occurring mental illness (SAMHSA, 2009). Additionally, titles and terms used to search for social capital include: social participation, social cohesion and integration, neighborhood environment, bonding, bridging, and linking. Selected articles reviewed are comprised of theoretical qualitative and quantitative studies that explore topics involving social capital, health, and mental illness.

Thus, one of the objectives of the literature review is to examine issues relating to the availability or lack of social capital and exposure to risks of MDE and substance abuse in adolescents, and the mechanisms by which social capital associates with depression. The literature review reveals gaps in knowledge regarding: (a) the relative impact of structural and cognitive social capital on substance abuse and depression; (b) the nature of association between social capital and depression; and (c) to what extent for example, substance abuse influences the associations between social capital and

depression. The literature review begins with examining the origin and development of social capital, its application, and how it is related to health, for example, adolescents' substance abuse and depression.

The Origin of Social Capital, Its Applications, and Related Theories

This section reviews the origin and development of social capital and provides opportunities to evaluate whether a social capital framework can be used to improve understanding of substance abuse and depression in adolescents.

The Origin and Development of Social Capital

The explicit origin of social capital is not clear. Several social theorists are credited with its conceptual development. These include Karl Marx's idea of "atomized class-in-itself" versus a "mobilized class-for-itself," and Emile Durkheim's "group life as an antidote to anomie and self-destruction" (Portes, 1998; Macinko and Starfield, 2001). Additionally, David Hume, Edmund Burke, and Adam Smith are associated with the origin of social capital, and all describe it in terms of "economic norms of cooperation" and "natural protecting principles for proper the functioning of a market mechanism (Macinko and Starfield, 2001; Woolcock, 1988). The description of social capital as social assets existing in social units consisting of things such as good will, fellowship, sympathy, and social interaction among individuals and families is associated with Hanifan (1920) (Woolcock, 1988; Macinko and Starfield, 2001). Portes (1988) outlines processes that lead to the creation of social capital, for example: (a) "value interjection" based on Durkheim's notion that internalized values, norms, and moral imperatives, from family, friends, neighbors, or organizations inform individual actions; (b) "bounded

solidarity," a notion by Karl Marx that adverse circumstances help unrelated people to bond together to improve their lot, which come in the form of provision resources or social support; (c) "concept of reciprocity" based on Simmel's notion that credits (nonmonetary debts) accumulate through non-market exchanges among community members; (d) "enforcement trust," the idea by Weber that sanctioning the capacity of group rituals ensures compliance by individuals with social expectations and norms. This helps to moderate an individual's risky health choices and actions including drug use (Portes, 1988; Portes and Senenbrenner, 1993; Macinko and Starfield, 2001).

Macinko and Starfield (2001), note that social capital is used to describe social relationships at the individual and group levels, which highlights its functional definitions. Portes (1998) defines social capital as the capacity of individuals to access social resources due to membership in social networks. Putman, Leonardi, and Nanetti (1993) refer to it as features of social organization consisting of trust and norms that improve the efficiency of societal actions. Also, social capital is described as natural-occurring social relationships among individuals, which facilitate access to assets and resources (Coleman, 1990), and it consists of the sum of resources available to a group as a result of the presence of durable social networks (Bourdieu and Wacquant, 1992). Thus, for the purpose of this study, social capital is seen as both individual and group variables, which influence health outcomes such as substance abuse and depression in adolescents.

The Applications of Social Capital

Social capital has been associated with several socio economic outcomes including health, politics, incomes, and employment (Hawe and Shiell, 2000) in the adult and youth populations. It has been widely applied in social sciences, for example,

political science economics, sociology, psychology, and education (Ferlander, 2007). Robert Putman and colleagues are the first to apply the concept in political science in "Making Democracy Work in Italy." The study argues that differences in the levels of political and economic development among various regions in Italy may be associated to variations in social relations (Putman, 1993). Additionally, the utilization of social capital by Putman (1995) in "Bowling Alone," a precursor to civil participation and political development in the United States, resulted in an upsurge in application of the concept in other social science research, notably economics and public health (Macinko and Starfield, 2001). In public health, it has been associated with income distribution and mortality levels, substance use, and depression in youths (Lynch, Smith, Kaplan, & House, 2000; Winstanly, et al.2008; Fitzpatrick, et al. 2005).

In 1988, Bourdieu used social capital in the field of economics to examine an individual's social status in a class-based social structure in which class determines an individual's economic and cultural capital. For example, Coleman (1988) used the concept as a measure of level resources or assistances required by individuals to meet needs, which are expressed as rational actions for beneficial and purposeful consumption decisions to maximize utility (Swain, 2000) . Additionally, in 1966, Wilkinson applied social capital in a study, "Unhealthy Societies," using an epidemiology perspective. Wilkinson stressed that in relatively affluent societies, social capital determines the relationships between income inequality and mortality rates (Szreter and Woolcock, 2004). The ideas of Putman (1993; 1996) and Wilkinson (1996) are considered important influences in the conceptual development of social capital and its related topics including

social cohesion, social support, social integration (neighborhood characteristics), and civil society (Szreter and Woolcock, 2004).

Hawe and Shiell (2000) note that the World Bank and World Health Organization have started to incorporate social capital in theory, practice, and policy in areas of community and institutional development strategies, and improving health resources and facilities in developing countries. The wide application of social capital highlights its relevance in addressing social phenomena. In this dissertation, social capital is relevant to understanding factors that influence substance abuse and depression in adolescents, evaluating the intervening processes that lead to vulnerability or exposure to adverse health outcomes, and programs that can protect youths against risky health choices such as substance abuse, and depression.

Theoretical and Methodological Issues in Using Social Capital

De Silva, et al. (2006) describes social capital as a multi-dimensional concept and similar to other social science constructs, faces theoretical, and methodological issues. However, these issues do not compromise the usefulness of the construct in understanding health and psychological functioning in adolescents (Zimmerman and Arunkumar, 1994).

Theoretical Issues

Social capital is comprised of two components, structural and cognitive (Ferlander, 2007). However, a one- dimension measurement of the concept consisting of participation in social events has been fully developed and commonly used in health research in adult and youth population (Freelander, 2004; 2007; Putman, 1993; De Silva,

et al., 2006; Winstanley, et al., 2008), and this limits research efforts on cognitive components of social capital. Researchers, for example, Kawachi, Kim, Coutts, and Subramanian (2004) have been concerned about the measurement of social capital either as an individual or group variable. For example, when measured as an individual variable, social capital involves analyses of frequencies or quantities of individual memberships in associations (structural social capital), and the perceptions or qualities of participation (cognitive social capital). Also, group variables may include ecological or neighborhood variables, which can be aggregated and divided into an index to examine health outcomes (Winstanley, et al., 2008). This approach has been considered weak, because neutral or middles scores are combined with more extreme scores, which may obscure information about these variables (Zimmerman and Arunkumar, 1994). De Silva, et al. (2006) notes that past studies have focused on individual levels analysis, and have resulted in a lack of understanding of individual and group interactions that have important consequences on health outcomes. Also, most studies are cross-sectional analyses, which are one-time assessments of health dysfunctions in adolescents (Winstanley, et al., 2008; Sampson, et al., 1997; De Silva, et al., 2006).

Methodological Issues

One of the criticisms of social capital includes a lack of valid measurements. For example, it is measured by multiple concepts including structural, cognitive, neighborhood environment, and social economic status (Ferlander, 2007; Sampson, et al.1997; Fitzpatrick, et al. 2005). This has resulted in a lack of common approach to studying it, measurement problems, and inconsistencies across studies (Ferlander, 2004; 2007; Szreter and Woolcock, 2004; De Silva, et al. 2006). One of these problems

according to Harpham, Grant and Thomas (2002) is that topics covered in the instruments, for example, satisfaction, security, neighborhood facilities and (dis)organization (e.g., crime and violence), length of residence in community, voluntary group and community activities consist of what social capital is, its consequences, and outcomes (Sampson, et al. 1997; Harpham, et al. 2002). Likewise, Stone and Hughes (2002) stress that topics such as life expectancy, suicide rates, crime rates, and violence are "distal indicators" that must be avoided when measuring social capital. Additionally, Putman (1993) notes that elements of social capital, for example, social trust, norms of reciprocity, social networks, social integration, and cooperation are mutually reinforcing and not discrete, create virtuous circles, and are heuristically unhelpful in measuring the variables. Also, Harpham, et al., (2002) contends that concepts such as "social network" and "social relationships" describe behavioral patterns, trust and reciprocity measure attitudes, and trust and reciprocity measure behavior patterns. On the other hand, Abbot and Freeth (2008) note that concepts such as trust and reciprocity are culturally and contextually defined and may impact the overall face and content validity of instruments. To overcome these difficulties, Harpham, et al. (2002) propose that these issues can be addressed by creating boundaries of what constitute measures of social capital, and should be based on the conceptual framework of specific study.

Thus, measures adopted to improve research using social capital include the use of the SASCAT tool, a psychometric assessment of the validity of an instrument to determine the scope of topics covered (De Silva, et al. 2006). Additionally, an Adapted Social Capital Assessment tool has been developed for designing instruments and data collection on youths' social capital (De Silva, et al., (2006). This study utilizes youth

experience variables in the NSDUH (2009). The data has been tested and validated in order to provide accurate estimates regarding the association between social capital, substance abuse and depression in adolescents (SAMHSA, 2009).

Related Theories of Social Capital and Association with Mental Illness

This section examines social factors in understanding mental illness in adolescents. The theories reviewed include the social control and resilience model (Masten and Powell, 2006; Garmezy, Masten, and Tellegan, 1984; Hirschi, 1969).

Social Control Theory

The social control theory developed by Hirschi (1969), proposes that processes of socialization and social learning influence self-control, and the likelihood of having antisocial behaviors. Akers (1973) and Sutherland and Cressey (1966), further explore the concepts of socialization and social learning and note that one can learn delinquent behaviors through interactions and relationships by individuals, social group, family, and peers (Lin, 2008). In later development of social control theory, referred to as the social bonding theory, Hirschi (1969) argues that relationships, commitments, values, norms and beliefs may be sources of discouragement from indulging in antisocial behaviors (Psychology.wikia, 2012). And with respect to youths, the theory proposes that youths who do not have a strong bond to conventional social institutions are less likely to commit acts of delinquency, for example, substance use and abuse, crime, and violence (Lin, 2008). This study notes that a lack of family bonding and membership in social institutions consists of low participation, negative family and peer influences, and may indicate negative or low levels of social capital (Putman, 1995; Ferlander, 2007).

Elements of social control theory (e.g., social learning and socialization) have been utilized in previous empirical studies to investigate adolescents' substance use. For example, Pagliaro and Pagliaro (1996) find that components of social capital such as family connectedness, parental support and social integration, measured by youths' relationships with parents, friends, or peers' associate with adolescents' alcohol and drug use (AOD). Also, Winstanley et al. (2008) find that youths who report higher levels of social capital (civic participation) have lower odds of alcohol and drug (AOD) use relative to youths who have lower levels of social capital. Additionally, Brook, Whiteman, Gordon, and Cohen (1986) examine the occurrence of depressive moods among female college students and find that time spent with fathers heightens respondents' responsibility, assertiveness, and parental identification in predicting low levels of depression. Thus, these studies indicate that social control theory is relevant in predicting antisocial behaviors including substance abuse and depression in adolescents.

The Resilience Model

Norman Germezy (1985) conceptualized the resilience model for research in psychology and psychiatry. It is intended for use to understand the nature and origin of schizophrenia. However, it has been extended to investigate children at risk of psychopathology, and applied in Project Competence, a study of competence, adversity, and resilience (Germezy, 1985; Fleming and Ledogar, 2008). Resilience consists of factors and processes that impact trajectories from risks to problem behaviors or psychopathology, and result in positive outcomes in the presence of adversity. Also, it includes processes of, or capacity for, positive outcomes, or successful adaptation in the face of threatening circumstances (Germezy and Masten, 1991; Zimmerman and

Arunkumar, 1994). Social factors such as low levels of social capital are sources of constant threats that increase vulnerability to substance abuse and depression in adolescents (Winstanley et al.2008; Fitzpatrick et al.2005). On the other hand, factors including positive interaction with parents, peers, and friends, may protect youths from risks and maintain healthy development.

Historically, in youth development research, the Resilience Model has been used to investigate youth life experiences such as individual attributes, family qualities, peers, and community supportive systems (e.g., social networks, schools and religion) that protect against health risks (Sandler, 2001; Rutter, 1979; Garmezy, Masten, and Tellegan, 1984). According to Garmezy and Gewirtz (2006), the Resilience Model provides convergence in research on youth development, psychopathology, and prevention science, and highlights the importance of early childhood protection afforded by positive relationships, healthy brain development, good self-regulation skills, community supports for families, and learning opportunities.

In this study, the Resilience Model offers insights to the health risks facing the adolescents, the causal and intervening processes of exposure or vulnerability to risky health outcomes, as well as the mechanism for prevention (Fleming and Ledogar, 2008; Rutter, 1990). Also, it provides knowledge of processes, for example, social, environmental, and psychological factors. These are vital for understanding particular exposure to health risks, policies and practices that can be designed to promote healthier development in youths' who face adverse life experiences (such as substance abuse and depression) (Rutter, 2005; Garmezy and Gewirtz, 2006). These policies may include prevention programs that promote good parenting skills, provisions of social support, and

specific interventions for adolescents who experience life stressors (Masten and Powell, 2006). In 2005, Fergus and Zimmerman (2005) proposed a framework comprised of compensatory, protective factors, and challenge models that provide understanding of relationships between risks and protective factors that alter trajectories of exposure to risky health outcomes. The compensatory and protective factors are relevant and further explored in this study.

Protective Factors

Protective factors consist of process variables that interact with risk factors to reduce the probability of having negative health outcomes (Zimmerman and Arunkumar, 1994). These factors are comprised of assets or resources that moderate the effects of negative health outcomes, for example, emotional regulations, by parents, teachers, and peers, good social economic status (SES), effective schooling such as youth participation in school activities, and neighborhood safety (Fleming and Ledogar, 2008). Masten and Reed (2002) and Masten and Powell (1999) note that accounting for these factors in the lives of youths is important for good adaption, reducing exposure to health stressors, and having positive health outcomes. Studies including Brook, Nomura, and Cohen (1989) on the relationships of neighborhood, school, peer, and family factors on adolescents' drug use, find that a harmonious and organized school environment interacts with peer substance use (e.g., alcohol, cigarettes, and marijuana) to decrease adolescents' use of the three substances. Also, Newcomb and Felix-Ortiz (I992) show that adolescents' susceptibility to social influences can interact with social influences to influence drug use. For example, negative peer influence due to membership in social organizations can increase risk of drug use. On the other hand, membership can provide youths' with self-

regulation, which interacts with risk factors (e.g. negative peer influences) to moderate or reduce drug use**.**

Compensatory Factors

Garmezy, et al. (1984) defines compensatory factors as variables that neutralize exposure to risks; these may not eliminate the risk factors, but can have a direct effect on the independent variables and outcome of interest. Masten et al. (1988) provides examples of compensatory factors to include cognitive factors e.g., care, empathy, and encouragement from parents and teachers, and can help to predict adolescents' health behaviors. Thus, it is suggested that the presence of cognitive factors compensates for higher levels of stress or depression, and youths who are exposed to beneficial (or quality) cognitive factors tend to maintain positive health behaviors comparable to youths who have low levels of cognitive factors (Masten et al., 1988). Additionally, Zimmerman and Arunkumar (1994) suggest that if examined in a linear regression, the direct effect of compensatory variables may predict fewer odds of occurrence of depression, substance abuse, and delinquency. Similarly, Anderson and Ledogar (2008) find that alcohol abstinence or moderation is compensatory because it independently associates with lower risks of youth suicide. The protective and compensatory models are not mutually exclusive, for example, positive experiences in the lives of youths may compensate for risk factors interacting with other factors to reduce negative health stressors like substance abuse and depression. On the other hand, compensatory factors may help to make stress levels manageable so that future exposure to risks is less debilitating. Also, it acts as a resource to deal with exposure to high levels of stress, depression, and substance abuse in adolescents (Zimmerman and Arunkumar1994).

An Integrated Model of Social Theories and Mental Illness

There is interconnectedness between social control and resilience theories. Researchers, for example, Pagliaro and Pagliaro (1996), Newcomb and Felix-Ortiz (I992), Winstanley, et al. (2008), Agnew (1993), Massey and Krohn (1986); and Lin (2008) integrate elements of resilience, socialization, and social learning (Social Control Theory), in cross-sectional and longitudinal studies . They investigate social factors that influence health behaviors and outcomes in adolescents, for example, substance abuse and depression. In this dissertation research, elements of social control and resilience theories are integrated in order to understand psychosocial factors that influence or moderate adolescents' health behaviors and outcomes, and guide in interventions that may reduce substance abuse and depression.

Social Theory, Mental Illness, and the Role of Age and Sex

Social theories like Social Learning Theory are mainly utilized to understand antisocial behaviors in the male population (Lin, 2008). The focus on males is due to the rate of antisocial behaviors in this population, which is more frequent than in the female population. However, Smith (1979) and Segrave and Hastad (1985) argue for the need to utilize the same concepts and theories for research in both male and female populations. They emphasized that theories that explain males' health behaviors and outcomes are valid for explaining the same health behaviors and outcomes in the female population. Thus, in this dissertation research, youth social capital is utilized to examine substance abuse and depression in both the male and female populations.

Demographic variables for example, age, sex, and race are used in investigation of adolescents' health outcomes (Almgren, Magarati, & Mogford, 2009). Empirical and

theoretical studies including; Zimmerman and Arunkumar (1994); Kessler, Sonnega, Bromet, Hughes, &Nesson, (1995); and Sunder, Grady, & Wu, (2007), examine the association of social factors, health outcomes and gender effects. The conclusion drawn from these studies indicates that social factors which predict hopelessness, futility, risks and problems (including substance abuse, and depression) are the same for males and females.

Likewise, age has been utilized as a correlate of substance use and depression in adolescents (Hasin, D., Samet, S., Nunes, E., Meydan, J., Matseoane, J., &Waxman, R., 2006). A study by Akers and Cochran (1985) that examines health behaviors and outcomes between age groups finds that social capital, for example family and school bonding may have different effects on adolescents and young adults (Friedman and Rosenbaum, 1988).

Additionally, studies from National Longitudinal Study of Adolescent Health (Add Health) find that somatic illnesses such as headache, stomachaches, and general malaise among adolescents differ significantly by race (Udry, 2003). On the other hand, Almgren, et al, (2009) argue that there is a confounding effect of race, socio-economic status, and a variety of latent factors (for example, social capital). This has led to questions about the utility of race as a useful construct to explain differences in health outcomes, except for a limited number of diseases with known, established, race-based risks such as cystic fibrosis and sickle-cell anemia. As in most studies, for example, Almgren, et al., (2009) race is used in this study as a correlate of adolescents' substance abuse and depression without explicit expectations of its effect. This research proposes

that for adolescents ages 12 to 17, the effects of youth social capital, substance abuse, and depression may be the same for males and females.

Types of Social Capital and the Relationships with Health

Szreter and Woolcook, (2004) conceptually distinguish three types of social capital consisting of bonding, bridging, and linking (Ferlander, 2007). Bonding is a type of relationship that occurs among people who share the same social identity. Bridging consists of associations among individuals who share no similar social identity such as age, ethnicity, and profession. Linking includes relationships that occur across an explicit formal power gradient in the society, for example, between health institutions and beneficiaries (Szreter and Woolcook, 2004). The classification of social ties is important in understanding how social capital can associate with health outcomes. Thus, these distinctions are based on levels of social ties expressed in terms of: strength and diversity, formality of relationships, horizontal and vertical, formal and informal, and weak and strong social ties (Ferlander, 2007). Bonding and bridging are horizontal types of associations with strong and diverse social ties involving close friends, members of the same family, social class, religion, individuals' of the same age, ethnicity, and education (Szreter and Woolcook, 2004). However, bonding and bridging may be weak social ties if they involve people in voluntary associations. Linking is a vertical form of relationship and consists of strong social ties if it occurs among colleagues in similar hierarchical positions. On the other hand, it may be a weak social tie if members are distant colleagues, or in a different hierarchical position (Ferlander, 2007; Szreter and Woolcook, 2004; Granovetter, 1973).

Theorists, including Coleman (1990), equate social capital with strong social ties, stressing that a family is good source of social capital. In contrast, Putman (1993) and Granovetter (1973) contend that informal or weak ties are better sources of opportunities for civic skills, access to services, information supports, and consist of paths of association between social capital and health. They described weak social ties as the route for resources, influences, and information flows central in the shaping of an individual as well as community welfare and wellbeing (Granovetter, 1973). Additionally, Ferlander (2007), and Lin (2001), argue that informal networks are vital in sustaining networks and sources of emotional and instrumental support that lead to health and wellbeing. This study agrees with the two schools of thought and notes that strong and weak social ties (social capital) associate with adolescents' health outcomes, including substance abuse and depression.

On the other hand, Szreter and Woolcook (2004) stress that strong or close ties can lead to negative impacts on health, which may constrained opportunities, reinforced delinquency, and adverse behaviors (Hawe and Shiell, 2000; Putman, 2000). Other negative outcomes include localism, exclusion, bullying, and mistrusts of outsiders, stagnation, lack of motivation, and inability to adapt or adjust to new ideas (e.g., change to new health values, norms, and behaviors) (Portes and Landolt, 1996).

How Social Capital Associates with Health

In spite of the above debate, theoretical evidence has shown that social capital is associated with individuals' health outcomes. Kang, Wallace, Hyun, Morris, Coffman, and Bloom (2007) note that the means by which mental illness, for example, depression, relate with group characteristics and feed back into individuals' health outcomes can be

assessed in terms of function, structure and content of social capital (Maulik, Eaton, Bradshaw, 2009).

Function

Function consists of perceived social supports received in networks such as care and emotional stability (Kang et al, 2007; Maulik, et al, 2009). The quality and availability of social support in networks are associated with levels of generalized trust and norms of reciprocity. These factors consist of environmental trustworthiness, which influences socioeconomic exchanges and access to resources and opportunities (Abbot and Freeth, 2008). Socioeconomic variables include income (inequality) and are regarded as a pathway by which social capital is associated with health (Kawachi, Kennedy, and Wilkinson, 1999). In 2002, a study found that across twenty-two U.S. cities, generalized trust and reciprocity influenced access to health-improved functioning, and efficiency of community health institutions (Hendryx, Ahern, Loverich, and McCurdy, 2002). Also, it reduced outcomes such as neighborhood violence, divorce, delinquency, and the homicide rate among youths (Putman, 1993; Sampson, Raudenbush, and Earls, 1997).

Content

Content is comprised of attitudes, values, and norms transmitted in networks. It includes things such as regular use of services and checkups, and resistance to deviant behaviors (Granovetter, 1973; Prentice, 2006). Content impacts health because of the notion that individuals' behavior and identities (both adults and adolescents) could be influenced by the social groups they belong to (Earp, Viadro, Vincus, Altpeter, Flax, Mayne, Eng, 1997). Also, it is suggested that individuals who are in close social relationships are more likely to adopt positive health values and norms, for example,

seeking regular care and preventative checkups (Prentice, 2006). Additionally, Lindstrom et al. (2006) note that close social ties, as exist in the family, household, and homogenous groups, facilitate regular access to doctors, psychiatric services and clinical follow-up, diagnosis, and treatment of adverse health behaviors (Carpenter and White, 2002).

Structure

Kang et al. (2007) describes structure as the frequency or number of contacts among members in networks, for example, between youths and parents, teachers, friends, and peers. The frequency of contacts can impact health in several ways: (a) by influencing access to health information; (b) diffusion of desired health norms, values, and behaviors; (c) social control over deviant health behaviors, and improvements in psychological processes (e.g., affective support, self-esteem, and mutual respect) (Kawachi and Berkman, 2000). At the organizational level, Granovetter (1973), Davis (1969), Becker, (1970), and Hawe and Shiell (2000) note that increased frequency of contacts can lead to: treatment innovations, utilization of new drugs, and new treatment strategies, information dissemination, circulation of privileged information, reduction of health transaction costs, and fewer information distortions. This study acknowledged that frequency of association can lead to negative health values and behaviors such as negative peer influence. However, Becker (1970) argues that users of bad information may be mostly socially isolated individuals and those who are less subjected to social pressure.

Thus, these factors are vital for understanding how social capital associates with health. In addition, this dissertation seeks to explore whether these factors (social capital)

are an important channel for health information to promote interventions that address wellbeing in adolescents.

Social Capital and Health Promotion among Youths

The notion of whether a social capital framework is a means of health information and health promotion is examined using theories including the "Action-oriented learning theory" (Freire, 1970; Rappaport, 1984). This states that individuals are able to increase their self-efficacy and change their behaviors if learning takes place in a group based on interconnection between development of awareness and action. The "Social Cognitive Theory"(Bandura, 1986) notes that individuals who participate in social networks derive benefits including an increase in self-awareness of health choices, knowledge of health risk behaviors, opportunities for vicarious learning, observing others' actions, and verbal persuasion through exhortations from others. Thus, membership in organizations enhances an individual's self-identity, group interaction; feedback loops, and offers a point of reference for individuals to evaluate themselves (Frable, Wortman, Joseph, 1997).

Empirical studies show that a social capital framework can be a medium for health information. For example, in 1991, Weitz found that participation in community-based organizations helps individuals living with diseases, such as AIDS, to cope with the challenges of the diseases and find positive meaning for their lives. Also, Sobieszek (1974) found that interaction between individuals' improves their overall worth and self-esteem, which relates to psychological wellbeing and health. The study emphasizes that individual membership in programs influence peer networks in health decision making. Similarly, Love, Gardner, and Legion (1997) argue that membership serves as an

effective conduit for health information and resource use, guides consumers on how to access services, plays invaluable and cost-effective roles in promoting and delivering culturally appropriate healthcare. Public health interventions that have used a social capital framework for health information dissemination and promotion include the "Save Our Sisters Project" (SOSP), (Eng, 1993), "Youth Lay Health Advisors" (YLHA) (Berkley-Patton, Fawcett, Paine-Andrews, and Johns (1997), and "The Camp Health Aide Program" (CHAP), (Booker, Robinson, Kay, Najera, and Stewart, 1997). These programs have played important roles in promoting health outcomes, including breast cancer screening and maintaining healthy lifestyle behaviors among their members.

What Constitutes Mental Illness and Its Prevalence in Youths?

The boundaries delineating illnesses such as mental or psychiatric disorders are not consistent or precisely operationally defined (Stein, Philips, Bolton, Fulford, Sadler, and Kendler, 2010). As a result, the level of abstraction of mental illnesses (disorders) has been complex and comprised of terms including: distress, dysfunction, disadvantage, disability, inflexibility, irrationality, syndromal pattern, etiology, and statistical deviation (Stein, et al., 2010). However, none of these terms is equivalent to mental disorder. Verhoeff and Glas (2010) and Stein, et al. (2010) argue that the determination of whether a disorder is present or not is based on the context in which the classification is made. Mental disorder has been classified into two main types: dysfunction 2, which consists of brain abnormalities, and basic psychological disturbances, and dysfunction 1, which involves dysfunctions at clinical levels such as affective instability, thought disorder, and inability to maintain stable relationships. This distinction is important in understanding the 'real' underlying basis of dysfunction (Verhoeff and Glas, 2010). At the clinical

levels, mental illness is comprised of substance use, psychiatric disorders, and symptoms of major depressive episodes, which co-occur with substance use or substance use disorder, however, the causal sequence of association is not clear (SAMHDA, 2009). The inability to understand the causal sequence complicates the diagnosis and treatment of psychiatric disorders among substance abusers, and can be attributed to the resemblance of intoxication and withdrawal effects to symptoms of psychiatric disorders (Hasin, Samet, Nunes, Meydan, Matseoane, &Waxman, 2006).

Diagnostic Instruments of Mental Illness (Disorder)

Accurate diagnosis is vital for the classification and determination of youths who have mental illnesses (Hasin, Trautman, Miele, Samet, Smith, Endicott, 1996). Thus, diagnostic instruments with in-depth structured questionnaires have developed. For example: Psychiatric Research Interview for Substance and Mental Disorders (PRISM), Center for Epidemiological Studies for Depression (CES-D) Scale (Radloff, 1977), The World Organization Disability Assessment Schedule (WHODAS) (Novak, Colpe, Barker, and Gfroerer, 2010), and Diagnostic Statistical Manual (DSM-1V) of mental disorder (APA, 1994).

The *DSM-1V* of mental disorders (APA, 1994) is used in the NSDUH (2009) to collect data on adolescents' substance dependence and abuse and major depressive episodes (MDE) in the U.S (SAMHDA, 2009). The *DSM-1V* definition of mental disorder and features operationalizing clinical diagnosis (Stein, et al. 2010) must consist of criteria including:

(a) A clinically significant behavioral or psychological syndrome or patterns that occur in an individual.

(b) The syndrome is associated with present distress (e.g., a painful symptom) or disability (for example, impairment in one or more important areas of functioning) or with significantly increased risks of suffering involving death, pain, disability, or an important loss of freedom.

(c) The syndrome or patterns cannot be an expectable and culturally sanctioned response to a particular event such as death of a loved one.

(d) A manifestation of behavioral, psychological, or biological dysfunction in the individual.

(e) Neither deviant behavior (for example, political, religious, or sexual) nor conflicts that are primarily between the individuals and society are mental disorder unless the deviance or conflict is a symptom of a dysfunction in the individual.

However, Van Praag, (2000) criticizes the *DSM-1V* of mental disorder for creating many diagnostic categories, and has eroded the distinctions between psychopathology and normal psychological phenomena, for example, sadness after a stressful event such as death and shyness in social situations. Despite this criticism, Stein, et al. (2010), argue that the *DSM-1V* provides rigorous and reliable diagnostic criteria for social phobia and major depressive episodes. Thus, it was widely used in patient care and studies of mental disorders. In this study, the *DSM-1V* provides an understanding of sources of substance abuse and symptoms of depression in adolescents.

Prevalence and Correlates of Mental Illness in Adolescents

The section is reviewed in order to track and understand the levels of occurrence and evaluate the nature of mental illness among youths. The SAMHSA (2009) survey of adolescents' mental disorders is based on Past Year (PY) and Life Time (LT) dependence

and abuse of illicit drugs and symptoms of major depressive episode (MDE). The burden and prevalence of health problems (or mental illness) is examined and characterized by its frequency, comorbidity, and associated human and fiscal cost (Offord, Kraemer, Kazdin, Jansen, and Harrington, 1998).

Frequency of PY MDE Severe Impairment by Age and Sex

In 2009, a total of 2 million youths (8.1 percent of youths population) aged 12 to 17 reported having PY MDE (SAMHSA, 2009). The demographic analyses indicated that the prevalence of MDE varied by sex and gender. For example, in terms of gender, 11.7 percent of females and 4.7 percent of males had PY MDE, and 8.6 percent of females and 3.2 percent of males had MDE with severe impairment, Also, by age, 3.6 percent of youths aged 12 years and 10.9 percent among the 17 year olds had MDE with severe impairment.

In terms of age specifics (12 to17), among the youths aged 12 years old, 3.6 percent had PY MDE including 2.6 percent who experienced MDE with severe impairment, and 1.0 percent who did not have severe impairment. Also, for youths aged 13 years old, 5.5 percent had PY MDE, comprised of 3.8 percent who had severe impairment; and 1.7 percent without severe impairment. Additionally, among the youths aged 14 years old, 7.1 percent who had PY MDE are made up of 4.8 percent who reported having severe impairment, and 2.3 percent without severe impairment. Among the 7.1 percent of youths aged 15 years old who had PY MDE, 4.8 percent had severe impairment, while 2.3 percent did not have severe impairment. A similar outcome is reported for youths aged 16. Among the 10.4 percent who had PY MDE, 7.5 percent had severe impairment, and 2.7 were without severe impairment. Also, among the 10.9

percent of youths aged 17 who had PY MDE, 8.1 percent had severe impairment, and 2.8 did not have severe impairment (SAMHSA, 2009).

Frequency of PY MDE and Substance Use Disorder by Age

Among youths aged 12 to 17 who experienced PY MDE in 2009, 35.7 percent used illicit drugs in the PY compared to 18 percent who did not have PY MDE. The pattern of co-occurrence of MDE and substance use is consistent with substances such as: marijuana, inhalants, hallucinogens, cocaine, or heroin and nonmedical use of prescription-type psychotherapeutics. For example, youths who had PY MDE consist of daily cigarette users in the past month relative to those who did not have PY MDE (3.6 versus 1.9 percent).Also, youths who had PY MDE are found to be heavy alcohol users relative to those who did not have PY MDE (4.2 versus 1.9 percent) (SAMHSA, 2009).

For the individual substances, the percentage of youths who used marijuana in the PY is 24.2 percent including those had PY MDE, and 12.6 percent who did not have PY MDE. The percentage of youths who were PY users of psychotherapeutics is 19.2 percent, consisting of those who had PY MDE, and 6.6 percent who did not have PY MDE. Additionally, the percentage of youths who used inhalants in the PY is 8.0 percent in addition with youths who had MDE; 3.4 did not have MDE. Among other substances (e.g., hallucinogens), PY use is 6.8 percent including youths who had PY MDE, and 2.6 percent who did not have PY MDE. The PY use of cocaine is 2.2 percent, comprised of users who had MDE, and 0.9 percent who did have PY MDE; 0.5 percent PY users of heroin consisted of those users who had MDE and 0.1 who did not have PY MDE (SAMHSA, 2009).

One of the conclusions derived from this review is that among the substances abused or used by youths, there appeared to be likely prevalence and comorbidity of cigarettes and major depressive episodes; marijuana and major depressive episodes, or alcohol and major depressive episodes. The abuse of these substances is consistent with the "getaway hypothesis" which noted that onset adolescents' substance dependence or abuse begins with beer or, wine, and moves progressively to hard liquor, or tobacco, marijuana, and finally illicit drugs (Tarter, Vanyukov, Kirisci, Reynolds, and Clark, 2006).

The Prevalence of Substance Abuse and MDE in Adolescents' Population

Novak, Colpe, Barker, and Gfroerer (2010) and Kessler, Merikangas, Berglund, Eaton, Koretz, and Walter (2003) note that prevalence estimates may be an under representation of the actual population prevalence rates of youths who are experiencing mental illness. This is because it may be that some symptoms of mental illness in youths are not seriously impairing and may be excluded from the classification and measurement resulting in substantially lower prevalence estimates (Novak et al. 2003). Also, the classification of mental disorder is based on respondents meeting a number of criteria at some time in their lifetime, and the percentage of respondents that meet the criteria of at least one of the disorders at some point in the last 12 months before the interview are likely to be lower than the actual population count of the prevalence (Novak, et al., 2003).

Thus, steps adopted to improve prevalence estimates of mental disorders include measures that address the impairment requirements as one the features of mental illness estimation. For example, under the Public Law (PL) 102-321 of the Alcohol, Drug,

Abuse and Mental Health Administration Reorganization Act (Alcohol Drug Abuse and Mental health Administration, 1992), the Substance Abuse and Mental Health Services Administration (SAMHSA), an operational definition of (adult) serious mental illness (SMI) has been developed, which required DSM diagnosis of substance use disorder or any other 'organic' mental disorder that involved a "substantial functional impairment in one or more major life activities" (SAMHSA, 2009). This impairment requirement is operationalized based on the Global Assessment of Functioning (GAF) score of ≤ 50 (SAMHSA, 2005; 2009; Kessler, et al., 2003).

Even though the SMI is developed to assess the prevalence of mental disorders in adults, the adolescent mental illnesses (for example, depression and substance dependence an abuse) examined in this dissertation are estimated with nine attributes or symptoms associated with major depressive episodes (MDE) in the *DSM-1V* of mental disorders (SAMHSA, 2009; APA, 1994). Thus, tracking the prevalence of mental disorders in adolescents in the U.S is important in order to provide treatment and improve the health and well-being of the affected population. Kessler, et al., (2003) stressed that the challenges of tracking the population of prevalence of mental illness is that a large multipurpose survey capable of monitoring the prevalence of youths on an ongoing basis requires an enormous amount of resources.

The Human and Fiscal Cost of Mental Illness

The cost of mental illness includes: exposure to domestic violence, individual and family distresses, crime rates, delinquency, and school dropout rates etc. (Fitzpatrick, 1993; Mark, Levit, Buck, Coffey, & Vandivort-Warren, (2007).

Thus, given the seriousness of impact of mental illness, studies and interventions on substance abuse and depression in adolescents are needed. This dissertation uses reliable and valid diagnostic instruments (*DSM-1V*) and large population data of adolescents in the U.S to examine the risk factors associated with substance abuse and depression. This may help in the designing of intervention strategies to reduce mental illness and improve wellbeing and health in adolescents.

Empirical Studies on Association of Social Capital and Mental Illness

The association of social capital and mental illness has been investigated in the U.S and International literature (Whitley and Prince, 2005; Aslund, Starrin, and Nilsson, 2010; Hamano, Fujisawa, Ishida, Subramanian, Kawachi, Shiwaku, 2010); Giannakopolulos, Dimitrakaki, Pedeli, Kolaitis, Rotsika, Raven-Sieberer, and Tountas, 2009; Fitzpatrick, Wright, Piko, and LaGory, 2005; and Winstanley, et al. 2008). These studies consist mostly of cross-sectional studies, which use aggregated measures of social capital and constructed indexes (for example, “low” “medium” and “high”) to examine health outcomes. In all the studies reviewed, the findings are conclusive that social capital is associated with health outcomes. Some of the empirical studies reviewed focus on the adult population because less is known about how social capital influences substance abuse and depression in the adolescent population (Aslund, et al. 2010). The reviewed studies include topics relating to: the association between social capital and depression, the association between social capital and substance abuse, and the association between substance abuse and depression.

The Association between Social Capital and Depression

The association between social capital and depression is examined by Giannakopolulos, et al. in 2003. The study is conducted in Greece based on the framework of a European project "Screening and Promotion for Health Related Quality of life (HRQol) in Childern and Adolescents-A European Public Health Perspectives". The study examined the relationships between parents' subjective physical and mental health statuses and adolescents' Health Related Quality of life (HRQol). The participants consisted of 1, 900 adolescents aged 11 to 17 years and 973 households selected in a muti-staged, random sampling of schools based on National Census data 2001. The adolescents' HRQol was measured using KIDSCREEN-52, a generic self-reported questionnaire for children and adolescents aged 8 to 18 which assessed dimensions of every day wellbeing, and functioning (e.g., physical, emotional, mental, social, and behavioral). The youths' socioeconomic statuses and social support (measure of social capital) were measured by the family socioeconomic status and affluent scale (FAS), measured by seven items, for example, family ownership, having their own unshared room, the number of computers at home, and times spent on holiday in the past 12 months. These items were aggregated to create a range (0 to 7), and recoded as 'low' (0-3), 'intermediate' (4-5), and 'high' (6-7).

Also, the parents' subjective health statuses were assessed with a self-administered SF-12 questionnaire, which covered topics such as physical functioning, physical role, bodily pain, general health perception, vitality, social functioning, emotional role, and mental health (Greek standard version 1.0). A score scale data of 0 to 100 and summary deviation score of mean 50 was created for statistical analysis. Thus, a

bivariate analysis indicated that FAS was significantly associated with adolescents' psychological wellbeing, moods and emotions, parents' relations and home life, and peers and support relations. Also, a multivariate analysis showed that the total KIDSCREEN-52 score of physical wellbeing increased by 2.49 for a point increase in the OSLO social support scale. This finding indicates the importance of social support (social capital) on adolescents' quality of life. Also, the study notes that a low subjective physical health status in parents was strongly associated with a less positive self-perception in adolescents. A better parental subjective mental health status significantly correlates with higher physical and psychological wellbeing, moods, and emotions, parent/child relationships, school environments and financial resources (Giannakopolulos, et al. 2009).

Additionally, in Japan in 2010, Hamano et al. utilized a multimodel approach to assess whether variations in mental health outcomes were determined by compositional effects (such as age, sex, educational attainment, and income) and contextual effects (for example, community social capital measured at ecological levels by aggregating individual perceptions). Using a nationally represented random survey of 81, 974 households and 120,846 participants aged 30 to 80 years, a self-rated questionnaire was used to assess participants' social capital (cognitive and structural) and mental health. Cognitive social capital was measured with nine (9) items that assess features of social organization such as trust, norms, and networks, rated on a 10 point scale, and collapsed into a summary index (1-4 "low trust" and 5-9 "high trust"). Also, structural social capital was assessed by the number of civic participations in neighborhood associations, for example, sports, hobby, recreation, or cultural groups; aggregated on individual responses

at neighborhood levels (contextual effect) and recoded as 0 “no I do not belong;” 1 “yes I belong”. Mental health was measured with SF-36 comprised of eight dimensions such as physical functioning, physical role, bodily pain, social functioning, general health perceptions, emotional role, and mental health. A measure of mental health consisted of five (5) items, e.g., "have you been nervous”, “have you felt calm and peaceful”, “have you felt downhearted, and depressed”, and “have you been happy”, rated on a five point likert scale, summed to a range of 0 to 100; and a higher score indicated better mental health.

A regression statistics analysis found that cognitive and structural social capital was associated with an individual’s mental health status. Further the study noted that the components of social capital have contextual influence on mental health in Japan. Also, the multilevel analysis found that, in the rural population, cognitive social capital (measured as “trust”) was positively associated with psychological health. Likewise, a multilevel study by Yip, Subramanian, Mitchell, Lee, and Wang (2007) found a positive association between cognitive social capital (‘trust’) and psychological health in China. In contrast, Stanfford, De Silva, Stansfeld, and Marmor (2008) find no evidence of association between cognitive social capital (‘trust’) and psychological health in the United Kingdom (Hamano, et al., 2010).

The Association between Social Capital and Substance Abuse

Winstanley, et al. (2008) used self-reported variables of the National Survey of Drug Use and Health (NSDUH) in 1999 and 2000 to examine the impact of neighborhood disorganization and social capital on adolescent alcohol use among youths aged 12 to 17 in the United States. The NSDUH survey is a publicly released data set

comprised of a multi-stage probability sampling design of 38,115 youths. The independent variables included neighborhood disorganization measured with 8 items and summed to a range of 0 to 8, and divided into low '0', medium '1', and high '2-8'. Also, social capital was operationalized by 10 items that examined youths' participation in social activities. These items were summed to a range of 0 to 10 to capture the degree or index of participation, and divided into tertiles, for example, low '0-1', medium '2-3' and high '4-10'.The dependent variables were alcohol use and dependence (AOD) and the receipt of AOD treatment. AOD use was categorized into 0 "never used AOD" and 1 "used AOD." Also, AOD treatment is measured by 10 stem questions, for example, "have you received treatment or counseling for your use of alcohol or any drug, not counting cigarettes?" A summary variable was created and recoded into 0 "no treatment" and 1 receipt of treatment". The NSDUH questions for determining symptoms of AOD and severe impairment were based on the criteria in the DSM-IV of mental disorders (APA, 1994).The result of the multinomial logistic regression analysis of the data showed that youths' who have high levels of social capital have lower odds of receiving AOD treatment compared to youths who reported low levels of social capital (it is likely that high levels of social capital led to less AOD use and less need for AOD treatment). Additionally, the data indicated a positive liner relationship between AOD use and neighborhood disorganization, for example, the odds of AOD use increases between the lowest category of neighborhood disorganization compared to the medium and high levels of both AOD use (Winstanley, et al. 2008). Additionally, measures of social capital such as family connectedness and parental support have been associated with alcohol dependence and use (Pagliaro and Pagliaro, 1996). Also, it have been suggested that

participation in school or community-based organizations that encouraged positive adult supervision may prohibit drug use (Winstanley, et al. 2008).

The Association between Substance Abuse and Depression

The relationship between depressive symptom levels and an increase in substance use among youths' with emotional disturbance was examined in the United States in 2008 by Wu, Hoven, Liu, Fan, Musa, Wicks, Mandell, & Cook. The study aimed to determine the relationships between depression, use of cigarettes, alcohol, and other drugs in low-income adolescents diagnosed with severe emotional disturbances (SED); and the impact of depressive symptoms on changes in pattern of substance use. The Multisite study in Managed Behavioral Health care was conducted in Pennsylvania, New York, Oregon, Tennessee/Mississippi, and Ohio.

The participants were youths aged 4 to 17 with SED who enrolled in Medicaid or Fee for Services behavioral health plans from May 1977 through 1999. The selection criteria for participation in the study consisted of: (a) youth with SED or the Diagnostic and Statistical Manual of Mental Disorders (APA, 1994); (b) absence of diagnosis of developmental disability; (c) intensive use of mental health services in the past year (consisting of inpatient, residential, day treatment, partial hospitalization, in-home support, rehabilitation, therapeutic foster care etc.). The exclusion criteria were based on youths having a disorder that was viewed as too mild. The data was from the Substance Abuse and Mental Health Services Administration (SAMHSA). It was comprised of 1,724 families interviewed at the baseline (wave1) in which 88 percent completed the follow-up interview (1,517) (wave 2). A subsample of youths aged 11 or older who completed the interview N=784 at wave 1 were used for the study, comprised of 65.7

percent males, 44.3 percent minority groups, and 70.4 percent not living in traditional two parent household.

The variables consisted of substance abuse (the outcome) and symptoms of depression (the predictor). The outcome variable, substance abuse, was measured by questions related to whether youths have ever used cigarettes, alcohol, cannabis, cocaine, amphatamines, sedatives, inhalants, hallucinogens, and heroin etc., and the frequency of use. The variable was measured at levels:(1) never smoked cigarettes;(2) no smoking increase or other substance use increase (initiated smoking by wave 1, but did not increase use between waves 1 and 2, or initiate the use of other substances) ;(3) smoking increase only (did increase or initiate smoking between waves 1 and 2, but did not increase use of any other substance); (5) use of cigarettes and other substances (e.g., alcohol and illicit drugs between waves 1 and 2). Likewise, the variable created for the analysis of alcohol, was measured at the same levels as the outcome variable. Changes in cigarette and alcohol use were examined by comparing levels 3 and 5 with the reference level 1.

The use of illicit drugs was measured by categories different from cigarette and alcohol use (onset drug use begins after alcohol and cigarette use). The variable created for the analysis of illicit drug use has categories including: (1) never used any illicit drug (never reported having used drugs at both wave 1 and 2); (2) no drug use increase (initiated drug use by wave 1 but did not increase drug use level between waves 1 and 2); (3) drug use increase (increased or initiated use of illicit drugs between waves).

Depressive symptoms, the predictor variable and externalizing behavioral problems were measured at base line for youths aged 11-18 using youth self-reports. This

consisted of twelve items comprised of: loneliness, frequent crying, self-harm, talking about suicide, feeling unloved, feeling worthless, being overtired, excessive sleep, inadequate sleep, trouble sleeping, underactivity, and being depressed (measured with depression scale). Respondents were examined at base line and follow-up, the base line measures was used in the study.

The baseline depressive symptoms were grouped into three categories (1) Low (zero to one depressive symptoms), (2) medium (two to six depressive symptoms), and (3) high (seven or more depressive symptoms). These ranks were used to examine changes in substance use over time. A cut-off score of seven symptoms of the 75^{th} percentile was chosen for the sample. Also, externalizing behavior (have been found to be associated with substance use and depressives symptoms) was used as a control variable. The covariates included: age, gender, race, family composition (one vs. two parents), and health status, and was scored as definitely true, mostly true, don't know, mostly false, definitely false.

The data analysis methods consisted of descriptive statistics; the chi-square test was used to examine the bivariate relationships between wave 1 substance use and depressive symptom levels. The multinomial hierarchical logistics regression analysis was used to assess increases in substance abuse. Thus, the three levels of statistical analyses conducted were: in Model 1, a baseline level of depressive symptoms was used as the main predictor variable, controlling for the study site. In Model 2, the covariates were controlled, and Model 3, youth health statuses and externalizing behaviors were added in the model.

The results indicated the mean age of children aged 11 to 17 was 13.7. The percentage distribution of substance use, the rates of lifetime use of cigarettes, alcohol, and illicit drugs among these children were 50.9, 42.7, and 31.5 respectively. Also, 21.7 percent levels of depressive symptoms (seven or more symptoms) were reported for the sample. A bivariate cross-sectional relationship between depressive symptoms and levels of substance abuse, at the baseline for children who have high levels of depressive symptoms were 41.7 percent never used illicit drugs; 20.8 percent of children who had low depressive symptoms levels had used drugs. Depressive symptoms were significantly associated with current smoking; the relationships between depressive symptoms, current alcohol use, and drug use were not significant. This result is attributed to low rates of past month use, especially for illicit drugs.

Additionally, regarding the impact of depressive symptoms on the increase in substance use, a multinomial logistic regression based on the longitudinal relationships between depressive symptoms and changes in substance use levels at baseline at wave 1 and wave 2 (6 month interval, model 1) indicated that children who experienced high levels of depressive symptoms (seven or more symptoms) at the base line were more likely to initiate or increase substance use other than cigarettes (Group 4; adjusted odd ratio AOR=2.42, p £.05), in some cases together with initiation in smoking (Group 5; AOR=2.77, p £. 001), compared with those with low levels of depressive symptoms. In model 2, a similar result was derived when demographic and family factors were controlled. However, when externalizing behavior problems and health statuses were controlled, these results were no longer statistically significant.

Regarding alcohol use, children with high levels of depressive symptoms at base line were more likely to initiate or increase either alcohol use (Group 3; AOR=2.09, p £.05), or the use of both alcohol and other substances (Group 5; AOR= 3.01, p £.001) compared to children with low levels of depressive symptoms. In model 3, when demographic and family factors, externalizing behaviors, and health statuses were controlled, the association between levels of depressive symptoms and the increase in both alcohol use and other substances use remained significant.

Additionally, in model 1, concerning the use of illicit drugs, children who had high depressive symptoms (AOR=3.28, p £.001) or medium depressive symptoms (AOR=2.03, p£ .01) at wave 1 were statistically significant and more likely to increase or initiate the use of illicit drugs by wave 2, compared with those with low depressive symptoms. These results were significant after controlling for sociodemographic factors and child externalizing behaviors. In terms of the covariates, at family and individual levels, age and externalizing behaviors problems were significantly associated with substance use outcome variables.

Overall, the longitudinal analysis indicated that depressive symptom levels were not independently predictive of later increases in cigarette smoking. Depressive symptom levels were independently predictive of increases in the use of alcohol and illicit drugs, but when the covariates were controlled the predictive relationship with alcohol use was no longer significant. In general, depressive symptoms were significantly predictive of illicit drug use increases.

Likewise, a study by Wise, Miller, & Preussler (2003) in the United States, found that individuals (aged 18 to 65) who reported only alcohol use, or alcohol use and other

substances reported higher levels of depression than those who reported no substance use. Also, those who reported alcohol use or alcohol use and another substance have higher scores of depression compared to those who reported no substance use. The study noted that alcohol use by gender did not appear to be related to depression in the participants investigated.

Limitations of the Previous Studies

The literature review indicated that past studies focus on issues relating to social capital, adolescents', or adults' physical health (Winstanley, et al. 2008; Aslund et al. 2010; Giannakopolulos, et al., 2009; Hamano, et al. 2010; Iversen, 2008). Several of the studies reviewed were conducted in Asia and Europe. It is not known within the context of this study whether the results from the studies will be the same if conducted in the U.S. Additionally, these studies use aggregated summary indexes of social capital variables, (for example, 0 "low" 1-2 "medium" and 4-6 "high), in logistic regression statistics to examine the association of social capital and health outcomes (Winstanley, et al. 2008). This approach has been criticized for loss of information on the middle or neutral variables (Zimmerman and Arunkumar, 1994). Thus, this dissertation focuses on adolescents because not much is known of how social capital associates with mental health in this population. It is suggested that adolescents' could be largely affected by variations in social capital because of their vulnerability to feelings of shame, sensitivity to peer influences, community factors, physical, and cognitive maturational changes (Aslund et al. 2010). It used the structural equation modeling (SEM) to examine the associations among social capital, substance abuse, and depression in adolescents.

Policies to Improve Social Capital and Reduce Prevalence of Mental Illness in Adolescents

Theoretical and empirical findings indicate that variations in the quantity and quality of social capital associate with mental illness in adolescents (Pearson and Oyebode, 2009; Putman, 1993). Thus, policies to improve the quality and quantity of social capital are required to reduce the current prevalence of mental or psychiatric illness in adolescents and alter negative trajectories that may extend the illness to adulthood (Winstanley et al. 2008). In this case, Hawe and Shiell, (2000) and Hanks (2008) stress the need for structural changes that improve community or neighborhood quality. This includes the creation of settings such as schools, facilities that allow increased youth participation in social activities such as in community institutions, particularly for minorities. This may likely increase a sense of community, which has important implications on health outcomes. Similarly, Pearson and Oyebode stress the need for services that increase adolescents having good perceptions of their communities. For example, providing education, improved access to health information, access to health resources, and promoting good parenting behaviors, or highlighting the importance of parent involvement in the adolescents' lives. These may help parents to support the youths and facilitate detecting the onset of adolescent mental illness before it becomes severe.

Additionally, Hanks (2008) proposed the need to bridge community relationships through actions that increase interactions among different racial groups. This may increase the injection of knowledge and experience, reduce exclusive relationships that lead to negative misconceptions about others which lead to violence, retaliation in violence, and create a cycle of school dropouts and unemployment. Similarly, Winstanley

et al. (2008) suggested improving the protective role of civic participation which helps adult leaders of community organizations to understand activities that moderate adolescents' adverse heath behaviors such as substance dependence and abuse. Also, understanding neighborhood disorganization characteristics, for example, crime, violence, drugs and alcohol is an important tool to assess the extent to which these factors influence adolescents' risky health values and behaviors, and can be used in urban planning strategies to create healthy neighborhoods (Winstanley et al. 2008). Also, government urban policies that are directed at improving social capital include AOD prevention programs in federally designated, high-intensity drug trafficking areas (HIDTA) and the designation of areas that have experienced harmful consequence of drug (Office of National Drug Control Policy, 2004; Winstanley et al. 2008).

The Need for Social Capital Theory in Evaluation

Given the growing interest in health research and interventions in adolescent mental illness, a social capital framework may play important roles in public health programs. As a social science concept, it can provide researchers with verifiable knowledge of social risk factors and principles that shape adolescents' health values and behaviors; understanding of etiology of substance abuse and depression in adolescents; and guides to the development of interventions that may result in positive health outcomes (Donaldson and Lipsey, 2008). Regarding the diagnosis of adolescent mental illness, a social capital framework can provide useful contextual information about each adolescents' diagnosis of mental disorder (including sources of psychological dysfunction e.g., personal behaviors and attitudes, parents' mental illness, and peers

influence). This information increases clinical utility and facilitates process evaluation relevant for improving treatments and outcomes (Kendler, 1990; Stein, 2010).

Additionally, in terms of improving the program's outcome, Eng and Parker (1994) suggest that social capital can play an important role in building of relational ties, enhance problem-solving capacities in communities, and improve the process of working in partnership in communities leading to outcomes such as sharing power and building skills (Hawe and Shiell, 2000). Also, Eng, Briscoe, and Cunningham (1990) note that partnerships developed in working in a particular community issue can provide flow-on benefits in other issues, for example, participatory approaches to building water supplies in third world countries are found to increase other outcomes such as vaccination rates. Thus, community partnerships can improve community competence, problem-solving capacity, measurements of health outcomes, and capacity-building based on the sensitivity of local context (Eng and Parker, 1994; Hawe and Shiell, 2000).

Summary

The literature reviewed showed that most research on social capital, substance abuse, and depression focuses mostly on youths' physical and adults' mental health. The findings from the reviewed literature indicate that few studies have examined the relationships between social capital, substance abuse and depression in the U.S adolescent population. Overall, a research gap exists regarding whether social capital is associated with substance abuse and depression in adolescents, and the extent or process by which the relationship is influenced by a third variable such as substance abuse. Chapter 3 describes the methodology for investigating whether social capital is associated with depression in adolescents in the U.S

CHAPTER III

METHODOLOGY

Statement of Purpose

The data source is the National Survey of Drug Use and Health (NSDUH) (2009). The study ascertains whether youth experience variables, expressed as youth social capital, are associated with substance abuse and depression in adolescents. Thus, the larger objective of the study examines adolescents' social capital in order to enhance early diagnosis and valid intervention to reduce the risks of substance abuse and depression in adolescents. In this chapter, the study proposes the use of structural equation modeling (SEM) to evaluate the nature of associations among youth social capital, substance abuse, and depression.

The topics discussed in this chapter are organized as follows: the research questions and hypotheses; design of the study; description of the data; the variables examined in the study; the measurement and manipulation of variables; and the data analysis technique. The chapter was concluded with a discussion on the dissemination of findings and summary of the chapter.

Research Questions and Hypotheses

Research Questions

1. Is there a relationship between youth cognitive social capital and depression for adolescents?

Is there relationship between youth cognitive social capital and substance abuse for adolescents?

3. Is there a relationship between youth structural social capital and depression for adolescents?

4. Is there a relationship between youth structural social capital and substance abuse for adolescents?

5. Is the relationship between youth cognitive social capital and depression the same for males and females?

6. Is the relationship between youth cognitive social capital and substance abuse the same for males and females?

7. Is the relationship between youth structural social capital and depression the same for males and females?

8. Is the relationship between youth structural social capital and substance abuse the same for males and females?

9. Does substance abuse mediate the association between youth cognitive social capital and depression?

10. Does substance abuse mediate the association between youth structural social capital and depression?

Hypotheses

H1: Adolescents who have low levels of cognitive social capital are more likely to have depression than adolescents who have high levels of cognitive social capital.

H2: Adolescents who have low levels of cognitive social capital are more likely to experience substance abuse than adolescents who have high levels of cognitive social capital.

The probability or risk of illness can be influenced by the inability of adolescents to get emotional supports. This can lead to stress and loss of autonomy over the course of one's

life. Research shows that there is a '*prima facie'* bio-medical plausibility that stress is a correlate of anxiety such as depression and adverse health risks including substance abuse

H3: Adolescents who have low levels of structural social capital are more likely to experience depression than adolescents who have high levels of structural social capital.

H4: Adolescents who have low levels of structural social capital are more likely to experience substance abuse than adolescents who have high levels of structural social capital.

Positive relationships among friends and colleagues increase access to and the availability of social support. This can reduce health stressors, for example, depression and illicit substance use. On the other hand, individuals' who have negative peer or parent influences are likely to lack social support and, experience drug use and depression.

H5: Adolescents who experienced substance abuse are more likely to have depression than adolescents who did not experience substance abuse.

Adolescent substance abuse may lead to depression. For example, adolescents who have low self-esteem and no parental care are more susceptible to substance dependence or abuse, which may result in depression.

H6: The effects of levels of youth cognitive social capital on depression are the same for males and females.

H7: The effects of levels of youth cognitive social capital on substance abuse are the same for males and females.

H8: The effects of levels of youth structural social capital on depression are the same for males and females.

H9: The effects of levels of youth structural social capital on substance abuse are the same for males and females.

H10: Substance abuse is an intervening variable, which mediates the association between youth cognitive social capital and depression

H11: Substance abuse is an intervening variable, which mediates the association between youth structural social capital and depression

Design of the Study

Quantitative Design

This dissertation utilizes a quantitative research design to examine cross-sectional data of the sample of youth in the NSDUH (2009) to determine whether there are associations among youth cognitive and structural social capital, substance abuse, and depression in adolescents. The NSDUH survey is comprised of the latent variables as well as measurements of the constructs. The utilization of the quantitative method allows this research to examine empirically the relationships among these latent variables, and to draw inferences regarding the likelihood of exposure to substance abuse and depression as a result of variations in the levels of youth cognitive and structural social capital. Additionally, the quantitative design provides insight on the nature of relationships among the constructs, for example, whether youth cognitive and structural social capital associate directly with depression and substance abuse, or whether substance abuse mediates the association between youth structural and cognitive social capital and depression.

Quantitative Design Strategies

The study is comprised of sample youths measured on characteristics including age, sex, race, social experiences, substance abuse, and depression in 2009. The structural

equation modeling (SEM) is utilized to quantify the associations among the structural and measurement models and examine whether youth structural and cognitive social capital directly associate with substance abuse and depression, or whether substance abuse mediates the association between youth structural and cognitive social capital and depression (Kenny, 2009)

Thus, the utilization of quantitative design in the study facilitates hypothesis testing, answering research questions, and the verification of findings regarding the variables under investigation. The quantitative design allows for the confirmation of constructs and the relationships among the indicators and constructs, and the validation of findings by determining whether they fit with previous findings and explanations in theoretical and empirical studies on the subject matters (Krathwohl, 1993).

The conclusions regarding the association among youth cognitive and structural social capital, substance abuse, and depression from the statistical findings are examined in relation to the current theoretical and empirical research studies. This study predicts that the analysis of the NSDUH data may show that there is a statistically significant relationship among youth cognitive and structural social capital, substance abuse, and depression in adolescents. For example, low levels of youth cognitive and structural social capital may predict substance abuse, and depression. The confirmation or non-confirmation of the hypotheses allows the researcher to examine similarities and discrepancies in the NSUDH (2009) data and compare the findings with previous studies.

Benefits of the Quantitative Design

The quantitative design helps to: (a) illuminate knowledge by providing guides to answering the research questions and testing of the hypotheses; (b) provide breadth and

in-depth knowledge on the impact of youth cognitive and structural social capital on substance abuse and depression; (c) guide in the validation of findings, elaborations of results for expansion and advancement of issues that have been raised in theory concerning youth cognitive and structural social capital and health outcomes (Greene, et al., 1989).

The Data

The data for the study is the National Survey of Drug Use and Health 2009. The NSDUH is a population-based prevalence estimate of mental disorder related issues including mental illness and major depressive episodes (MDE) in the Unites States. The survey estimates utilized in this research include the module of questions on adolescent depression, youth experiences (consisting of measures of youths' social capital), and substance abuse. These estimates are used for the purpose of capturing whether the cumulative youth social capital is associated with substance abuse and depression in adolescents. The variables, examined in this study (for example, youths' social capital, substance abuse, and depression) are theoretical constructs, or latent variables, which could not be measured directly. Thus, some sets of variables in the survey are used for the measurement of these latent variables.

The NSDUH Sample Design

The NSDUH 2009 is a part of the coordinated 5-year sample design estimates of the 50 states and the District of Columbia of the U.S. For the 50 States sample design, states are designated as the first levels of stratification and reporting variables. Based on this approach, 8 states including California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas (viewed as large sample states) have designated sample sizes of

3,600. The remaining 42 states and the District of Columbia (small states) have designated sample sizes ranged from 868 to 974. This is to ensure sufficient sample size to support each state estimate using direct method or small area estimation (SEA) (SAMSHA, 2009).

Additionally, states are stratified into 900 State sampling regions (SSRs) (48 regions in each large state and 12 regions in small sample state). These regions are considered contiguous geographic areas designed to yield the same number of interviews. For each SSR, 48 census tracts are selected with probability proportional to the population size. A sample census tract and an adjacent census block are combined to create a second-stage sampling unit in which one area segment is selected within each sampled census tract with probability proportional to population size (SAMSHA, 2009). A sample address is selected from two segments in each calendar quarter and in each of the area segments, a listing of all addresses is made from which a national sample of 195,132 addresses is selected (SAMSHA, 2009). Of the selected addresses, 161,321 are considered eligible sample units and in these sample units (which may be a household or units with a group quarter), a sample of persons are randomly selected using an automated screening procedure programmed in a handheld computer by the interviewer. Nationwide, 68,700 persons are selected to represent the U.S population which includes a sample of 17, 705 youths, the targeted population of this study

Participants

The participants in the NSDUH (2009) survey are comprised of population of adolescents' aged 12 to 17 and adults' aged 18 or older living in the United States. This study used only the 12 to 17 year old participants, consisting of a sample of civilians

living in households/townhouses, apartments, condominiums, and noninstitutionalized group quarters such as shelters, rooming/boarding, houses, college dormitories, migration work camps, and halfway houses (SAMSHA, 2009). Persons excluded from the survey are individuals who have no fixed household address (for example, homeless or transient persons not in shelters), active-duty military personnel (may have different mental illness issues such as combat situations, or stressors associated with prolonged overseas deployment), and residents of institutional group quarters such as correctional facilities, nursing homes, mental institutions and long-term hospitals (SAMSHA, 2009).

Protection and Confidentiality of Information

The measures incorporated in the data collection in order to maintain the confidentiality of information and increase the respondent's willingness to provide honest report to sensitive topics concerning substance abuse behaviors and symptoms of depression include the following: no respondents' personal identification information is captured in the CAI record, private and confidential settings are used for the interview, confidentiality is stressed in all written and oral communication with potential respondents, and respondents were rewarded with $30 for participating in the survey (SAMSHA, 2009).

Data Collection Methodology

The data collection methodology is comprised of in-person interviews, administered by providing questionnaires to a representative sample of the population through a face-to-face interview at the respondent's place of residence. The interview process starts with introductory letters sent to sample addresses, followed by interviewer

visits. The field interviewer begins by contacting a dwelling unit (DU) and speaking with an adult resident, aged 18 or older who served as a screening respondent. The filed interviewer, using a handheld computer, completes a 5-minute procedure with the screening respondent that involves a listing of household members and all basic demographics data.

The interview is conducted for an average of one hour in English and Spanish with CAPI and ACASI. The questions consist of core and noncore sections, the core sections (first part of the interview) measure trends and prevalence estimates, administered by the interviewer. These questions pertain to demographic items (interviewer administered) and self-administered questions on the use of substances such as tobacco, alcohol, marijuana, cocaine, heroin, hallucinogens, inhalants, pain relievers, tranquilizers, stimulants, and sedatives. The noncore questions (the second part) are self-administered, covering topics such as mental illness and utilization of services, injection drug use, perceived risks of substance use, substance dependence, and others not related to this study (for example, arrests, treatment for substance use problems, pregnancy, and other health issues including immigration, current school enrollment, employment, and workplace issues, health insurance coverage, and income) (SAMHSA, 2009).

The interview starts with CAPI questions with the interviewer reading from the computer screen and the respondent replying into the computer; the interview proceeded to the ACASI for the more sensitive questions such as drug use (SAMHSA, 2009). The survey questions are administered to both the youths and adults, however, some questions are asked only to youths or adults. For example, both youths and adults are asked questions about major depressive episodes (MDE) and mental health service utilization.

The interview protocols involve screening adults in the household who served as the screening respondents. The screening is completed with a computer and consists of listing of all persons in the household to obtain basic demographic data. The computer has a preprogrammed selection algorithm that allows sample selection from zero to two persons, depending on the composition of the household. The selection process is designed to provide the necessary sample size for the specified population age groupings. Samples of respondents who completed the interviews are randomly selected for verification and data collection, which are transmitted to the Research Triangle Institute (RTI) International for verification and assessment of validity.

The overall survey weighted response rate consisting of the weighted screening response rate and weighted interview response rate is 67.2 percent. Data processing procedures to reduce nonresponse rates and improve data accuracy include data coding, logical editing, and statistical imputation. Also, the relative standard error (RSE) is used to suppress errors related to direct survey estimates. The minimum sample suppression criterion (n=100) is used for all variable estimations to protect against small sample sizes. An analysis weight is used to control for nonresponse and extreme population weight for larger population totals in view of the 50-state design. A detailed description of the methods utilized to improve the NSDUH data reliability is described in the SAMHA website.

Comparisons of the NSDUH and Other Data Sources of Mental Illness

A variety of surveys other than NSDUH provide estimates of mental health indicators in Unites States. When utilizing and discussing the NSDUH and mental health issues, it is useful to examine estimates from other national data sources to assess

whether these estimates and the NSDUH can be compared (SAMSHA, 2009). Though the goals and approaches employed in surveys differ and methodological issues such as: the population surveyed, timing of data collection, sample design, mode of data collection, instruments used, operational definitions, and estimations methods are inconsistent across sources and may complicate comparisons of estimates (SAMSHA, 2009). The comparisons are useful because consistencies or inconsistencies can help confirm or support results and conclusions about trends and the prevalence of mental illness and inform areas for future studies. Descriptions of data systems that provide a national estimate of mental health indicators are examined. These include data systems that use methods covered by the NSDUH 2009, for example, the NCS (National Comorbidity Survey), the NCS-R (National Comorbidity Survey-Replicated).

A definition of serious mental illness (SMI) is useful in the comparison of estimates of mental illness across surveys. SAMSHA (2009) defines SMI for persons aged 18 or older as having a diagnosable mental, behavioral, or emotional disorder (excluding developmental and substance use disorder) of sufficient duration to meet the criteria in the Diagnostic and Statistical Manual of Mental Disorder (DSM, IV) (American Psychiatric Association, APA, 1994) that results in serious functional impairment and substantially limits one or more life activities (see Page 98 for DSM, IV criteria). The SMI models for youths aged 12 to 17 is adapted from the adults and revised by reducing the length of questions to make them appropriate for youths (SAMSHA, 2009).

National Comorbidity Survey (NCS)

The NCS is conducted by the University of Michigan Survey Research Center and sponsored by the National Institute of Mental Health (NIMH), the National Institute on Drug Abuse (NIDA), and the W.T. Grant Foundation. It was conducted in 1990 and 1992 with 8,098 household respondents and measures population prevalence, risks factors, and consequences of psychiatric morbidity and comorbidity. The NCS uses a modified version of the Composite International Diagnostic Interview (University of Michigan [UM]-CIDI) to estimate the prevalence of mental disorder based on the criteria in the DSM, 3rd revised edition (DSM-111-R (APA, 1987). The estimate of the prevalence of having one or more disorders assessed in the NCS includes substance use disorder, which is excluded in the NSUDH estimate.

Methodological differences between the two surveys that may affect mental illness estimates include: (a) age ranges of targeted populations, the NSDUH involves 12 to17 or 18-year-olds or older, versus 18 to 54-year olds for the NCS; (b) the modes of administration, the NSDUH uses the audio computer-assisted self-interviewing [ACASI], versus PAPI –face to face interview, for the NCS (self-administered interview has been found to result in higher reporting of sensitive behavior) (SAMSHA,2009); (c) differences in the instrumentation and estimation methods to estimate the prevalence of mental disorder, the NSDUH estimates serious mental illness (SMI) and any mental illness (AMI) based on the response to brief measure of psychological distress and functional impairment from a subsample of structured clinical interview by clinical interviewers, versus the UM-CIDI for the NCS; (d) data are collected at different times,

2009 for the NSUDH versus 1990 to 1992 for the NCS. These differences in estimates may reflect changes in population prevalence estimates (SAMSHA, 2009).

National Comorbidity Survey-Replicated (NCS-R)

The NCS-R consists of a follow-up and replication study of the original NCS known as the National Comorbidity Survey Replication (NCS-R). It was conducted in 2001 and 2003 with a nationally represented, multistage, clustered area probability sample of 9,282, U.S household respondents aged 18 or older. The study is conducted by the University of Michigan Survey Research Center and sponsored by the National Institute of Mental Health (NIMH), the National Institute on Drug Abuse (NIDA), SAMSHA, Robert Wood Johnson Foundation, and John W. Alden Trust. The interview is conducted with computer-assisted personal interviewing (CAPI) and unlike the NCS, it uses the DSM-IV criteria to measure mental disorder and the World Mental Health Version of the Composite International Diagnostic Interview (the WMH-CIDI) to generate a diagnosis according to the criteria of the DSM-IV. The disorder measured in the NCS-R includes: anxiety disorder, mood disorder, intermittent explosive disorder, and substance use disorder (SANSHA, 2009).

The methodological difference in the estimates of SMI and AMI between the NCS-R and NSDUH include: years represented in the surveys, for example, NCS-R is collected in 2001 and 2002; and uses interviewer-administered questionnaires. The NSDUH was collected in 2009; and uses a self-administration interview etc. In addition, for items in the NCS-R, for example, serious thoughts of suicide and suicidal behavior, respondents are required to report lifetime suicidal thoughts, plans, or behaviors before they are asked whether these behaviors occurred in the past 12 months. On the other

hand, in the NSDUH, respondents (adult and youths) are asked about suicidal thoughts and behavior in the past 12 months (SAMSHA, 2009).

` The methodological differences among the NSDUH 2009, NCS, NCS-R, and others (not described), such as the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) and the Uniform Reporting System (URS) may impact the prevalence estimates of mental illness derived from these data sources. This study predicts that estimates and results produced with the NSDUH 2009 may differ from estimates and results from other sources that produce data of mental illness.

Measurement and Manipulation of Variables

The Covariates

The covariates consisted of sociodemographics variables such as age, gender, and race (see Table 1). The data on these variables were obtained by entries in the questionnaire and data collected on the interview date. For example, age is determined by the birthdate entered in the questionnaire and the edited age variable utilized in this study is coded CATAG2. The age sample of youths 12 to 17 consists of 31 percent of the overall population in the dataset. Gender is determined by questions on the respondent's sex and is coded IRSEX in the data. For the purpose of this study, male is assigned a code value of 1 and females a code value of 2. Likewise, data on race is obtained through the entries on the respondent's ethnicity. A race variable is coded NEWRACE2 at seven levels as follows: 1) NonHispanic White; 2) NonHispanic Black African American; 3); NonHispanic Native AM/AK; 4) NonHispanic Native HL/Other Pacific Island; 5) NonHispanic Asian; 6) NonHispanic, more than one race; 7) Hispanic. In this study, these categories are recoded 1) NonHispanic White; and 2) Hispanic/NonHispanic more

Table 1

Demographic Variables

Respondent Characteristics	N=17,705	Valid	Coded Value
Gender			
Male	8,970	50.7	1
Female	8,735	49.3	2
Race			
NonHisPWhite	10403	58.8	1
Hisp/NonHisp more than one race	7302	42.2	2
Age			
12-13	5,336	9.6	
14-15	6,064	10.9	
16-17	6,305	11.3	

than one race. Race other than NonHispanic White is coded as one variable as a result of low frequency distribution of these racial groups.

The Exogenous Variables

Youth Social Capital

Youth social capital is used as the exogenous variable. Participants' responded to 47 items about their social experiences, some of which may be potential indicators of theoretical components of (structural and cognitive) social capital. These items are measured by questions such as: "during the past 12 months, in how many different kinds of school-based activities, such as team sports, cheerleading, choir, band, student

government, clubs, religious, and self-esteem groups have you participated?" Also, youths' were asked questions about their relationships with their parents (parents include biological parents, adoptive parents, stepparents, or adult guardians who live in the household).The questions include: (a)"during the past 12 months, how many times parents check on whether you had done your homework?"; (b)"during the last 12 months, how often did your parents make you do chores around the house?"; (c) "during the last 12 months, how often did your teacher let you know that you were doing a good job?" The response rating scale consists of four options, for example, "Always," "Sometimes," "Seldom," and "Never." However, these options are collapsed to binary-valued scores, 1:"Always/Sometimes" and 2: "Seldom/Never" (SAMHSA, 2009). The overall response measures are scored as dichotomous outcomes, for example, 1: "Yes" and 2: "No" 94: "Don't know" 97: "Refused" 98: "Blank (no answer)," 99: "legitimate skip, 89: "logically assigned." In this study, these scores are recoded as follows: (2, 89, 98, and 99=0 "NO") (1 "Yes") and (94 and 97= missing values) (see Table 2 for distribution and descriptive statistics).

Table 2

Distribution and Descriptive Statistics for Youth Experience Variables

Variables	1"YES	0"NO"	Missing	Mean	Std Dev.
NMVIN5YR2: NUMBER OF TIMES.YOUTH MOVE IN PAST 5 YRS	12,972	4,320	413	.750	.433
NSCHFELT: HOW YOUTH FELT: ABOUT GOING TO SCHOOL IN PAST YEAR	13,358	4,320	29	.756	.430
NAVGGRADE: GRADE AVGRAGE FOR LAST GRADING PERIOD COMPLETED	958	16,467	280	.055	.228

Table 2-Continued

Variables	1"YES	0"NO"	Missing	Mean	Std Dev.
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES	4,300	12,910	495	.250	.433
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH	4,064	12,875	766	.240	.427
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES	7,040	10,087	578	.411	.492
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK	2,765	14,089	851	.164	.370
NPARCHKHW: PARENTS CHECK IF HOMEW WORK DONE IN PAST YEAR	13,063	4,587	55	.740	.440
NPARHLPHW: PARENTS HELP WITH/ HOME WORK IN PAST YEAR	13,130	4,511	64	.744	.436
NPRCHORE2: PARENTS MAKE YOUTTH DO CHORES AROUND HOUSE IN PAST YEAR	15,388	2,254	63	.872	.333
NPRLMTTV2: PARENTS LIMIT AMOUNT OF TV IN PAST YEAR	6,779	10,804	123	.386	.487
NPARLMTSN: PARENTS LIMIT TIME OUT ON SCHOOL NIGHT IN PAST YEAR	11,489	5,991	225	.657	.475
NPRGDJOB2: PARENTS TELL YOUTH HAD DONE GOOD JOB IN PAST YEAR	13,114	4,439	152	.747	.435
NPRPROUD2: PARENTS TELL YOUTH PROUD OF THINGS DONE IN PAST YEAR	14,931	2,698	76	.847	.360
NARGUPAR: TIMES ARGUED/HAD A FIGHT WITH ONE PARENT IN PAST YEAR	13,344	4,101	260	.765	.424

Table 2-Continued

Variables	1"YES	0"NO"	Missing	Mean	Std Dev.
NYOFIGHT2: YOUTH HAD SERIOUS FIGHT AT SCHOOL/WORK	3,842	13,763	100	.218	.413
NYOGRPFT2: YOUTH FOUGHT WITH GROUP VS OTHER GROUP	2,580	15,039	86	.146	.354
NYOHGUN2: YOUTH CARRIED A HANDGUN	626	17,009	70	.036	.185
NYOSELL2: YOUTH SOLD ILLEGAL DRUGS	648	17,010	47	.037	.188
NYOSTOLE2: YOUTH STOLE/TRIED TO STEAL ITEM >$50	871	16,774	60	.049	.217
NYOATTAK2: YOUTH ATTACKED WITH INTENT TO SERIOUSLY HARM	1,319	16,326	60	.075	.263
NPRPKCIG2: YOUTH THINK: PARENTS FEEL ABOUT YOUTH SMOKE PACK OF CIGARETTE/DAY	1,485	15,969	251	.915	.279
NPRMJEVR2: YOUTH THINK: PARENTS FEEL ABOUT YOUTH TRY MARIJUANA /HASH	15,657	1,822	226	.896	.306
NPRMJMO: YOUTH THINK: PARENTS FEEL ABOUT YOUTH USE MARIJUANA/ HASH MONTHLY	16,083	1,386	236	.921	.270
NPRALDLY2: YOUTH THINK: PARNTS FEEL ABOUT YOUTH DRINK 1-2 ALCOHOL BEVERAGE/DAY	15,659	1,820	226	.896	.305
NYFLPKCG2: HOW YOUTH FEELS: PEERS SMOKE PACK/DAY OF CIGARETTE	15,633	1,861	211	.894	.308

Table 2-Continued

Variables	1"YES	0"NO"	Missing	Mean	Std Dev.
NYFLTMRJ2: HOW YOUTH FEELS: PEERS TRY MARIJUANA/HASH	14,127	3,362	216	.808	.394
NYFLMJMO: HOW YOUTH FEELS: PEERS USING MARIJUANA/HASH MONTHLY	11,374	5,921	210	.662	.473
NYFLADLY2: HOW YOUTH FEELS: PEERS DRNK 1-2 ALCOHOL BEVERAGE/DAY	12,204	5,291	210	.698	.459
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK/DAILY	15,151	2,294	260	.869	.338
NFRDMEVR2:YOUTH THINK: CLOSE FRNDS FEEL ABOUT YOUTH TRY MARIJUANA/HASH	14,098	3,348	259	.808	.400
NFRDMJMON: YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTLY	14,372	3,070	263	.824	.381
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YTH HAVE 1-2 ALCOHOL/DAY	14,714	2,714	277	.844	.363
NTALKPROB: WHO YOUTH TALKS WITH ABOUT SERIOUS PROBLEMS	671	16,889	145	.038	.192
NPRTALK3: TALKED WITH PARENT ABOUT DANGER OF TOBACCO/ALCOHOL/ DRUG	12,003	5,653	49	.680	.467
NPRBSOLV2: PARTICIPATED IN PROBLEM SLOVING /COMMICATION SKILL /SELFESTEEM GROUP	3,692	13,678	335	.213	.409

Table 2-Continued

Variables	1"YES	0"NO"	Missing	Mean	Std Dev.
NPREVIOL2: PARTICIPATED IN VIOLENCE PREVENTION PROGRAM	2,418	15,135	152	.138	.345
NPRVDRGO2: PARTICIPATED IN DRUG PREVENTION.PROGRAMOUTSIDESCHOOL	15,424	2,144	137	.122	.327
NGRPCNSL2: PARTICIPATED IN.PROGRAM TO HELP SUBSTANCE ABUSE	714	16,824	167	.041	.198
NPREGPGM2: PARTICIPATED IN PREGNANT/STD PREVENTION PROGRAM	15,660	1,924	121	.109	.312
YTHACT2: YOUTH PARTICIPATED IN YOUTH ACTIVITIES	7,486	10,131	88	.425	.494
DRPRVME3: YOUTH SEEN DRUG PREVENTION MSG OUTSIDE SCHOOL	4,019	13,485	201	.770	.421
ANYEDUC3: YOUTH HAD ANY DRUG EDUCATION IN SCHOOL	16,425	1,172	108	.933	.249
RLGATTD: NUMBER OFTIMES.ATTENDED RELIGIOUS SERVICES IN PAST YEAR	5,210	12,089	406	.301	.459
RLGIMPT: RELIGIOUS BELIEFS VERY IMPORTANT IN LIFE	12,656	2,027	3,022	.862	.345
RLGDCSN: RELIG BELIEFS INFLUENCE LIFE DECISIONS	11,357	5,885	463	.659	.474
RLGFRND: IMPORTAANT FOR FRIENDS TO SHARE RELIGIOUS BELIEFS	11,507	56,79	159	.330	.470

Testing the Factorial Validity of Youth Experience Variables

A first-order confirmatory factor analysis (CFA) model is utilized to test the validity of youth experience variables. This is to determine whether these variables are comprised of a multidimensional construct of structural and cognitive social capital (Putman, 2000; Ferlander, 2007). The CFA model consists of latent factor F1 and latent factor F2 and the observed youth experience variables. Regression paths between the latent factors and observed measures of youth experience variables are arbitrarily scaled to 1.00 to improve model identification and estimations. The validity of the fitted models is examined using: model-fit summary statistics, the standardized and unstandardized regression weights, the standard error, the critical ratios, and P- values (Byrne, 2010).

The Model-Fit-Evaluation

Goodness-of-Fit Summary

The model goodness-of-fit statistics provides an overview of the model and information related to model identification. The analyzed model statistics are comprised of model-fit summary indexes such as Minimum Discrepancy (CMIN), Baseline Comparisons, Parsimony-Adjusted Measures, Root Mean Square Error of Approximation (RMSEA), Akaike Information Criterion (AIC), and the Regression Weights estimates. These indexes range from 0 to 1, and values close to 1 indicate good model fit (see Appendix A for the description of model fit summary indexes).

The Model-Fit-Summary Statistics

The model fit statistics expressed by the Chi-square is statistically significant χ^2 (1037) =44043.442, *P*, =.001 (see Appendix B). The estimated indexes include: Minimum Discrepancy (Number of Parameters (NPAR) = 91, (CMIN) = 46043.442), Degrees of Freedom (DF) = 1037, Probability Value (P) = .000, and CMIN/DF = 44.401. The Baseline Comparisons (Normed Fit Index (NF1Delta 1) =.191, RFI (rho1) = .156, IFI (Detal2) =.194, TLI (rho2) =.159, and Comparative Fit Index (CFI) = .193). The Parsimony-Adjusted Measures (PRATIO = .959, PNFI = .183 and PCFI = .186), the Root Mean Square Error of Approximation (RMSEA) = .050, the 90 percent confidence interval (CI) (HO = .049; HI = .050).The RMSEA CI appears to indicate a good degree of precision between the correlation covariance of the data and the hypothesized model.

The Root Mean Square Error of Approximation (RMSEA) supports the validity of the model and the data. On the other hand, the value of fit indexes such as the Parsimony-Adjusted Measures, Baseline Comparison, and the CMIN indicate poor model fit with the sample data. However, these poor index values may have been impacted by the large sample size.

Regression Weight Estimates

The regression weight estimates consist of the standardized and unstandardized estimates, the standard error, the critical ratios, and Probability-values. These regression coefficients provide information regarding the size or strength of correlation between the observed youth social capital variables and the latent factors F1 and F2. The unstandardized regression weight estimates have no statistical value and are not analyzed (Kline, 2011) (see Appendix C).

The Standardized Regression Weight Estimates

The covariances estimate between the latent factors F1 and F2 is .00 standard error .000, critical ratio, 3.035, *P*=.002, and the correlation, R^2= .188 (see Table 3).

Table 3

Standardized Regression Weight Estimates for Youth Experience Variables

Variables-Structural Factors	Estimates	P
NPRGDJOB2: PARENTS TELL YOUTH HAD DONE GOOD JOB IN PAST YEAR <----------F2	.009	***
NPRPROUD2: PARENTS TELL YOUTH PROUD OF THINGS DONE IN PAST YEAR <----------F2	-.024	.036
NARGUPAR: TIMES ARGUED/HAD A FIGHT WITH ONE PARENT IN PAST YEAR <----------F2	.036	.012
NYOFIGHT2: YOUTH HAD SERIOUS FIGHT AT SCHOOL /WORK <----------F2	.020	.054
NYOGRPFT2: YOUTH FOUGHT WITH/ GROUP VS OTHER GROUP <----------F2	.023	.039
NYOHGUN2: YOUTH CARRIED A HANDGUN <----------F2	-.011	.256
NYOSELL2: YOUTH SOLD ILLEGAL DRUGS <---------F2	-.092	.003
NYOSTOLE2: YOUTH STOLE/TRIED TO STEAL ITEM >$50<----------F2	-.028	.034
NYOATTAK2: YOUTH.ATTACKEDWITH/INTENT TO SERIOUSLY HARM <----------F2	.014	
NPRPKCIG2: YOUTH THINK: PARENTS FEEL ABOUT YOUTH SMOKE PACK CIGARETTE/DAY <----------F2	-.002	.874
NPRMJEVR2: YOUTH THINK: PARENTS FEEL ABOUT YOUTH TRY MARIJUANA/HASH <----------F2	.085	.005

Table 3-Continued

Variables-Structural Factors	Estimates	P
NPRMJMO: YOUTH THINK: PARENTS FEEL ABOUT YOUTH USE MARIJUANA/HASH MNTHLY <----------F2	.079	.006
NPRALDLY2: YOUTH THINK: PARNTS FEEL ABOUT YOUTH DRINK 1-2 ALCOHOL BEVERAG/DAY<----------F2	-.051	.007
NPRTALK3: TALKED WITH PARENT ABOUT DANGER OFTOBACCO/ALCOHOL/DRUG<----------F2	-.009	.316
NTALKPROB: WHO YOUTH TALKS WITH ABOUT SERIOUS PROBLEMS <----------F2	.018	***
NFRDADLY2: YTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY <----------F2	.587	.001
NFRDMJMON: YOUTH THINK:CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONLY<-------F2	.886	.001
NFRDMEVR2: YOUTH THINK CLOSE FRIENNDS FEEL ABOUT YOUTH TRY MARIJUANA/HASH<----------F2	.898	.001
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PAC DAILY <----------F2	.588	.001
NYFLMJMO: HOW YOUTH FEELS: PEERS USING MARIJUANA/HASH MONTHLY <----------F2	.200	.001
NYFLTMRJ2: HOW YOUTH FEELS: PEERS TRY MARIJ-UANA/ HASH<----------F2	.343	.001
NYFLPKCG2: HOW YOUTH FEELS: PEERS SMOKE PACK/DAY CIGARETTE <----------F2	.015	***
NRLGIMPT: RELIGIUOS BELIEFS VERY IMPOR-TANT IN LIFE <----------F1	.080	***
NRLGDCSN: RELIGIOUS BELIEFS INFLUENCE LIFE DECISIONS <----------F1	.104	***
NYFLADLY2: HOW YOUTH FEELS: PEERS TRY MARIJ-UANA/HASH <----------F1	.009	.352

Table 3-Continued

Variables-Structural Factors	Estimates	P
RLGFRND: IMPORTANT FOR FRIENDS TO SHARE RELIGIOUS BELIEFS <----------F1	.072	***
NRLGATTD: NUMBER OF TIMES ATTENDED RELIGIOUS SERVICES IN PAST YEAR <----------F1	.030	.002
NANYEDUC3: YOUTH HAD ANY DRUG EDUCATION IN SCHOOL <----------F1	-.417	***
NDRPRVME3: YOUTH SEEN DRUG PREVENTION MSG OUTSIDE SCHOOL <----------F1	-.038	***
NYTHACT2: YOUTH PARTICIPATED IN YOUTH ACTIVITIES **<----------F1**	-.016	.081
NPREGPGM2: PARTICIPATED IN PREGNANT /STD PREVENTION PROGRAM <----------F1	.037	***
NGRPCNSL2: PARTICIPATED IN PROGRAM TO HELP SUBSTANCE ABUSE <----------F1	.046	***
NPRVDRGO2: PARTICIPATED DRUG PREVENTION PROGRAM OUTSIDE SCHOOL <----------F1	.066	***
NPRBSOLV2: PARTICIPATED.PROBLEM SLOVING/ COMMICATION SKILL SELFESTEEM GROUP <----------F1	.064	***
NPRCHORE2: PARENTS MAKE YOUTH DO CHORES AROUND HOUSE IN PAST YEAR <---S1	.026	.006
NPARHLPHW: PARENTS HELP WITH HOME-WORK IN PAST YEAR <----------F1	-.150	***
NPARCHKHW: PARENTS HELP WITH HOME-WORK IN PAST YEAR <----------F1	-.124	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK **<----------F1**	-.596	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES <----------F1	-.712	***

Table 3-Continued

Variables-Structural Factors	Estimates	P
NPARLMTSN: PARENTS LIMIT TIME OUT ON SCHOOL NIGHT IN PAST YEAR <----------F1	-.089	***
NPRLMTTV2: PARENTS LIMIT AMOUNT OF TV IN PAST YEAR <----------F1	-.151	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH <----------F1	-.673	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES <----------F1	-.645	***
NAVGGRADE: GRADE AVGERAGE FOR LAST GRADING PERIOD COMPLETED <----------F1	-.118	***
NMYEMOV5Y2: NUMBER OF TIMES YOUTH MOVED IN PAST 5 YEARS <----------F1	.002	.832
NSCHFELT: HOW YOUTH FELT: ABOUT GOING TO SCHOOL IN PAST YEAR <----------F1	-.130	***
NPREVIOL2: PARTICIPATED IN VIOLENCE PREVENTION PROGRAM <----------F1	.388	***

The standardized regression estimates indicate variations measured as standard deviations in the observed variables due to the latent factors F1 and F2. For example, the regression weight of the variables "NPRGDJOB2 PARENTS TELL YOUTH HAD DONE GOOD JOB IN PAST YEAR and F2 is.009. This result can be interpreted as one standard deviation increase in the latent factor F2 predicts a .009 standard deviation increase in the observed youth social capital variable. Also, the regression estimate for the variables "NPRPROUD2 PARENTS TELL YOUTH PROUD OF THINGS DONE IN PAST YEAR" and F2 is -.024. The inverse estimate can be interpreted as when F2 increases by one standard deviation, the observed youth social capital decreases by a .024 standard deviation. All other regression

weight estimates can be explained in the same way.

Data Reduction Strategy

The criteria for data reduction (see Table 4) are comprised of parameter weight estimates, appropriateness of the standard errors, critical ratio, and probability levels. The parameter weight estimates are determined by the coefficient sizes. A variable with with weight estimates of less than ±.45 (±.45) or greater than 1.00 (> 1.00) is not retained in the model.

Table 4

Selected Youth Experience Variables and Latent Factors F1 and F2

Variables-Structural Factors	Estimates	P
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY <----------F2	-.587	***
NFRDMJMON: YOUTH THINK:CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUNAN/HASH MONTLY<----F2	.886	***
NFRDMEVR2: YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH TRY MARIJUNAN/HASH<----------F2	-.898	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY <----------F2	-.151	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJ-UANA/HASHISH <----------F1	-.673	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES <----------F1	-.645	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK <----------F1	-.596	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES <----------F1	-.712	***

Assessment-of-Fit of Selected Variables

An assessment of the validity of the selected youth experience variables and the latent factors, F1 and F2, indicate that the Chi-square (χ^2) statistic is significant, χ^2 (19) = 2474.220 *P*=.001. The other estimates include the Minimum Discrepancy (CMIN) Likelihood ratio (Number of Parameters (NPAR) = 17, (CMIN) = 2474.220), DF Degrees of Freedom (DF) = 19, *P* =.001, and CMIN/DF=130.222.

Also, the Baseline Comparisons (Normed Fit Index (NF1Delta 1) = .835, RFI (rho1) = .757, IFI (Detal2) =.836, TLI (rho2) = .759, and Comparative fit index (CFI) =836). The Parsimony-Adjusted Measures (PRATIO = .679, PNFI = .567, and PCFI = .567). The Root Mean Square Error of Approximation (RMSEA) is .085, the 90 percent confidence interval is (HO = .083; HI = .088), and the PCLOSE = .000. The model fit indexes, for example, Parsimony-Adjusted Measures and Baseline Comparisons appear to support the validity of these latent factors, the observed variables, and the data.

Selected Youth Experience Variables and Latent Factor F2

A total of 4 youth experience variables legitimately predict the latent factor F2 (see Table 5). The variables "NFRDMEVR2: YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH TRY MARIJUANA/HASH" (.898) and "NFRDMJMON: YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTHLY (.886) are the strongest predictors of the construct F2. These variables, which predict the latent variable, have characteristics and contents related to what youth think close friends feel regarding youth substance use. These contents and topics involve youths' feelings or perceptions of friends and may be consistent with the theoretical description of cognitive social capital (Harpham, et al. 2002). Thus, for the purpose of this study, these variables are classified

as youth cognitive social capital and are utilized in multivariate statistics in chapter four

Table 5

Youth Cognitive Social Capital Variables and Latent Factor F2

Variables	Estimates	P
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY <----------F2	-.587	***
NFRDMJMON: YOUTH THINK:CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUNAN/HASH MONTLY<----F2	.886	***
NFRDMEVR2: YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH TRY MARIJUNAN/HASH<----------F2	-.898	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY <----------F2	-.151	***

Selected Youth Experience Variables and Latent Factor F1

The predicted association between the observed youth social capital and latent factor F1 is accounted for by 4 variables (see Table 6). The variables "NSTNDALC STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES" (-.712), NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH" (-.673), and NSTNDSCIG STUDENTS IN YOUTH GRADE SMOKE CIGARETTES" (.645) are the strong predictor latent variable F1.These predictors have characteristics and contents relating to membership or participation in youth grade activities and are consistent with the definition of structural social capital (Putman, 2000; Ferlander, 2007). For the purpose of this study, these predictors are classified as youth structural social capital (Winstanley et al. 2008). These variables are used in CFA models to examine the association among youth structural

Table 6

Youth Structural Social Capital Variables and Latent Factor F1

Variables	Estimates	P
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJ-UANA/HASHISH <----------F1	-.673	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES <----------F1	-.645	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK <----------F1	-.596	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES <----------F1	-.712	***

social capital, substance abuse and depression in chapter four.

The Endogenous Variables

Adolescent Depression (AD)

Adolescents' depression is measured by the period of lifetime or past year (PY) when the respondent experienced symptoms of a major depressive episode (MDE) and met the criteria for severe functional impairments described in the *DSM-1V* (APA, 1994). These criteria consist of: (a) "Depressed most of the day," (b) "Markedly diminished interest or pleasure in all or almost all activities most of the day" (c) "Weight" (d) "Insomnia or hypersomnia" (e)"Psychomotor agitation or retardation"(f) "Fatigue or loss of energy" (g) "Feelings of worthlessness" (h) "Diminished ability to think or concentrate or indecisiveness" (i) "Recurrent thoughts of death or recurrent suicide ideation". On the other hand, respondents are classified as having past year (PY) MDE if

they experienced symptoms such as depressed mood or loss of interest or pleasure in daily life activities in at least 4 of the 7 symptoms of MDE in the *DSM-1V* (APA, 1994).

These criteria are measured by questions including: During the worst/most recent period of time: (a) “did you feel sad, empty, or depressed most of the day nearly every day?”; “did you feel discouraged about how things were going in your life most of the day nearly every day?” (b) “did you lose interest in almost all things like work and hobbies and things you like to do for fun?”; “did you lose the ability to take pleasure in having good things happen to you, like winning something or being praised or complimented?” (c) “did you have a much smaller appetite than usual nearly every day during that time?”; “did you have a much larger appetite than usual nearly every day?”; “did you gain weight without trying to (i) because you are growing , (ii) or because you were pregnant?” (iii) “how many pounds did you gain?” (iv) “did you lose weight without trying to?”. (i) “because you were sick or on a diet?” (ii) “how many pounds did you lose?” (d) “did you have a lot more trouble than usual falling asleep, or waking too early nearly every night during that worst/most recent period of time?”; “did you sleep a lot more than usual nearly every night?”

Additionally, questions asked to measure symptoms of MDE are :(e) “did you talk or move more slowly than is normal for you nearly every day?” (i) “did anyone else notice that you were talking or moving slowly?”; “were you so restless or jittery nearly every day that you paced up and down or couldn’t sit still?” (ii) “did anyone else notice that you were restless?” .A respondent is regarded to have experienced depression if they answer “yes” (to parts (i) and (ii)). (f) “did you feel tired or low in energy nearly every day even when you had not been working very hard?” (g) “did you feel that you were not

as good as other people nearly every day?";"did you feel totally worthless nearly every day?" (h) "did your thoughts come much more slowly than usual or seem confused nearly every day?"; "did you have a lot more trouble concentrating than usual nearly every day?"; "were you unable to make decisions about things you ordinarily have no trouble deciding about?" (i) "did you often think about death, either your own, someone else's or death in general?"; "did you ever think it would be better if you were dead?"; "did you think about committing suicide?" (i) "did you make a suicide plan?" (ii) "did you make a suicide attempt?" The questions are coded 1: "Yes" for respondent who had symptoms of depression and 2: "No", for respondents who did not experience symptoms of past year depression, 94: "Don't know," 97 "Refused," 98: "Other missing or not applicable", 99: "legitimate skip." In this study, these codes are recoded as follows: (2, 98, and 99=2 "NO") (1 "Yes") and (94 and 97= missing values). The assessment of the risks of depression in adolescents is based on PY symptoms of MDE and this classification is consistent with the cross-sectional focus of this dissertation research.

Distribution and Descriptive Statistics of MDE Symptoms

The values represented in the table consist of responses coded 1: "YES", 2: "NO". (see Table 7). The missing values consist of ambiguous information or responses. Also,

Table 7

Distribution and Descriptive Statistics for MDE Symptoms

Variable-MDE/Symptoms N=17,705	1"YES"	2 "NO"	Missing	Mean	Std.Dev
NYO_MDEA1:"SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOURAGED	2,330	15,349	26	1.87	.34

Table 7-Continued

Variable-MDE/Symptoms N=17,705	1"YES"	2 "NO"	Missing	Mean	Std.Dev
NYO_MDEA2: "LOST INTEREST OR PLEASURE IN MOST THINGS	2,495	15,169	41	1.86	.35
NYO_MDEA3: "CHANGES IN APPITITE OR WEIGHT"	1,934	15,737	34	1.89	.31
NYO_MDEA4 : "SLEEP PROBLEMS	2,321	15,367	17	1.87	.34
NYO_MDEA5: "OTHERS NOTICED THAT YOU ARE RESTLESS OR LETHARGIC	1,421	16,254	30	1.91	.27
NYO_MDEA6: "FELT TIRED/ LOW ENERGY NEARLY EVERY DAY	2,219	15,471	15	1.87	.33
NYO_MDEA7: "FELT WORTHLESS NEARLY EVERYDAY	1,371	16,321	13	1.92	.27
NYO_MDEA8: "INABILITY TO CONCENTRATE OR MAKE DECISIONS	2,354	15,334	17	1.87	.34
NYO_MDEA9: "ANY THUOUGHTS OR PLANS OF SUICIDE"	1,876	15,802	27	1.89	.31

the descriptive statistics consist of values of mean and standard deviation of the items

Testing the Factorial Validity of MDE Indicators

A CFA model analysis is conducted to examine the validity of PY MDE indicators. The model evaluation strategies include: model fit summary statistics, regression weight estimates, the standard errors, the critical ratios, and probability levels. Thus, parameter weight estimates less than ± .45 (±.45), greater than1.00 (> 1.00) are considered unfit and are removed from the model.

The Model-Fit-Summary Statistics

The summary estimates such as the Chi-square (χ^2) summary statistic is statistically significant, χ^2 (27) =1504.930, *P*, =.001 (see Appendix D). The Minimum Discrepancy (CMIN) Likelihood ratio (Number of Parameters (NPAR) =18, (CMIN) =1504.930), Degrees of Freedom (DF) =27, Probability Value (P) = .000 and CMIN/DF = 55.738. The Baseline Comparisons (Normed fit index (NF1Delta 1) =.849, RFI (rho1) = .799, IFI (Detal2) =.851, TLI (rho2) = .802, and Comparative fit index (CFI) =851). Additionally, the Parsimony-Adjusted Measures (PRATIO = .750, PNFI = .637, and PCFI = .638). The Root Mean Square Error of Approximation (RMSEA) is .056, the 90 percent confidence interval (HO = .053; HI=.058) and PCLOSE = .000. The model fit indexes such as Baseline Comparisons, Parsimony-Adjusted Measures, and the RMSEA supports the validity of the model.

Regression Weight Estimates

The regression weight estimates include the standardized and unstandardized estimates, the standard error, the critical ratios, and P- values. However, the unstandardized regression estimates are not analyzed (see Appendix. E).

The Standardized Regression Weight Estimates

The standardized regression weights between the latent factor DPS and the observed indicator, for example, "NYO_MDEA8: INABILITY TO CONCENTRATE OR MAKE DECISIONS" and DPS is .950, is the strongest predictor of depression (see Table 8). This regression estimate can be interpreted as one standard deviation increase in the latent

variable; DPS predicts a .950 standard deviation increase in the observed measure of depression.

Also, the predicted regression weight between "NYO_MDEA4: SLEEP PROBLEMS" and the latent factor DPS is .947, and it is the second strongest predictor of depression in this sample of adolescents. The regression weight estimate can be interpreted as one standard deviation increase in DPS predicts a .947 standard deviation increase in the observed variable. The regression weight estimate between the latent factor DPS and observed indictors "NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOURAGED" is .929. The result indicates that one standard deviation increase in DPS predicts a .929 standard deviation increase in the observed measure of depression. The regression weight estimate between the variables NYO_MDEA2: LOST INTEREST OR PLEASURE IN MOST THINGS and DPS is .910. Also, it indicates that one standard deviation increases in latent variable DPS predicts a .910 standard deviation increase in the observed variable of depression. Additionally, the regression weight estimate between the latent factor DPS and observed indictors "NYO_MDEA5: OTHERS NOTICED THAT YOU ARE REST-LESS OR LETHARGIC" is .752. This estimate, which is the weakest predictor of depression, indicates that one standard deviation increase in DPS predicts a .752 standard deviation increase in the observed measure of depression. All other regression weight estimates in the table can be explained in the same way. These variables are used in a multivariate statistics to examine the association among youth social capital, substance abuse, and depression.

Table 8

Standardized Regression Weight Estimates for MDE Symptoms

Variables	Estimates	p
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOSTOF DAY OR DISCOURAGED <----------DPS	.929	***
NYO_MDEA2: LOST INTEREST OR PLEASURE IN MOST THINGS <----------DPS	.910	***
NYO_MDEA: CHANGES IN APPITITE OR WEIGHT < -DPS	.869	***
NYO_MDEA4: SLEEP PROBLEMS <----------DPS	.947	***
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE REST-LESS OR LETHARGIC <----------DPS	.752	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY <----------DPS	.932	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY <----------DPS	.763	***
NYO_MDEA8: INABILITY TO CONCENT ATE OR MAKE DECISIONS <----------DPS	.950	***
NYO_MDEA9 ANY THUOUGHTS OR PLANS OF SUICIDE <---------- DPS	.863	***

The Mediator Variables

Substance Dependence and Abuse

Adolescent substance dependence and abuse is measured separately by Past Year (PY) substance dependence and PY abuse of illicit drugs, alcohol, and dependence on nicotine (cigarette) criteria in the *DSM-1V* (SAMHSA, 2009). Nicotine (cigarette) dependence is measured by the Nicotine Dependence Syndrome Scale (NDSS)

(Shiffman, Hickcox, Gnys, Paty, and Kassel, 1995; Shiffman, Waters, and Hickcox, 2004) and the Fagerstrom Test of Nicotine Dependence (FTND) (Fagerstrom, 1978; Heatheron, Kozlowski, Frecker, and Fagerstrom, 1991). Dependence and abuse of substances other than nicotine, for example, alcohol, cocaine, heroin, pain relievers, sedatives, marijuana, tranquilizers, stimulants, hallucinogens, and inhalants are assessed with questions in the Diagnostic and Statistical Manual of Mental Disorder *(DSM-1V),* 4th edition (American Psychiatric Association (APA), 1994). This study is focused on PY abuse of substances other than nicotine because the criteria of classification of substance abuse are based on PY use, which is consistent with the cross-sectional focus of the study. The classification of nicotine dependence is based on past month use, which is inconsistent with the approach of this study (SAMHSA, 2009).

Criteria for Substance Abuse

Adolescent abuse of illicit drugs is measured by substances including: alcohol, marijuana, cocaine, heroin, hallucinogens, inhalants, pain relievers, and tranquilizers. Respondents are classified to have abused a substance if he/she answers "Yes" to one or more of the abuse criteria, comprised of (a) "reported having serious problems due to substance use at home, work, or school"; (b) "reported using a substance regularly and then did something where substance use might have put them in physical danger"; (c)"reported substance use causing actions that repeatedly got them in trouble with the law"; (d)"reported having problems caused by substance use with family or friends and continued to use the substance even though it was thought to be causing problems with family and friends" (SAMHDA, 2009). These criteria are coded 1: "Yes" and 2: "No, 83:"Respondents who did not use alcohol past 12 months or used greater than 6 days";

91: “Never used alcohol” 93: “Respondents who did not use alcohol past 12 months or used greater days”, 94: “Don’t know” and 97: “Refused”. In this study, these options are recoded as: (2, 83, 91, and 93=2: “NO”) (1: “Yes”) and, (94 and 97 = missing values).

Distribution and Descriptive Statistics of Substance Abuse Variables

The substances represented in the table do not contain all the substances in the *DSM-IV* criteria (see Table 9). The variables utilized have considerably larger sample

Table 9

Distribution and Descriptive Statistics for Substance Abuse Variables

Variables	1”YES”	2”NO”	Missing	Mean	Std.Dev
NALCSERPB: ALCOHOL CAUSE SERIOUS PROBLEMS AT HOME/ WORK/SCHOOL PAST 12 MONTHS	268	17,108	329	1.98	.123
NALCPDANG: DRINK ALCOHOL AND DO DANDEROUS ACTIVTIES PAST 12.MONTHS	536	16,383	313	1.96	.173
NALCLAWTR: DRINK ALCOHOL CASUE PROBLEMS WITH LAW PAST 12 MONTHS	156	17,222	327	1.99	.094
NALCFMFPB: DRINK ALCOHOL CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12 MONTHS	425	16,924	329	1.97	.159
NALCFMCTD: CONTINUED TO DRINK ALCOHOL DESPITE PROBLEMS WITHFAMILY/FRIENDS	234	14,395	3,076	1.98	.125
NMRJLAWTR: USING MARIJUANA CAUSE PROBLEMS WITH LAW PAST 12 MONTHS	130	17,565	140	1.99	.086

Table 9-Continued

Variables	1"YES"	2"NO"	Missing	Mean	Std.Dev
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12MONTHS	342	17,221	142	1.98	.138
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12MONTHS	342	17,221	142	1.98	.138
NMRJFMCTD: CONTINUED TO USE MARIJUANA DESPITE PROBLEMS WITH/FAMILY/FRIENDS	238	15,928	1,539	1,98	.120
NANLSERPB: PAIN RELIEVER CASUE SERIOUS.PROBLEMS AT.HOME/ WORK/SCHOOL PAST 12 MONTHS	79	16,550	1,076	1.99	.067
NANLPDANG: USING PAIN RELIEVERR &DO DANDEROUS ACTIVITIES PAST 12 MONTHS	79	17,272	354	1.99	.066
NANLFMFPB: USING PAIN RELIEVER CASUE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS	95	17,351	354	1.99	.074
NANLFMCTD: CONTINUED TO USE PAIN RELIEVER DESPITE PROBLEMS WITH/FAMILY/FRIENDS	53	16,239	1,413	1.99	.057

sizes relative to other measures of substance abuse in the data; for example, cocaine, heroin, sedatives, stimulants, hallucinogens, and inhalants. The sample size or responses for these variables are small and may not provide valid outcomes in a statistical test.The values represented in the table consist of responses coded 1: "YES", 2: "NO" and the missing information. The missing values consist of ambiguous information, responses, or

invalid codes. The descriptive statistics consist of values of mean and standard deviation of the variables.

Testing the Factorial Validity of Substance Abuse Variables

A CFA model evaluation is conducted to examine the fit of observed measures of substance abuse, the latent variable (SB). The model evaluation criteria of the variables include: model fit summary, standardized and unstandardized estimates, standard errors, critical ratio, and probability levels.

The Model-Fit-Summary Statistics

The model-fit statistic expressed as the Chi-square (χ^2) statistics is significant, χ^2 (65) =33622.486, P =.001 (see Appendix F). The other model summary estimates include the Minimum discrepancy (CMIN) Likelihood ratio (Number of parameters (NPAR) = 39, (CMIN) = 33622.486), Degrees of Freedom (DF) = 65, Probability value (P) = .0001, and CMIN/DF=517.269. The Baseline Comparisons (Normed fit index, NF1 (Delta 1) = .553, RFI (rho1) = .374, IFI (Detal2) = .553, TLI (rho2) = .374, and Comparative Fit Index (CFI) = .553). The Parsimony-Adjusted Measures (PRATIO = .714, PNF I= .395, and PCFI= .395). The Root Mean Square Error of Approximation (RMSEA) is .171, the 90 percent confidence interval (HO = .169; HI = .172), and PCLOSE=.001. The values of the model fit indexes such as the Baseline Comparisons, Parsimony-Adjusted Measures, and RMSEA indicate the validity of the model and the sampled data**.**

Regression Weight Estimates

The regression weight estimates include the standardized and unstandardized regression weight estimates, standard error, critical ratio, and probability values (see

Appendix G).

The Standardized Regression Weight Estimates

The standardized regression weight estimates indicate that the variables; for example, "NMRJFMCTD: CONTINUED TO USE MARIJUANA DESPITE PROBLEMS WITH/FAMILY/FRIENDS" and the latent factor substance abuse SB (.879) is the strongest predictor of substance abuse (See Table 10). This result can be interpreted as one standard

Table 10

Standardized Regression Weight Estimates for Substance Abuse Variables

Variables	Estimates	P
NALCPDANG: DRINK ALCOHOL AND DO DANDEROUS ACTIVTIES PAST 12.MONTHS <-------SB	.390	***
NALCLAWTR: DRINK ALCOHOL CASUE PROBLEMS WITH LAW PAST 12 MONTHS <----------SB	.360	***
NALCFMFPB: DRINK ALCOHOL CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12 MONTHS <--------SB	.466	***
NMRJSERPB: MARIJUANA.CAUSE.SERIOUS PROBLEMS AT HOME/ WORK/SCHOOL PAST 12 MONTHS <----------SB	.597	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS <-------SB	.517	***
NMRJLAWTR: USING MARIJUANA CAUSE PROBLEMS WITH LAW PAST 12 MONTHS <----------SB	.407	***
NMRJFMCTD: CONTINUED TO USE MARIJ-UANA DESPITE PROBLEMSWITH/FAMILY/ FRIENDS <----SB	.879	***

Table 10-Continued

Variables	Estimates	P
NALCSERPB: ALCOHOL CAUSE SERS PROBS AT HOME/ WORK/SCH PST 12 MOS <----------SB	.371	***
NANLSERPB: PAIN RELIEVER CASUE SERIOUS. PROBLEMS AT.HOME/ WORK/ SCHOOL PAST 12 MONTHS <----------SB	.274	***
NANLPDANG: USING PAIN RELIEVERR &DO DANDEROUS ACTIVITIES PAST 12 MONTHS <------SB	.314	***
NANLFMCTD: CONTINUED TO USE PAIN RELIEVER DESPITE PROBLEMS WITH/ FAMILY/FRNDS <------SB	.339	.***
NALCFMCTD: CONTINUED TO DRINK ALCOHOL DESPITE PROBLEMS WITH FAMILY/FRIENDS <----SB	.688	***
NMRJFMFPB: USING MARIJUANA CAUSE PROB-LEMS WITH FAMILY/ FRIENDS PAST 12MONTHS <---------SB	.769	***

deviation increase in the latent variable substance abuse SB predicts a .879 standard deviation in the observed variable. Also, the regression weight of the variable "NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS" and the latent factor SB is .769; "NALCFMCTD: CONTINUED TO DRINK ALCOHOL DESPITE PROBLEMS WITH FAMILY FRIENDS" and SB (.688) are other strong predictors of substance abuse. . On the other hand, "NANLSERPB: PAIN RELIEVER CAUSE SERIOUS PROBLEMS AT HOME/WORK/SCHOOL PAST 12 MONTHS" (.274) is the weakest predictor of substance abuse. This result shows that one standard deviation increase in the latent variable SB predicts a .274 standard deviation in the observed variable. The strong

predictors of substance abuse in this sample of youths consist of marijuana and alcohol use, and the weak predictor consist of hard drugs. All other regression weights estimates are interpreted the same way. The six valid indicators of substance abuse, which have regression weights above the specified criteria, are utilized in chapter four in multivariate analysis

Assessment-of-Fit of Selected Variables

The Chi-square (χ^2) =8915.651, (DF) =9, P=.0001 is significant (see Table 11). The estimates for CMIN Likelihood (Number of parameters (NPAR) =18, Minimum Discrepancy (CMIN) = 8915.651), DF Degrees of Freedom (DF) = 9, P=.000,

Table 11

Selected Substance Abuse Variables

Variables	Estimates	P
NALCFMFPB: DRINK ALCOHOL CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12 MONTHS <--------SB	.466	***
NMRJSERPB: MARIJUANA.CAUSE.SERIOUS PROBLEMS AT HOME/ WORK/SCHOOL PAST 12 MONTHS <----------SB	.597	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS <-------SB	.517	***
NMRJFMCTD: CONTINUED TO USE MARIJ-UANA DESPITE PROBLEMSWITH/FAMILY/ FRIENDS <----SB	.879	***
NALCFMCTD: CONTINUED TO DRINK ALCOHOL DESPITE PROBLEMS WITH FAMILY/FRIENDS <----SB	.688	***
NMRJFMFPB: USING MARIJUANA CAUSE PROB-LEMS WITH FAMILY/ FRIENDS PAST 12MONTHS < ----------SB	.769	***

CMIN/DF = 990.628 IFI. The Baseline Comparisons (Normed Fit Index (NF1Delta 1) =.782, RFI (rho1) =.492, IFI (Detal2) =.782, TLI (rho2) =.492,
and Comparative Fit Index (CFI) =.782). The Parsimony-Adjusted Measures (PRATIO =.429, PNFI = .335 and PCFI = .335). The Root Mean Square Error of Approximation (RMSEA) is .236, the 90 percent confidence interval (HO = .232; HI = .241), and PCLOSE= .000. The indexes such as Baseline Comparisons and Parsimony-Adjusted Measures indicate a good fit between the selected variables and the data.

Data Analysis Techniques

The data analysis method is the structural equation modeling (SEM). The SEM is considered appropriate for analysis because it: (a) allows for the analysis of the relationships among variables in the model (see Figure 1); (b) helps to understand the theories that under pinned the associations among youth social capital, substance abuse, and depression; (c) allows the simultaneous analysis of observed and latent factor variables in a model; (d) facilitates the integration of relationships between the measurement and latent models; and (e) helps to determine the extent to which the hypothesized model is consistent with the data (Byrne, 2010; Baron and Kenny, 1986). The SEM procedures include: model description, the structural model, the measurement model, assumptions of the SEM, the hypothesized model test, and testing the nature of relationships among the variables.

The SEM Analysis Approach

The SEM analysis consists of an examination of the model fit indexes such as the CMIN, Baseline Comparisons, Parsimony-Adjusted Measures, Root Means Square of

Approximation (RMSEA), the standardized Regression Weight estimates, and Probability values.

The Model Description

The qualitative relationships among the variables in the hypothesized model are guided by the empirical and theoretical frameworks of Putman (2000), Ferlander (2007) Fitzparick, et al. (2005), Winstanley, et al.(2008); Hasin, Tsai, Endicott, Mueller, Coryell, and Keller (1996); and Hasin, Stinson, Ogburn, and Grant (2007). Regarding the schematic network of interrelationships among the variables, youth social capital has been associated with depression and substance abuse (Winstanley, et al. 2008; Fitzpatrick et. al.2005). Also, substance abuse, such as alcohol use, has been described as a symptom leading to clinically significant impairment such as depression (Hasin, et .al 2007).

On the other hand, it has been suggested that youths' who experience depressive symptoms, for example, feelings of worthlessness, low self-esteem, recurrent thoughts of death, and suicide ideation are more likely to acquire adverse health choices such as substance use or abuse, which in turn may exacerbate the symptoms of major depressive events (MDE) (Thoits, 2011, APA, 1994; Hasin et.al 2007). In this situation, it appears there is interdependence between substance abuse and depression. Also, substance abuse shows co morbidity, or co-occurs with symptoms of depression. Even though youth social capital has been found to predict substance abuse and depression, the association among youth social capital, substance abuse, and symptoms of depression is unclear. In this study, the proposed model examines the nature of relationships among the three structural variables. For example, it examines whether youth social capital predicts substance abuse, which co-occurs with depression, or whether youth social capital

predicts substance abuse, which mediates (M_0) the association between the youth social capital (X) and depression (Y), ($X \rightarrow M_0 \rightarrow Y$,) (Baron and Kenny, 1986; Mackinnon, 2008).

The Structural Model

The structural model consists of the latent variables, for example, youth cognitive social capital (CSC) and structural social capital (SSC), substance abuse (SB) and depression (DPS) (see figure 1, p.10). The structural model examines the associations among these latent variables and assesses whether variations in the levels of youth structural and cognitive social capital predict substance abuse, which predicts, or mediates the association between youth structural and cognitive social capital and depression in adolescents ($X_i \rightarrow M_0 \rightarrow Y_i$), and whether youth structural and cognitive social capital directly predict substance abuse and depression, which co-exist in adolescents.

The Measurement Model

The latent variables youth structural and cognitive social capital, substance abuse, and depression are measured by multi-item scales (See Table 12). For example, the youth cognitive and structural social capitals are defined by four variables respectively (X_1…..X_4). Substance abuse is measured by six variables (M_1….M_6), and depression is measured by nine variables (Y_1…..Y_9). These observed measures of the latent factors are derived by a confirmatory factor analysis (CFA) approach.

Table 12

Measurement Model

Construct	Variables	Variable Definition	Standardized Estimates	P-Value
STRUCTURAL SOCIAL CAPITAL(SSC)	**NFRDPCIG2:**	THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY	.588	***
	NPRMJEVR2:	YOUTH THINK: PARENTS FEEL ABOUT YOUTH TRYMARIJUANA/HASH	.898	***
	NFRDMJMON:	YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTHLY	.886	***
	NFRDADLY2:	YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY	.587	***
COGNITIVE SOCIAL CAPITAL(CSC)	**NSTNDSMJ:**	STUDENTS IN YOUTH GRADE USE MARIJUANA HASHISH	-.673	***
	NSTNDSCIG:	STUDENTS IN YOUTH GRADE SMOKE CIGARE- TTES	-.645	***
	NSTNDDNK:	STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK	-.596	***
	NSTNDALC:	STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES	-.712	***
DEPRESSION (DPS)	**NYO_MDEA1:**	SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOURAGED	.929	***

Table 12-Continued

Construct	Variables	Variable Definition	Standardized Estimates	P-Value
	NYO_MDEA2:	LOST INTEREST OR PLEASURE IN MOST THINGS	.910	***
	NYO_MDEA3:	CHANGES IN APPITITE OR WEIGHT	.869	***
	NYO_MDEA4:	SLEEP PROBLEMS	.947	***
	NYO_MDEA5:	OTHERS NOTICED THAT YOU ARE RES-TLESS OR LETHARGIC	.752	***
	NYO_MDEA6:	FELT TIRED/ LOW ENERGY NEARLY EVERY DAY	.932	***
	NYO_MDEA7:	FELT WORTHLESS NEARLY EVERYDAY	.763	***
	NYO_MDEA8:	INABILITY TO CONCENTRATE OR MAKE DECISIONS	.950	***
	NYO_MDEA9:	ANY THUOUGHTS OR PLANS OF SUICIDE	.863	***
SUBSTANCE ABUSE(SB)	**NALCFMFPB:**	DRINK ALCOHOL CAUSE PROB-LEMS WITH FAMILY/ FRIENDS PAST 12 MONTHS	.466	***
	NMRJSERPB:	MARIJUANA.CAUSE.SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS	.597	***
	NMRJPDANG:	USING MARIJUANA AND DO DANGEROUSACTIVTIES PAST 12 MONTHS	.517	***

Table 12-Continued

Construct	Variables	Variable Definition	Standardized Estimates	P-Value
	NMRJFMCTD:	CONTINUED TO USE MARIJ-UANA DESPITE PROBLEMS WITH/FAMILY/ FRIENDS	.879	***
	NALCFMCTD:	CONTINUED TO DRINK ALCOHOL DESPITE PROBLEMS WITH FAMILY/ FRIENDS	.688	***
	NMRJFMFPB:	USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12MONTHS	.769	***

The Underlying Assumptions of the Factor Models (Amos)

The statistical analysis is based on the Generalized Least-Squares (GLS) procedure in AMOS. The efficiency of GLS (or maximum likelihood) in estimating dichotomous outcome variables and hypotheses testing involve some underlying assumptions (Arbuckle, 2010; Kline, 2011), as follows:

a. The observations are independent. For example, the adolescents in the study are independently and randomly selected from the population.

b. There is a multivariate normality of distribution of all observed variables.

c. If the exogenous variable is fixed (that is, known or measured without error), the distribution may take any shape, provided that: (a) the random variables have a (conditional) normal distribution (b) The (conditional) variances/covariances matrix of the random variables is the same for every pattern of the fixed variables (c) The

(conditional) expected values of the random variables depend linearly on the values of the fixed variables.

The Hypothesized Model Test

The model analyses involve the incorporation of the measurement and structural models. The statistical estimates include: (a) the model fit estimates between the model and the data; (b) regression weights estimates of the associations between the measurement variables and the structural factors, and the estimates of the structural factors; (c) the effect (mediation) estimations; (d) analysis of the regression weights estimates for males and females. The regression data imputation method is implemented to address missing data. This imputation approach is utilized because it can predict unobserved values for each missing case as a linear combination of the observed values for the same case with the predicted values plugged in for the missing values and allow for the estimation of data with missing values (Arbuckle, 2010).

Testing the Nature of Relationships among the Variables

The purpose of mediation analysis is to examine the nature of association between youth cognitive and structural social capital and substance abuse. In specific terms, it includes: understanding the relationships between youth structural and cognitive social capital and depression; the association among youth structural and cognitive social capital, substance abuse, and depression, and determining whether substance abuse is part of the causal sequence that influences depression ($X_i \rightarrow M_0 \rightarrow Y_i$); or whether substance abuse co-occurs with depression in the presence of youth structural and cognitive social capital. Specifically, the analysis examines the effect or mediation statistics, which

involve the estimation of the total, direct, and indirect relationships among youth structural and cognitive social capital, substance abuse, and depression.

Dissemination of Findings

The potential stakeholders of this research includes: The Evaluation Center, Western Michigan University, researchers and evaluators in the field of mental health, substance abuse, public policy, the community of healthcare administrators, and the academic community. This researcher strived to ensure that the findings are relevant by targeting the areas of interest and needs of the stakeholders. For example, the literature review is conducted to identify the areas and directions of research most needed. The problems of limited research and evaluation studies on social capital suggest that its model needs more research in order to develop a framework for understanding youth social experiences that impact adolescents' health, the strategies necessary for prevention, and protection from substance abuse and depression.

The dissemination approaches of the findings consist of those for academics and health care management purposes. For the purposes of academics and research, the study provides comprehensive descriptions of the data, the analysis of the quantitative data and integration of the theoretical framework of youth social capital, substance abuse, and depression. The quantitative data is analyzed and examined in relation to theories and research studies in social capital and mental illness in adolescents. Additionally, for healthcare management purposes, the findings are presented and translated in lay terms in order to improve its utility.

Summary

The sample studied is comprised of adolescents aged 12 to 17 across the 50 states of the United States and the District of Colombia. The survey was administered with computer-assisted interviewing (CAI) and an audio computer-assisted self-interview (ACASI). These methods provide respondents' privacy, confidentiality, and increase honest reporting on sensitive topics. Less sensitive items were administered with computer-assisted personal interviewing (CAPI). The adolescents' were interviewed on topics such as: depressive symptoms, substance abuse, and youth experiences related to youth social capital. A CFA factorial validity assessment of youth experience variables in the NSDUH 2009 indicates that the data consist of the multidimensional structure of cognitive and structural social capital. The quantitative design method facilitates an in-depth understanding of the relationships among youth cognitive and structural social capital, substance abuse and depression in adolescents.

CHAPTER IV

RESULTS

Introduction

This chapter focuses on data analysis with the objectives of answering the research questions and testing the hypotheses. The data analysis is aimed to determine the goodness-of-fit of the hypothesized model (see Figure 1, p.10) and the data; that is, whether the observed data fit the proposed model and; whether the model and the data describe the hypothesized associations among youth cognitive and structural social capital, substance abuse, and depression. Additionally, it is aimed to determine whether substance abuse mediates the association between youth cognitive and structural social capital and depression. These statistical analyses are conducted using the structural equation modeling (SEM) procedure described in the previous chapter.

In this section, three SEM models are examined in order to understand the nature of associations among youth social capital, substance abuse, and depression. The first SEM model (see Figure 2a, p. 122) postulates that youth structural and cognitive social capital predicts substance abuse, which has a direct causative effect to clinical depression in adolescents. The second tested SEM model (see Figure 3a, p. 139) postulates that youth structural and cognitive social capital directly predicts substance abuse and depression and that substance abuse mediates clinical depression in adolescents. The third hypothesized SEM model (see Figure 5a, p. 155) postulates that youth structural and cognitive social capital predicts substance abuse, which co-occurs or co-exists with symptoms of clinical depression in adolescents.

The statistical analyses conducted to evaluate the fit of the first hypothesized models include the following procedures: preliminary evaluation of the model and the sample data; data diagnoses, (e.g., multivariate normality assessment, outliers' identification); and model misspecification assessment. Also, model fit summary statistics, and analysis of the standardized regression weight estimates are used to assess of the three hypothesized models.

Additional statistical analyses in this chapter are comprised of model analysis using the covariate (male and female) to determine whether the associations among youth cognitive and structural social capital, substance abuse, and depression are the same for males and females. Likewise, the analyzed statistical estimates include the model-fit-summary statistics and standardized regression weights estimates.

The organization of the chapter is as follows: descriptive statistics and bivariate correlations among the structural variables; the hypothesized model 1; preliminary evaluation of the hypothesized model; post-hoc model analysis using the standardized regression weight estimates; the hypothesized model number 2; post hoc model analysis; the effect estimations; model analysis using the covariates; testing of hypotheses; key findings; and discussions of findings. The computed statistical analyses are presented in figures and summary tables.

Descriptive Statistics and Spearman Correlation among the Latent Variables

The estimates are comprised of mean, standard deviation, and co-relation statistics among the structural variables (see Table 16). Youth social capital variables have inverse correlation with substance abuse and depression. For example, a two-tailed Spearman correlation indicates that the association between youth structural social capital and

substance abuse is -.20, *P* = 0.01. This relationship indicates that increased levels of youth structural social capital predicts a decrease in substance abuse.

Table 13

Descriptive Statistics and Spearman (Rho) Correlation among the Latent Variables

Variables	Mean	Std.Dev.	Structural Social Capital	Cognitive Social Capital	Substance abuse	Depression
Structural Social Capital	.002	.291	1.000			
Cognitive Social Capital	-.001	.248	.380**	1.000		
Substance abuse	.0003	.117	-.20**	-.21**	1.000	
Depression	-.0004	.262	-.17**	-.09**	.10**	1.000

Also, the correlation between youth structural social capital and depression is -.17, *P* = 0.01. Likewise, this result indicates that increased levels of youth structural social capital predicts a decrease in depression. Additionally, the result shows that youth cognitive social capital has an inverse correlation with substance abuse at -.21, *P* = 0.01, and depression at -.09, *P*= 0.01. These estimates indicate that increased levels of youth cognitive social capital predicts a decline of substance abuse and depression in adolescents. The correlation between substance abuse and depression is .10 and indicates that increased abuse of substance predicts increases in depression.

The Hypothesized Model 1

The hypothesized model1 (see Figure 2a, p.122) postulates a priori the plausibility that youth structural and cognitive social capital predicts substance abuse, which in turn predicts symptoms of clinical depression in adolescents. The hypothesized SEM model

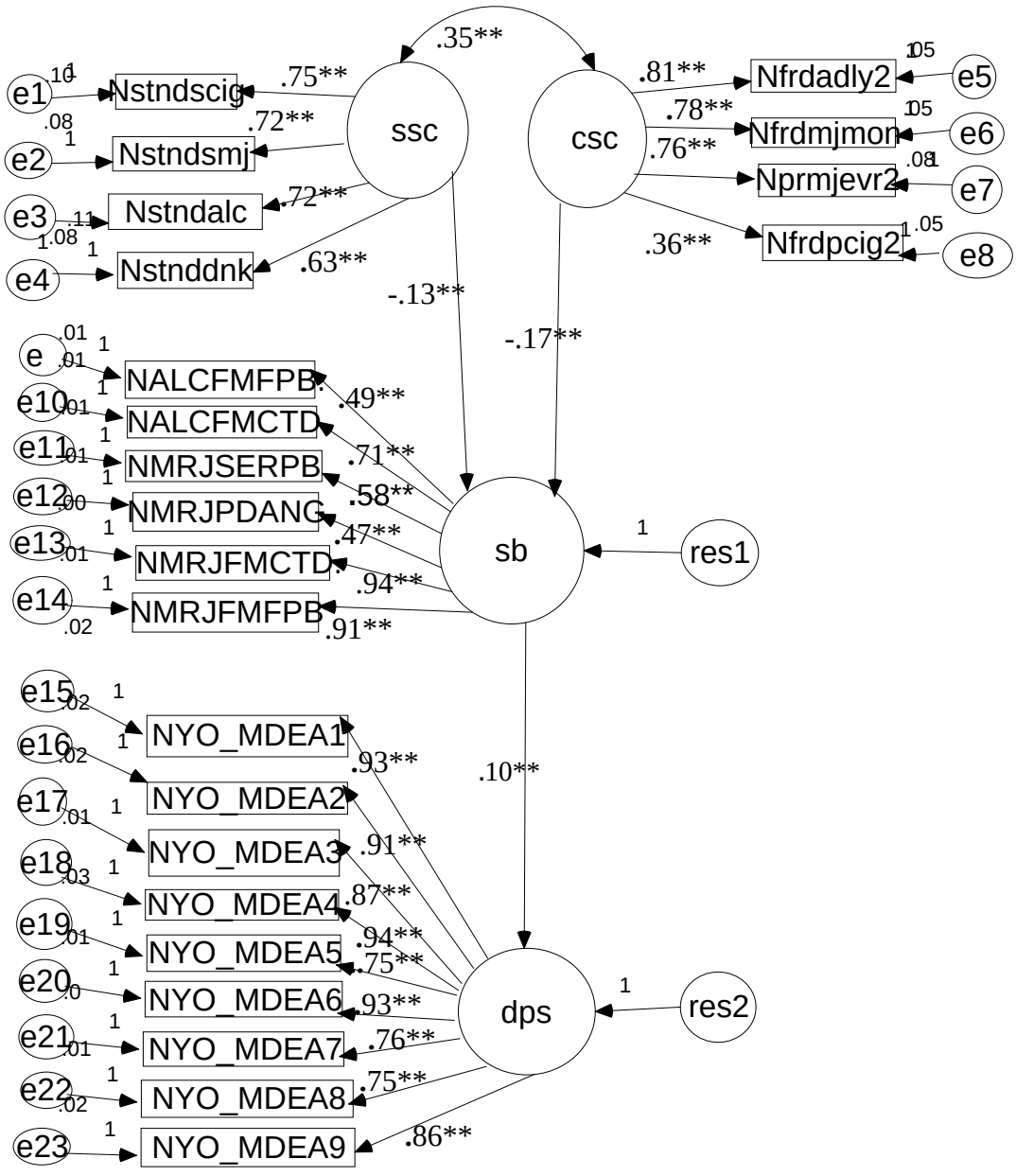

Figure 2a. The Hypothesized Recursive SEM Structural and Measurement Model 1

** Significant at .001

** SCP = Structural Social Capital; CSP = Cognitive Social Capital;
SB= Substance Abuse; DPS = Depression; Res1= Residual 1; Res 2= Residual 2; e = Error terms.

consists of multiple characteristics including four structural factors comprised of youth

cognitive (CSC) and structural social capital (SSC), substance abuse (SB), and depression (DPS). The two components of youth social capital (the exogenous variables) are allowed

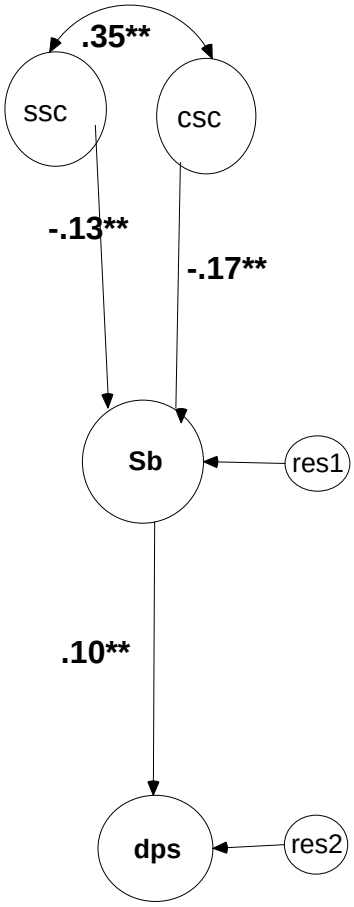

Figure 2b. The Hypothesized Recursive SEM Structural Model 1

**SCP = Structural Social Capital; CSP = Cognitive Social Capital;

SB= Substance Abuse; DPS = Depression; Res1= Residual 1;

Res 2= Residual 2

to vary and covary, and are correlated by two-headed arrows because causes of these variables are not represented in the model (the correlation symbol represented this assumption) (Kline, 2011). Additionally, substance abuse is linked to depression by a single-headed arrow. The presumed causes of these endogenous variables, unlike the

exogenous variables, are explicitly represented in the modeled figure; therefore, these variables cannot be correlated and are not free to vary or covary (Kline, 2011).

The SEM diagram is comprised of 23 observed variables, which were used to measure the four structural factors. These measurement variables are linked to the structural factors by unidirectional arrows. Also, each observed variable is loaded on a factor, which has corresponding disturbance terms (res1 and res2). These disturbance terms reflect the assumptions that the endogenous variables have at least one common omitted cause (Kline, 2011). Also, the measurement variables have corresponding error terms (err 01 to err23), which accounts for covariances/correlations and variances among the indicators. One of the paths linking the measurement variables and the structural factor is arbitrarily restricted to a scale of 1.00 to facilitate the model identification and improve accurate estimation of the parameters.

Preliminary Model Evaluation

Several model evaluation procedures are implemented to examine the validity of the hypothesized model. These include analyses of model-fit- summary, multivariate normality test, outlier identification, model misspecification, and analysis of regression weight estimates.

The Model-Fit-Summary Statistics

The analysis indicates that minimum is achieved for the SEM model. This implies that variances and covariances in the model are successfully estimated. The Chi-square statistic is statistically significant: χ^2 (226) = 8153.692.076, *P*=.001 (see Appendix H). Also, estimates such as the Minimum Discrepancy (NPAR = 50, CMIN = 8153.692), DF

= 226, *P* = .001, CMIN/DF= 36.078. The Baseline Comparisons (Normal Fit Index, NFI (Delta1) = .759, the RFI (rho1) = .730, IFI (Delta2) = .764, TLI (rho2) = .735, and the CFI =.763).

The Parsimony-Adjusted Measure (PRATIO =.893, PNFI =.678 and PCFI = .682). The Root Mean Square Error of Approximation (RMSEA) is .045, the 90 percent confidence interval is (HO = .044; HI=.045), and *P* = 1.000. The model predictive indexes, (e.g., the Baseline comparison, Parsimony-adjusted measures, and the root mean square error of approximation) indicate that there is good fit regarding how the hypothesized model described the sample data.

Multivariate Normality Assessment

Multivariate normality of distribution is assumed when large sample size is utilized in multivariate statistics (Kline, 2011).The normality assumption is tested to examine the univariate distribution of individual variables, and multivariate normality distribution of observations in the data (see Table 14). Thus, using skewness and kurtosis distribution statistics, skewness values less than 2 (< 2) and kurtosis equal or less than 7 (≤ 7) indicate multivariate normality distribution of variables and the data. On the other hand, skewness values greater than 2 (>2) and (kurtosis) greater than 7 (>7) are considered a departure from multivariate normality (West, Finch, and Curran, 1995; Byrne, 2010).

The overall mean kurtosis of variables in the data is approximately 2.00 and critical ratio, CR =3.00. These values indicate that the data meet the multivariate normality assumption. However, individual variables, for example, **"**NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY," have large skewness (-3.149) and kurtosis (7.92),

Table 14

Multivariate Normality Assessment

Variables	Mini-mum	Maxi-mum	Skew - ness	Critical ratio	Kurt-osis	Critical ratio
NFRDPCIG2: YOUTH THINK:CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PAC DAILY	000	1.000	2.15	116.53	2.69	73.12
NPRMJEVR2: YOUTH.THINK: PARENTS FEEL ABOUT.YOUTH TRY MARIJUANA/HASH	000	1.000	2.56	138.82	4.66	126.65
NFRDMJMON: YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTHLY	000	1.000	1.67	90.85	.870	23.63
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2ALCOHOL/DAY	000	1.000	1.88	102.04	1.59	43.13
NYO_MDEA9: ANY THUOUGHTS OR PLANS OF SUICIDE	1.000	2.000	-2.54	-138.03	4.46	121.21
NYO_MDEA8: INABILITY TO CONCENTRATE OR MAKE DECISIONS	1.000	2.000	-2.15	-116.87	2.63	71.43
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY	1.000	2.000	-3.15	-171.05	7.92	215.16
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY	1.000	2.000	-2.25	-122.40	3.08	83.59
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE RESTLESS OR LETHARGIC	1.000	2.000	-3.06	-166.43	7.40	200.99
NYO_MDEA4: SLEEP PROBLEMS	1.000	2.000	-2.18	-118.20	2.74	74.31
NYO_MDEA3: CHANGES IN APPETITE OR WEIGHT	1.000	2.000	-2.48	-134.85	4.17	113.24
NYO_MDEA2: LOST INTEREST OR PLEASURE IN MOST THINGS	1.000	2.000	-2.06	-111.82	2.24	60.86

Table 14-Continued

Variables	Mini-mum	Maxi-mum	Skew - ness	Critical ratio	Kurt-osis	Critical ratio
NYO_MDEA1:.SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED	1.000	2.000	-2.17	-118.03	2.72	73.96
NMRJFMFPB: USING MARIJUANA CAUSE PROBLMS WITH FAMILY/FRIENDS PAST 12 MONTHS	1.000	2.000	-6.89	-374.37	44.86	1245.7
NALCFMCTD: CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH FAMILY/ FRIENDS	1.000	2.000	-7.53	-408.95	58.09	1577.9
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVITIES PAST 12 MONTHS	1.000	2.000	-7.90	-429.16	60.91	1654.3
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/WORK/SCHOOL PAST 12 MONTHS	1.000	2.000	-7.63	-414.30	56.60	1537.4
NALCFMCTD: CONTINUED.TO DRINK ALCOHOLDESPITE PROBLEMS WITH FAMILY/ FRIENDS	1.000	2.000	-5.93	-321.88	39.42	1070.6
NALCFMFPB: DRINK ALCOHOL CAUSE PROBLMSS WITH/ FAMILY/FRIENDS PAST 12MONTHS	1.000	2.000	-5.84	-317.26	32.79	890.60
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK	000	1.000	1.74	94.22	1.26	34.10

Table 14-Continued

Variables	Mini-mum	Maxi-mum	Skew - ness	Critical ratio	Kurt-osis	Critical ratio
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES	000	1.000	.35	19.25	-1.82	-49.42
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJU-ANA/HASHISH	000	1.000	1.18	64.22	-.46	-12.50
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES	000	1.000	1.13	61.34	-63	-17.16
Multivariate					1533.2	3007.9

which indicated non-normality distribution. Additionally, variables such as "NMRJSERPB: MARIJUANA CAUSE SERIOUSS PROBLEMS AT HOME/WORK/SCHOOL PAST 12 MONTHS" have large skewness (-7.90) and kurtosis (60.91) and indicate non-normality distributions of these variables. The distributions of these variables have high peaks and no tails. These positive or negative peaked distributions are consistent with binary scored data in which responses to items scaled "Yes" or "No" are mostly selected over the other. Overall, the data met the multivariate normality distribution assumptions.

Assessment of Multivariate Outliers

The outlier's identification involves assessment of cases of observations in the data that have scores substantially different from others and may impact estimates of statistical outcomes and analysis. Potential multivariate outliers can be characterized by extremely high or low values of Mahalanobis distance-square relative to other D^2 values. The Mahalanobis d-square (D^2) of 20 observation cases is represented (see Table 15).

Table 15

Outliers Identification Summary Statistics

Observations	Mahalanobis d-square	P^1	P^2
12992	342.870	.000	.000
14688	339.494	.000	.000
3220	339.241	.000	.000
3025	338.440	.000	.000
11589	336.480	.000	.000
14923	332.893	.000	.000
9544	329.609	.000	.000
17076	319.618	.000	.000
2080	317.240	.000	.000
12668	313.047	.000	.000
15046	308.204	.000	.000
984	307.846	.000	.000
3711	307.736	.000	.000
6806	305.352	.000	.000
***	***	.000	.000
***	***	.000	.000
***	***	.000	.000
790	217.332	.000	.000
10272	216.936	.000	.000
4774	216.427	.000	.000

The computed values which decreased in ranked order are statistically significant, $P = .001$. The estimates indicate that observation 12292 is the most extreme value and has the largest D^2 (342.870) distance compared to other observations in the model. Even though this observation has the largest Mahalanobis d-square (D^2), it is not distinctively far-apart from the second extreme observation (14688) Mahalanobis D^2 (339.494) and

other observations in the table to be considered an outlier. The Mahalanobis d-square (D^2) statistics shows no sufficient evidence of serious multivariate outliers in the data that need to be addressed.

Model Misspecification Assessment

The extent to which the proposed model is appropriately described is examined using the modification indices (MI) (Byrne, 2010).Model misfit expressed by the MIs indicates decline or change in value of the chi-square (χ^2) if the model is tested in another run. Associated with the MI is the expected parameter change (EPC), which is expressed as the predicted change (negative or positive) in the value of the chi-square χ^2 due to each fixed parameter. It provides information about how much value the chi-square can be increased or decreased to improve the model fit if the model is to be reparameterized (Byrne, 2010).

Thus, EPC value greater than (> .258), indicate model misfit or factor cross-loadings (loading in more than one factors and error covariances) (Byrne, 2010).For simplicity, covariances between error terms (error 1to error 23) is presented (see table 19). An examination of the covariances, that is, the MI and EPC, indicate that all the EPC estimates are less than .258, and considered to be of little concern to the model fit (Byrne, 2010). However, these covariances estimates have no substantive values. Further analysis is provided with parameter regression weights.

The Parameter Weight Estimates

An analysis of the estimates (see Table 17).shows that values for the first two MI and EPC consisting of the regression weights between youth cognitive social capital and depression (-.158) and youth structural social capital and depression (-.195) are larger

Table 16

Covariances, Modification Indices, and Parameter Change

Error terms	Modification Indices M.I	Par change
res2 <----------->SSP	356.096	-.009
res2 <----------->res1	14.439	-.001
e23<----------->SSP	6.158	.001
e23 <----------->e15	78.286	.001
e22 <----------->e15	89.093	.001
e21<----------->Scp	4.667	-.001
e21<----------->res1	17.360	.001
e21<----------->e23	454.935	.004
e21<----------->e22	30.471	-.001
***	*	*
***	*	*
***	*	*
e2<----------CSC	48.432	.002
e2<----------->CSC	6.066	-.001
e2<----------->res1	5.394	-.001
e2<----------res2	46.360	-.005
e1<----------->res2	61..401	-.005
e1<----------->e20	4.117	.001
e1<----------e18	5.948	-.001

than other estimates, though these estimated values did not exceed (.258) Likewise, the regression weight estimate between the observed measure of structural social capital

Table 17

Regression Weights, Modification Indices, and Parameter Change

Error terms	Modification Indices M.I	Par change
DPS <----------CSC	61.276	-.158
DPS <----------SSC	401.046	-.195
NYO_MDEA1<---------- ----------NYO_MDEA9	19.359	.015
NYO_MDEA1<---------- --NYO_MDEA8	8.077	.009
NYO_MDEA7<----------SCP	6.777	-.017
NYO_MDEA7<----------SB	21.127	.056
NMRJFMFPB <----------CSP	9.602	.020
NMRJFMCTD <----------SCP	15.494	.010
NMRJFMFPB<----------NFRDPCIG2	11.786	006
***	*	*
***	*	*
***		
NSTNDSMJ<----------CSC	41.252	.163
NSTNDSMJ <----------SB	10.570	-.073
NSTNDSMJ <----------DPS	19.704	-.034
NSTNDSMJ<---------- NYO_MDEA9	9.894	-.026
NSTNDSMJ<---------- NYO_MDEA8	20.054	-.034
NSTNDSMJ<---------- NYO_MDEA7	11.666	-.033
NSTNDSMJ<---------- NYO_MDEA6	17.176	-.032

"NSTNDSMJ" and cognitive social capital (CSC) is relatively large (.163). These large estimates may be seen as evidence of misspecification of fit of these variables in the

model and may have occurred due to: (a) systematic error, such as measurement error related to item responses, or characteristics specific to the respondents and items in the data, such as bias responses “Yes” and “No”, to items and social desirability; (b) high degree of overlap in item contents and redundancy in the wordings of items; and (c) high level of correlations among indicators in the data, such as depression (see Table 11) (Byrne, 2010; Aish and Joreskog, 1990). However, this is not an issue of concern because the MI and EPC did not exceed the critical value of .258.

Post hoc Model Analyses

The statistical analyses include assessment of the regression weights comprised of standardized and unstandardized estimates, standard error, critical ratio, and p-values.

Regression Weight Estimates

The regression weight estimates involve analyses of the feasibility of the standardized estimates, the standard error, the critical ratio, and the probability values (P) of the parameters in the model. However, the analysis of the unstandardized estimates is not provided because it does not have substantial statistical values (Kline, 2011) (see Appendix I).

The Standardized Regression Weight Estimates for Structural Model 1

The covariances estimate between youth structural and cognitive social capital is .009, S.E = .000, C.R= 26.521, P = .001, and correlation, R^2 = .35. These values are significantly different from zero and indicate that there is a good fit between the predicted and observed relationships of the two latent variables, the hypothesized model and the data (Kline, 2011). The standardized regression weight estimates between substance

abuse (SB) and youth structural social capital (SSC) is -.13 (see Table 18). This inverse regression weight estimate is significantly different from zero (P = .001), and can be interpreted as one standard deviation increase in youth structural social capital predicts a .013 standard deviations decrease in substance abuse.

Additionally, the standardized regression weight estimate of association between substance abuse and youth cognitive social capital (CSC) is -.17. Also, this result is significantly different from zero (P = .001). It can be interpreted as one standard deviation increases in youth cognitive social capital predicts a .017 standard deviation decrease in substance abuse in adolescents. Also, this result may indicate that high levels

Table 18

Standardized Regression Weights Estimates for Structural Model 1

Variables	Estimates	P
SUBSTANCE ABUSE<----------SCP	-.13	***
SUBSTANCE ABUSE<----------CSP	-.17	***
DEPRESSION<----------SB	.10	***

of youth structural social capital, for example, 2 or 3, standard deviations will predict 2.17 or 3.17 standard deviations decline in substance abuse in adolescents (Meyers, et al. 2006). Also, the predicted regression weight estimate of the association between depression and substance abuse is .10. This result is significantly different from zero (P = .001), and can be interpreted as one standard deviation increase in substance abuse predicts a .010 standard deviation increase in depression. This result indicates that youths who experienced past year substance abuse are more likely to experience past year symptoms of depression.

The Standardized Regression Weight Estimates for Measurement Model 1

The standardized regression weight estimate of the latent variable structural social capital (SSC) and measurement variable "NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES" is .67 (see Table 19).

Table 19

Standardized Regression Weights Estimates for Measurement Model 1

Variables	Estimates	P
Structural Social Capital (SSC)		
NSTNDSCIG:STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SSC	.67	***
NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH<----------SSC	.72	***
NSTNDALC STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SSC	.72	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<----------SSC	.63	***
Cognitive Social Capital(CSC)		
NFRDMJMON: YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY<----------CSC	.81	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSC	.78	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSC	.75	***
NPRMJEVR2: YOUTH.THINK: PARENTS FEEL ABOUT. YOUTH TRY MARIJUANA/HASH<----------CSC	.36	***
Substance Abuse (SB)		

Table 19-Continued

Variables	Estimates	P
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.49	***
NALCFMCTD: CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEDND <----------SB	.71	***
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS<----------SB	.58	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS<----------SB	.47	***
NMRJFMCTD: CONTINUED TO USE MARI-JUANA DESPITE PROBLEMS WITH/ FAMILY/FRIENDS<----------SB	.94	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	.85	***
Depression (DPS)		
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.93	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.91	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <-----DPS	.86	***
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.94	***
NYO_MDEA5:OTHERS NOTICED THAT YOUARE RESTLESS OR LETHARGIC<----------DPS	.74	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.93	***
NYO_MDEA7: FELTWORTHLESSNEARLYEVERYDAY<-DPS	.75	***

Table 19-Continued

Variables	Estimates	P
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	.94	***
NYO_MDEA9 "ANY THUOUGHTS OR PLANS OF SUICIDE<---------DPS	.86	***

The coefficient is positive and significantly different from zero (*P* = .001). This outcome is interpreted as one standard deviation increases in youth structural social capital predicts a .067 standard deviation increase in the measurement variable.

Likewise, the standardized regression weight estimate of the latent variable (SSC) and measurement variable "NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH" is .072. This result is positive and significantly different from zero (*P* = .001). Also, it can be interpreted as one standard deviation increases in youth structural social capital predicts a .072 standard deviation increases in the measurement variable. All other regression weight estimates in the model can be interpreted in the same way.

The Hypothesized Model 2

The hypothesized model 2 (see Figure 3b, p. 139) is nested in model 1. It postulates a priori that: (a) youth structural and cognitive social capital directly predicts substance abuse, (b) youth structural and cognitive social capital directly predicts depression; and (c) substance abuse mediates the association between youth structural and cognitive social capital and depression. Thus, the model implies that youths who have low levels of social structural and cognitive social capital may experience substance

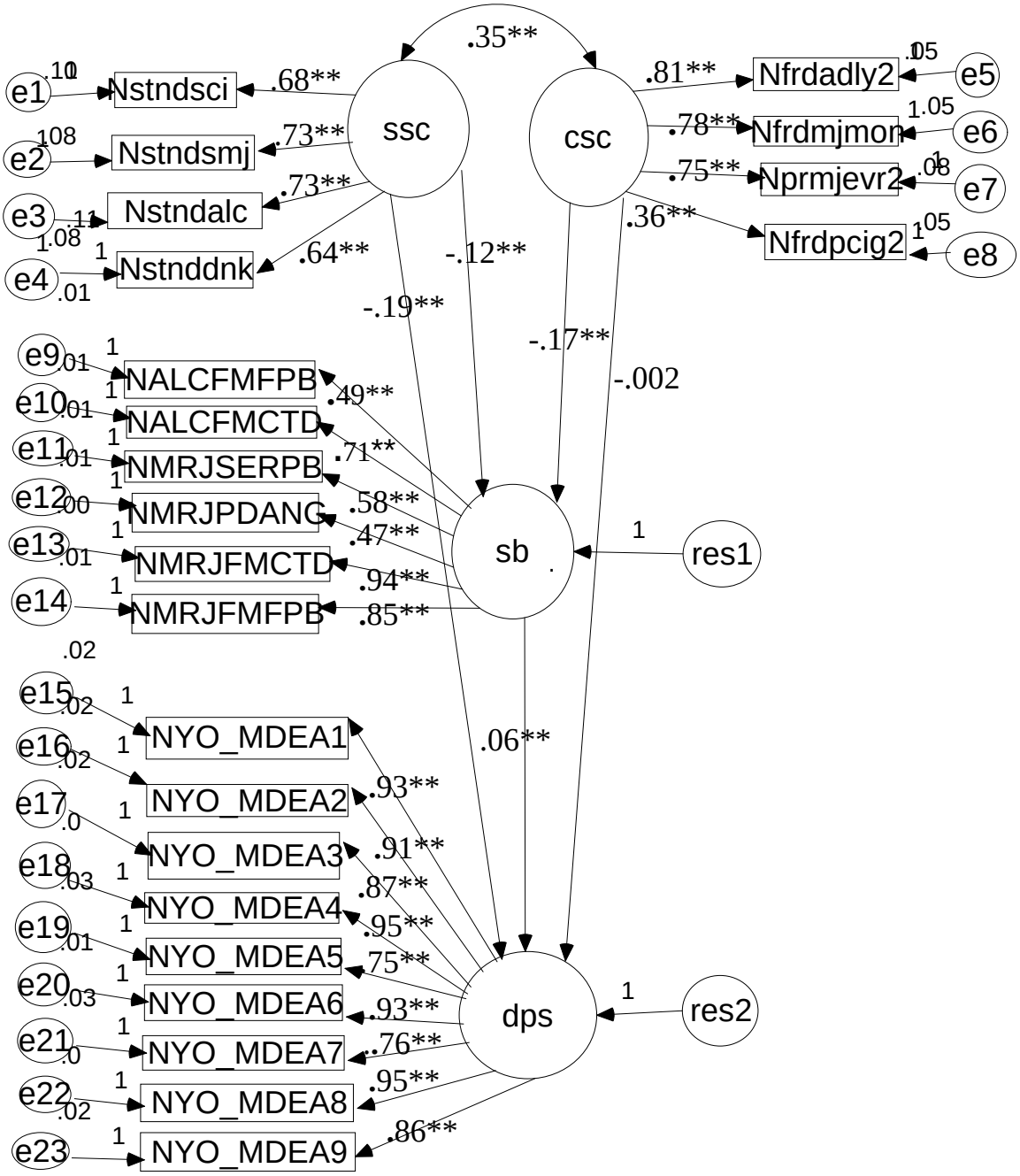

Figure 3a. The Hypothesized Recursive SEM Structural and Measurement Model 2

** Significant at .001

**SCP = Structural Social Capital; CSP = Cognitive Social Capital

SB= Substance Abuse; DPS = Depression, Res1= Residual 1; Res 2= Residual 2

e=Error terms

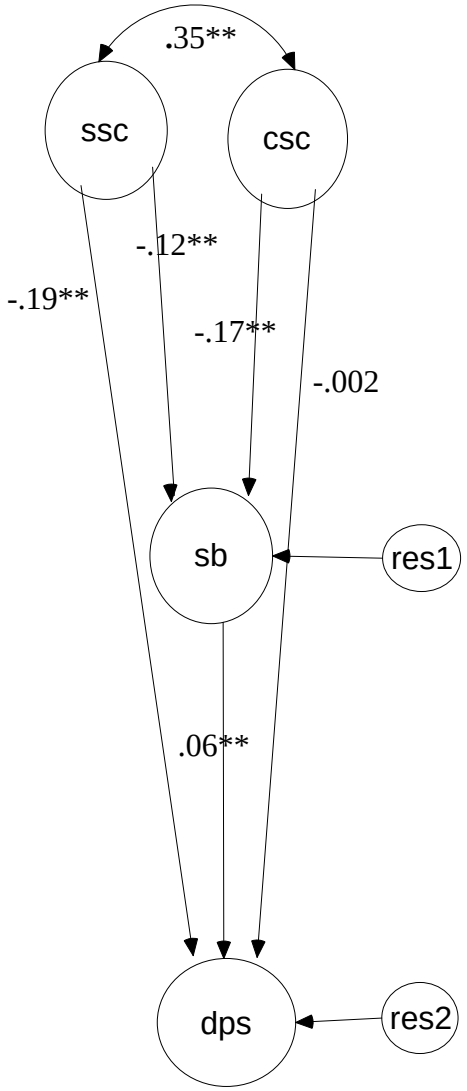

Figure 3b. The Hypothesized Recursive SEM Structural Model 2

**SCP = Structural Social Capital; CSP = Cognitive Social Capital

SB= Substance Abuse; DPS = Depression, Res1= Residual 1; Res 2= Residual 2

abuse and depression. Also, substance abuse may be the causal process by which youth structural and cognitive social capital influences depression in adolescents.

Model-Fit-Evaluation

The model-fit evaluation consist of analyses of model-fit-summary, for example, the CMIN, Baseline Comparisons, Parsimony-Adjusted Measures, the Root Mean Square of Approximation (RMSEA), and the Regression weight estimates.

The Model-Fit-Summary Statistics

The analysis shows that minimum is achieved for the SEM model. This indicates that the variances and covariances in the model are successfully estimated. The Chi-square statistic is statistically significant, χ^2 (224) =7674.077, *P* = .001 (see Appendix J). The summary estimates such as the Minimum Discrepancy (NPAR = 52, CMIN = 7674.077) , DF = 224, *P* = .001, CMIN/DF= 34.259. The Baseline Comparisons (Normal Fit Index, NFI (Delta1) = .773, the RFI (rho1) = .743, IFI (Delta2) = .778, TLI (rho2) = .749, and CFI = .778). The Parsimony-Adjusted Measures (PRATIO= .885, PNFI= .684 and PCFI = .689). The Root Mean Square Error of Approximation (RMSEA) is .043, the 90 percent confidence interval was (HO = .043; HI =.044), and PCLOSE = 1.000.

Regression Weight Estimates

The regression weights estimates evaluation consists of analyses of the standardized and unstandardized weights, standard error, and statistical significance of critical ratio and the probability values. The analysis of the unstandardized estimates is not provided (see Appendix K).

The Standardized Regression Weight Estimate for Structural Model 2

The covariances estimate between youth structural and cognitive social capital is .009, S.E. = .000, C.R= 27.517, *P* = .001, and the correlation, R^2 = .35. The estimated

covariance and correlations values are significantly different from zero (*P* = .001). This result indicates that there is a good fit between the predicted and observed relationships of the latent variables, the hypothesized model, and the data (Kline, 2011).

Thus, the regression weight estimate of association between substance abuse (SB) and youth structural social capital (SSC) is -.12 (see Table 20). This result is significantly different from zero (*P* = .001). The inverse sign indicates that one standard deviation increases in youth structural social capital (SSC) predicts a .012 standard deviation decrease in substance abuse. Also, the regression weight estimate between substance abuse and youth cognitive social capital is -.17 and is significantly different from zero (*P* = .001). Similarly, this result indicates that one standard deviation increases in youth cognitive social capital predicts a 0.17 standard deviation decrease in substance abuse.

Additionally, the predicted regression weight between youth structural social capital (SSC) and depression is -.19 and is significantly different from zero (*P* = .001). Likewise, this result indicates that one standard deviation increases in youth structural social capital predicts a .019 standard deviations decreases in depression. The regression weight estimate between youth cognitive social capital and depression is -.002. However, this result is not significantly from zero (*P* = .886). The non-statistical significant probability level may be evidence of inadequate fit of these parameters, which may indicate that these variables may be unimportant in the model (Byrne, 2010). Also, the regression weight showing the association between depression and substance abuse is .06. This result indicates that one standard deviation increases in substance abuse predicts a .006 standard deviation increase in depression. This result appeared to indicate that substance abuse predicts depression.

Table 20

Standardized Regression Weight Estimates for Structural Model 2

Variable	Estimates	P
SUBSTANCE ABUSE<----------SCP	-.12	***
SUBSTANCE ABUSE<----------CSP	-.17	***
DEPRESSION<----------SUBSTANCE ABUSE	.06	***
DEPRESSION<----------SCP	-.19	***
DEPRESSION<----------CSP	-.002	.866

However, a further analysis is conducted to understand whether substance abuse can predict depression. This involved interchanging the placement of the two variables in the model; for example, by depression predicting substance abuse. The obtained regression weight estimate is .06, which is similar to the result derived for the initial analysis, in which substance abuse is allowed to predict depression. Since the same regression weight estimate is derived for the two analyses, the cause and effect, direction of association between substance abuse and depression is not conclusive.

The Standardized Regression Weight Estimates for Measurement Model 2

The first standardized regression weight estimate for latent variable, structural social capital (SSC) and the measurement variables "NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES" is .68 (see Table 21). This result indicates that there is a positive association between the variables and it is statistically significantly different from zero (P = .001). This result can be interpreted as one standard deviation increases in youth structural social capital predicts a .068 standard deviation increase in the

measurement variable. The regression weight estimate for latent variable (SSC) and the measurement variables "NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/ HASHISH" is .73. Also, this result indicates a positive association between the variables, which is statistically significant and means that one standard deviation increases in SSC predicts a .073 standard deviation increase in the measurement variable.

The regression weight estimate for cognitive social capital (CSC) and the measurement variables "YOUTH THINK: CLOSE FRNDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY" is 81. This result indicates a positive statistically significant association between the variables and means that a standard deviation increase in CSC predicts a. 081 standard deviation increases in the measurement variable.

The regression weight estimate for substance abuse (SB) and the measurement variable "NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS" is .49. This result indicates a positive statistically significant association between the variables (*P*. =.001). The result indicates that one standard deviation increases in SB predicts a. 081 standard deviation increase in the measurement variable

Table 21

Standardized Regression Weight Estimates for Measurement Model 2

Variables	Estimates	P
Structural Social Capital (SSC)		
NSTNDSCIG:STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SSC	.68	***
NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH<----------SSC	.73	***
NSTNDALC STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SSC	.73	***

Table 21- Continued

Variables	Estimates	P
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<----------SSC	.64	***
Cognitive Social Capital (CSC)		
NFRDMJMON:YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY<----------CSC	.81	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSC	.78	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSC	.75	***
NPRMJEVR2:YOUTH.THINK: PARENTS FEEL ABOUT. YOUTH TRY MARIJUANA/HASH<----------CSC	.36	***
Substance Abuse (SB)		
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.49	***
NALCFMCTD:CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEDND <----------SB	.71	***
NMRJSERPB:MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS<----------SB	.58	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS<----------SB	.47	***
NMRJFMCTD:CONTINUED TO USE MARI-JUANA DESPITE PROBLEMS WITH/ FAMILY/FRIENDS<----------SB	.94	***
NMRJFMFPB:USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	.85	***
Depression		
NYO_MDEA1:SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.93	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.91	***

Table 21- Continued

Variables	Estimates	P
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <-----DPS	.86	***
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.94	***
NYO_MDEA5:OTHERS NOTICED THAT YOUARE RESTLESS OR LETHARGIC<----------DPS	.75	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.93	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	.95	***
NYO_MDEA9 "ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	.86	***

All other regression weight estimates in the measurement model can be interpreted in the same way.

The Model Respecification

The regression weight estimate or path between youth cognitive social capital and depression (in figure 3b) is not significantly different from zero (P = .866), which appears to indicate inadequate fit of the variables or that the association between the variables may be unimportant in the model (Byrne, 2010). The path between these variables is deleted and the model reanalyzed (see Figure 4).

Post hoc Model Analyses

The Model-Fit-Summary Statistics

The fit index estimates such as the Chi-square statistic is statistically significant, χ^2 (225) = 7674.105, *P* = .001. The Minimum Discrepancy ((CMIN) NPAR = 51, CMIN

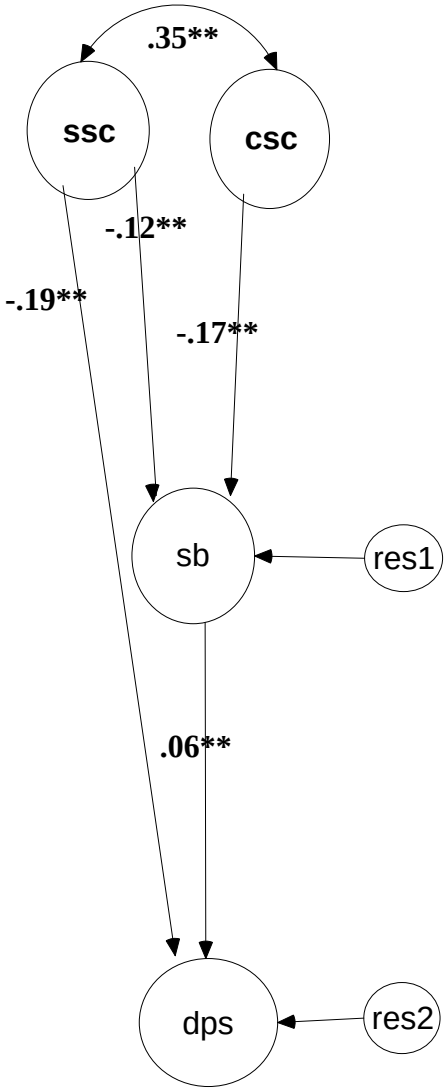

Figure 4. Respecified Hypothesized Recursive SEM Structural Model 2

**SCP = Structural Social Capital; CSP = Cognitive Social Capital

SB = Substance Abuse; DPS = Depression, Res1 = Residual 1; Res 2 = Residual 2

= 7674.105, DF =, 225), *P* = .001, CMIN/DF= 34.107. The Baseline Comparisons (Normal Fit Index NFI (Delta1) = .773, the RFI (rho1) = .744, IFI (Delta2) = .778, TLI (rho2) = .750, and CFI =.778). The Parsimony-Adjusted Measures (PRATIO = .889, PNFI = .687 and PCFI = .692. The Root Mean Square Error of Approximation is .043, the 90 percent confidence interval was (HO = .042; HI = .044), and PCLOSE = 1.000. Thus, deleting the regression path between cognitive social capital and depression from the model did not seem to improve the model fit. For example, the model predictive index such as the Baseline Comparisons, the NIF (Delta1) =.773, CFI =.778 and the RMSEA = .043; 90% CI (LO = .043-HI = .044) for both models are the same. It can be concluded that the regression path between youth cognitive social capital and depression did not constitute misfit or misspecification of these variables in the model. Rather the non-significant *P*-value (*P* = .866), may be associated to things such as systematic error related to distribution of observation of these variables or issues associated with respondents' characteristics; for example, bias responses, redundancy of item contents, and high correlations among the observed measures of latent variables, particularly depression.

Model-Fit-Evaluation of Hypothesized Model 1 and Model 2

A comparison of model fit of the hypothesized model 1 and model 2 is examined to verify which of the models that represents better fit and can be replicated in a hypothetical study using the same sample of data (see Table 22). The model summary statistics, including the Chi-square, Baseline Comparison, AIC, and RMSEA are examined. The estimated RMSEA indicating the residual or total variability for model 1 is .045 and the close-fit is (P = 1.000). The upper and lower bound 90 percent

Table 22

Selected-Fit-Statistics of Hypothesized Model 1 and Model 2

	Model	
Index	Hypothesized model1 (figure 2)	Hypothesized model 2 (figure 3a)
Chi-square (χ^2_M)	8153.692	7674.077
Degree of freedom ($df_{M)}$)	226	224
Probability levels (*P*)	< .001	< .001
RMSEA (90% CI)	.045 (LO = .044- HI =.045)	.043 (LO =.043- HI = .044)
NFI (Delta1)	.759	.773
CFI	.763	.778
AIC	8253.692	7778.077

confidence interval is .044 - .045, and indicates good precision of the model fit. Likewise, the RMSEA showing the residual or total variability for model 2 is .043, and close-fit is (P = 1.000). The upper and lower bound confidence interval is .043 -.044 and indicates good precision of model fit.

The chi-square test of difference between the models is computed as follows: χ^2 = (8153.7-7674.1 = 479.6); DF (266-224 = 2); (α = .01 at df_M (2) = 4.61). The analysis shows that the computed chi-square is greater than the critical value (479.6 > 4.61), which indicates that model 2 may be better fit than model 1. Also using the Baseline comparison; for example, NFI and CFI (larger values indicate better fit of the model and the data) and the AIC; (smaller values indicated evidence of good fit) (Kline, 2011). The values NFI and CFI seem to be the same and AIC appears to be favorable to model 2.The

chi-square and AIC estimates indicate that model 2 represents a better fit with the data and more is likely to be replicated than model 1.

The Effect Estimations

Given the relationships among the variables in the structural model in figure 3b, effect estimation consisting of the direct, indirect, and total effects is conducted to understand the nature of associations among these variables.

Direct Effect Estimation

The direct effect consists of the unmediated or direct effect of youth structural and cognitive social capital on substance abuse and depression. The analysis involves examination of the standardized parameter weight estimates of these variables (see Table 23). The derived direct effect estimates are similar to standardized regression weights estimates depicted in Figure 3b. The standardized direct or unmediated effect of youth structural social capital and depression is -.19. The result indicates that due to direct or unmediated effect of youth structural social capital on depression, when structural social capital increases by one standard deviation, depression declines by -.19 standard

Table 23

Standardized Direct Effect Estimates among the Structural Factors for Model 2

Variables	Structural Social Capital	Cognitive Social Capital	Substance Abuse	Depression
Substance Abuse	-.12	-.17	.000	.000
Depression	-.19	-.002	.06	.000

deviations. This estimated value includes any indirect or mediated effect of youth structural social capital on depression (Kline, 1998). Also, the direct or unmediated effect of youth structural social capital on substance abuse is -.12. The result indicates that due to direct (unmediated) effect of youth structural social capital on substance abuse, when structural social capital increases by one standard deviation, substance abuse declines by -.12 standard deviations. The direct effect of youth cognitive social capital on substance abuse is -.17, and can be interpreted that due to direct (unmediated) effect of youth cognitive social capital on substance abuse, when cognitive social capital increases by one standard deviation, substance abuse declines by -.17 standard deviations. The direct (unmediated) effect of youth cognitive social capital on depression is -.002 and indicates that due to direct effect of youth cognitive social capital on depression, when cognitive social capital increases by one standard deviation, depression declines by -.002 standard deviations. Likewise, the direct (unmediated) effect of substance abuse on depression is .06, and also can be interpreted that due to direct effect of substance abuse on depression, when substance abuse increases by one standard deviation, depression increases by .006 standard deviations.

Indirect Effect Estimation

The indirect effect is comprised of standardized estimates of the product of direct effect or path coefficient between the youth structural and cognitive social capital and, substance and depression in which the effect of youth structural and cognitive social capital on depression is transmitted through substance abuse (Kline, 2010).(see table 24).Thus, the standardized indirect effect of youth structural social capital on depression is -.007. This estimate is derived as follows. The direct effect of youth structural social

capital on substance abuse is -.19. Thus, the indirect effect of youth structural social capital on depression is presumed to be transmitted by substance abuse. This result

Table 24

Standardized Indirect Effect Estimates among the Structural Factors for Model 2

Variables	Structural Social Capital	Cognitive Social Capital	Substance Abuse	Depression
Substance Abuse	-.000	.000	.000	.000
Depression	-.007	-.010	.000	.000

indicates that depression in adolescents decreases by .007 standard deviations for every standard deviation increase in youth structural social capital through its prior effects or interactions with substance abuse (Kline, 2011). Alternatively, the estimated indirect effect can be interpreted that due to indirect or mediated effect of structural social capital on depression, when structural social capital increases by one standard deviation, depression decreases by .007. This outcome includes any direct or unmediated effect that youth structural social capital may have on depression. This result is assumed to be statistically significant $P = .001$.Likewise, the indirect effect of youth cognitive social capital depression is -.010. This result is derived as follows. The direct effect of youth cognitive social capital on substance abuse is -.17. The indirect effect of youth cognitive social capital on depression is presumed to be transmitted by substance abuse. However, this result may not be statistically significant ($P = .001$). Though these indirect effects are small, it is presumed that substance abuse partially transmits its causal effect to depression and may be mediating the association between youth structural and cognitive social capital and depression.

Total Effect Estimation

The total effect consists of the product of both direct and indirect effects; for example, total effects = direct effect + indirect effects. The estimated coefficients consist of standardized direct effects and indirect effects of youth cognitive and structural social capital on depression through substance abuse (see Table 25). The total effect of youth structural social capital and depression is -.20. The estimate is derived as follows Youth structural social capital has direct effect (-.19) and indirect effect (-.007) on depression, and the total effects is the sum of the direct and indirect effect estimates (-.19 + .007 = -.20). This outcome is approximately similar to the result obtained in Figure 3b.

Table 25

Standardized Total Effect Estimates among the Structural Factors for Model 2

Variables	Structural Social Capital	Cognitive Social Capital	Substance Abuse	Depression
Substance Abuse	-.12	.-.17	.000	.000
Depression	-.20	-.012	.062	.000

The result indicates that one standard deviation increases in youth structural social capital predicts a.-.20 standard deviation decline in depression through all presumed direct and indirect causal links between the variables (Kline, 2011). Also, the total effects of youth structural social capital and substance abuse is -.12. Youth structural social capital has direct effect (-.12) and indirect effect (-.000) on substance abuse, and the total effects is the sum of the direct and indirect effects (-.12 + .000 = -.12). The result indicates that one standard deviation increases in youth structural social capital predicts a -.12 standard

deviations decline in substance abuse through all presumed direct and indirect causal links between the variables (Kline, 2011).

Likewise, the total effects of youth cognitive social capital and substance abuse is -.17. This result consists of the sum of direct effect (-.17) and indirect effect (-.000) of youth cognitive social capital and substance abuse (-.17 + .000 = -.17). The result can be interpreted as one standard deviation increases in youth structural social capital predicts a-.017 standard deviations decline in substance abuse through all presumed direct and indirect causal links between the variables.

Effects Decomposition Summary

The effect decomposition provides summary estimates of the direct, indirect, and total effects due to presumed causal relationships between substance abuse and depression (Kline, 2011) (see Table 26). Thus the computed standardized total effect equals the sum of direct and indirect effects.

Table 26

Effect Decomposition Summary among the Structural Factors

	Causal Variables			
	Depression	Substance Abuse	Depression	Substance Abuse
Cognitive Social Capital			Structural Social Capital	
Direct Effect	-.002	-.17	-.19	-.12
Indirect Effect	-.010	.000	-.007	.000
Total Effect	-.012	-.17	-.20	-.12

The Hypothesized Model 3

The hypothesized model 3 (see Figure 5a, p.152) postulates a priori that: a) youth structural and cognitive social capital directly predict substance abuse, (b) youth

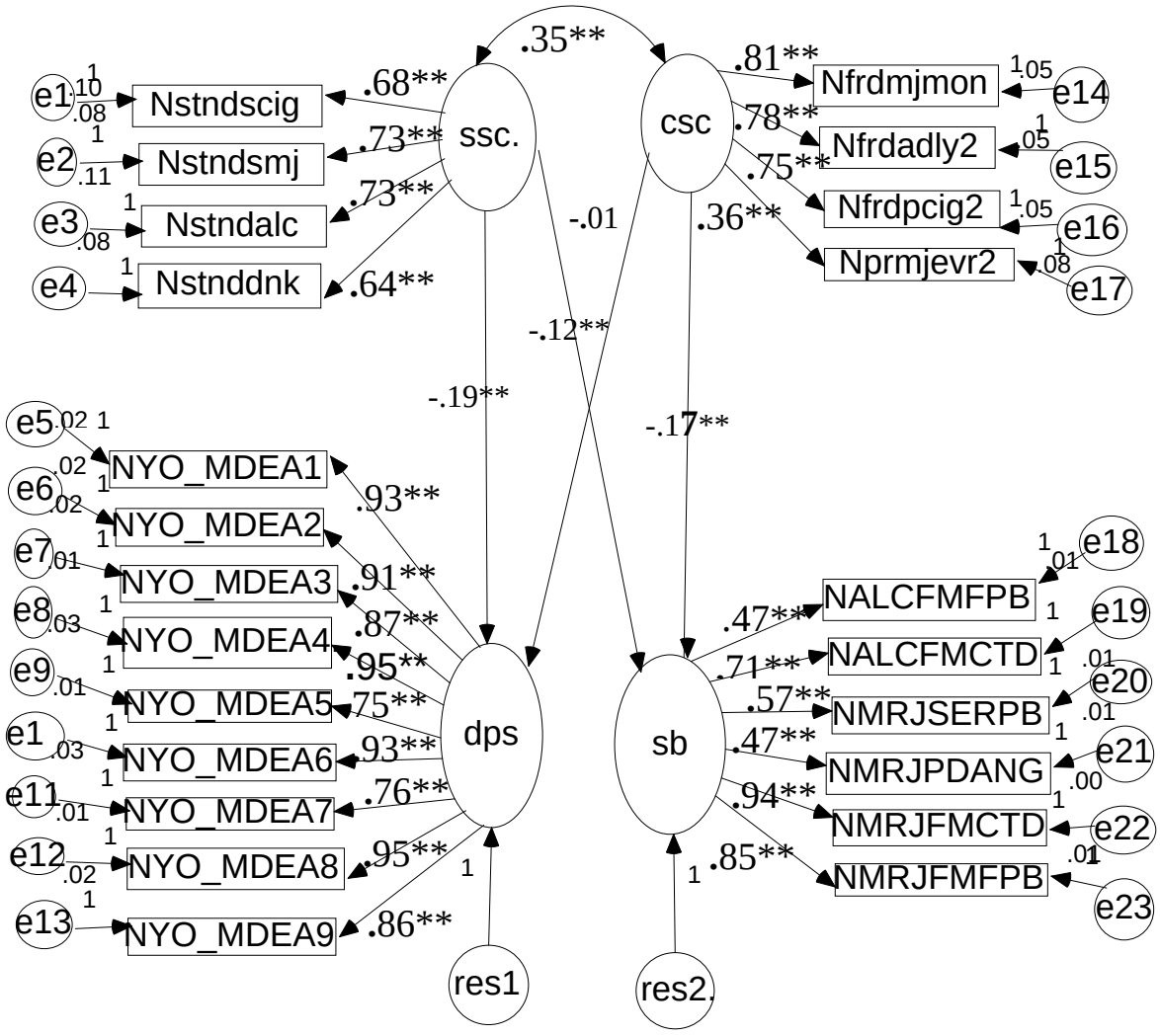

Figure 5a: The Hypothesized Recursive SEM Structural and Measurement Model 3

** Significant at .001

**SCP = Structural Social Capital; CSP = Cognitive Social Capital

SB = Substance Abuse; DPS = Depression, Res1 = Residual 1; Res 2 = Residual 2

e=Error term

structural and cognitive social capital directly predict depression, and (c) substance abuse and depression co-occur or co-exist in adolescents. The model implies that youths who have low levels of social capital and experience substance abuse may experience symptoms of depression simultaneously. As in hypothesized model 1, the current model loaded onto four structural factors is comprised of youth cognitive and structural social capital, substance abuse, and depression. Youth cognitive and structural social capital variables are correlated by a double-directional arrow and are each connected to substance abuse and depression by a single-directional arrow. Additionally, the four structural factors are connected to 23 observed variables, which in turn are connected to error terms by unidirectional arrows. Substance abuse and depression are connected to corresponding residual terms. Unlike the youth structural and cognitive social capital variables, substance abuse and depression are not free to vary or covary. This is shown by not using the symbol of unanalyzed association or the double directional arrow to connect the two variables. In the SEM analyses, double-directional arrows cannot directly be connected to two different endogenous variables, and the symbol of a variance cannot start from and end with any endogenous variable (Kline, 2011).

Thus, the described model depicts that structural and cognitive social capital directly predicts both substance abuse and depression; that is substance abuse and depression may co-occur, or co-exist in adolescents (Kline, 2011). A path linking each of the structural factors and observed indicators is restricted or fixed to 1. For example, the variables "NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK" and SCP," and "NPRMJEVR2**:**YOUTH.THINK PARENTS FEEL ABOUTT.YOUTH TRY MARIJUANAJ/ HASH" and CSP, and the other paths were freely estimated.

Model -Fit-Evaluation

The model fit evaluation involves the analyses of predictive indexes such as the Minimum Discrepancy (CMIN), Baseline Comparisons, Parsimony-Adjusted Measures, the Root Means Square Error of Approximation (RMSEA), and the Regression weight estimates.

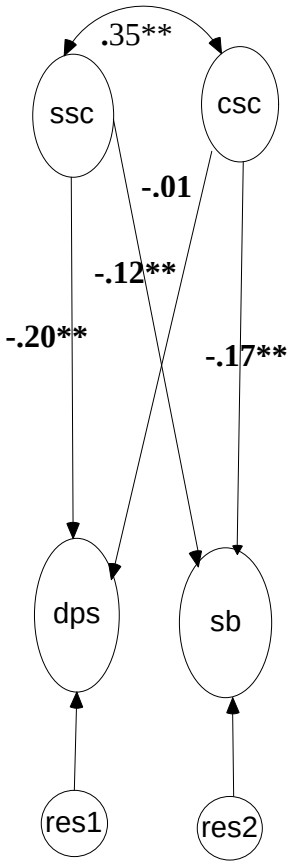

Figure 5b. The Hypothesized Recursive SEM Structural Model 3

**SCP = Structural Social Capital; CSP = Cognitive Social Capital

SB= Substance Abuse; DPS = Depression; Res 1= Residual 1; Res 2 = Residual 2

The Model-Fit-Summary Statistics

The SEM analysis indicates that minimum is achieved and that the variances and covariances in the model are successfully estimated. The summary index statistics such as the Chi-square statistic is statistically significant, χ^2 (225) = 7730.207, *P* = .001 (see Appendix L). Also, the Minimum discrepancy ((CMIN) NPAR = 51, the CMIN = 7730.207), DF = 225, *P* = .001, CMIN/DF = 34.356. The Baseline Comparisons (Normal Fit Index, NFI (Delta1) = .771, the RFI (rho1) = .743, IFI (Delta2) = .776, TLI (rho2) = .748, and CFI =.776). The Parsimony-Adjusted Measures (PRATIO = .889, PNFI = .686 and PCFI = .690). The Root Mean Square Error of Approximation (RMSEA) is .043, the 90 percent confidence interval was (HO = .043; HI =.044), and PCLOSE =1.000. Thus, the model predictive indexes such as the Baseline Comparisons, Parsimony-Adjusted Measure, and the RMSEA appeared to indicate the hypothesized model was a close fit of the data.

Regression Weight Estimates

The regression weights estimates consists of analyses of the standardized and the unstandardized estimates, standard error, and statistical significance of critical ratio, and the probability value, (see Appendix M). The unstandardized regression estimates is not analyzed because it has no statistical value (Kline, 2011).

The Standardized Regression Weight Estimates for Structural Model 3

The covariances estimate between youth structural and cognitive social capital is .009, S.E = .000, C.R = 27.475, *P* = .001, and correlation, R^2 = .35. The estimated covariance and correlations are significantly different from zero and indicate a fit between the predicted and observed relationships of the variables, the hypothesized

model, and the data (Kline, 2011) (see Table 27). Thus, the first regression weight -.20 is the standardized estimate between depression and youth structural social capital (SSC). This result has an inverse sign and is significantly different from zero (*P* = .001). This result indicates that one standard deviation increase in levels of youth structural social capital (SCP) predicts a .020 standard deviation decrease in depression.

Table 27

Standardized Regression Weight Estimates for Structural for Model 3

Variables	Estimates	P
DEPRESSION<----------SSC	-.20	***
SUBSTANCE ABUSE<----------SSC	-.12	***
SUBSTANCE ABUSE<----------CSC	-.17	***
DEPRESSION<----------CSC	-.01	.162

Also, the regression weight estimate between substance abuse and youth structural social capital is -.12 and is significantly different from zero (*P*.=.001). Also, this result indicates that one standard deviation increases in youth structural social capital predicts a.012 standard deviations decreases in substance. Thus, it may be stated that youths who have, for example, 2 standard deviations, a high level of structural social capital, may have 2.12 standard deviations decrease of likelihood of having substance abuse (Meyers, et al. 2006).

The predicted regression weight between youth cognitive social capital and substance abuse is -.17. Also, the regression weight estimate of youth cognitive social capital and depression is.-01. This result is not significantly differently from zero (*P*

=.162) and appears to indicate an evidence of model misfit or irrelevance of these variables in the model (Byrne, 2011).

The Standardized Regression Weight Estimates for Measurement Model 3

In Table 28, the first standardized regression weight estimate for the latent variable (SSC) and the measurement variable "NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES" is .68. This result is significantly different from zero (P = .001) and can be interpreted as one standard deviation increases in youth structural social capital predicts a .068 standard deviation increases in the measurement variable. Also, standardized regression weight estimate for (SSC) and the measurement variables "NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES" is .73. Likewise, this result is significantly different from zero and is interpreted as one standard deviation increases in youth structural social capital predicts a .073 standard

The regression weight estimate for the latent variable (CSC) and the measurement variable "NFRDMJMON**:** YOUTH THINK: CLOSE FRNDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTLY is .81. This result is significantly different from zero (P = .001) and can be interpreted as one standard deviation increases in youth cognitive social capital predicts a .081 standard deviation increase in the measurement variable.

Additionally, the regression weight estimate for the latent variable (SB) and the measurement variable "NALCFMCTD**:** CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEDND is .71. This result is significantly different from zero (P = .001). This estimate can be interpreted as one standard deviation increases in substance abuse predicts a .071 standard deviation increase in the measurement variable.

All other regression weight estimates in the measurement model can be interpreted in the same way.

Table 28

Standardized Regression Weight Estimates for Measurement Model 3

Variables	Estimates	P
Structural Social Capital (SSC)		
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SSC	.68	***
NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH<----------SSC	.73	***
NSTNDALC STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SSC	.73	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<----------SSC	.64	***
Cognitive Social Capital (CSC)		
NFRDMJMON: YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY<----------CSC	.81	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSC	.78	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSC	.75	***
NPRMJEVR2: YOUTH.THINK: PARENTS FEEL ABOUT. YOUTH TRY MARIJUANA/HASH<----------CSC	.36	***
Substance Abuse (SB)		
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.49	***
NALCFMCTD: CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEND <----------SB	.71	***

Table 28-Continued

Variables	Estimates	P
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS<----------SB	.58	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS<----------SB	.47	***
NMRJFMCTD: CONTINUED TO USE MARI-JUANA DESPITE PROBLEMS WITH/ FAMILY/FRIENDS<----------SB	.94	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	.85	***
Depression (DSP)		
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.93	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.91	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <-----DPS	.86	***
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.94	***
NYO_MDEA5:OTHERS NOTICED THAT YOUARE RESTLESS OR LETHARGIC<----------DPS	.75	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.93	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------	.76	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	.95	***
NYO_MDEA9 "ANY THUOUGHTS OR PLANS OF SUICIDE<----------	.86	***

The Model Respecification

Thus, given that the standardized regression weights estimates between youth cognitive social capital and depression (Figure 5b, p.153) is not significantly different from zero (*P*=.162). The path between these variables was deleted and the model reanalyzed (see Figure 6).

Post hoc Model Analyses

The Model-Fit-Summary Statistics

The derived index estimates include: the Chi-square statistic is statistically significant, χ^2 (226) =7732.114, *P* = .001. The Minimum Discrepancy ((CMIN) NPAR = 50, the CMIN = 7732.114), DF =, 226, *P* = .001, CMIN/DF= 34.213). The Baseline Comparisons (Normal Fit Index, NFI (Delta1) = .771, the RFI (rho1) = .744, IFI (Delta2) = .776, TLI (rho2) = .748, and CFI =.776, TLI (rho2) = .748, and CFI =.776). The Parsimony-Adjusted-Measures (PRATIO = .893, PNFI = .689, and PCFI = .693). The Root Mean Square Error (RMSEA) is .043, the 90 percent confidence interval is (HO = .042; HI =.044), and PCLOSE = 1.000.

Even though it appears that the regression path between youth cognitive social capital and depression is problematic in the model and was deleted. The predictive index such as the Baseline Comparisons, the NIF (Delta1) = .771, CFI = .776, and the RMSEA = .043; 90% CI (LO = .042-HI = .044) for both models are not quite different. Deleting the path between cognitive social capital and depression from the model did not seem to improve the model fit. Thus, it may be concluded that the regression path between youth cognitive social capital and depression did not constitute misfit or misspecification in the

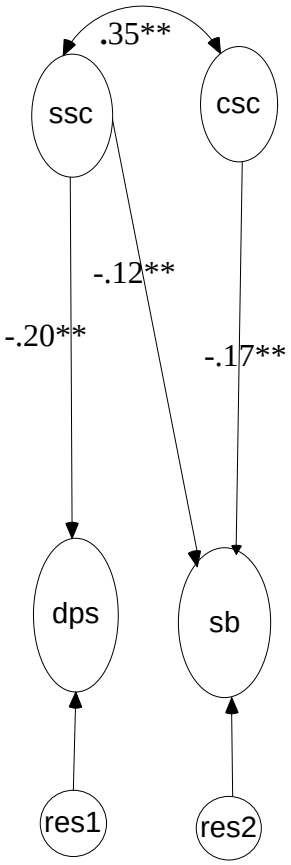

Figure 6. Respecified Hypothesized Recursive SEM Structural Model 3

**SCP = Structural Social Capital; CSP = Cognitive Social Capital
SB= Substance Abuse; DPS = Depression; Res 1= Residual 1; Res 2= Residual 2

model. The non-significant *P*-value (*P* = .162) may be due to measurement error associated with the items in the data (Byrne, 2010). Item improvements strategies such as item content revisions may be appropriate strategies to improve these variables and the model but cannot be implemented in this research. Thus, the hypothesized model 2 and the derived regression weight estimates are retained in the study (Byrne, 2010).

Model-Fit-Evaluation of Hypothesized Model 2 and Model 3

Given the obtained statistical results for hypothesized model 2 and model 3, a model evaluation is conducted using predictive fit indexes such as the chi-square, NFI, CFI, AIC, and RMSEA to verify model fit and indicate the model that can be replicated in a hypothetical study using a randomly selected sample size in the same population (Kline, 2011) (see Table 29).

The estimated RMSEA showing the residual or total variability for model 3 is .043, and the close-fit is *P*= 1.000. The upper and lower bound confidence interval is .042-.044 indicating moderately good precision of model fit. The chi-square test showing differences between model 2 and model 3 is computed as follows: χ^2 = (7674.1-7730.2 = -56.1); DF (224-225 = 1); (α = .01 at df_M (1) = 2.71). Analysis shows that the critical value is less than computed chi-square value (2.71 < .56.1). This result indicates that model 3 may not be better than model 2. Also, in terms of model fit predictive indexes, the NFI, CFI and AIC for both models are approximately the same for both models, though the chi-square appears to indicate that model 2 represents better fit with the data and more likely to be replicated than model 3. However, it can be seen that the NFI, CFI, and AIC estimates for these models seem to be the same.

Regarding the two models in relation to the association among youth structural and cognitive social capital, substance abuse, and depression, the model evaluation outcomes seem be consistent with the hypothesized model 2 and 3, which postulate that (a) youth structural and cognitive social capital is directly associated with substance with substance abuse and depression, (b) in combination with youth structural and cognitive

Table 29

Selected- Fit-Statistics of Hypothesized Model 2 and Model 3

	Model	
Index	Hypothesized model2 (figure 3a)	Hypothesized model 3 (figure 5a)
Chi-square (χ^2_M)	7674.077	7730.207
Degree of freedom ($df_{M)}$)	224	225
Probability levels (*P*)	< .001	<.001
RMSEA (90% CI)	.043 (LO = .043- HI =.044)	.043 (LO =.042 - HI =.044)
NFI (Delta1)	.773	.771
CFI	.778	.776
AIC	7778.077	7832.207

social capital, substance abuse appears to partially transmit its causal effect to depression or mediate the association between youth structural and cognitive social capital and depression, and (c) substance abuse and depression appear to co-exist or co-occur in the population of youths investigated. Subsequent analyses such as model analysis using the covariates and testing of hypotheses is based on the estimates derived from hypothesized model 2.

Model Analyses Using the Covariates

Time-invariant covariates comprised of gender and race are investigated in order to understand whether the associations among youth structural social capital, substance abuse, and depression and youth cognitive social capital, substance abuse, and depression differ for males and females and by race (White/Nonwhites). However, the statistical analysis using race is not conducted because studies (e.g., Almgern, et al. (2009)) found

that there is correlation or confounding effect in the interaction between race and social capital variables. Also, race may not be a useful variable for predicting health outcomes such as substance abuse and depression among adolescents. Thus, the covariate sex (male and female) is included in the hypothesized model 3 (see Figure 5a, p.152) to determine whether the effect of levels of youth social capital is more likely to predict exposure to substance abuse, and depression in males than in females, or vice versa.

The addition of the covariate in the model resulted to changes in the model such as the increase in the number of sample moments, number of parameters in the model, degrees of freedom, and the chi-square statistics. Thus, the hypothesized model 3 was evaluated again, and the statistical analyses examined included model fit-summary statistics and the regression weight estimates for males and females.

The Model-Fit-Summary Statistics

The SEM analysis indicates that minimum is achieved which implies that variances and covariances in the model are successfully estimated. The model fit estimates such as the Chi-square is statistically significant χ^2 (450) = 15460.413, *P* = .001 (see Appendix N). The Minimum Discrepancy ((CMIN) NPAR = 50, the CMIN = 7732.114), DF =, 226, *P* = .001, CMIN/DF= 34.213). The Baseline Comparison (NFI (Delta1) =.771, RFI (rho1) = .734, IFI (Delta2) = .776, TLI (rho2) = .748, and CFI = .776) .The Parsimony-Adjusted measures (PRATIO = .889, PNFI = .686 and PCFI = .690). Also, the RMSEA = .031, the 90 percent CI, (LO =.030 – HI = .031), PCLOSE = 1.000. These predictive indexes indicate that there is a good fit between the model and the data.

Regression Weight Estimates for Males

The regression weight estimates consist of the analyses of standardized and unstandardized (see Appendix O) regression weight, standard error, critical ratio, and probability value.

The Standardized Regression Weight Estimates of the Structural Model for Males

The standardized regression weight estimate for substance abuse and youth structural social capital (SSC) is -.12, and is significantly different from zero (P = .001) (see Table 30). The inverse sign indicates that one standard deviation increase in youth structural social capital predicts a .012 standard deviation decline in substance abuse.

Table 30

Standardized Regression Weight Estimates of the Structural Model for Males

Variables	Estimates	P
DEPRESSION<----------SSC	-.20	***
SUBSTANCE ABUSE<----------SSC	-.12	***
SUBSTANCE ABUSE<----------CSC	-.17	***
DEPRESSION<----------CSC	-.01	.162

The regression weight estimate for depression and youth cognitive social capital (CSP) is -.01 and is not statistically different from zero (P = .162). Likewise, the regression weight estimate for depression and structural social capital is -.20, and is significantly different from zero (P = .001). The result indicates that one standard deviation increase in youth structural social capital predicts a .020 standard deviation decrease in depression. The regression weight estimate for substance abuse and cognitive social capital is -.17. This

result is significantly different from zero (*P* = .001). Also, it indicates that one standard deviation increase in youth cognitive social capital predicts .017 standard deviation declines in substance abuse.

The Standardized Regression Weight Estimates of the Measurement Model for Males

The standardized regression weight estimate for the latent variable (SSC) and the measurement variable "NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES" is.68 (see Table 3)1. This result is significantly different from zero (*P*=.001), and can be interpreted as one standard deviation increase in youth cognitive social capital predicts a .081 standard deviation increase in the measurement variable.

The standardized regression weight estimate for the latent variable (CSC) and the measurement variable "NFRDMJMON**:** YOUTH THINK: CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTHLY" is.81. This estimate is significantly different from zero (*P*=.001), and can be interpreted as one standard deviation increase in youth cognitive social capital predicts a .081 standard deviation increase in the measurement variable. Also, the regression weight estimate for the latent variable (CSC) and the measurement variable **"**NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAS 1-2 ALCOHOL/DAY" is .78. This result which is significantly different from zero (*P*=.001), and can be interpreted as one standard deviation increase in youth cognitive social capital predicts a .78 standard deviation increase in the measurement variable. All other estimates in the measurement model can be interpreted in the same way.

Table 31

Standardized Regression Weight Estimates of the Measurement Model for Males

Variables	Estimates	P
Structural Social Capital (SSC)		
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SSC	.68	***
NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH<----------SSC	.73	***
NSTNDALC STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SSC	.73	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<----------SSC	.64	***
Cognitive Social Capital (CSC)		
NFRDMJMON: YOUTH THINK:CLOSE FRIENDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY<-----CSC	.81	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSC	.78	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSC	.75	***
NPRMJEVR2: YOUTH.THINK: PARENTS FEEL ABOUT. YOUTH TRY MARIJUANA/HASH<----------CSC	.36	***
Substance Abuse (SB)		
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.49	***
NALCFMCTD: CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEND <----------SB	.71	***

Table 31-Continued

Variables	Estimates	P
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS<----------SB	.58	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS<----------SB	.47	***
NMRJFMCTD: CONTINUED TO USE MARI-JUANA DESPITE PROBLEMS WITH/ FAMILY/FRIENDS<----------SB	.94	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	.85	***
Depression (DPS)		
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.93	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.91	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <-----DPS	.86	***
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.94	***
NYO_MDEA5:OTHERS NOTICED THAT YOUARE RESTLESS OR LETHARGIC<----------DPS	.75	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.93	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	.95	***
NYO_MDEA9 "ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	.86	***

Regression Weight Estimates for Females

The standardized regression weight estimates for females, like the estimates for males involve the analyses of the standardized and unstandardized (see Appendix P) regression estimates, the standard error, critical ratio, and the probability levels.

The Standardized Regression Weight Estimates of the Structural Model for Females

The standardized regression weight estimate for substance abuse and youth structural social capital (SSC) is -.12, and is significantly different from zero (P = .001). The inverse sign indicates that one standard deviation increase in youth structural social capital predicts a .012 standard deviations decline in substance abuse in adolescents (see Table 32). Also, the derived regression weight estimate for depression and youth cognitive social capital (CSC) is -.01. However, this result is not significantly different from zero (P= .162).

Table 32

Standardized Regression Weight Estimates of the Structural Model for Females

Variables	Estimates	P
DEPRESSION<----------SSC	-.20	***
SUBSTANCE ABUSE<----------SSC	-.12	***
SUBSTANCE ABUSE<----------CSC	-.17	***
DEPRESSION<----------CSC	-.01	.162

Additionally, the regression weight estimate for depression and structural social capital is -.20. This result is significantly different from zero (P = .001). Thus, it indicates that when youth structural social capital increases by one standard deviation depression

declines by .020. The regression weight estimate for substance abuse and cognitive social capital is -.17, and is significantly different from zero, (*P* = .001). This indicates that when youth cognitive social capital increases by one standard deviation substance abuse declines by .017.

The Standardized Regression Weight Estimates of the Measurement Model for Females

In Table 33, the standardized regression weight estimate for cognitive social capital (CSC) and the measurement variable "NFRDPCIG2**:** YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY is .75, and is significantly different from zero (*P* = .001). This result can be interpreted as one standard deviation increases in youth cognitive social capital predicts a .075 standard deviations increase in the measurement variable. Also, the regression weight estimate for the latent variable (CSC) and the measurement variable **"**NPRMJEVR2**:**YOUTH.THINK: PARENTS FEEL ABOUT. YOUTH TRY MARIJUANA/HASH" is .36. This result is significantly different from zero, (*P* = .001) and can be interpreted as one standard deviation increase in youth cognitive social capital predicts a .036 standard deviations increase in the measurement variable. Additionally, the regression weight estimate of substance abuse (SB) and the measurement variable **"**NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS" is .49. This result is significantly different from zero (*P* = .001) and can be interpreted as one standard deviation increases in substance abuse predicts a .049 standard deviation increases in the measurement variable. The regression weight estimate for the variables NALCFMCTD**:** CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEDND and substance abuse (SB) is .71 and be interpreted as one standard deviation increases in substance abuse predicts a .071 standard deviation

Table 33

Standardized Regression Weight Estimates of the Measurement Model for Females

Variables	Estimates	P
Structural Social Capital(SSC)		
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SSC	.68	***
NSTNDSMJ STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH<----------SSC	.73	***
NSTNDALC STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SSC	.73	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<----------SSC	.64	***
Cognitive Social Capital (CSC)		
NFRDMJMON: YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY<----------CSC	.81	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSC	.78	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSC	.75	***
NPRMJEVR2: YOUTH.THINK: PARENTS FEEL ABOUT. YOUTH TRY MARIJUANA/HASH<----------CSC	.36	***
Substance Abuse (SB)		
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.49	***
NALCFMCTD: CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEND <----------SB	.71	***

Table 33-Continued

Variables	Estimates	P
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS<----------SB	.58	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS<----------SB	.47	***
NMRJFMCTD: CONTINUED TO USE MARI-JUANA DESPITE PROBLEMS WITH/ FAMILY/FRIENDS<----------SB	.94	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	.85	***
Depression (DPS)		
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.93	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.91	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <-----DPS	.86	***
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.94	***
NYO_MDEA5:OTHERS NOTICED THAT YOUARE RESTLESS OR LETHARGIC<----------DPS	.75	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.93	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	.95	***
NYO_MDEA9 "ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	.86	***

increases in the measurement variable. All other regression weight estimates in the model can be interpreted in the same way.

Testing of Hypotheses

Hypothesis number 1: Adolescents who have low levels of cognitive social capital are more likely to have depression than adolescents who have high levels of cognitive social capital.

In Figure 3b (p .144), the path of association and the standardized regression weight estimates of the association between youth cognitive social capital and depression is -.002. This result is not significantly different from zero and appears to indicate that the association between these variables is not important in the model or there is no relationship between the variables. Thus, the association between youth cognitive social capital and depression is inconsistent with the hypothesis.

Hypothesis number 2: Adolescents who have low levels of cognitive social capital are more likely to experience substance abuse than adolescents who have high levels of cognitive social capital

The path and the standardized regression weight between youth cognitive social capital and substance abuse in Figure 3b (p. 144), is -.17. The derived inverse estimate is statistically significant and indicates an association between these variables. This result indicates that youths who have high levels of youth cognitive social capital are less likely to abuse substances. On the other hand, youths who have low levels of youth cognitive social capital are more likely to experience substance abuse. Thus, this result is consistent with the hypothesis.

Hypothesis number 3: Adolescents who have low levels of structural social capital are more likely to have depression than adolescents who have high levels structural social capital.

In Figure 3b (p.144), the regression path and the standardized regression weight between youth structural social capital and depression is -.20. This inverse regression weight estimate is

statistically significant and indicates that there is an association between these variables. Thus, the result indicates that youths who have high levels of youth structural social capital are less likely to have depression. On the other hand, youths who have low levels of structural social capital are more likely to have depression. This result is consistent with the hypothesis.

Hypothesis number 4: Adolescents who have low levels of structural social capital are more likely to experience substance abuse than adolescents who have high levels of structural social capital.

In Figure 3b (p.144), the regression path and the standardized regression weight between youth structural social capital and substance abuse is -.12. This inverse regression weight is statistically significant and indicates an association between these variables. This result is interpreted that adolescents who have high levels of structural social capital are less likely to abuse substances. On the other hand, adolescents who have low levels of youth structural social capital are more likely to abuse substances. This result is consistent with the hypothesis.

Hypothesis number 5:.Adolescents who experienced substance abuse are more likely to have depression than adolescents who did not experience substance abuse.

The hypothesized model 2, Figure 3b (p.144), indicates the path and standardized regression weight estimate between substance abuse and depression and a revised regression path between depression and substance abuse is .06. This result appears to indicate that in combination with youth structural and cognitive social capital, youths who experienced substance abuse are likely to have depression. Also, youths who experienced depression are likely to abuse substances. Thus, this result is consistent with the hypothesis.

Hypothesis number 6: The effects of youth cognitive social capital on depression are the same for males and females.

The path of association between youth cognitive social capital and depression in Figure 5b (p.161), and the standardized regression weight estimates of the structural model in Table 30, (p.173) and Table 32, (p.176) is -.01 for both males and females. These results are not significantly different from zero. The results indicate that the effects of youth

cognitive social capital on depression for both males and females are the same. These results are consistent with the hypothesis.

Hypothesis number 7: The effects of youth cognitive social capital on substance abuse are the same for males and females.

The path of association between youth cognitive social capital and substance abuse in Figure 5b (p. 161), and the standardized regression weight estimates of the structural model in Table 30, (p.173), and Table 32, (p.176) is-.17 for both males and females. The results are significantly different from zero and show that the effects of youth cognitive social capital on substance abuse are not different for the male and female adolescents in the study. The results are consistent with the hypothesis.

Hypothesis number 8: The effects of youth structural social capital on depression are the same for males and females.

The path of association between youth structural social capital and depression in Figure 5b (p.161), and the standardized regression weight estimates of the structural model in Table 30, (p.173) and Table 32, (p.176) is -.20 for both males and females. The results are significantly different from zero and indicate that the effects of youth structural social capital on depression are the same for males and females. These results are consistent with the hypothesis.

Hypothesis number 9: The effects of youth structural social capital on substance abuse are the same for males and females.

The predicted standardized regression weight estimates in Table 30 (p.173), and Table 32 (p.176), and the path of association between youth structural social capital and substance abuse in Figure 5b (p.161), is -.12, for both males and females. These results are significantly different from zero and indicate that the effects of youth structural social capital on substance abuse are the same for male and female adolescents. Thus, these results are consistent with the hypothesis.

Hypothesis number 10: Substance abuse is an intervening variable that mediates the association between youth cognitive social capital and depression.

In Figure 3b, (p.144), hypothesized model 2, youth cognitive social capital, seems to have statistical significant direct association with substance abuse and non-significant direct

association with depression. Additionally, in Table 24, (p. 155), youth cognitive social capital has indirect effects on depression (-.010). These results seem to indicate that substance abuse transmits causal effect or partially mediates the association between youth cognitive social capital and depression. Thus, these results are consistent with the hypothesis.

H10: Substance abuse is an intervening variable which mediates the association between youth structural social capital and depression

In Figure 3b (p.144), hypothesized model 2, youth structural social capital, seems to have statistically significant direct association with substance abuse and depression. Additionally, in Table 24, (p. 155), the indirect effects of youth structural social capital on depression are -.007. These results appear to indicate that substance abuse transmits causal effect or partially mediates the association between youth structural social capital and depression. Thus, these results are consistent with the hypothesis.

Key Findings

The standardized regression weight estimates indicate that there are inverse associations between: youth structural social capital and substance abuse and youth structural social capital and depression. These results imply that high levels of youth structural social capital predict less likelihood of substance abuse and depression in adolescents. On the other hand, low levels of structural social capital predict more likelihood of substance abuse and depression in adolescents. Additionally, youth cognitive social capital has an inverse association with substance abuse, which indicates the likelihood of substance abuse as a result of low levels of cognitive social capital. However, youth cognitive social capital appears to have a non-statistically significant relationship with depression.

The model predictive fit indexes in Table 29 (p.170), (e.g.,, the chi-square, NFI, CFI, and the AIC) indicate that the hypothesized model 2, Figure 4a and hypothesized

model 3, Figure 5a seem to be the same and are more likely to be replicated than hypothesized model 1 in a hypothetical study using a randomly selected sample size of the same population. Also, regarding the associations among the latent variables in the structural model, youth cognitive and structural social capital appear to have direct relationships with substance abuse and depression in the population of adolescents investigated. These outcomes indicate that youths who have low levels of structural and cognitive social capital are more likely to have substance abuse and depression. Also, in Table 24 (p.155), it appears that substance abuse transmits causal effects to depression. However, hypothesized model 3, Figure 5b (p.161), seems to indicate that youths who abuse substances experience symptoms of depression simultaneously. Thus, substance abuse may predict depression, and depression, in turn, may be a predictor of substance abuse. These symptoms co-occur and co-exist in adolescents.

For the population of adolescents investigated in this study, the regression path and the standardized regression weight estimates in Table 30 (p.173), and Table 32 (p.176), indicate that the effects of youth structural social capital on substance abuse and depression are statistically significant and the same for both male and female adolescents. Also, the effect of youth cognitive social capital on substance abuse is statistically significant and the same for both males and females. On the other hand, the effect of youth cognitive social capital on depression is not statistically significant for both males and females. These findings indicate that for youths who have low levels of cognitive or structural, social capital, the consequences may include risky health choices and outcomes such as substance abuse and depression irrespective of sex of the adolescents.

Discussion

The findings derived from statistical estimates confirmed theoretical and empirical results and conclusions from previous studies and extended the scope of research on youth social capital. Additionally, it offers some implications concerning the effects of social capital on health outcomes in adolescents. One of the objectives of this dissertation is to predict the associations among youth structural and cognitive social capital, substance abuse, and depression in adolescents. Ferlander (2004), Litwin (2011), Hamano, et al. (2010), Aslund, et al. (2010), Fitzpatrick, et al. (2005), and Winstanley, et al (2008) have found that structural and cognitive social capital are associated with health outcomes in adults and adolescents such as substance use and depressive symptomology.

The CFA factorial validity assessment of youth experience variables in the NSDUH 2009 indicated that youth cognitive and structural social capital variables represented the domains or components of social capital. These components of social capital constitute the risk factors associated with substance abuse and depression for the population of youths investigated. Among the key hypotheses considered in this research includes whether youths who have low levels of cognitive and structural social capital are likely to have substance abuse and depression.

For hypotheses one to four, using the computed standardized regression weight estimates, I analyze statistical results of the relationship of youth cognitive social capital to substance abuse and to depression; and of youth structural social capital to substance abuse and to depression in adolescents. These statistical outcomes reveal as follows: there is a statistical significant regression weight estimate between youth cognitive social capital and substance abuse, youth structural social capital and substance abuse, and

youth structural social capital and depression. These regression estimates indicate that there are associations among these latent variables. It is inferred from these results that youth cognitive and structural social capital may be regarded as one of the psychosocial factors leading to substance abuse and depression (mental illnesses) in adolescents. In this situation, low levels of youth cognitive and structural social capital may result in the likelihood of substance abuse, and depression. On the other hand, high levels of youth cognitive social capital may predict less likelihood of substance abuse and depression.

In this study, the definition of mental illness (e.g., depression) is limited to diagnosable mental, behavioral, or emotional disorders (excluding developmental and substance use disorder) (DSM-IV, APA, 1994). An analysis of the total variability of the model as indicated by the RMSEA, Table 29 (p 170), regarding how well youth cognitive and structural social capital predicts variations in depression and substance may have been affected by the scope of items that defined mental illness in the NSDUH. For example, the scope of definition of depression, which excluded developmental (biological and genetic factors), may have affected associations among the variables in the model. Likewise, the residual estimate may be an indication that youth cognitive and structural social capital is not the only predictor of symptoms of MDE and substance abuse. On the other hand, the variability of the model may be related to problems concerning the relationships between symptoms of MDE and cognitive social capital variables.

Youth cognitive social capital variables express feelings of emotional conditions, and symptoms of MDE (depression) in the DSM-IV (p. 99) are operationalized by items relating to emotional characteristics. These emotional related variables highly associate and correlate (Meehl, 1978; Ingram, 1998) and result in confounding effect and

correlation between cognitive social capital and depression variables. Studies exploring social-cognitive relations have been found to be vulnerable and are known or believed to be correlated (Ingram, 1989). Based on the correlations between these variables, it can be suggested that the relationships between these variables may be confounding the impact of youth social capital on depression in the models and affecting the ability of the variable to predict depression. Additional problem associated with emotional related variables that may have affected the association among the variables in the model are methodological issues inherent in the nonspecificity of scales of measurement of index symptoms of depression (Dobson, 1985).

Therefore, the finding of a non-significant association between youth cognitive social capital and depression may be associated with the correlation and confounding effect of youth cognitive social capital and symptoms of MDE (depression) in the model. The confounding effect has implications in providing potential treatment for clinical depression; for example, it may compound understanding cognitive social capital variables that influence or moderate depression and help the design of effective treatments to reduce mental illness in youths.

Regarding the scope of definition of depression in the NSDUH 2009, that is, if developmental variables such as biological and genetic factors are included among the items that defined depression, would the same results be obtained? This is not investigated in this study; however, it can be noted that bioecological theory states that development processes in youths occur through complex interactions among "biopsychosocial"factors consisting of human beings (the parents), objects, symbols, and proximal and distal environments (Abrams, Theberge, & Orv, 2005). These factors, in

turn, affect youths' characteristics such as physical health, temperament, personality, development abilities, strengths, coping skills, and vulnerabilities (Abrams et al. 2005). For example, youths may be affected by stressed parents or negative family issues which influence early parenting during youths' development leading to substance abuse and depression. It is not certain whether the theoretical relationships among these factors relates with youth social capital or may empirically predict substance abuse and depression in youths.

On the other hand, it is unlikely that different results may be derived if other data sources or surveys are analyzed for this research. This may be attributed to methodological differences in the NSDUH and other surveys or data sources, for example, NCS, NCS-R, and NESARC. These methodological differences are comprised of things including the time of survey administration and targeted population, etc. (SAMSHA, 2009).

Overall, the finding of associations among youth social structural and cognitive social capital and substance abuse is consistent with results derived by Hamano, et al. (2010) and De Silva (2006). These empirical works suggest that youth social capital consists of a process of interactions of youths with his or her proximal and distal environments. The proximal environment is comprised of relationships with parents and the family nested in the communities comprised of peers and friends. These proximal and distal variables play important roles in adolescents' health outcomes and consist of trajectories of substance abuse and depression in adolescents. In this study, the distal variable constitutes the major trajectory to substance abuse and depression. On the other hand, these trajectories can be utilized for intervention to reduce adverse health choice

and outcomes and to counterbalance the risks of substance abuse and depression in adolescents.

In this dissertation research, youth cognitive social capital is operationalized by four variables that relate to what youths think peers and friends feel (perceptions) about youth substance use; for example, alcohol, marijuana etc. These variables, particularly those related to what friends feel about youth use of substances account for the largest predictors of substance abuse in adolescents. This result affirms the existence of trajectories of adolescent onset substance use from sources such as friends, and peers (Martino, Ellickson, & McCaffrey, 2009) and theories of adolescents' drinking behavior (Simon-Morton & Chen, 2005; Henry, Slater, & Oetting, 2005). These studies emphasize that there are associations between the number of friends who drink and adolescent drinking behavior, referred to as the social influence model of drug or alcohol abuse. In addition, the socialization and selection effects, which suggest that youths who drink, or are inclined to drink, tend to seek out peers who are similarly inclined to drink (Martino, et al. 2009).

The findings from this study and those of previous studies may have demonstrated that friends and peers play important roles in adolescent substance abuse and depression (Brook, et al.1989; Zimmerman, & Arunkumar, 1994) and has highlighted the etiology of substance abuse and depression in youths. Regarding the interventions to address substance abuse and depression, these results underscored the importance of community-based institutions and activities such as boys/girls scout, big brothers/big sisters, schools, and health care organizations for health promotions (Sloboda, et al. 2009). The result of the study, which suggests that interventions that include components of improving of

social capital to reduce illicit drug use and depression among youths, seems to supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) funding and the use of community-based prevention programs including Midwestern Prevention Projects and Skill, Opportunity and Recognition (Sloboda, et al. 2009) to target illicit drug use among youths.

The benefits of community-based institutions include moderating adverse health behaviors and, providing supportive care and opportunity for self-evaluation from other youths. These may help to improve health choices, attitudes, and outcomes (Winstanley, et al. 2008; Sloboda, et al.2009). Also, utilizing community-based institutions for drug prevention strategy for youths may play important roles in engaging the whole community as partner in research and effective dissemination strategy to promote healthy behaviors and reduce the menace of substance abuse and depression among youths.

On the other hand, peer pressure and social desirability behaviors resulting from civic participation may contribute to substance abuse and depression. In order to counter peer influence, it has been suggested that protective roles of civic participation can be maximized by ensuring that adult or selected members of community organizations assume managerial or supervisory roles and understand the activity roles that moderate risky adolescent health choices, such as substance abuse (Winstanley, et al. 2008; Hamano, et al.2010).

Additionally, in hypothesis number five, I tested whether adolescents who experienced substance abuse are more likely to have symptoms of depression than adolescents who did not experience substance abuse. The fitted SEM models do not provide a conclusive result on the direction of association between substance abuse and

depression, that is, whether substance abuse predicts depression or depression predicts substance abuse. This finding is consistent with the earlier studies by Bukstein, Brent, and Kaminer, (1989), which note that depression may lead to substance abuse or substance abuse to depression, and both of these can be predicted by a third factor such as environmental or genetic factor, which may exacerbate the variables in the same ways. In this study, the third factor consists of youth cognitive and structural social capital. The magnitude of effect's size of youth cognitive and structural social capital on substance abuse and depression indicate that these exogenous variables affect substance abuse and depression in the same ways.

It has been suggested that longitudinal studies are well suited for studying the nature of association between substance abuse and depression (Wu, Hoven, Liu, Fuller, Fan, Musa, Wicks, Mandell, and Cook, 2008). Also, few studies have investigated the co-occurring relationships between substance abuse and depression using a longitudinal method (Wu, et al. 2008). Windel and Windel (2001) find that there is a balanced reciprocal relationship between cigarette smoking and symptoms of depression. For example, for the youths examined in the study, high levels of cigarette smoking or symptoms of depression in the 10^{th} or 11^{th} grade are associated with a 1.5 increase in depression in later years. Even though this dissertation research is a cross-sectional study, the tested SEM model, which postulates comorbidity of substance abuse and depression in the presence of youth cognitive and structural social capital, is affirmed by the longitudinal study.

In hypotheses six to nine, I examined whether the effects of youth structural and cognitive social capital on substance abuse and depression are the same for males and

females. The standardized regression weight estimates indicate invariance of standardized regression weight estimates among these variables for male and female adolescents. Several explanations can be deduced from these results. First, low sample distribution of youths who reported past year marijuana and alcohol use may have impacted detection of any statistical differences when analyzed for males and females

Additionally, reasons for the low sample distribution of youths who reported past year abuse of alcohol and marijuana may be attributed to the Government's restriction of the legal age for substance use (for example, drinking alcohol) in the USA. However, this study does not have any evidence of whether this policy has been empirically associated with low substance use among youths. Second, youth social capital can be regarded as one of the early childhood developmental factors or experiences and has the same impact on youths irrespective of their sex. A study by Zimmerman and Arunkumar (1994) notes that in childhood development, there are correlations between hopelessness and futility, risks and problems including substance abuse and depression regardless of whether the victim is male or female.

This research is not able to identify previous empirical studies to compare whether the effect of youth social capital and health outcomes such as substance abuse and depression differ for male and female adolescents. A related study by Hasin, et al (1996) of patients aged 40 years treated for alcoholism and depression, find that remission from alcoholism and depression are higher among females than males. However, it is not clear what were the predictors or contexts in which these outcomes occurred (Mezulis, Hyde, & Abramson, 2006). Other studies on this subject matter, for example, Crum, et al. (1999), find that males more than females are likely to be offered

drugs (those in sixth through eighth grade). However, the focus of this study is on the association of youth social capital, substance abuse, and depression, which are in existence at a point in time, and not an analysis of frequency of access to substance abuse and depression.

Also, individual level factors such as low-income levels have been found to influence marijuana use in females (aged18 to 31) more than males. Additionally, covariates including neighborhood disadvantages (that is, crime or violent neighborhood) age, education level, employment status (working part time or at a minimum wage and living independent at an earlier age) have been found to significantly predict illicit drug use in young adults (Kessler, Sonnega, Bromet, Hughes, &Nesson, 1995; Sunder, Grady, & Wu, 2007). This dissertation does not examine these covariates, and it is unlikely that differences will be found for youths age 12 to 17.

The final hypothesis tested examines whether substance abuse mediates the association between youth structural and cognitive social capital and depression. The hypothesized recursive model 2, Figure 3b (p.144), and Table 24 (p.155), indicate that substance abuse may be an intervening variable between youth structural and cognitive social capital and depression. However, there is dual or co-occurring association between substance abuse and depression indicating that youths who lack cognitive and structural social capital may be susceptible to substance abuse and depression simultaneously. Thus, it is likely that one of these conditions, substance abuse or depression, may have a direct causative effect on the other. .This finding has important implications for interventions of substance abuse and depression in adolescents. First, in order to address these health outcomes, for example, substance abuse there is need to identify its sources

(for example, peers and friends), and programs can be designed to minimize these sources, which may in turn reduce occurrence of depression or vice versa.

Research has shown that substance abuse and depression have overlapping symptoms. For example, there is a resemblance of intoxication and withdrawal effects of substance abuse in patients who experience symptoms of psychiatric disorder (e.g., depression) (Hasin, et al. 2006). As a result of complications of diagnosis of psychiatric disorders among substance abusers, it cannot be determined with certainty which of these conditions is a direct causal of the other for this population of youths under investigation. Diagnostic instruments such as the *DSM-1V* are designed to provide researchers with guidelines for differentiating independent and substance-induced disorders for individuals with histories of substance use disorders (Hasin, et al. 2006), however, diagnoses of major depressive disorder in substance abusers have been problematic as both illnesses have been found to co-occur frequently in the clinical and general population (Hasin, Nunes, & Meydan, 2004).

Despite these problems, the effects of youth cognitive and structural social capital on substance abuse and depression underscore the importance of addressing youth social capital in adolescent health outcomes. The finding from this study may help in prevention and evaluation research in development of action theory of intervention. For example, the identification of low levels of youth cognitive social capital may be evidence of the existence of risk factors in youths. Invariably, this will lead to the development of intervention such as emotional support that may help to alter trajectories that lead to substance abuse and depression (Mackinnon, Taborga, Morgan-Lopez, 2002).

Most empirical studies that investigate the associations of youth social capital, substance use, and depression in adolescents and adults involve individual-level (or aggregated variable) analyses using bivariate or multiple logistics regression methods (Crum, et al. 1996; Fitzpatrick et al. 2005; Winstanley et al. 2008; Litwin, 2011; Hamano, et al.2010). In this study, using the SEM approach provides this research the ability to predict relationships among the latent variables instead of a separate number of observed (aggregated) variables. Also, it allows this research to design models, investigate, and gain understanding on the nature of association among the latent variables.

Summary

The SEM statistical analyses conducted in this chapter are set forth to test hypotheses and answer the research questions. The analyses conducted utilize the standardized regression weight estimates to predict: (a) whether there are associations between youth structural and cognitive social capital and depression or youth cognitive and structural social capital and substance abuse, (b) substance abuse and depression, (c) whether the effects of youth structural and cognitive social capital, substance abuse, and depression are the same for males and females, and (d) whether substance abuse mediates the association between youth cognitive and structural social capital and depression. The findings and discussions of what are known and what can be learned from these statistical analyses is described.

CHAPTER V

CONCLUSION

This chapter consists of four sections including: summary of the study; the limitations; the implications of the study for evaluation research with focus on practice, theory, and policy; recommendations of areas of additional or future research; and the concluding summary.

Summary of the Study

The correlates and predictors of substance abuse and depression in adolescents have been associated with youth structural and cognitive social capital (Winstanley et al. 2008; Szreter and Woolcook, 2000; Aslund, et al.2010). Theoretical analysis of the social capital construct indicates that it is comprised of two components: structural and cognitive (Ferlander, 2007). Most empirical research has focused on the association of structural social capital and health outcomes; for example, substance dependence or use and access to treatment (Winstanley at al. 2008; Litwin, 2011). Research on social capital has been limited to structural social capital or individual-level analysis. The objectives of this dissertation are to examine whether youth cognitive (group-level analysis) and structural social capital (individual-level) predict substance abuse and depression in adolescents, to understand the relative impacts of youth cognitive and structural social capital on substance abuse and depression, and to determine the nature of association between youth cognitive and structural social capital, substance abuse, and depression. The larger goal is to understand the risk factors that influence substance abuse and depression in adolescents.

The literature review of social capital indicates that the concept has vast applications in the field of social sciences. Due to its wide usage in research, there is a need to specify the context in which it is applied (Ferlander, 2007). In this study, social capital is utilized to examine social factors that influence and moderate substance abuse or depression in adolescents. The literature review of substance abuse and depression indicates that these variables may be co-occurring elements of mental illness. At the clinical levels, the difficulty of classification and diagnoses of substance abuse and depression is attributed to the overlapping of symptoms of substance abuse and depression. The *DSM-1V* criteria are used for screening prevalence of substance abuse and depression for the population of youths examined in the study.

The stochastic regression imputation method is conducted to address problems of incomplete data in the NSDUH (2009) survey. Also, the CFA procedure is conducted to assess the validity of observed measures of youth experiences, substance abuse, and depression. The CFA procedure indicates that eight observed variables of youth experiences (four for cognitive and structural social capital respectively) legitimately define youth social capital based on criteria such as regression weight coefficients, standard error, critical ratios, and probability levels. Four selected indicators of youth experience variables, which have characteristics and content related to what youths think friends and peers feel (perceptions) about youth substance use; for example, marijuana and alcohol are classified as youth cognitive social capital. Also, four selected youth experience variables, which have characteristics and content related to student participation in youth grades (or membership) are classified as youth structural social capital. These two variables are utilized as exogenous variables (Cohen and Wills, 1985;

SAMHDA, 2009). The CFA procedure indicates that the youth experience variables in the NSDUH (2009) consist of multidimensional constructs of social capital, structural and cognitive, and are used in the SEM model. Additionally, a factorial validity assessment of substance abuse and depression variables indicates that six variables and nine variables respectively, represent these constructs.

The analytical method consists of the generalized least squares (GLS) estimator in the Analysis Moment structure (AMOS) because the variables are binary scored. The proposed recursive regression (SEM) model is comprised of a structural model that consists of youth cognitive and structural social capital, substance abuse, and depression. The measurement model consists of eight indictors for youth cognitive and structural social capital (exogenous variables), six indicators of substance abuse (mediator variable) and nine indicators of depression (endogenous variable).

The standardized regression weight estimates indicate that there is an inverse statistically significant association of youth structural social capital with substance abuse and depression and of youth cognitive social capital with substance abuse. On the other hand, the association between youth cognitive social capital and depression is not statistically different from zero, which seems to indicate that there is no relationship between these variables. The inverse regression weight estimates between youth structural social capital, substance abuse, and depression and between youth cognitive social capital and substance abuse is interpreted as one standard deviation increase in levels of youth structural social capital predicts a standard deviation decreases in substance abuse and depression. Also, one standard deviation increase in youth cognitive social capital predicts a standard deviation decreases in substance abuse. Additionally,

the CFA model indicates the plausibility that in combination with youth social structural and cognitive social capital, substance abuse and depression seem to co-occur or co-exist in adolescents. In this case, substance abuse and depression may have direct causative effects on each other, but the nature of causal process is unclear. On the other hand, substance abuse seems to be a partial mediator that transmits the effects of youth structural and cognitive social capital on depression. Finally, the addition of a time-invariant covariate in the model (gender) does not change the values of the standardized regression weight estimates of these latent variables. This can be interpreted that the effect of youth structural and cognitive social capital on substance abuse and depression is the same for males and females. The findings from this dissertation research are interpreted with caution because of several limitations.

Limitations

The limitations in this study are comprised of constraints related to methodological issues and the data.

Methodological Constraints

Some necessary but not sufficient conditions for conducting SEM analysis such as preliminary identification of the hypothesized model are needed prior to the data collection. This dissertation utilizes secondary data of the National Survey of Drug Use and Health (NSDUH) (2009). The survey instrument for the data is not designed specifically for this study. Utilizing this secondary data presents some challenges; for example, high redundancy of item content and correlations among indicators of latent variables, particularly the variables associated with measurement of depression. Thus,

these problems may increase the measurement error and discrepancies between the observed data and the proposed model.

Additionally, utilizing a large sample of subjects is important in the study; however, it may impact the values of model fit summary indexes such as the values of chi-square, base comparisons, parsimony-adjustment measures, and root mean square error approximation (RMSEA). It has been observed that in SEM, large sample size tends to highlight small discrepancies between the observed data and predicted covariances in the model and may erroneously suggest that the model does not fit the data (Meyers, et al.2006). Sample sizes larger or equal to N = 5000 have been observed to cause the value of the chi-square to increase even when the differences between the observed and predicted covariances are small (Kline, 2011). Also, the measurements of the variables are based on past prevalence or occurrence of events, for example, past year youth social capital, past year substance abuse, and past year symptoms of depression. Thus, it is possible that the associations among the variables in the model may be influenced by omitted variables.

The statistical results and evidence from prior biomedical studies show that the relationship between substance abuse and depression is unclear. Regarding the design of this study, the exogenous variables (youth cognitive and structural social capital) are not manipulated; the participants were not randomly assigned to groups, (experiment and control groups) in order to determine whether levels of youth cognitive and structural social capital predict substance abuse and depression, and to determine a causal relationship between depression and substance abuse. On the other hand, substance abuse and depression in adolescents can predict low levels of social capital in adolescents. In

other words, the association between levels of youth cognitive and structural social capital, substance abuse, and depression may have reverse causation.

Data Constraints

The NSDUH (2009) survey consists of self-reported data of youths. The validity of information provided by youths; for example, regarding their relationships with peers and friends, may be inaccurate and questionable. Additionally, youths who report "YES" and "NO" to past year substance abuse and symptoms of depression may be biased or may have provided socially desirable information on these sensitive subject matters. These constraints may lead to methodological bias in the study.

Implications of the Study for Research Evaluation

Despite the recognized limitations of this study, it poses several implications for research evaluation practice, theory, and policy on youth social capital, substance abuse, and symptoms of depression. The implications described below are intended to generate ideas and focus attention to the etiology and risk factors associated with adolescents' mental illness and programs that can be used to address these risk factors.

Research Evaluation Theory and Practice

This dissertation may not make a major contribution to evaluation theory. The constructs of social structural and cognitive capital are widely used in social science research (Ferlander, 2004), though these are not much used in evaluation of social programs. The analyses presented in this dissertation research indicate that youth social structural and cognitive social capital may be helpful in research evaluation in understanding the origin of substance abuse and depression in adolescents. Additionally,

it is likely that adolescent health problems beyond the ones examined in this study (e.g., obesity, crime, violence, and teen pregnancy), which in part, constitute serious public health problems, may be associated with a lack of youth social capital. Thus, it may be essential to incorporate the framework of youth social capital in programs designed to improve individual and community health care delivery strategies.

This dissertation may extend the scope of methodological work on social capital in adolescents (a population understudied in research on social capital) and exposure to substance abuse and depression. The use of SEM to analyze simultaneously the associations among the latent variables provides this study with a clear and precise understanding of how these latent variables associate with one another and the nature of associations between individual observed variables and the constructs. Previous studies have utilized methods such as the bivariate or multiple logistic regression to predict the associations between individual or aggregated observed variables. This approach constrains analyses and findings to observed variables and limits understanding of interactions among the latent variables. The SEM approach is more consistent with how these health phenomena manifest and are investigated in biomedical research. Thus, conceptualizing the observed variables in terms of latent variables may be important because these risk factors have substantial effect and are easier to address when occurring together with other risk factors than when examined in isolation.

In the sample of youths investigated in this study, the findings confirm empirical and theoretical frameworks regarding the existence of trajectories of substance abuse in adolescents. These consist of peers' and friends' perceptions regarding alcohol drinking, or marijuana use, and the manifestation of symptoms of depression in adolescents; for

example, sadness, feeling empty, and discouragement, loss of interest or pleasure in most things, tiredness and low energy, and feelings of worthlessness. These indicators offer concise signals of the risks of depression and exposure to substance abuse in adolescents. These insights may be used as a guide to developing interventions.

The study assumes explanation of causal associations among youth structural and cognitive social capital, substance abuse, and depression. This might be critical in evaluating health programs to reduce substance abuse and depression, and in general, evaluating programs to address social phenomena. The knowledge of these relationships can facilitate identifying interventions that can reduce or ameliorate substance abuse and depression. For example, addressing onset levels of social capital in adolescents may help to reduce the cost of prevention programs that target substance abuse and depression or other illnesses associated with substance abuse. Also, understanding the associations among these observed variables has the potential to reveal the causal processes that result in health behavior change; for example, smoking marijuana and drinking alcohol may lead to substance abuse and depression. This knowledge may be essential in designing efficient and effective interventions to ameliorate these symptoms in adolescents (Judd and Kenny, 1981; Mackinnon and Dwyer, 1993).

Research Evaluation Policy

A renewed shift of focus on research in social capital has increased in recent years. Notable examples include the use of the concept by the World Health Organization (WHO) as a policy initiative for human capital development in developing countries (Almedom, 2005). However, research on youth social capital and health is in its infancy. Therefore, greater funding is needed to increase the number of researchers studying

topics in youth social capital. An increased funding of research would likely help to shift focus from curative to preventative health care in adolescent and adult mental health.

Measures to reduce risk factors associated with low levels of youth structural and cognitive social capital, substance abuse, and depression may involve multi-level programs. This bolsters arguments for interventions such as optimal supportive care through community-outreach, schools, public health agencies, and family/parental engagements of youths (Zimmerman and Arunkumar, 1994). Developing and utilizing a comprehensive approach would alter these risk factors and contribute immensely to reducing substance abuse and depression in youths.

Concluding Summary

Several comparable studies have been done on social structural and cognitive capital and health outcomes. These studies focus on structural social capital; for example, individual participation in networks or social capital activities. These studies provide this dissertation with the understanding of associations between social capital and health outcomes such as illicit drug use and depressive symptoms. However, unlike the previous studies, this dissertation extends the scope of research on the subject matter by utilizing SEM to investigate the association among latent variables, i.e., youth cognitive and structural social capital, substance abuse, and depression. The method adopted in this study facilitates an in-depth understanding of associations among these latent variables. Youth social capital can be referred to as a developmental construct. Understanding how it may deteriorate may be vital in improving wellbeing in adolescents.

The statistical analysis method utilized in this dissertation provides an understanding of the nature of associations among these latent variables. For example,

youth cognitive and structural social capital predicts substance abuse and depression and substance abuse may mediate the association of youth cognitive and structural social capital and depression, and substance abuse and depression co-occur in adolescents. However, examining the process of causality between substance abuse and depression is inconclusive. Thus, in terms of treatment, adolescents who reported past year substance abuse or past year depression may need the same form of interventions.

Recommendations

The recommendations emerging from this study are discussed as follows: levels of analyses, longitudinal research, further research in social capital in different populations, and relative impact of structural and cognitive social capital on health outcomes, especially, substance abuse and depression.

Levels of Analyses

Further research needs to be focused on group attributes, such as, peers, friends, and parents (family) and other factors that influence or moderate substance abuse and depression in adolescents. Most previous studies have concentrated on individual-level analyses such as participation in social activities. Youths have been described as a "captive audience" (Wilcox, Arria, Caldeira, Vincent, Pinchevsky, & O'Grady, 2010). A group level analysis would help identify how social institutions like schools, communities, and public health agencies may be utilized to provide programs that help youths to sustain capacity against risk factors that have serious health consequences.

Longitudinal Studies

Most studies of youth social capital consist of cross-sectional analyses. This approach describes one period of analysis of social phenomenon and cannot be effectively utilized to analyze causal relationships and interactions. Future research based on longitudinal analysis would be needed to study youth social capital, how it develops, declines, and ultimately leads to adverse health outcomes such as substance abuse and depression.

Research in Social Capital in Different Populations

There is a sizeable knowledge gap in research on youth social capital. Thus, increased study of the subject matter is needed because youths tend to be more sensitive and vulnerable to influences from peers and friends as well as from physical and cognitive maturational changes (Aslund, et al.2010). Additionally, studies that examine social capital in different populations (e.g., age) will help to identify how social capital differs between age levels and affects health outcomes such as substance abuse and depression. In addition, studies of how social capital differs between populations will help to specify how it affects subjects in different ethnic groups, especially among populations where bicultural issues are part of developmental experiences for youths.

APPENDIX

The appendix was intended to provide detailed information of the CFA model-fit summary statistics. In the test of this dissertation, model-fit summaries, (i.e., the CMIN, Baseline comparisons, Parsimony-adjusted measures, and the RMSEA) were provided. The tables in this appendix provide comprehensive statistical outcomes of the CFA models.

A. Description of the Model-Fit Summary Indexes

The model fit in SEM was examined by unstandardized approximate fit indexes. The values of these indexes measured the fit of the hypothesized model and the data used in the study (Kline, 2011; Byrne, 2010). These fit indexes were scaled as measures of goodness-of-fit statistics and ranged from 0 to1, and higher values indicate close fit of the hypothesized model and the data. The four main fit indexes utilized in this study include: minimum discrepancy (CMIN), baseline comparisons, parsimony-adjusted measures, the root mean square error of approximation (RMSEA), and the Akaike information criterion (AIC) (Kline, 2011, Meyers, Gamst, & Guarino, 2006).

The minimum discrepancy (CMIN) included labels such as NPAR, CMIN, DF (degrees of freedom), P (probability value), and CMIN/DF. The CMIN, represented the chi-square (χ^2), and examined the difference (correlations/covariances) between the predicted and observed relationship in the model. The higher the probability value (P >.005) related to the CMIN, the closer the fit of the hypothesized model and the data, and *P*<.001, indicated inadequate fit between the data and the model. Large sample size may increase the value of the chi-square and its power to detect discrepancies between the observed

and the predicted covariances, which may indicate misfit between the hypothesized model and data (Meyers, et al.2006).

The baseline comparisons: This described the comparative indices of model fit. The labels, such as NFI and CFI, assessed the fit of the hypothesized model relative to an independent model or against some standards. The values of these indices ranged from 0 to 1, and values of .95 or larger were considered good model fit (Byrne, 2010).

The parsimony-adjusted measures: This fit index was computed in relation to NFI and CFI and addressed the issue of complexity of the model. Thus, the model's complexity evaluation labels included PRATIO, the NFI, and CFI, which related to the initial parsimony ratios in the baseline comparison test. Large values of PNFI and PCFI, (.95) indicate good model fit with the data (Byrne, 2010).

The root means square error of approximation (RMSEA) consists of the average of the residuals between the observed (correlation/covariances) from the sample and the population estimated in the model (Meyers, et al.2006; Byrne, 2010). The RMSEA values decline with larger degrees of freedom and larger sample size (Kline, 2011) and can be classified as follows: less than .08 indicate good fit; .08 to 1, moderate fit; and greater than 1 indicates poor model fit (Meyer, et al.2006).

The Akaike information criterion (AIC): This statistic was mainly used to select among competing nonhierarchical models that can be replicated with the data if run in another test. The model with smaller AIC value was considered more valid, most likely to be replicated, indicate relative better fit, and have fewer free parameters compared to the competing models (Kline, 2011). The AIC index was utilized in chapter four to evaluate

and select between three competing models examined regarding the association among youth social capital, substance abuse, and depression in adolescents.

Table B.

Model-Fit-Summary Statistics for Youth Experience Variables

Computation of degrees of freedom	
Number of distinct sample moments	1128
Number of distinct parameters estimated	91
Degrees of freedom (1128-91)	1037
Minimum was achieved	.
Chi-square	46043.442
Degrees of freedom	1037
Probability level	.000
Number of variables in the model	96
Number of observed variables	47
Number of unobserved variables	49
Number of exogenous variables	49
Number of endogenous variables	47

Parameter summary	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	53	0	0	0	0	53
Labeled	0	0	0	0	0	0
Unlabeled	41	1	49	0	47	91
Total	94	1	49	0	47	144

Table B-Continued

CMIN-Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	91	46043.442	1037	.000	44.401
Saturated model	1128	.000	0		.
Independent model	47	56881.920	1081	. .	52,620
Zero model	0	416044.000	1128	.000	368.833.000

Baseline comparisons	NFI Delta1	RFI rho1	IFI Delta 2	TLI rho2	CFI
Default model	.191	.156	.194	.159	.193
Saturated model	1.000	.	.1.000	.	1.000
Independent model	.000	.000	.000	.000	.000

Parsimony-Adjustment Measures	PRATIO	PNFI	PCFI
Default model	.959	.183	.186
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA	RMSEA	LO 90	HI90	PCLOSE
Default model	.050	.049	.050	.981
Independence model	.054	.054	.054	.000

Table C.

Unstandardized Regression Weight Estimates for Youth Experience Variables

Variables-Structural Factors	Estimates	Standard Error	Critical Ratio	P
NPRGDJOB2: PARENTS TELL YOUTH HAD DONE GOOD JOB IN PAST YEAR <----------S2	1.000			
NPRPROUD2: PARENTS TELL YOUTH PROUD OF THINGS DONE IN PAST YEAR <----------S2	-2.211	1.057	-2.092	.036

Table C-Continued

Variables-Structural Factors	Estimates	Standard Error	Critical Ratio	P
NARGUPAR: TIMES ARGUED/HAD A FIGHT WITH ONE PARENT IN PAST YEAR <----------S2	4.341	1.738	2.298	.012
NYOFIGHT2: YOUTH HAD SERIOUS FIGHT AT SCHOOL/WORK <----------S2	2.149	1.115	1.927	.054
NYOGRPFT2: YOUTH FOUGHT WITH/ GROUP VS OTHER GROUP <----------S2	2.077	1.007	2.063	.039
NYOHGUN2: YOUTH CARRIED A HANDGUN <----------S2	-575	.506	-1.137	.256
NYOSELL2: YOUTH SOLD ILLEGAL DRUGS <----------S2	-4.446	1.485	-2.994	.003
NYOSTOLE2: YOUTH STOLE/TRIED TO STEAL ITEM >$50<----------S2	-1.632	.770	-2.119	.034
NYOATTAK2: YOUTH. ATTACKEDWITH/ INTENT TO SERIOUSLY HARM <----------S	1.000			
NPRPKCIG2**:** YOUTH THINK: PARENTS FEEL ABOUT YOUTH SMOKE PACK CIGARETTE/DAY <----------S2	-.104	.655	-159	.874
NPRMJEVR2: YOUTH THINK: PARENTS FEEL ABOUT YOUTH TRY MARIJUANA/HASH <-----S2	3.987	1.413	2.821	.005
NPRMJMO: YOUTH THINK: PARENTS FEEL ABOUT YOUTH USE MARIJUANA/HASH MNTHLY <----------S2	3.243	1.180	2.748	.006
NPRALDLY2: YOUTH THINK: PARNTS FEEL ABOUT YOUTH DRINK 1-2 ALCOHOL BEVERAG/DAY<----------S2	-3.733	1.381	-2.702	.007
NPRTALK3: TALKED WITH PARENT ABOUT DANGER OFTOBACCO/ALCOHOL/DRUG<----S2	-1.090	1.087	-1.003	.316

Table C-Continued

Variables-Structural Factors	Estimates	Standard Error	Critical Ratio	P
NTALKPROB: WHO YOUTH TALKS WITH ABOUT SERIOUS PROBLEMS <----------S2	1.000			
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY <----------S2	51.267	15.871	3.230	.001
NFRDMJMON: YOUTH THINK:CLOSE FRIENDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONLY<----------S2	85.256	26.407	3.299	.001
NFRDMEVR2: YOUTH THINK CLOSE FRIENNDS FEEL ABOUT YOUTH TRY MARIJUANA/HASH<----------S2	89.389	27.684	3.229	.001
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PAC DAILY <----------S2	48.569	14.993	3.239	.001
NYFLMJMO: HOW YOUTH FEELS: PEERS USING MARIJUANA/HASH MONTHLY <---------S2	17.381	5.404	3.216	.001
NYFLTMRJ2: HOW YOUTH FEELS: PEERS TRY MARIJUANA/HASH<----------S2	24.624	7.542	3.265	.001
NYFLTMRJ2: HOW YOUTH FEELS: PEERS TRY MARIJUANA/ HASH<----------S2	24.624	7.542	3.265	.001
NYFLPKCG2: HOW YOUTH FEELS: PEERS SMOKE PACK/DAY CIGARETTE <----------S2	1.000			
NRLGIMPT: RELIGIUOS BELIEFS VERY IMPOR-TANT IN LIFE <----------S1	1.000			
NRLGDCSN: RELIGIOUS BELIEFS INFLUENCE LIFE DECISIONS <----------S1	1.523	.182	8.377	***

Table C-Continued

Variables-Structural Factors	Estimates	Standard Error	Critical Ratio	P
NYFLADLY2: HOW YOUTH FEELS: PEERS TRY MARIJUANA/HASH <----------S1	.126	.135	.930	.352
RLGFRND: IMPORTANT FOR FRIENDS TO SHARE RELIGIOUS BELIEFS <----------S1	1.267	.201	6.317	***
NRLGATTD: NUMBER OF TIMES ATTENDED RELIGIOUS SERVICES IN PAST YEAR <---------S1	.529	.172	3.078	.002
NANYEDUC3 YOUTH HAD ANY DRUG EDUCATION IN SCHOOL <----------S1	-3.085	.321	-9.620	***
NDRPRVME3 YOUTH SEEN DRUG PREVENTION MSG OUTSIDE SCHOOL <--------S1	-.681	.177	-3.843	***
NYTHACT2: YOUTH PARTICIPATED IN YOUTH ACTIVITIES <----------**S1**	-.326	.187	-1.743	.081
NPREGPGM2 PARTICIPATED IN PREGNANT /STD PREVENTION PROGRAM <----------S1	.466	.123	3.806	***
NGRPCNSL2: PARTICIPATED IN PROGRAM TO HELP SUBSTANCE ABUSE <----------S1	.358	.080	4.474	***
NPRVDRGO2: PARTICIPATED DRUG PREVE-NTION PROGRAM OUTSIDE SCHOOL <----------S1	.822	.138	5.974	***
NPRBSOLV2: PARTICIPATED.PROBLEM SLOVING/COMMICATION SKILL SELFESTEEM GROUP <----------S1	1.000			
NPRCHORE2: PARENTS MAKE YOUTH DO CHORES AROUND HOUSE IN PAST YEAR <---S1	.361	.130	2.773	.006
NPARHLPHW PARENTS HELP WITH HOME-WORK IN PAST YEAR <----------S1	-2.022	.255	-7.916	***

Table C-Continued

Variables-Structural Factors	Estimates	Standard Error	Critical Ratio	P
NPARCHKHW: PARENTS HELP WITH HOME-WORK IN PAST YEAR <----------S1	-1.772	.242	-7.324	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK <----------S1	-9.283	.939	-9.883	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES <----------S1	-14.223	1.433	-9.922	***
NSTNDALC: STUDENTS IN YOUH GRADE DRINK ALCOHOL BEVERAGES <----------S1	-14.223	1.433	-9.922	***
NPARLMTSN: PARENTS LIMIT TIME OUT ON SCHOOL NIGHT IN PAST YEAR <----------S1	-1.597	.245	-6.527	***
NPRLMTTV2: PARENTS LIMIT AMOUNT OF TV IN PAST YEAR <----------S1	2.918	.334	8.732	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH <----------S1	-11.450	1.154	-9.919	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES <----------S1	-11.571	1.169	-9.900	***
NAVGGRADE: GRADE AVGERAGE FOR LAST GRADING PERIOD COMPLETED <----------S1	-1.116	.138	-8.092	***
NMYEMOV5Y2: NUMBER OF TIMES YOUTH MOVED IN PAST 5 YEARS <----------S1	.035	.164	.212	.832
NSCHFELT: HOW YOUTH FELT: ABOUT GOING TO SCHOOL IN PAST YEAR <----------S1	-1.955	.253	-7.738	***
NPREVIOL2: PARTICIPATED IN VIOLENCE PREVENTION PROGRAM <----------S1	1.388	.166	8.380	***

Table D

Model-Fit-Summary Statistics for Depression

Computation of degrees of freedom	
Number of distinct sample moments	45
Number of distinct parameters estimated	18
Degrees of freedom (45-18)	27
	.
	.
Minimum was achieved	.
Chi-square	1504.930
Degrees of freedom	27
Probability level	.000 .
Number of variables in the model	19
Number of observed variables	9
Number of unobserved variables	10
Number of exogenous variables	10
Number of endogenous variables	9

Parameter summary	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	10	0	0	0	0	10
Labeled	0	0	0	0	0	0
Unlabeled	8	0	10	0	9	18
Total	18	0	10	0	9	28

CMIN- Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	18	1504.930	27	.000	66.703
Saturated model	45	.000	0	.	.
Independence model	9	9970.833	36	.000	276.968
Zero model	0	79668.000	45	.000	1770.400

Table D-Continued

Baseline comparisons	NFI Delta1	RFI rho1	IFI Delta 2	TLI rho2	CFI
Default model	.849	.999	.851	.802	.851
Saturated model	1.000	.	1.000	.	1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjustment Measures	PRATIO	PNFI	PCFI
Default model	.750	.637	.638
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA	RMSEA	LO 90	HI90	PCLOSE
Default model	.056	.053	.058	.000
Independence model	.125	.123	.127	.000

Table E.

Unstandardized Regression Weight Estimate for Depression

Variables	Estimates	Standard error	Critical ratio	p
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOSTOF DAY OR DISCOURAGED <-----DPS	1.191	.006	185.201	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS <---------- -------DPS	1.203	.007	169.483	***
NYO_MDEA: CHANGES IN APPITITE OR WEIGHT < ---------- ----------DPS	1.033	.006	159.000	***
NYO_MDEA4: SLEEP PROBLEMS <------DPS	1.217	.007	183.826	***
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE RESTLESS OR LETHARGIC <-DPS	.776	.007	118.237	***

Table E-Continued

Variables	Estimates	Standard error	Critical ratio	p
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY <----------DPS	1.173	.007	171.743	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY <----------DPS	.760	.006	134.309	***
NYO_MDEA8: INABILITY TO CONCENT ATE OR MAKE DECISIONS <----------DPS	1.226	.007	182.902	***
NYO_MDEA9 ANY THUOUGHTS OR PLANS OF SUICIDE" <---------- DPS	1.000			

Table F.

Model-Fit-Summary Statistics of Substance Abuse Variables

Computation of degrees of freedom	
Number of distinct sample moments	104
Number of distinct parameters estimated	39
Degrees of freedom (104-65)	65
Results	. .
Minimum was achieved	.
Chi-square	33622.486
Degrees of freedom	65
Probability level	.000 .

Table F-Continued

Variables	27
Number of variables in the model	13
Number of observed variables	14
Number of unobserved variables	14
Number of exogenous variables	13
Number of endogenous variables	

Parameter summary	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	14	0	0	0	0	14
Labeled	0	0	0	0	0	0
Unlabeled	12	0	14	0	13	39
Total	26	0	14	0	13	39

CMIN- Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	39	33622.486	65	.000	517.269
Saturated model	104	.000	0	.	.
Independence model	13	75194.935	91	.000	826.318
Zero model	0	79668.000	45	.000	2870.400

Baseline comparisons	NFI Delta1	RFI rho1	IFI Delta 2	TLI rho2	CFI
Default model	.553	.374	.553	.374	.553
Saturated model	1.000	.	1.000	.	1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjustment Measures	PRATIO	PNFI	PCFI
Default model	.714	.395	.395
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA	RMSEA	LO 90	HI90	PCLOSE
Default model	.171	.169	.172	.000
Independence model	.216	.215	.217	.000

Table G.

Unstandardized Regression Weight Estimates for Substance Abuse

Variables	Estimates	Standard error (SE)	Critical ratio(CR)	P
NALCPDANG: DRINK ALCOHOL AND DO DANDEROUS ACTIVTIES PAST 12.MONTHS <----------SB	1.000			
NALCLAWTR: DRINK ALCOHOL CASUE PROBLEMS WITH LAW PAST 12 MONTHS <----------SB	.428	.014	31.537	***
NALCFMFPB: DRINK ALCOHOL CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12 MONTHS <----------SB	1.099	.027	40.593	***
NMRJSERPB: MARIJUANA.CAUSE.SERIOUS PROBLEMS AT HOME/ WORK/SCHOOL PAST 12 MONTHS <----------SB	1.116	.025	45.297	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS <----------SB	.933	.022	42.720	***
NMRJLAWTR: USING MARIJUANA CAUSE PROBLEMS WITH LAW PAST 12 MONTHS <----------SB	.514	.014	37.770	***
NMRJFMCTD: CONTINUED TO USE MARIJ-UANA DESPITE PROBLEMSWITH/FAMILY/ FRIENDS <----------SB	1.624	.032	50.265	***
NALCSERPB: ALC CAUSE SERS PROBS AT HOME/WORK/SCH PST 12 MOS <----------SB	.677	.019	35.763	***
NANLSERPB: PAIN RELIEVER CASUE SERIOUS.PROBLEMS AT.HOME/ WORK/ SCHOOL PAST 12 MONTHS <----------SB	.274	.009	29.130	***
NANLPDANG: USING PAIN RELIEVERR &DO DANDEROUS ACTIVITIES PAST 12 MONTHS <----------SB	.306	.010	32.091	***
NANLFMCTD: CONTINUED TO USE PAIN RELIEVER DESPITE PROBLEMS WITH/ FAMILY/FRNDS <----------SB	.339	.009	36.451	.***

Table G-Continued

Variables	Estimates	Standard error (SE)	Critical ratio(CR)	P
NALCFMCTD: CONTINUED TO DRINK ALCOHOL DESPITE PROBLEMS WITH FAMILY/FRIENDS <----------SB	1.366	.029	46.730	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12MONTHS <----------SB	1.576	.032	49.020	***

Table H.

Model-Fit- Summary Statistics of Hypothesized Model 1

Computation of degrees of freedom	
Number of distinct sample moments	276
Number of distinct parameters estimated	50
Degrees of freedom (276-50)	226
	.
Minimum was achieved	
Chi-square	8253.692
Degrees of freedom	226
Probability level	.000 .
Variables	
Number of variables in the model	52
Number of observed variables	23
Number of unobserved variables	29
Number of exogenous variables	27
Number of endogenous variables	25

Table H-Continued

Parameter summary	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	29	0	0	0	0	29
Labeled	0	0	0	0	0	0
Unlabeled	22	1	27	0	0	50
Total	51	1	27	0	0	79

CMIN-Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	50	8153.692	226	.000	36.078
Saturated model	276	.000	0	.	.
Independence model	23	33768.434	253	.000	133.472
Zero Model	0	203596.000	276	.000	737.667

Baseline comparisons	NFI Delta1	RFI rho1	IFI Delta 2	TLI rho2	CFI
Default model	.759	.730	.764	.735	.763
Saturated model	1.000	.	1.000	.	1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjustment Measures	PRATIO	PNFI	PCFI
Default model	.893	.678	.682
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA	RMSEA	LO 90	HI90	PCLOSE
Default model	.045	.044	.045	1.000
Independence model	.087	.086	.087	.000

AIC/Model	AIC	BCC	BIC	CAIC
Default model	8253.692	8253.828	8642.772	8692.772
Saturated model	552.000	552.749	2699.722	2975.722
Independence model	3381.434	33814.497	33993.411	34016.411
Zero model	203596.000	203596.000	203596.000	203596.000

Table I

Unstandardized Regression Weight Estimate for Model 1

Variables	Estimates	Standard error.(S.E)	Critical ratio(C.R)	P
SUBSTANCE ABUSE<----------SCP	-.07	.01	-.13.12	***
SUBSTANCE ABUSE<----------CSP	-.18	.01	-16.77	***
DEPRESSION<----------SB	.23	.02	12.33	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ -----SCP	1.23	.02	64.37	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJUANA/HASHISH<----------SCP	1.28	.02	67.10	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<---------SCP	1.49	.02	68.30	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<------SCP	1.000			
NFRDMJMON: YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARI-JUANA/HASH MONTLY <----------CSP	2.80	.06	44.23	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSP	2.60	.06	41.82	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSP	2.33	.06	41.71	***
NPRMJEVR2: YOUTH.THINK:PARENTS FEEL ABOUT.YOUTH TRY MARIJUANA /HASH<----------CSP	1.000			
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.54	.01	49.56	***
NALCFMCTD: CONTINUED TO DRNK ALCOHOL DESPITE PROBLEMS WITH/ FAMILY/FRIEDND <----------SB	.71	.01	80.59	***

Table I-Continued

Variables	Estimates	Standard error.(S.E)	Critical ratio(C.R)	P
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/ WORK/ SCHOOL PAST 12 MONTHS<----------SB	.62	.01	79.19	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS<----------SB	.49	.01	61.10	***
NMRJFMCTD: CONTINUED TO USE MARI-JUANA DESP-ITE PROBLEMS WITH/ FAMILY/FRIENDS<----------SB	.96	.01	139.69	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	1.000			
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	1.20	.01	161.36	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <----------DPS	1.02	.01	151.17	***
NYO_MDEA4: SLEEP PROBLEMS<------DPS	1.21	.01	175.31	***
NYO_MDEA5: OTHERS NOTICED THAT YOUARE RESTLESS OR LETHARGIC<--DPS	.77	.01	112.67	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	1.17	.01	163.66	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	.01	127.70	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<-----DPS	1.22	.01	174.31	***
NYO_MDEA9 ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	1.000			

NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<---DPS	1.19	.01	176.68	***

Table J.

Model-Fit-Summary Statistics of Hypothesized Model 2

Computation of degrees of freedom	
Number of distinct sample moments	276
Number of distinct parameters estimated	52
Degrees of freedom (276-51)	224
Minimum was achieved	.
Chi-square	7674.007
Degrees of freedom	224
Probability level	.000 .
Variables	
Number of variables in the model	52
Number of observed variables	23
Number of unobserved variables	29
Number of exogenous variables	27
Number of endogenous variables	25

Parameter Summary	Weight	Covariances	Variances	Means	Intercepts	Total
Fixed	29	0	0	0	0	29
Label	0	0	0	0	0	0
Unlabeled	24	1	27	0	0	52
Total	53	1	27	0	0	81

CMIN/Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	52	7674.077	224	.000	34.356
Saturated model	276	.000	0		
Independence model	23	33768.434	253	.000	133.472
Zero Model	0	203596.000	276	.000	737.667

Table J-Continued

Baseline Comparisons Model	NFI (Delta 1)	RFI (rho1)	IFI (Delta2)	TLI (rho2)	CFI
Default model	.773	.743	.778	.749	.778
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parismony-Adjusted Measures/ Model	PRATIO	PNFI	PCFI
Default model	.885	.684	.689
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA-Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.043	.043	.044	1.000
Independence model	.087	.086	.087	.000

AIC-Model	AIC	BCC	BIC	CAIC
Default model	7778.077	7778.218	8129.720	8234.720
Saturated model	552.000	552.749	2699.722	2975.722
Independence model	33814.434	33814.497	33993.411	34016.411
Zero model	203596.000	203596.000	203596.000	203596.000

Table K.

Unstandardized Regression Weight Estimate for Model 2

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
SUBSTANCE ABUSE<----------SCP	-.06	.005	-12.27	***
SUBSTANCE ABUSE<----------CSP	-.18	.010	-16.88	***
DEPRESSION<-----SUBSTANCE ABUSE	-.14	.019	7.59	***

Table K-Continued

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
DEPRESSION<----------CSP	-.004	.022	-.17	.162
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARE- TTES<----SCP	1.26	.018	68.26	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJUANA HASHISH< ----------SCP	1.29	.018	70.97	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOLBEVERAGES <----------SCP	1.51	.021	72.35	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK <---- ----------SCP	1.000			
NFRDMJMON: YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTHLY<----CSP	2.79	.062	44.75	***
NFRDPCIG2: THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSP	2.32	.055	42.17	***
NPRMJEVR2:YOUTH THINK: PARENT FEEL ABOUT YOU- TH TRY MARIJU-ANA/HASH<----------CSP	1.000			
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSP	2.58	.061	42.29	***

Table K-Continued

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
NALCFMCTD: CONTINUED.TO DRINK ALCOHOL.DESPITE PROBLEMS WITH FAMILY/FRIENDS<----------SB	.71	.009	80.59	***
NMRJSERPB: MARIJUANA.CAUSE SERIOUS PROBLEMSATHOME/WORK/ SCHOOL PAST 12 MONTHS<----------SB	.62	.008	79.18	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUSACTIVTIES PAST 12 MONTHS<----------SB	.48	.008	61.08	***
NMRJFMCTD: CONTINUED TO USE MARIJ-UANA DESPITE PROBLEMS WITH/FAMILY/ FRIENDS<----------SB	.96	.007	139.66	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12MONTHS<----------SB	1.000			
NYO_MDEA2: LOST INTEREST OR PLEASURE IN MOST THINGS<------DPS	1.20	.007	168.27	***
NYO_MDEA3: CHANGES IN APPITITE OR WEIGHT<----------DPS	1.03	.007	157.91	***
NYO_MDEA4: SLEEP PROBLEMS<-- DPS	1.22	.007	182.57	***
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE RES-TLESS OR LETHARGIC<----------DPS	.78	.007	117.65	***

Table K-Continued

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<--DPS	1.18	.007	170.45	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	.006	133.23	***
NYO_MDEA8: INABILITY TO CONCE-NTRATE OR MAKE-DECISIONS<---DPS	1.23	.007	181.53	***
NYO_MDEA9: ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	1.000			
NYO_MDEA1: SAD/EMPTY /DEPRESSEDMOST OF DAY OR DISCOURAGED<----------DPS	1.19	.006	184.02	***

Table L.

Model-Fit-Summary Statistics of Hypothesized Model 3

Computation of degrees of freedom			
Number of distinct sample moments	276		
Number of distinct parameters estimated	51		
Degrees of freedom (276-51)	225		
Minimum was achieved	.	.	
Chi-square	.7730.207		
Degrees of freedom	225		
	.000		.

Table L.-Continued

Computation of degrees of freedom	
Variables	
Number of variables in the model	52
Number of observed variables	23
Number of unobserved variables	29
Number of exogenous variables	27
Number of endogenous variables	25

Parameter Summary	Weight	Covariances	Variances	Means	Intercepts	Total
Fixed	29	0	0	0	0	29
Label	0	0	0	0	0	0
Unlabeled	23	1	27	0	0	51
Total	52	1	27	0	0	80

CMIN/Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	51	7730.207	225	.000	34.356
Saturated model	276	.000	0		
Independence model	23	33768.434	253	.000	133.472
Zero Model	0	203596.000	276	.000	737.667

Baseline Comparisons Model	NFI (Delta 1)	RFI (rho1)	IFI (Delta2)	TLI (rho2)	CFI
Default model	.771	.743	.776	.748	.776
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parismony-Adjusted Measures/ Model	PRATIO	PNFI	PCFI

Table L-Continued

Default model	.889	.686	.690
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA-Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.043	.043	.044	1.000
Independence model	.087	.086	.087	.000

AIC-Model	AIC	BCC	BIC	CAIC
Default model	7832.207	7832.345	8229.068	8280.068
Saturated model	552.000	552.749	2699.722	2975.722
Independence model	33814.434	33814.497	33993.411	34016.411
Zero model	203596.000	203596.000	203596.000	203596.000

Table M.

Unstandardized Regression weight Estimates for Model 3

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
SUBSTANCE ABUSE<----------SCP	-.06	.005	-12.27	***
SUBSTANCE ABUSE<----------CSP	-.18	.010	-16.88	***
DEPRESSION<-----SUBSTANCE ABUSE	-.14	.019	7.59	***
DEPRESSION<----------SCP	-.22	.011	-20.18	***
DEPRESSION<----------CSP	-.004	.022	-.17	.162
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARE- TTES<----SCP	1.26	.018	68.26	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MARIJUANA HASHISH< ----------SCP	1.29	.018	70.97	***

Table M-Continued

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOLBEVERAGES <----------SCP	1.51	.021	72.35	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK <----------SCP	1.000			
NFRDMJMON: YOUTH THINK:CLOSE FRNDS FEEL ABOUT YOUTH USE MARIJUANA/HASH MONTHLY<----CSP	2.79	.062	44.75	***
NFRDPCIG2: THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSP	2.32	.055	42.17	***
NPRMJEVR2: YOUTH HINK:PARENTS FEEL ABOUT YOUTH TRY MARIJU-ANA/HASH<----------CSP	1.000			
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL/DAY<----------CSP	2.58	.061	42.29	***
NALCFMFPB: DRINK ALCOHOL CAUSE PROB-LEMS WITH FAMILY/ FRIENDS PAST 12 MONTHS<----------SB	.54	.011	49.55	***
NALCFMCTD: CONTINUED.TO DRINK ALCOHOL.DESPITE PROBLEMS WITH FAMILY/FRIENDS<----------SB	.71	.009	80.59	***

Table M-Continued

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
NMRJSERPB: MARIJUANA.CAUSE SERIOUS PROBLEMSATHOME/WORK/ SCHOOL PAST 12 MONTHS<----------SB	.62	.008	79.18	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUSACTIVTIES PAST 12 MONTHS<----------SB	.48	.008	61.08	***
NMRJFMCTD: CONTINUED TO USE MARIJ-UANA DESPITE PROBLEMS WITH/FAMILY/ FRIENDS<----------SB	.96	.007	139.66	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/ FRIENDS PAST 12MONTHS<----------SB	1.000			
NYO_MDEA2: LOST INTEREST OR PLEASURE IN MOST THINGS<------DPS	1.20	.007	168.27	***
NYO_MDEA3: CHANGES IN APPITITE OR WEIGHT<----------DPS	1.03	.007	157.91	***
NYO_MDEA4: SLEEP PROBLEMS<--DPS	1.22	.007	182.57	***
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE RES-TLESS OR LETHARGIC<----------DPS	.78	.007	117.65	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<--DPS	1.18	.007	170.45	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.76	.006	133.23	***

Table M-Continued

Variable	Estimates	Standardized Error(S.E)	Critical Ratio(C.R)	P
NYO_MDEA8: INABILITY TO CONCE-NTRATE OR MAKE-DECISIONS<---DPS	1.23	.007	181.53	***
NYO_MDEA9: ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	1.000			
NYO_MDEA1: SAD/EMPTY/ DEPRESSED MOST OF DAY OR DISCOURAGED<----------DPS	1.19	.006	184.02	***

Table N.

Model-Fit-Summary Statistics of Covariates

Computation of degrees of freedom	
Number of distinct sample moments	552
Number of distinct parameters estimated	102
Degrees of freedom (552-102)	450
Minimum was achieved	.
Chi-square	15460.413
Degrees of freedom	450
Probability level	.000
Variables	
Number of variables in the model	52
Number of observed variables	23
Number of unobserved variables	29
Number of exogenous variables	27
Number of endogenous variables	25

Table N-Continued

Parameter Summary	Weight	Covariances	Variances	Means	Intercepts	Total
Fixed	29	0	0	0	0	29
Label	0	0	0	0	0	0
Unlabeled	23	1	27	0	0	51
Total	52	1	27	0	0	80

CMIN- Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	102	15460.413	450	.000	34.356
Saturated model	552	.000	0	.	.
Independence model	46	67536.869	506	.000	133.472
Zero Model	0	407192.000	552	.000	737.667

Baseline comparisons	NFI Delta1	RFI rho1	IFI Delta 2	TLI rho2	CFI
Default model	.771	.743	.766	.748	.776
Saturated model	1.000	.	1.000	.	1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjustment Measures	PRATIO	PNFI	PCFI
Default model	.889	.686	.690
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

RMSEA	RMSEA	LO 90	HI90	PCLOSE
Default model	.031	.030	.031	1.000
Independence model	.061	.061	.062	.000

Table O

Unstandardized Regression weight Estimates for Males

Variables	Estimates	Standard Error	Critical Ratio	P
SUBSTANCE ABUSE<----------SCP	-.06	.01	-21.48	***
DEPRESSION<----------CSP	-.04	.03	-1.40	.162
DEPRESSION<----------SCP	-.28	.01	-21.12	***
SUBSTANCE ABUSE<----------CSP	-.18	.01	-16.71	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SCP	1.26	.02	68.22	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MJ/HASHISH<----------SCP	1.30	.02	70.93	***
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SCP	1.51	.02	72.31	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<---------- ---------SCP	1.000			***
NFRDMJMON: YOUTH THINK:CLOSE FRIE-NDS FEEL ABOUT YOUTH USE MARIJUANA /HASH MON <----------CSP	2.80	.06	44.70	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL /DAY<----------CSP	2.60	.06	42.24	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSP	2.32	.06	42.12	***
NPRMJEVR2: YOUTH.THINK:PARENTS FEEL ABOUT.YOUTH.TRY.MARIJUANA/HASH←CSP	1.000			

Table O-Continued

Variables	Estimates	Standard Error	Critical Ratio	P
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.52	.01	48.13	***
NALCFMCTD: CONTINUED TO DRNK ALCOH-OL DESPITE PROBLEMS WITH FAMILY/ FRIENDS <----------SB	.70	.01	79.51	***
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/WORK/SCHOOL PAST 12 MONTHS<----------SB	.62	.01	78.68	***
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS <----------	.48	.01	60.91	***
NMRJFMCTD: CONTINUED TO USE MARIJU-ANA DESPITE PROBLEMS WITH FAMILY FRIENDS<----------SB	.96	.01	138.40	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	1.000			
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.97	.004	251.76	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.98	.004	231.03	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <----------DPS	.84	.004	192.52	***

Table O-Continued

Variables	Estimates	Standard Error	Critical Ratio	P
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.99	.004	271.37	***
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE RESTLESS OR LETHARGIC<----------DPS	.63	.01	136.59	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.96	.004	250.47	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.62	.01	133.47	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	1.000	.		
NYO_MDEA9 ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	.81	.01	180.44	***

Table P

Unstandardized Regression weight Estimates for Females

Variables	Estimates	Standard Error	Critical Ratio	P
SUBSTANCE ABUSE<----------SCP	-.06	.01	-21.48	***
DEPRESSION<----------CSP	-.04	.03	-1.40	.162
DEPRESSION<----------SCP	-.28	.01	-21.12	***
SUBSTANCE ABUSE<----------CSP	-.18	.01	-16.71	***
NSTNDSCIG: STUDENTS IN YOUTH GRADE SMOKE CIGARETTES<------ ----------SCP	1.26	.02	68.22	***
NSTNDSMJ: STUDENTS IN YOUTH GRADE USE MJ/HASHISH<----------SCP	1.30	.02	70.93	***

Table P-Continued

Variables	Estimates	Standard Error	Critical Ratio	P
NSTNDALC: STUDENTS IN YOUTH GRADE DRINK ALCOHOL BEVERAGES<----------SCP	1.51	.02	72.31	***
NSTNDDNK: STUDENTS IN YOUTH GRADE GET DRUNK ONCE/WEEK<---------- ---------SCP	1.000			***
NFRDMJMON:YOUTH THINK:CLOSE FRIE-NDS FEEL ABOUT YOUTH USE MARIJUANA /HASH MON <----------CSP	2.80	.06	44.70	***
NFRDADLY2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH HAVE 1-2 ALCOHOL /DAY<----------CSP	2.60	.06	42.24	***
NFRDPCIG2: YOUTH THINK: CLOSE FRIEND FEEL ABOUT YOUTH SMOKE 1+ PACK DAILY<----------CSP	2.32	.06	42.12	***
NPRMJEVR2: YOUTH.THINK:PARENTS FEEL ABOUT.YOUTH.TRY.MARIJUANA/HASH←CSP	1.000			
NALCFMFPB: DRNK ALCOHOL CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS <----------SB	.52	.01	48.13	***
NALCFMCTD: CONTINUED TO DRNK ALCOH-OL DESPITE PROBLEMS WITH FAMILY/ FRIENDS <----------SB	.70	.01	79.51	***
NMRJSERPB: MARIJUANA CAUSE SERIOUS PROBLEMS AT HOME/WORK/SCHOOL PAST 12 MONTHS<----------SB	.62	.01	78.68	***

Table P-Continued

Variables	Estimates	Standard Error	Critical Ratio	P
NMRJPDANG: USING MARIJUANA AND DO DANGEROUS ACTIVTIES PAST 12 MONTHS <----------SB	.48	.01	60.91	***
NMRJFMCTD: CONTINUED TO USE MARIJU-ANA DESPITE PROBLEMS WITH FAMILY FRIENDS<----------SB	.96	.01	138.40	***
NMRJFMFPB: USING MARIJUANA CAUSE PROBLEMS WITH FAMILY/FRIENDS PAST 12 MONTHS<----------SB	1.000			
NYO_MDEA1: SAD/EMPTY/DEPRESSED MOST OF DAY OR DISCOUR AGED<----------DPS	.97	.004	251.76	***
NYO_MDEA2: LOST INTEREST OR PLEAS-URE IN MOST THINGS<----------DPS	.98	.004	231.03	***
NYO_MDEA3. CHANGES IN APPITITE OR WEIGHT <----------DPS	.84	.004	192.52	***
NYO_MDEA4: SLEEP PROBLEMS<----------DPS	.99	.004	271.37	***
NYO_MDEA5: OTHERS NOTICED THAT YOU ARE RESTLESS OR LETHARGIC<----------DPS	.63	.01	136.59	***
NYO_MDEA6: FELT TIRED/ LOW ENERGY NEARLY EVERY DAY<----------DPS	.96	.004	250.47	***
NYO_MDEA7: FELT WORTHLESS NEARLY EVERYDAY<----------DPS	.62	.01	133.47	***
NYO_MDEA8: INABILITY TO CON-CENTRATE OR MAKE DECISIONS<----------DPS	1.000	.		
NYO_MDEA9 "ANY THUOUGHTS OR PLANS OF SUICIDE<----------DPS	.81	.01	180.44	***

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