Predictors of Mental Health Service Utilization among Minnesota High School Students

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

Nicholas G. Leonard

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Sandra, L. Christenson, Ph.D., Advisor

September 2009

Acknowledgements

Completing this dissertation and my graduate degree could not have been done without a tremendous amount of support and encouragement from many people. First, I would like to thank my family for their patience and support through all of my academic endeavors. Additionally, I would like to express my profound appreciation to my advisor, Dr. Sandra Christenson, for her unwavering guidance and support throughout my graduate school career. I would also like to thank the rest of my committee for all of their help and encouragement: Professors Annie Hansen, Charles Oberg, and John Romano. Finally, I would like to express my gratitude to the Center for Excellence in Children's Mental Health (CECMH), MN Department of Education, and MN Center for Health Statistics. This dissertation focusing on adolescent mental health utilization and school-based mental health service delivery would not have been possible without the partnership and collaboration of these organizations.

Abstract

Mental health is an essential component of young peoples' overall health and wellbeing. Untreated, mental health problems interfere with normal development and functioning. Unfortunately, for most adolescents with mental health problems, the overwhelming majority will not receive the supports and services they need. By merging two extant databases, this study provides Minnesota's first state-wide assessment of mental health utilization. Patterns of utilization are provided. Findings indicate that 7% of Minnesota high school students utilized mental health services during a 12-month period. In addition, Andersen's Behavioral Model of Health Care Utilization was utilized to examine predictors of mental health utilization. Various predisposing, enabling, need variables were found to be significant predictors of mental health utilization. Finally, the study examined school-based mental health in the context of an enabling variable. Findings suggest that students from schools with greater mental health promotion and prevention efforts are less likely to utilize mental health supports and services.

Table of Contents

Table of Contents (continued)

List of Tables

List of Tables (continued)

List of Figures

CHAPTER ONE

Introduction

According to the World Health Organization (WHO), there is no one "official" definition of mental health; however, most experts agree that "mental health" and "mental illness" are not opposites (Murthy, 2001). That is, the absence of a recognized mental disorder is not necessarily an indicator of mental health. For the purposes of this thesis, mental health is defined as “the successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and to cope with adversity; from early childhood until late life, mental health is the springboard of thinking and communication skills, learning, emotional growth, resilience, and self-esteem” (U.S. Department of Health and Human Services, 1999, p. vii).

Prevalence of Child & Adolescent Mental Health Concerns

The emotional and psychological wellbeing of youth in America is a growing concern. *Bullying, high dropout rates, childhood depression and anxiety, high adolescent suicide and homicide rates, school shootings.* Newspaper headlines across the country reflect the sad fact that a substantial proportion of children and adolescents have mental health problems. Researchers have also begun to document the prevalence of mental health concerns in children and adolescents in recent years. A review of the growing body of research reveals some variability in prevalence estimates. The most thorough examination of mental illness literature by Costello, Egger, and Angold (2005) concluded between 3% and 18% of youth have a psychiatric disorder causing significant impairment. At the national level, various studies have examined data from the 2001–2003 National

Health Interview Survey (NHIS) (Botman, Moore, Moriarity, & Parsons, 2000). Based on parent report data, 12% of children 4 - 17 years of age had at least one diagnosable mental health disorder. Furthermore, NHIS included the parent report version of the Strengths and Difficulties Questionnaire (SDQ) (Bourdon, Goodman, Rae, Simpson, & Koretz, 2005). Approximately 5% of children 4 - 17 years of age had parental reports of severe/definite emotional or behavioral difficulties during the past 6 months and 17% had reports of minor difficulties. Kessler and his colleagues (2005) examined the lifetime prevalence estimates and age-of-onset distributions of DSM-IV disorders with nationally representative face-to-face household survey. In their study, about half of Americans (46.4%) met the criteria for a DSM-IV disorder sometime in their life, with first onset usually in childhood or adolescence.

Studies examining mental health prevalence in specific geographic regions and/or community samples have also grown more common in recent years. The Surgeon General's 1999 Report on Mental Health is one of the most frequently cited publications in regard to mental health prevalence. The Surgeon General's report, which summarized findings from the Methodology for Epidemiology of Mental Disorders in Children and Adolescents (MECA) study(Shaffer et al., 1996), estimated that 20.9% (nearly 14 million) of all U.S. children ages 9 to 17 have a diagnosable mental disorder with at least *minimum* impairment. That is, approximately one in five youth experiences the signs and symptoms of a DSM-IV disorder during the course of a year. In addition, the Surgeon General report estimated that 11% (approximately 4 million youth) suffer from a major mental illness that results in *significant* impairments at home, at school, and with peers. Finally, when *extreme* functional impairment as the criterion, an estimated 5% of U.S.

children and adolescents are affected (U.S. Department of Health and Human Services, 1999). The Great Smoky Mountain Study (GSMS) examined mental health prevalence and utilization in an 11-county area of the southeastern United States (Costello et al., 1996). Costello and her colleagues reported that 27% of youth had evident mental health impairment. More recently, in a follow-up of this longitudinal GSMS study, over 13% of youth had a 3-month prevalence of at least one mental health disorder. In addition, during the study period, nearly 37% of participants (9-16 year olds) had at least one psychiatric disorder (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003).

Patterns of Mental Health Utilization

While the number of children and teens in need of mental health services is unfortunate, more concerning is the fact that millions will never receive any services or treatment. A growing collection of research has documented the unmet mental health needs of children and adolescents (Burns et al., 1995; Kataoka, Zhang, & Wells, 2002; Leaf et al., 1996; Pottick, Bilder, Vander Stoep, Warner, & Alvarez, 2008; Simpson, Scott, & Henderson, 2002). While estimates vary, it is safe to conclude that well below 50% of youth with diagnosable disorders actually receive any treatment. In fact, many epidemiological studies have concluded that the overwhelming majority of children's mental health needs are neglected.

While some variability in the utilization literature exists, lack of resources and underserved children and adolescents is a common theme. For example, Leaf et al. (1996) concluded that as many as two-thirds of children with psychiatric disorders and significant impairment do not receive specialist care. Hoagwood and Erwin (1997) reported even lower utilization, with only 2% of school children with serious behavioral and emotional disabilities actually receiving needed mental health services. Kataoka and her colleagues (2002) examined three nationally representative surveys to determine the rate of mental health service use by children and adolescents. In a 12-month period, 2%-3% of children 3-5 years old and 6%-9% of children and adolescents 6-17 years old used mental health services. Of those youth identified as needing mental health services, nearly 80% did not receive mental health care (Kataoka et al., 2002). Examining data from the 1998-1999 National Health Interview Survey, Simpson and his colleagues (2002) reported only 6.5% of children in the United States had contact with a mental health professional during a one year time period. These findings are supported by Sturm, Ringel, and Andreyeva (2003) who examined geographic disparities in children's mental health care. Their analysis of mental health utilization reveled considerable variability in the use of mental health services between 13 states (ranging from 5% to 12%), and a national average of 7.5%. The rate of unmet need ranged from a low of 51% to a high of nearly 81% (Sturm et al.).

Even when children and adolescents begin treatment, continued utilization is unlikely. Most children who enter outpatient treatment drop out after only one or two sessions (Armbruster, Gerstein, & Fallon, 1997; Kazdin, Holland, & Crowley, 1997). Various explanations exist for why children and adolescents fail to receive the necessary mental health services. Although rarely documented, the insufficient quantity of services and professionals is an obvious barrier. The supply of well-trained child and adolescent mental health professionals is inadequate in most areas of the country, especially rural areas. In the entire U.S., there are approximately 7,000 child and adolescent psychiatrists compared to nearly 14 million youth with a diagnosable mental disorder (Hogan, 2003).

In addition, even though considerable data suggests the roots of psychopathology develop early in childhood, services typically are provided when individuals are older and their problems quite severe (Power, 2003). Other factors contributing to the low rates of service utilization among children include: the cost of mental health treatment and the lack of parity of insurance benefits (Armbruster, Sukhodolsky, & Michalsen, 2004); stigma or shame associated with having a mental health problem and seeking out services (Friesen & Huff, 1996); and lack of trust in mental health professionals and the agencies through which services are provided (Tucker, 2002).

Impact of Unmet Mental Health Concerns

The human and economic costs for not addressing the mental health needs of youth in this country are significant. Children with mental health concerns are at significant risk for academic deficits, disruptive and high-risk behaviors, as well as social and familial difficulties relative to their normal counterparts (DuPaul, McGoey, Eckert, & VanBrakle, 2001; Willcutt & Pennington, 2000). Untreated, children with mental health issues will experience more serious problems and the need for more expensive services in adolescence and adulthood (Power, 2003). According to the President's New Freedom Commission on Mental Health (Hogan, 2003), no other illnesses damage so many children so seriously.

A growing collection of research has documented the negative impact of untreated mental health concerns on academic success. Children whose emotional, behavioral, or social difficulties are not addressed have a diminished capacity to learn and benefit from the school environment. In fact, despite making up less than 1% of the youth served in special education programs (Kutash, Duchnowski, & Friedman, 2005), students with emotional disturbances (ED) experience less school success than any other group. According to Landrum, Tankersley, and Kauffman (2003), these students earn lower grades and fail more courses than any other disability groups. Academic progress is frequently stunted because mental health issues compromise chances for fully utilizing learning opportunities. Research by (DuPaul et al., 2001) examined group differences between samples of children ages 3 to 5 years and diagnosed with ADHD, compared to a normal control group of 3 to 5 year old children. Children with ADHD scored significantly lower on a test of pre-academic skills. Walter et al. (1996) also demonstrated how untreated, chronic mental health problems are associated with impeded academic progress in a population of inner city middle school students. Left untreated, childhood disorders are likely to persist and lead to a downward spiral of school failure. Students with emotional disturbance have the lowest high school completion rate of all students with disabilities. Eventually, over half of these youth drop out of school – over 225,000 students with ED (U.S. Department of Education, 2002).

Compared to their normal counterparts, youth with mental health concerns exhibit more problem and high-risk behavior. There is a growing body of literature that suggests students with mental illnesses are more likely to engage in fighting, have problems with truancy, and exhibit more oppositional and antisocial behaviors. By comparing the demographic, behavioral, psychosocial, and academic characteristics of users vs. non-users of inner city middle school-based health clinics, Walter et al. (1996) demonstrated how untreated, chronic mental health problems were associated with inappropriate, destructive, or violent behaviors. Findings suggested that compared to nonusers, students who used the school-based clinics were more likely to have participated in “high-risk” behaviors and activities. Data suggested that these students were more likely to have had unprotected sexual intercourse, to have had suicide intentions or attempts, to be suspended from school for fighting, and to be exposed to violence and the illicit drug culture (Walter et al.).

For children and adolescents with untreated mental health concerns, functional impairment is also frequently observed in peer and familial relationships. From an early age, children with mental health concerns are described as less social skilled (DuPaul et al., 2001). In addition, untreated mental disorders often impede social development, leaving young people feeling socially isolated. Children who develop disruptive behavior patterns are frequently rejected by peers and can have a negative influence on the social environment (Conduct Problems Prevention Research Group, 1999). Research examining untreated social anxiety among adolescents indicated that these youth often have few or no friends, are unable to establish romantic relationships, and have poor social skills (Wittchen, Stein, & Kessler, 1999). In addition, untreated mental health disorders can be very costly to families. A survey conducted by the National Alliance for the Mentally Ill (NAMI) with parents of children with serious mental illness described family strain manifested in divorce, lost jobs, sibling rivalry, self-blame, and doubt (Vitanza et al., 1999).

Without treatment, the future for most mentally ill children and adolescents is bleak. Youth with unidentified and untreated mental disorders tragically end up in jails and prisons. According to an NIMH funded study, nearly two thirds (65%) of incarcerated males and three quarters (75%) of incarcerated females met diagnostic criteria for one or more psychiatric disorders (Teplin, Abram, McClelland, Dulcan, &

Mericle, 2002). Even excluding conduct disorder which is common among detained youth, nearly 60% of males and more than two thirds of females still met diagnostic criteria and had diagnosis-specific impairment for one or more psychiatric disorders. In addition, at least half of these youth had substance abuse problems, often a result of crude attempts at self-medication (Teplin et al.). In its 2000 report, the Coalition for Juvenile Justice described how the juvenile justice system has become a warehouse for children suffering from mental illness. Rather than identifying their disorders early and intervening with appropriate treatment, youth with mental disorders, some as young as 8 years, are being incarcerated (Hubner & Wolfson, 2000).

When untreated, childhood disorders and their adverse affects often lead to poor employment opportunities and poverty in adulthood. In addition, their smaller and manageable problems become quite severe. When children with untreated mental disorders become adults, they use more health care services and incur higher health care costs than other adults (Hogan, 2003). According to Power (2003), this reactive approach serves to overwhelm the mental health system with cases that are difficult to treat, time-consuming, and expensive.

Behavioral Model of Health Care Utilization

One of the most frequently used frameworks for analyzing utilization of healthcare services is the Behavioral Model of Health Care Utilization (Andersen, 1968). The model is used to organize and understand variables affecting service utilization. While used less frequently for examining mental health care, especially mental health services for children and families, this conceptual framework provides a systems perspective to investigate a range of individual, environmental, and provider-related variables associated with decisions to seek care. More specifically, the model includes three major categories: (a) predisposing factors (demographic, social structural, and attitudinal-belief variables); (b) enabling factors (family resources and characteristics of the community); and (c) need factors (perceived and evaluated illness).

Purpose of Current Study

Although research has consistently documented that children and adolescents receive inadequate or fragmented mental health services, little is known about actual pattern or predictors of utilization. In addition, few studies have investigated the role of schools and school-based mental health service delivery as a function of mental health utilization. This dissertation will use Behavioral Model of Health Care Utilization to investigate mental health service utilization among Minnesota high school students. The purpose of this dissertation is to 1) describe service utilization among high school students, 2) identify factors that predict mental health service utilization among high school students, and 3) assess the influence of school-based mental health supports and services on mental health utilization among high school students. The study will investigate the following research questions:

1) What does mental health service utilization look like among Minnesota high school students?
2) What factors predict mental health service utilization among Minnesota high school students?
3) Does mental health utilization among Minnesota high school students vary as a function of school-based mental health supports and services?

CHAPTER TWO

Review of the Literature

Mental health service utilization is a new, albeit, growing area of research. Researchers have only recently begun to document the prevalence of mental illness, much less the significant disparities that exist in regard to treatment. To fully understand the context of mental health service delivery and utilization among children and adolescents, this chapter provides a general overview of the literature. First, using the Behavioral Model of Health Care Utilization (Andersen & Newman, 1973) as an organizing framework, this chapter summarizes the literature on predictors of child/adolescent mental health service utilization. Next, this chapter provides an examination of school-based mental health literature. Given the documented and pervasive need for mental health services and the growing body of research describing schools as the "de facto" service providers for children and adolescents, this chapter examines the capacity of schools to improve mental health utilization.

Behavioral Model of Health Care Utilization

As outlined earlier, the overwhelming majority of children and adolescents are unlikely to receive the necessary mental health supports or services. Despite a growing collection of research documenting patterns of unmet need, fewer studies have examined predictors of service utilization. To truly improve access to and utilization of effective mental health services, we must gain greater familiarity with the "who's," "how's," and "why's" of mental health service's use – particularly the critical characteristics and variables that predict utilization.

Introduction to the Behavioral Model of Health Care Utilization

The most well-known and influential theoretical model for decision-making related to health service utilization is Andersen's Behavioral Model of Health Care Utilization. Developed by Ronald Andersen, the model has been revised several times over the past 40 years. The initial behavioral model developed in the 1960's was developed to assist the understanding of why families use health services; to define and measure equitable access to health care; and to assist in developing policies to promote equitable access (Andersen, 1995). The original model of health services' use focused on the family as the unit of analysis (Andersen, 1968). However, in subsequent work, Andersen shifted to the individual as the unit of analysis and over the next several years, he and his colleagues developed several models to predict and explain trends in health services utilization. As depicted in Figure 1, this early model suggests that people's use of health services is a function of their predisposition to use services, factors which enable or impede use, and their need for care.

Figure 1
Evolution of Andersen's Behavioral Model of Health Care Utilization

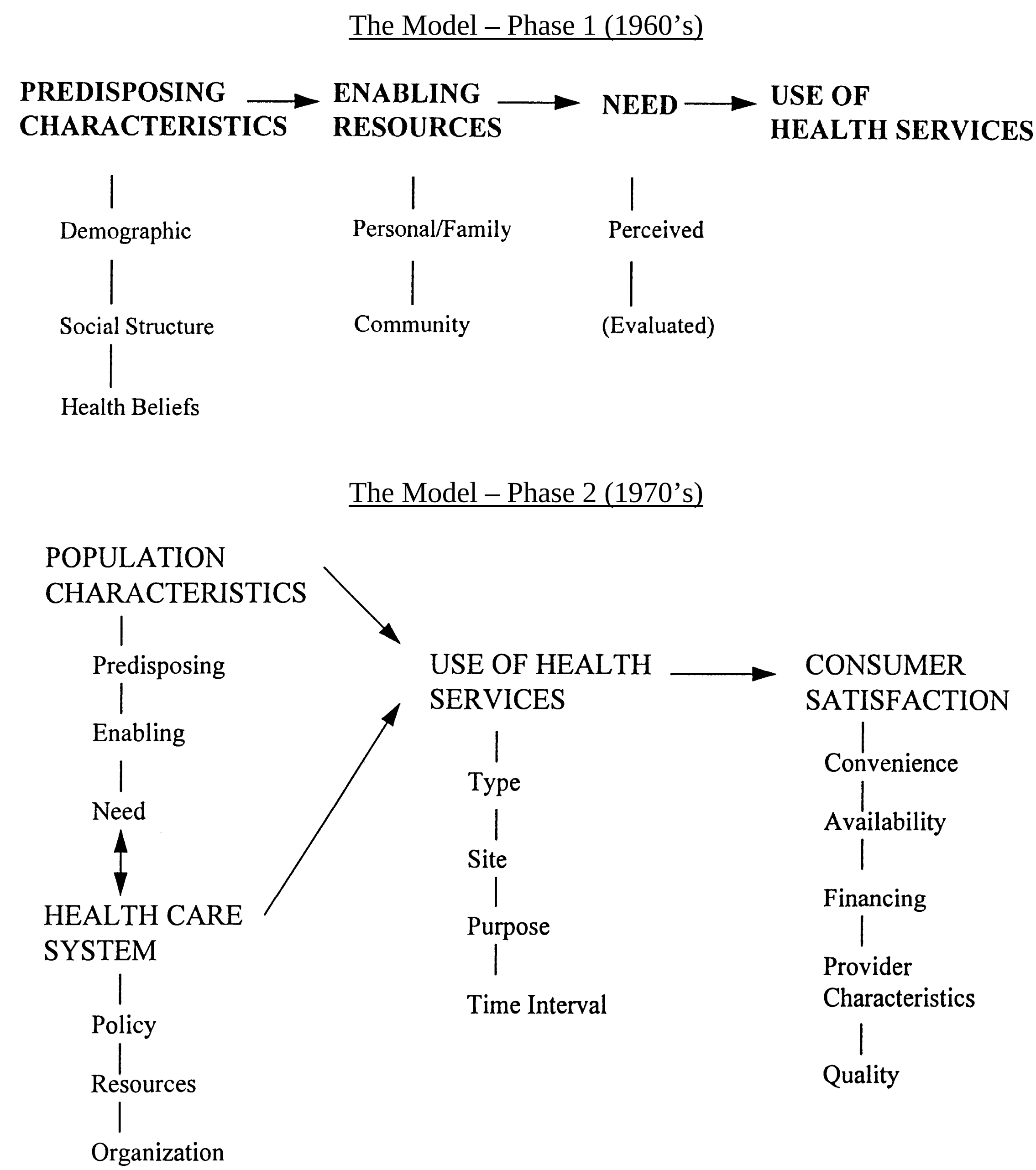
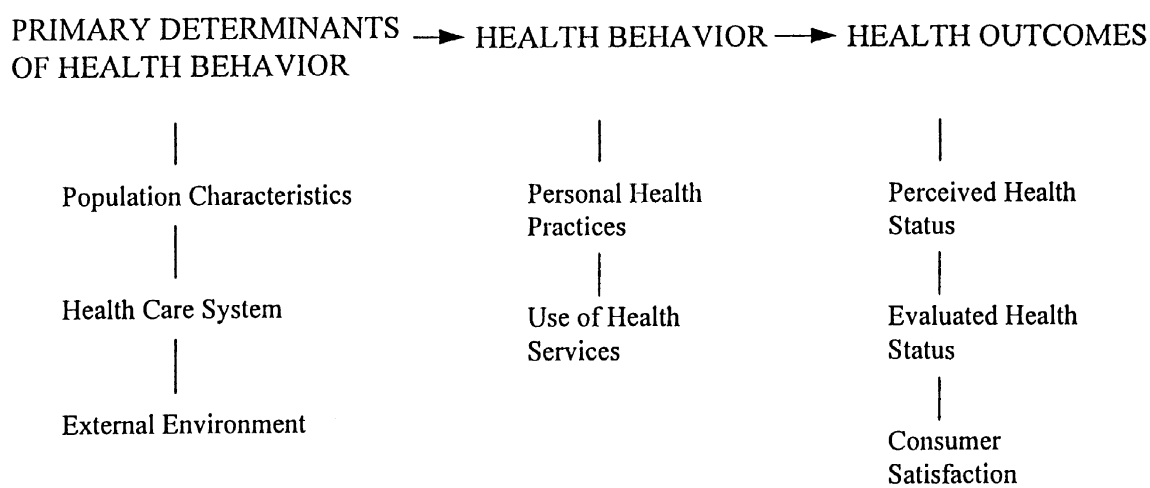
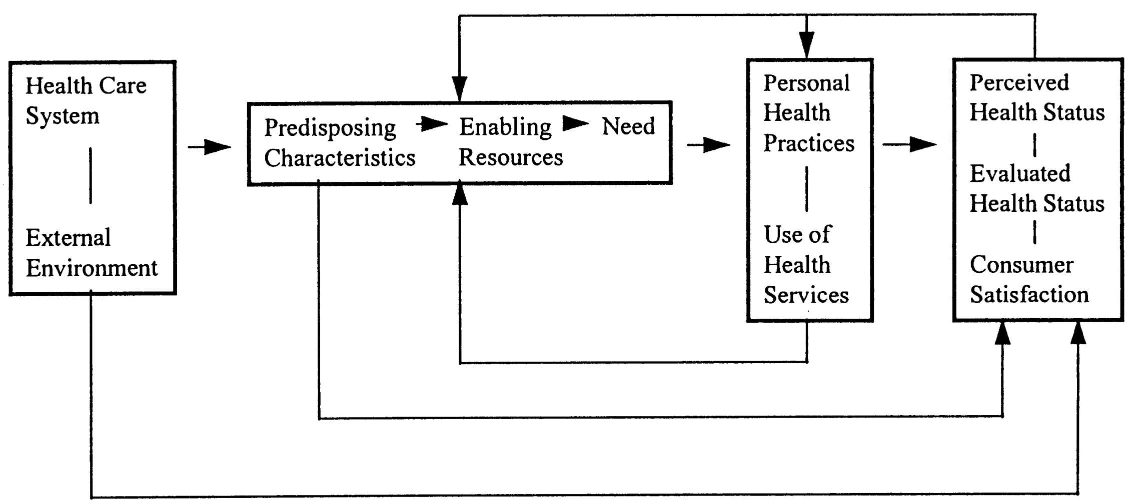


Figure 1 (continued)
Evolution of Andersen's Behavioral Model of Health Care Utilization

The Model – Phase 3 (1980's & 1990's)



The Model – Phase 4 (1990's)



Adapted from (Andersen, 1995)

In the 1970's, the second phase of the model was developed by Aday and other collaborators (Aday & Andersen, 1974; Andersen & Newman, 1973) (Figure 1). The health care system was explicitly included in this phase as important determinants of the population's use of services. The 1970's model also took into account both societal and individual determinants of service utilization. The updated model also added an explicit outcome of health services consumer satisfaction. A third phase of the model evolved during the 1980's and 1990's (Figure 1). Recognizing that health services are supposed to maintain and improve the health status of the population, Andersen included the external environment (including physical, political, and economic components) as an important component for understanding health service utilization. This model also took into account health behavior, such as diet exercise, and self care (Andersen, 1995). Most recently, in the 1990's, Andersen and his colleagues unveiled a final, albeit emerging, model which emphasized the dynamic and recursive nature of health services. As seen in Figure 1, this final model portrays the multiple influences on health services and includes feedback loops showing that outcome affects predisposing factors and perceived need for services as well as health behavior (Andersen, 1995).

Components of the Behavioral Model of Health Care Utilization

Despite an impressive expansion of Andersen's model over the past 40 years, this dissertation focuses exclusively on the individual level of service use rather than the societal level. Empirical research provides support to the individual determinants of the health service use being tested more rigorously than societal components. As such, this chapter only describes the components from the individual determinants model. In his original model (see Figure 1), Andersen identified three clusters of independent variables that affect service utilization: predisposing, enabling, and need variables (Andersen & Newman, 1973). Theoretically, individual determinants are considered to be a function of a) the predisposition of the individual to use services, b) the individual's ability to secure services, and c) the individual's illness level or need for health care services (Aday & Andersen, 1974).

Predisposing Variables. These variables indicate propensities of individuals to use health care services prior to episodes of any specific illness and reflect the fact that some persons are more likely to use health services than others. Andersen and Davidson (2001) suggest these are the basic characteristics or beliefs an individual has that make them more or less inclined to using health services. These variables typically exist prior to the onset of illness, and are not necessarily directly responsible for service use. Individual predisposing characteristics include three subgroups: demographic factors, social factors, and health beliefs (Andersen & Davidson). Demographic factors, such as age and gender, represent biological imperatives suggesting the likelihood that people will need health services (Andersen, 1995). Social factors relate to an individual's community status, their ability to cope with problems, and the resources they have to deal with problems. Traditional measures used to assess social factors include education, occupation, and ethnicity. Finally, health beliefs are attitudes, values, and knowledge about health and health service held by the individual and their family that might influence their subsequent perceptions of need and use of health services (Andersen).

Enabling Variables. Even if individuals are predisposed to use services, they must have the means available to them for service use (Andersen & Newman, 1973). Enabling resources must be present for health utilization to occur. Enabling variables are divided into two categories, including individual attributes and community attributes. Individual attributes involve having the financial resources or insurance available to pay for health services. Community attributes include an individual's access to health personnel and facilities (e.g., geographic setting, availability of professionals), as well as the means and know-how to get to those services. Frequently studied enabling variables include: income, health insurance, availability of local health care, as well as travel and waiting times (Andersen, 1995). There is also a growing body of criticism that suggests Andersen's original model ignores social networks and the extent and quality of social relationships (Pescosolido, 1992). As a result, in his more recent work, Andersen has documented the importance of measures of social relationships as enabling variables (Andersen).

Need Variables. According to Andersen and Newman (1973), need variables include evaluated need and perceived need, and are the most immediate factors related to health service use. Evaluated need represents professional judgment about people's health status and their need for medical care (Andersen, 1995). This evaluation may consist of diagnoses given, a severity or impairment rating, or suggestions about treatment. Perceived need is an individual's subjective view of his or her own health condition, including how they perceive their symptoms, the impairment caused by these symptoms, and their need for treatment (Andersen & Newman). Individuals and their families must believe illness or the change for illness is present in order for health service use to occur. Logical expectations, according to Andersen, are that perceived need will better predict care-seeking and adherence to a medical regimen, while evaluated need will be more closely related to the kind and amount of treatment provided after initial presentation to a health care provider.

Research Using the Behavioral Model of Health Care Utilization

The Behavioral Model is used for organizing determinants of service utilization, but more importantly, for making changes to service utilization in order to improve health outcomes. Andersen's model has been used extensively throughout the health field. A brief examination of the literature reveals Andersen's model being used to examine utilization for a host of medical and dental problems for countless sub-groups of consumers. For example, the model has been applied to studies examining dental care use by U.S. veterans (Gilbert, Branch, & Longmate, 1993), genetic contributions to health care utilization (True et al., 1997), and even the influence of sociodemographics on the quality of life for pediatric patients with asthma (Erickson et al., 2002).

More recently, the model has proven useful in describing and explaining various aspects of service utilization in the mental health field. To date, however, the overwhelming majority of studies have investigated specific diagnoses or mental health problems in specialized populations. For example, one study examined mental illness and help-seeking behavior among Mariel Cuban and Haitian refugees in Florida (Portes, Kyle, & Eaton, 1992). Another study examined the ability to predict the utilization of mental health services among homeless individuals with mental illness (Lemming & Calsyn, 2006). More specific to the current dissertation, only a small collection of studies have examined broad-based mental health utilization from a state or national perspective. Even fewer have investigated mental health utilization among children or adolescents. Using the Behavioral Model categories of predisposing, enabling, and need variables for organization, research on predictors of service utilization among children and adolescents is summarized below.

Predisposing Variables. As previously discussed, predisposing variables include demographics, social factors, and beliefs which describe an individual's propensity to use mental health services. While these characteristics are relatively stable and unchangeable, they remain important for determining which characteristics are common in those youth who do and do not utilize services. A handful of studies have investigated these characteristics in child and adolescent populations.

Much like the study at hand, Pandiani and his colleagues (2005) conducted a statewide study examining access to community mental health services in Vermont. Examining the state population as a whole, mental health service utilization by young people increased with age from 2% of children under 7 years of age, to 6% in the 7-12 age group, and 8% in the 13-17 age group. Boys were somewhat more likely than girls to receive mental health services (6% vs. 5%). However, when examined in respect to special populations (e.g., youth with IEP, involvement with juvenile justice), girls tended to be more likely than boys to access public mental health programs, and the rate of flow into mental health services decreased with age (Pandiani et al.). A study by Zwaanswijk et al. (2003) examined utilization among a sample of 1120 Dutch adolescents aged 11 to 18. Within the general sample, 3.1% of the adolescents (54% boys vs. 46% girls) reported utilizing mental health services over the past year and 3.8% reported unmet need. However, 3.8% of the total sample reported having a need for professional help, without having obtained it.

When examining adolescent populations exclusively, however, reported utilization appears higher among females. For example, Chandra and Minkovitz (2006) explored gender differences and the role of stigma in teen willingness to use mental health services. Self-administered, written questionnaires were conducted with 274 eighth graders in a suburban community in a mid-Atlantic state. Teens reported on social support for emotional concerns, mental health experience and knowledge, and stigma and barriers associated with mental health service use. According to their findings, boys had less mental health knowledge and experience and higher mental health stigma than girls. In addition, girls were twice as likely as boys to report willingness to use mental health services. However, a handful of studies report no significant difference in respect to gender (Flisher et al., 1997; Hurlburt et al., 2004).

In respect to social factors, ethnicity is most frequently the characteristic of analysis. A growing collection of research has revealed significant racial/ethnic disparities in mental health utilization among children and adolescents. In one study, non-Caucasian descent adolescents were more likely to have received mental health care than Caucasian youths (Zwaanswijk et al., 2003). However, this finding is in contrast with the majority of studies examining utilization and ethnicity (Cuffe, Waller, Cuccaro, Pumariega, & Garrison, 1995; Cunningham & Freiman, 1996; Wu et al., 2001). More frequently, utilization among white or Caucasian adolescents is more common compared to their non-white peers. Examining data from a national survey, Kataoka, Zhang, and Wells (2002) found higher levels of unmet need for Latino youth compared to their white peers. In addition, in a sample of youths with identified mental health needs, African American, Asian/Pacific Islander American, and Latino youth had significantly higher levels of unmet need (Yeh, McCabe, Hough, Dupuis, & Hazen, 2003). Similarly, in a study examining unmet mental health needs from a community sample of children and adolescents, being African American (compared to white) was significantly associated with unmet need (Flisher et al., 1997).

Enabling Variables. Research examining individual enabling attributes have documented that income and insurance do appear to influence utilization of mental health services for children and adolescents. Gyamfi (2004) examined the effect of poverty and children's mental health service use. Families living below the poverty threshold were more likely to receive fewer services even though no significant relationship was found between poverty status and emotional or behavioral problems. In addition, poor families received a smaller range of services than non-poor families. Similar findings were reported by Flisher (1997), who found a correlation between economic disadvantage (e.g., being on public assistance) and unmet mental health needs. A variety of other studies have found insurance status to be a strong predictor of utilization (Hurlburt et al., 2004; Pandiani et al., 2005).

There is increasing interest in the relationship between social support and mental health. A growing body of research shows that social support is negatively correlated with mental health concerns. For example, even controlling for other family characteristics, social support at the family level is associated with better mental and physical health for individuals. Longitudinal studies suggest that social support serves as a critical protective factor (Markward, McMillan, & Markward, 2003). A more recent study investigated perceived emotional support from family, friends, and teachers and depression in early and late adolescents during their transition to junior high school and college. According to Reis and his colleagues (2009), perceiving support from all three domains was associated with the lowest depressive symptoms. In the health utilization literature, social networks and support have been largely neglected as enabling variables. A study by Kouzis and Eaton (1998) found that social support interacted with psychological distress to effect the use of medical care. Even after controlling for gender, age, and insurance status, the combination of high distress and low social support by a confidante resulted in a fourfold increase of medical utilization. In a more recent study, consumers who had higher social network index scores had lower expenditures for inpatient services in state hospitals and outpatient services than those who have lower scores (Kang et al., 2007).

Research examining community enabling attributes traditionally has focused on an individual's access to health personnel and facilities. A smaller collection of research has examined geographic setting as a function of mental health utilization. From a national perspective, Sturm and his colleagues (2003) documented significant variability in the utilization of children's mental health services across states. Based on their findings, Minnesota was among five states with significantly higher utilization than the national average (9.27% vs. 7.45%). Surprisingly, differences in population characteristics across states did not explain much of the observed geographic variation in utilization. Furthermore, differences in utilization were not paralleled by differences in need (Sturm et al.). In regard to urban, suburban or rural differences, a handful of previous studies have found no geographic differences in the use of mental health services (Grusky, Tierney, Manderscheid, & Grusky, 1985; Sommers, 1989). However, the majority of existing research identifies urban dwellers as more likely to use services than rural residents (Goldstrom & Manderscheid, 1983; Watts, Scheffler, & Jewell, 1986). Most recently, Lambert and his colleagues (2009) examined three years of pooled data

(1997, 1999, 2002) from the National Survey of America's Families (NSAF). Their analysis revealed that rural children are slightly less likely to have a mental health visit than are urban children (7% rural vs. 8% urban). Among children with an identified mental or behavioral health issue, rural and urban rates of mental health visits in the past year are the same (36.5%).

Need Variables. As discussed, need variables include evaluated need and perceived need, and are the most immediate factors related to health service use. According to Leaf et al. (1988), factors indicative of need emerge as the strongest predictors of utilization. In respect to mental health utilization among youth, the overwhelming majority of studies have investigated need as evaluated by mental health professionals or perceived by parents, teachers or other caregivers. Few, if any, studies investigate self-perceived need among adolescents. Burns and her colleagues (2004) assessed the relationship between the need for and use of mental health services among a nationally representative sample of children who were investigated by child welfare agencies after reported maltreatment. The study included 3,803 children aged 2 to 14 years. Youths with clinical levels of mental health need, as perceived by the parent, were much more likely to receive mental health services than lower scoring youth. According to Burns et al., clinical need was related to receipt of mental health care across all age groups.

A plethora of investigations have been conducted with data from the four community site NIMH Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study. Leaf et al. (1996) sought to provide information about mental health and substance abuse service utilization in the community and schools. Youths aged

9 through 17 years and a parent/caretaker were interviewed about demographic characteristics, the existence of psychiatric symptoms, level of functioning, and risk factors for psychiatric disorders. In addition, information was collected about the youths' contacts with health, school-based, social services, and other service providers because of emotional or behavior problems or because of drug and alcohol problems. According to Leaf and his colleagues, having a psychiatric disorder and/or having impairment in functioning had a significant effect on reported use of specialized mental health services. Youth with mental illness and poor levels of functioning were 6.8 times more likely to have seen a mental health provider compared to children without a mental illness and with higher levels of functioning.

Again utilizing data from the MECA Study, Ping et al. (1999) examined the relationship of depressive and disruptive disorders with patterns of mental health services utilization in a community sample of children and adolescents. The MECA sub-sample consisted of 1,285 child (ages 9-17 years) and their parent/guardian. Data were collected on child psychopathology, impairment, child need and use of mental health services, and family socioeconomic status (SES). Findings revealed that children with depressive disorders were less likely to receive specialty mental health services than the youth with disruptive disorders. For utilization of school-based services, however, no differences were found between depressive and disruptive disorders. Interestingly, youth-parent differences were also reported in terms of perceived need. Parents perceived greater need for mental health services for children with disruptive disorders than for those with depression. Conversely, depression was more related to children's perception of mental health service need than was disruptive disorder (Ping et al.).

School-Based Mental Health

To date, health utilization research has focused largely on individual enabling attributes (i.e., availability of health insurance and financial resources). A handful of studies have also investigated community-level enabling attributes, including proximity to health care facilities, professionals, and/or specialized services. In the area of child and adolescent mental health, however, the institutions and systems that were created to address mental health concerns are failing. As a result, their reliability and validity as predictors of mental health utilization is suspect. Instead, a growing body of research points to public schools as the "major providers" of mental health services for school-aged children (Rones & Hoagwood, 2000, p. 223). In fact, it is argued that schools are second only to families in shaping children's development (Cowen, Hightower, Work, Pedro-Carroll, & Wyman, 1996). If true, a strong argument can be made that schools may be the most important community-level enabling attribute. The remainder of this chapter will provide an overview of school-based mental health service delivery, including its promise as an enabling variable for improving mental health utilization among children and adolescents.

Introduction to School-Based Mental Health Service Delivery

The education system has a long history of providing mental health services to students. In fact, these efforts have been mandated in special education for over 30 years (Kutash, Duchnowski, & Lynn, 2006). However, given the organizational differences between the education and mental health systems, understanding and defining school-based mental health service delivery has been challenging. In fact, while both systems have a long history of providing services to youth, even the terminology used to describe mental health supports and services is different. For example, even today the education system is often reluctant to use “mental health” when describing their services; relying instead on “social/emotional supports” or “social and emotional learning.” While the services provided by these systems are similar and overlapping, the organizational differences (including rhetoric) often lead to “co-location” rather than collaborative partnerships. Furthermore, reluctance by the education system to utilize “mental health” perpetuates the existing stigma around and traditional definition of mental health service delivery that focuses exclusively on individualized treatment. Throughout this dissertation, “school-based mental health (SBMH)” was the term utilized in hopes that common language will serve as the foundation for increased clarity.

Like agreeing on its name, agreeing on what should be included under the school-based mental health service delivery umbrella has also triggered renewed conflict between the two systems. To date, there are no state mandates about mental health services in schools and no clear definition of what constitutes mental health services. The term school-based mental health service delivery has generally come to be understood as any mental health service delivered in a school setting (Kutash et al., 2006). The obvious danger with such a broad-based definition is that it fails to clearly describe the type of supports and services encompassed, as well as the various delivery arrangements and personnel responsible for providing these services. For example, historically, mental health service delivery has been defined in terms of treatment for specific individuals with specific psychosocial or mental health disorders (Foster et al., 2005). More recently, however, both the education and mental health systems have begun to acknowledge a definition of service delivery that includes not only “treatment”, but also prevention of psychosocial and mental health problems, and promotion of social and emotional development (Policy Leadership Cadre for Mental Health in Schools, 2001). For the purposes of this thesis, school-based mental health service delivery is defined as any collaborative and coordinated effort by a school to *promote* the health and positive development, as well as *prevent* and *treat* mental health and behavioral challenges in children and adolescents. However, it should be noted that SCHOOL-BASED MENTAL HEALTH is about more than just creating full service schools and does not exist in isolation. As emphasized in a recent publication by the Center for Mental Health in Schools (2007), "it is about becoming part of a comprehensive, multifaceted systemic approach that strengthens students, families, schools, and neighborhoods" (p. 2). As the education systems' role in this comprehensive system continues to evolve and become clearer, there is no question that schools will more carefully examine the social, emotional, and behavioral conditions that are closely associated with academic achievement – specifically health promotion and prevention. Being such, a clear distinction between promotion, prevention and treatment strategies is necessary (Kutash et al.). Such a distinction will be made in the following section.

The Public Health Model: A Foundation for School-Based Mental Health

Historically, mental health services were disproportionaly provided to only the most severely impaired (Cowen et al., 1996). Schools, however, have the potential to promote health, prevent the more serious problems, and offer services to less-impaired youth. As such, schools have begun to consider the public health prevention model as they implement mental health supports and services. In fact, the concepts of "health promotion" and "prevention" have become central to the definition of school-based mental health. The adoption of this model also links two separate but complementary mental health approaches: prevention and treatment (Weisz, Sandler, Durlak, & Anton, 2005). As a result, the public health prevention model or "prevention triangle" (Commission on Chronic Illness, 1957; Gordon, 1987) has been infused into almost all school-based mental health programs and serves as the foundation for the few emerging conceptual models. In its original and most basic form, the "prevention triangle" consisted of three levels of prevention programming (see Figure 2).

Figure 2
Original Prevention Triangle: Description & Example of Levels

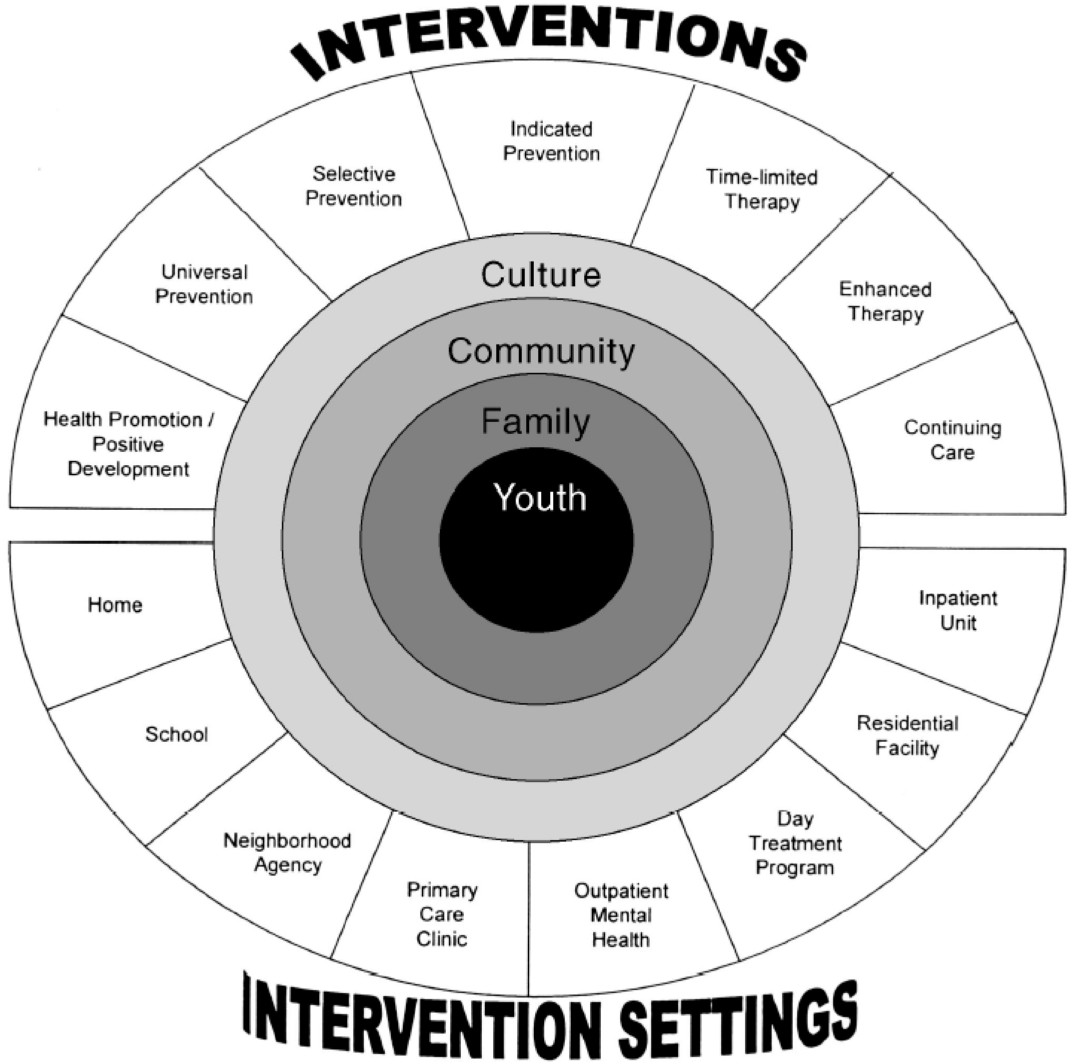
Level	Description	Examples of Programs
Universal	Focuses on promoting health and preventing risk for all children	Second Step (aggression prevention; see Grossman et al., 1997)
		Success for All (literacy development; see Slavin & Madden, 2001)
		Collaborative to Advance Social and Emotional Learning (CASEL; see Payton et al., 2000)
Selective	Focuses on preventing risk for subgroups of children known to be at heightened risk for unhealthy patterns of behavior	First Step to Success (aggression prevention; see Walker et al., 1998)
		Pathways (obesity prevention; see Davis et al., 1999)
		Infant Health and Development Program (early intervention; see Infant Health and Human Development Program, 1990)
Indicated	Focuses on reducing risk for children identified as having emerging problems or signs of risk	Fast Track (prevention of conduct problems; see Conduct Problems Prevention Research Group (2002)
		Primary Mental Health Project (prevention of mental health disorders; see Cowen et al., 1996)
		Anger Coping Program (aggression prevention; see Lochman, 1992)

(Power, 2003)

Despite the public health models' impressive record and valuable framework, its semantic inconsistencies (e.g. primary vs. universal, secondary vs. selected) have contributed to existing confusion associated with school-based mental health service delivery. In an effort to provide clarity and a common language necessary to support collaboration, a recent monograph by Kutash et al. (2006) provides an extensive discussion on the evolution of the public health model and its implications for school-based mental health service delivery. More importantly, after reviewing the literature and various adaptations of the public health model, the authors made a clear recommendation for conceptualizing and defining prevention, as well as distinguishing prevention strategies from treatment strategies in the school setting. According to Kutash and her colleagues, their recommendation – the Institute of Medicine Model (Mrazek & Haggerty, 1994) as adopted by Weisz et al. (2005) – is the most feasible and best suited to promote a common language necessary to support collaboration (see Figure 3).

Weisz and his colleges (2005) have expanded and transformed the original Institute of Medicine Model (Mrazek & Haggerty, 1994) into the "Mental Health (MH) Spectrum Model." The obvious strength of this model is the clarity it provides as a result of specific and more clearly delineated definitions (Kutash et al., 2006). While still including the aforementioned "triangle" components (i.e. universal, selective and indicated prevention), the MH Spectrum Model concretely distinguishes these prevention strategies from treatment strategies (see Figure 4). They have also added the relatively new concept of "health promotion/positive development" as a stand-alone component that precedes universal prevention strategies. Finally, this conceptual model seems well suited to advance and improve the coordination of school-based mental health because it recognizes the system of relationships that forms the young person's environment, as well as the broad range of contexts in which services can be delivered.

Figure 3
Mental Health Spectrum Model: Linking Prevention and Treatment



(Weisz, Sandler, Durlak & Anton, 2005)

Figure 4
Definitions of Promotion, Prevention, and Treatment

- **Health promotion/positive development** strategies target an entire population, with the goal of enhancing strengths so as to reduce the risk of later problem outcomes and/or to increase prospects for positive development.
- **Universal prevention** strategies are designed to address risk factors in entire populations of youth (e.g. all youth in a school).
- **Selective prevention** strategies target groups who are identified because they share a significant risk factor and mounts interventions designed to counter that risk (e.g. youth who have experienced death of a parent).
- **Indicated prevention** strategies include interventions with those youth who have significant symptoms of a disorder (e.g. major depressive disorder) but do not currently meet diagnostic criteria for the disorder.
- **Treatment interventions** generally target those who have high symptom levels or diagnosable disorders at the current time.

(Weisz, Sandler, Durlak & Anton, 2005)

Keeping the MH Spectrum Model in mind, many districts and their respective schools offer an extensive range of corrective and preventive activities to meet the mental health needs of students (Adelman & Taylor, 2000). On the surface, despite being grossly under-resourced (Weist, Paternite & Adelsheim (2005), schools appear to serve the mental health needs of students along a continuum of school-wide interventions (e.g. positive school climate, conflict resolution) to providing individualized supports for students with identifiable psychological disorders. Unfortunately, “precisely what is provided by schools under the rubric of mental health services…is largely unknown” (Rones & Hoagwood, 2000, p. 223). As discussed by the Policy Leadership Cadre for MH in Schools (2001), there is not a national database and only limited research that documents the nature and range of school-based mental health services.

While our general understanding of the type and frequency of services provided in schools is – at best – limited, some researchers (Davis, Fryer, & White, 1995; Heneghan

& Malakoff, 1997; Slade, 2003) have begun to examine the availability of school-based mental health. Not surprising, the vast majority of this literature has focused on treatment services provided to individual students with identified mental health concerns, rather than on promotion and prevention services provided to all (or even some) students. However, two recent large scale studies appear to provide the first step in addressing the immense need for school-based mental health data – including research on the availability and range of broader promotion and prevention activities. In November 2005, SAMHSA released *School Mental Health Services in the United States* (Foster et al., 2005), a report based on a national survey of school mental health services in 2002-2003. This study provides the first comprehensive examination of how mental health services are provided in schools, and how these services are organized, staffed, funded, and coordinated. More recently, the *Survey of Social/Emotional Supports and Services in Minnesota Schools 2005-2006: Report of Findings* (Leonard, Shevlin-Woodcock, Sander, Dona & Christenson, 2007) provided the first statewide look at social/emotional supports and services. This study collected "baseline" data on the type and frequency of social/emotional supports and services being provided in Minnesota schools, as well as information about the delivery arrangements and specific school personnel utilized to provide these services.

Research on School-Based Mental Health

The proliferation of promotion, prevention, and treatment services throughout many school districts across the country largely rests on two premises (Evans, 1999). The first is that school-based services will be effective, and show measurable impacts in the functioning of children. The second is that school-based services will improve access and utilization by children and adolescents. The purpose of this dissertation is to examine school-based mental health services as a function of utilization only. No assumptions or conclusions can be made about the quality or effectiveness of the services provided in this study. However, as discussed by Evans, if the effectiveness premise is not true, then improvements in utilization may be wasted. Being such, a brief review of the SBMH effectiveness literature will be provided, followed by an examination of literature on utilization of services.

Effectiveness Research. In recent years, major national reports (National Institute of Mental Health, 2001; U.S. Department of Health and Human Services, 1999; U.S. Public Health Service, 2000) have highlighted the importance of school-based mental health services and programs. In addition, researchers have documented the effectiveness of school-based programming and the major role schools play in meeting the mental health needs of school-aged youth. Documenting the various benefits of school-based mental health is critical as the prevalence of these supports and services continues to increase. Like outcome studies on typical delivery methods of outpatient mental health services, outcome studies on school-based mental health models are growing, but still limited (American Academy of Pediatrics Committee on School Health, 2004). Nevertheless, a growing body of literature has demonstrated many positive outcomes associated with school-based mental health services.

The implementation of school-based supports and services has the ability to improve functioning at the individual, classroom and school levels. However, research findings are most commonly reported in terms of subject outcomes (e.g. decrease in concerning behavior, improved classroom climate). Research demonstrates that students who receive social-emotional and prevention services achieve better in school and also experience improved emotional and behavioral health (Greenberg et al., 2003; Welsh et al., 2001; Zins et al., 2004). Klingman & Hochdorf (1993) conducted research on 237 eighth-grade students who were randomly assigned to treatment and control groups within classrooms. After 12 sessions of primary prevention program on skills coping with distress and self-harm, students in the treatment group displayed a lower risk of potential suicide, demonstrated more positive coping skills, and obtained significantly more knowledge of suicide facts and help resources than students in the control group.

As discussed by Paternite, 2005, there is compelling evidence that there are strong positive associations between mental health and academic success, and that emotional and behavioral health problems serve as significant barriers to learning. Being such, it is not surprising that a recent major study revealed that higher levels of school bonding and better social, emotional, and decision-making skills predicted higher standardized test scores and grades, while attention problems, negative behavior of peers, and disruptive and aggressive behavior predicted lower test scores and grades (Fleming et al., 2005). Cunningham, Martorelli, Tran, Young, & Zacharias (1998) examined the effects of a student-mediated conflict resolution program on training fifth-grade students in three schools in peer mediation and conflict resolution. The researchers reported positive findings, indicating the student mediation program reduced physically aggressive playground behavior by 51% to 65%. In addition, the effects were sustained at 1-year follow-up observations.

Based on their extensive review of school-based mental health services, Rones and Hoagwood (2000) indicated that “children whose emotional, behavioral, or social difficulties are not addressed have a diminished capacity to learn and benefit from the school environment…and children who develop disruptive behavior patterns can have a negative influence on the social and academic environment for other children" (p. 236). School mental health services in elementary schools have been found to improve aspects of the school climate (Bruns et al., 2004), and reduce disciplinary referrals, suspension, grade retention, and special education referrals and placement among at-risk students (Substance Abuse and Mental Health Services Administration, 2005).

Utilization Research. A growing body of school-based mental health research has also documented programmatic or implementation outcomes (e.g. increased accessibility to mental health services). For example, one advantage of the familiar setting of school for provision of mental health services is that students and families avoid the stigma and intimidation they may feel when they go to an unfamiliar and perhaps less culturally compatible mental health setting (American Academy of Pediatrics Committee on School Health). School-based mental health reduces the barriers children and families experience on a regular basis. Accessibility is commonly described as a major barrier to mental health. Providing school-based mental health services eliminates the need for transportation of students to and from off-site appointments and facilitates parent participation in mental health appointments (American Academy of Pediatrics Committee on School Health, 2004). According to Kaplan et al. (1998), adolescents with access to school-based mental health services were 10 times more likely than students without such access to initiate a visit for a mental health or substance abuse concern. Furthermore, participation or appointment follow through increases significantly because school-based mental health providers have direct access to the students. Service coordination is also improved since school-based mental health providers work collaboratively with teachers, student support personnel and school administrators. Finally, in addition to eliminating barriers to access to care, school-based mental health services offer the potential to improve accuracy of diagnosis as well as assessment of progress. Schools offer unlimited opportunities to acquire information about the child and family (e.g. how he/she deals with physical and social stresses and challenges) (American Academy of Pediatrics Committee on School Health).

The aforementioned programmatic and implementation advantages result in increased service utilization. Burns and colleagues (1995) analyzed data from the first wave of the Great Smokey Mountain Study of Youth, a population-based study of psychopathology and mental health service use among children. Of the 16% of children or adolescents receiving any mental health services, less than 25% received intervention through the general medical care sector. The overwhelming majority (70% to 80%) received them within the school setting. In addition, the school system provided the only source of mental health service for most children. For nearly half of the children with serious emotional disturbances who received services, the public school system was the sole provider (Burns et al.).

Other research has also documented the schools significant role as mental health service providers (Costello et al., 1996; Leaf et al., 1996; McGee et al., 1990; Zahner, Pawelkiewicz, DeFrancesco, & Adnopoz, 1992). As part of the NIMH funded MECA study, Leaf and his colleagues developed survey questions in order to identify how and where children and adolescents were utilizing mental health services. One quarter (25%) of the students surveyed reported having some contact with a mental health professional or other service provider related to a social/emotional, behavioral, or drug/alcohol concern. In addition, over 36% of the students receiving services met criteria for a psychiatric disorder, although, less than a third received services from a mental health specialist. Of the students receiving services, over 55% met their mental health needs in a school (Leaf et al.). Such findings demonstrate the significant role for the education sector in mental health service delivery and suggest schools may actually function as the “de facto” mental health system for children and adolescents.

CHAPTER THREE

Methods

Participants

Participants for this study include 18,894 9th and 12th grade students from 61 Minnesota high schools. The 61 schools from which the students were identified represent 42% of the 145 high schools originally sampled, and 16% of all Minnesota high schools operating during the 2005-06 school year (N=375). Descriptive data regarding these schools are provided in Table 1.

Table 1
Descriptive Characteristics of Participating High Schools

	Sample (n=61)		Population (N=375)	
	Number (n)	Percent (%)	Number (N)	Percent (%)
School Size				
<500	17	28	201	54
<1000	16	26	78	21
<1500	13	21	41	11
≥1500	15	25	55	15
Geographic Location				
Urban	9	15	16	5
Suburban	18	29	61	16
Rural	34	56	298	79

In terms of geographic setting, 15% (n=9) of the schools were located in urban areas (i.e., Minneapolis/St. Paul), 29% (n= 18) were from suburban areas (i.e., Twin Cities metro), and 56% (n=34) from rural areas. Analysis of response rates for each of the three strata revealed that urban and suburban schools are overrepresented in this sample, while rural school are underrepresented compared to the population of Minnesota high schools in 2005-06. This is, however, a result of intentional oversampling in the urban and suburban geographic regions to allow for more sophisticated statistical analyses in the future. Response rates also reveal that small schools (<500) are under represented in this sample, while schools with moderate or large student populations (>1000) are slightly overrepresented. While these differences are certainly important to document, given the size of the sample, each geographic region and size of school is well represented within this study. Furthermore, as discussed below, the actual participants for this study (i.e., individual students) are quite representative of the broader population of Minnesota high school students.

Demographic data for the 18,894 participants in this study, along with state comparisons, are presented in Table 2. The sample represents over 13% of all 9^{th} and 12^{th} grade students attending Minnesota high schools during the 2006-07 school year. In regard to ethnicity, the largest percentage of students is Caucasian (76%). Compared to the general population, females were slightly overrepresented in this study (51%). Students in 9^{th} grade were also slightly overrepresented compared to the broader population of Minnesota students in 2006-07. The largest percentage of students were 15 years old (37%), followed by 18 year old students (26%). In regard to students receiving free or reduced price lunch, the sample is quite reflective of the broader population. Overall, this sample is quite representative of the broader population of Minnesota 9^{th} and 12^{th} grade students during the 06-07 school year.

Table 2
Demographic Characteristics of Students

	Sample (n=18,874)		Population (N=142,080)	
	Number (n)	Percent (%)	Number (N)	Percent (%)
Gender				
Male	9264	49	72,788	51
Female	9630	51	69,292	49
Grade				
9th	10,841	57	68,807	48
12th	8,053	43	73,273	52
Age				
13	14	<1	-	-
14	3364	18	-	-
15	6995	37	-	-
16	376	2	-	-
17	2846	15	-	-
18	4982	26	-	-
19-20	194	1	-	-
Ethnicity				
White	14,413	76	112,702	79
Non-White	4340	23	29,378	21
Missing	141	<1	-	-
Free/Reduced Lunch				
Yes	4768	25	37,388	26
No	13,842	73	104,692	74

Procedures

This study was conducted by combining two extant databases. Database 1 is from the 2006 Survey of Social/Emotional Supports and Services (Appendix A). These data were collected as part of a state-wide study by the Department of Education in order to examine the various school-based mental health supports and services available in Minnesota schools. Database 2 is from the 2007 Minnesota Student Survey (Appendix B). These data were collected jointly by the Minnesota Departments of Education, Health, Human Services, and Public Safety in order to examine the activities, experiences, and behaviors of Minnesota students. The procedures for each of the aforementioned studies are described below. A description of the procedures related to this study, including data amalgamation, is then provided.

Survey of Social/Emotional Supports and Services

All traditional public schools (N=1461) in Minnesota were identified using a Department of Education data file. (Due to their unique characteristics, Alternative, Charter and K-12 schools were not included.) The population was stratified by school level (i.e. elementary, middle, secondary), and geographic setting (i.e. urban, suburban, rural). A total of n = 550 schools were then randomly selected, generally representing each of the various strata. Besides those strata with urban schools, 36% of schools were sampled from each strata. However, because considerably fewer urban schools exist, there was concern among the researchers that the necessary number of schools per strata (i.e. 15) for more extensive statistical analyses in the future would not be obtained. As a result, urban schools were over sampled.

Data collection began in mid March 2006. A cover letter explaining the nature of the survey, the specific information to be collected, the voluntary nature of their participation, and its various utilities (e.g. strategic planning for schools), was sent to the lead school psychologist of each school building. Directions, including a URL (web address) for completing the survey, were attached to the cover letter. School psychologists were encouraged to assemble a voluntary team of school personnel (e.g. school psychologist, social worker, teacher, special education teacher, administrator). Once identified, the team was directed to complete the on-line survey collaboratively.

In early May 2006, follow-up postcards with survey directions were sent to non-respondents in order to improve response rates. A sample of the postcard is available in

Appendix D. Beginning in June, phone calls and email messages were also utilized until the target response rate (40%) was reached. In some instances, surveys were completed at the district level rather than building level as directed. In addition, some teams began but failed to complete their surveys. These particular responses were not considered valid or used in the study. In July 2006, data collection concluded and complete responses were moved from an online databank into a statistical software program.

Minnesota Student Survey

The Minnesota Student Survey (Level: Secondary) was administered in the spring of 2007 to public school students in Grades 9 and 12 statewide. All public school districts in Minnesota were invited to participate. Local schools and school districts were responsible for the administration of the survey. The majority of schools in the state used a passive consent procedure for the survey (i.e., children participated unless parents requested omission from the survey). A few school districts used an active consent process (i.e., parents were required to return a signed permission slip before their children took the survey). Regardless of consent process, parents were informed about the survey in advance by each local school and had an opportunity to view the survey and determine their child’s participation. MDE provided sample parental consent letters to school district coordinators in English, Spanish, Somali, Hmong, Cambodian, Laotian, and Russian. Parents could choose not to have their children participate. Students themselves could decline to take the survey, or if they took the survey, they could skip any question or stop at any point. Surveys were anonymous; no names or identifying code numbers were used on the survey booklets. Answers cannot be traced to an individual.

Merging of Extant Databases

For the purposes of this study, it was necessary to link the two extant databases discussed above. First, Database 1 was prepared. All data outside the scope of this research were removed. All elementary and middle school data were removed, as well as six high schools that did not participate in the 2007 Minnesota Student Survey (and therefore would not have linkable data). An SPSS file with 61 identified high schools and their respective variables remained. These variables included: school size, geographic location of school, and the availability of various school-based mental health supports and services.

To obtain data from Database 2, a user request and user agreement form was submitted and approved by MDE. The SPSS file was then sent to the Minnesota Center for Health Statistics (CHS) who is responsible for maintaining Database 2. CHS merged the seven school-level variables from Database 1 with ten requested student-level variables from Database 2. After completing the merge, CHS removed all school and student identifying information. An SPSS file was returned, which included a total of 17 variables for 18,894 9^{th} and 12^{th} grade students from 61 Minnesota high schools (see Table 3).

Table 3
Database Variables Extracted for Current Study

Database 1 (School-Level)	Database 2 (Student-Level
School Size	Gender
Geographic Location	Grade
School-Based Services (Prevention/Promotion)	Age
School-Based Services (Early Identification)	Ethnicity
School-Based Services (Evaluation)	Perceived Social Support
School-Based Services (Program Planning)	Free-Reduced Lunch (SES)
School-Based Services (Coordination)	Mental Health Problem
	Symtomology Estimate 1
	Symtomology Estimate 2
	Service Utilization

Measures

Descriptions of the variables and measures relevant to this dissertation are organized below. First, the dependent variable (i.e., mental health utilization) is defined. Next, the predictor variables organized according to the Behavioral Model of Health Care Utilization are defined. These include student information (i.e., predisposing variables), community and/or school information (i.e., enabling variables), and information about the problem (i.e. need variables). Finally, the five measures of school-based mental health service delivery are discussed, including: Prevention and Promotion, Early Identification, Evaluation and Assessment, Program Planning, and Coordination of Services (Adapted from the Student Services Coalition for Effective Education Draft Position Statement, 2004). The variables included in this dissertation were operationalized using data collected by two measures, including the Survey of Social/Emotional Supports and Services, and the Minnesota Student Survey. This study used only a subset of variables from these measures. Appendix C lists all of the variables and the instruments utilized for operationalization.

Mental Health Service Utilization

This dissertation includes a single dependent variable. Mental health service utilization was operationalized through student self-report on the Minnesota Student Survey (Question 35 – Have you ever been treated for a mental or emotional health problem?). The survey provided three responses to measure mental health service utilization: no; yes (during the last year); yes (more than a year ago). For the purposes of this study, mental health service utilization was coded as “0”=no, and “1”=yes (during the last year).

Predisposing Variables

This dissertation includes four predisposing variables as potential predictors of mental health service utilization (i.e., gender, grade, age, ethnicity) (Appendix C). To operationalize all of these variables, this study used data collected in the 2007 Minnesota Student Survey.

- *Gender of Youth*. Gender was operationalized through student self-report on the Minnesota Student Survey (Question 1). Gender was coded as “0”=female and “1”=male.
- *Grade of Youth*. Grade was operationalized through student self-report on the Minnesota Student Survey (Question 2). Grade was coded as “1”=Grade 9 and “0”=Grade 12.
- *Age of Youth*. Age was operationalized through student self-report on the Minnesota Student Survey (Question 3). As a continuous variable, it was not necessary to recode age. However, due to the small number of 13 year

old respondents, 13 and 14 year olds were combined and coded as “14” = 13 and 14 years old.

- *Race/Ethnicity of Youth*. Race/ethnicity was operationalized through student self-report on the Minnesota Student Survey (Question 4). The survey categorized race/ethnicity into seven categories: American Indian; Black, African American; Mexican American or Chicano/Chicana; Puerto Rican or other Latin American; Asian American or Pacific Islander (including Cambodian, Hmong, Korean, Laotian, Vietnamese); White; I don’t know. For Research Question #1 and the independent chi-square tests, these seven ethnicity categories were included. Participants who failed to respond to this item were also included and combined with the “I don’t know” respondents. Furthermore, respondents who identified multiple ethnicities were included in an eighth category, “multi-racial.” For the logistic regressions in Research Questions #2 and #3, race/ethnicity of the youth was collapsed to “0”=non-white and “1”=white.

Enabling Variables

This study includes four enabling variables as potential predictors of mental health service utilization (i.e., social support, family socioeconomic status, geographic region of residence, school size). To operationalize all of these variables, this study used data collected in the 2007 Minnesota Student Survey and the 2006 Survey of Social/Emotional Supports and Services.

- *Social Support*. Social support was operationalized through student self-report on the Minnesota Student Survey (Question 47 – How much do you feel _____ care about you?). Question 47 consisted of six questions, each with five ordinal responses to measure social support: "1"=not at all, "2"=a little, "3"=some, "4"=quite a bit, "5"=very much. To be included in the analysis, students must have answered at least 75 percent of the questions. For students answering five or more questions, an average was calculated and included in the logistic regression as "social support."
- *Family Socioeconomic Status (SES)*. SES was operationalized through student self-report on the Minnesota Student Survey (Question 11 – Do you currently get free or reduced-price lunch at school?). SES was coded as "0"=no and "1"=yes.
- *Geographic Region of Residence*. Geographic region was operationalized based on existing geographic stratification by the Department of Education. The Survey of Social/Emotional Supports and Services collected the geographic location of each school (i.e., urban, suburban, and rural). The school data, including geographic location, was then linked to the individual student data from the Minnesota Student Survey. Geographic region was coded as "0"=urban, "1"=suburban, and "2"=rural.
- *School Size*. School size was operationalized based on the student population of the identified Minnesota high school. The Survey of Social/Emotional Supports and Services collected the student population of each school. The school size was then linked to the individual student

data from the Minnesota Student Survey. School size was coded as "1"=less than 500, "2"=500 to 999, "3"=1000 to 1499, "4"=1500 or greater.

Need Variables

This dissertation included three need variables as potential predictors of mental health service utilization (i.e., self-reported mental or emotional health problem, symptomology estimate 1, and symptomology estimate 2). These three variables represent the student's perception of their current mental health. These variables were operationalized using data collected in the 2007 Minnesota Student Survey.

- *Self-Reported Mental/Emotional Health Problem*. Presence of mental or emotional health problems were operationalized through student self-report on the Minnesota Student Survey (Question 34 – Do you have a mental or emotional health problem that has lasted at least 12 months?). SES was coded as "0"=no and "1"=yes.
- *Symptomology Estimate 1*. Common symptomology of mental or emotional health problems were operationalized through student self-report on the Minnesota Student Survey (Question 48 – How much do you agree or disagree with the following statements?). A four point likert scale ("1"=disagree, "2"=mostly disagree, "3" mostly agree, "4" agree) was used to collect student responses on eight symptom items frequently associated with mental or emotional health problems. To be included in the analysis, students must have answered at least 75 percent of the questions. For students answering six or more questions, an average was

calculated and included in the logistic regression as "symptomology estimate 1."

- *Symptomology Estimate 2.* Common symptomology of mental or emotional health problems were operationalized through student self-report on the Minnesota Student Survey (Question 49 – During the last 30 days, have you felt you were under any stress or pressure?; Question 50 – During the last 30 days, have you felt sad?; Question 51 – During the last 30 days, have you felt so discouraged or hopeless that you wondered if anything was worthwhile?; Question 52 – During the last 30 days, have you felt nervous, worried, or upset?). A five point likert scale ("1"=All the time, "2"=Most of the time, "3" Some of the time, "4" A little of the time, "5" None of the time) was used to collect student responses on five items frequently associated with mental or emotional health problems. To be included in the analysis, students must have answered at least 75 percent of the questions. For students answering three or more questions, an average was calculated and included in the logistic regression as "symptomology estimate 2."

School-Based Mental Health Variables

This dissertation includes five variables related to the provision of school-based mental health supports and services. The availability of school-based mental health services was operationalized through the 2006 Survey of Social/Emotional Supports and Services. These variables represent the schools perception of the availability of school-based mental health services along a continuum of school-wide interventions (e.g., positive school climate, conflict resolution) to providing individualized supports for students with identifiable mental health disorders.

The survey asked respondents (i.e. teams of school personnel) to indicate how often their school provided a variety of supports and services, either directly or through a community based organization (with which the school had a contracted arrangement). Respondents rated items on a six point likert scale: “0” = never, “1” = 1x/year, “2” = 1x/semester or quarter, “3” = monthly, “4” = weekly, “5” = daily. Each of the 58 survey items fall into five distinct categories of school-based mental health service delivery, including: Prevention and Promotion, Early Identification, Evaluation and Assessment, Program Planning, and Coordination of Services (Adapted from the Student Services Coalition for Effective Education Draft Position Statement, 2004) (Appendix D). Every school received a composite score in each of the five categories. For example, the Early Identification variable is comprised of eight different survey questions. Each of these survey questions was rated on a 0-5 scale. So, the highest possible composite score for the Early Identification variable is “40” (8 questions all rated “5” = 40). Conversely, the lowest possible composite score for the Early Identification variable is “0” (8 questions all rated “0” = 0). Higher composite scores would suggest greater availability of school-based mental health supports and services.

- *Prevention and Promotion*. Prevention and promotion supports and services were defined as: (a) strategies and programs for system-wide behavioral support, social-emotional learning and positive school climate; (b) strategies for teaching and reinforcing problem-solving, coping, social skills and character education were identified. In total, a list of 14 prevention and promotion supports and services was compiled. The total prevention and promotion composite score can range from 0 to 70.

- *Early Identification*. Early identification supports and services were defined as: (a) early recognition and identification of mental health concerns, including knowledge of related factors such as stress, chemical abuse, family/community or other environmental factors, and history of school success or failure; and (b) a referral process that facilitates family/parent/student access to services and support. In total, a list of eight early identification supports and services was compiled. The total early identification composite score can range from 0 to 40.
- *Evaluation and Assessment.* Evaluation and assessment supports and services were defined as coordinating with mental health professionals for diagnosis and assessment and the development of a comprehensive treatment plan. In total, a list of four evaluation and assessment supports and services was compiled. The total evaluation and assessment composite score can range from 0 to 20.
- *Program Planning.* Program planning supports and services were defined as: (a) direct intervention in the educational setting; (b) consultation with teachers regarding educational adaptations and classroom accommodations; (c) crisis planning and crisis management; (d) ongoing coordination with student, family/parent, educators and health care provider; (e) ongoing advocacy for the student with educators and health care providers in community settings; (f) medication management; and (g)

transition planning for students re-entering an education setting from a more restrictive placement. In total, a list of 25 program planning supports and services was compiled. The total program planning composite score can range from 0 to 125.

- *Coordination of Services.* Coordination supports and services were defined as partnering with community services to develop a network of prevention, assessment, and intervention services and supports for students and families. In total, a list of seven coordination supports and services was compiled. The total coordination of services composite score can range from 0 to 35.

Data Analysis

To investigate the three research questions, SPSS 17.0 was used to conduct various statistical analyses. A combination of descriptive statistical techniques and binary block logistic regression was utilized to analyze the data. While no identifying information is attached to these data, all electronic files were encrypted and kept on a computer that is password protected.

Research Question #1: Description of Service Utilization

For the first research question investigating what service utilization looks like among Minnesota high school students, descriptive data are presented to highlight the extent to which students report utilizing mental health services. Various student and school characteristics are included to provide general information about differences in service utilization. In addition, independent chi-square tests were utilized to examine differences in respect to gender, grade, age, ethnicity, school size, and geographic location.

Research Question #2: Predictors of Service Utilization

For the second research question, hierarchical logistic regression was used to determine which of the previously described predisposing, enabling, and need variables predict service utilization among Minnesota high school students. Logistic regression was selected because the single outcome variable (i.e., not utilized in past year vs. utilized in past year) is a categorical and dichotomous outcome variable. First, exploratory data analyses were run to test the assumptions of logistic regression and suitability for analysis. Second, the independent variables were added to three blocks using a hierarchical method (also called sequential logistic regression). In the first block, predisposing variables were added. In the second block, enabling variables were added, and in the third block, need variables were added. At each block, simultaneous entry was conducted for the variables in that block. The next block was then entered to determine the extent to which they predict the remaining variance. This process was continued until all three blocks were entered.

The block order was determined by the researcher based on the health care utilization literature. The Behavioral Model for Health Care Service Utilization suggests these three variable types have a linear order. Predisposing variables are in the first block because they are typically immutable, demographic variables that make an individual more or less inclined to use services. Even though an individual may be inclined to use services, they must have the means available to utilize services and so enabling variables are entered in the second block. Need variables are entered in the third block because individuals only use services if they believe they need services regardless of whether there are services available or they are predisposed for service use.

Research Question #3: School-Based Mental Health & Service Utilization

For the final research question, logistic regression was used to determine whether service utilization among Minnesota high school students varies as a function of the availability of school-based mental health supports and services. Logistic regression was selected because the single outcome variable (i.e., not utilized in past year vs. utilized in past year) is a categorical and dichotomous outcome variable. In addition, a hierarchical method was utilized in order to control for the aforementioned predisposing and enabling variables. In the first block, predisposing variables were added. In the second block, enabling variables were added. School-based mental health variables were added in the third and final block. Simultaneous entry was conducted for the variables in the first and second blocks. The school-based mental health variables were then entered to determine the extent to which they can predict the remaining variance. The block order was determined by the researcher based on previous literature and research. Predisposing variables were in the first block because they are typically immutable, demographic variables that make an individual more or less inclined to use services. The aforementioned enabling variables were in the second block because these provide an estimate of the person’s means and/or support for utilizing services. Finally, the school-based mental health variables were placed in the third block because they are additional enabling variables - attributes of the community that enable the student to obtain services.

CHAPTER FOUR

Results

The purpose of this study was three-fold. First, the study described mental health utilization among Minnesota high school students, including an examination of differences between students who utilize these services, and those who do not. Second, the study examined the extent to which predisposing, enabling, and need variables account for differences in the utilization of mental health services among high school students. Finally, controlling for predisposing and enabling variables, the study examined mental health utilization as a function of school-based mental health supports and services.

Suitability for Analysis

Prior to analysis, the data were examined for accuracy of data entry, missing values, and notable differences between respondents and non-respondents. In regard to Research Question #1, students must have answered Question 35 from the Minnesota Student Survey (i.e. Have you been treated for a mental or emotional health problem?) to be included in the analysis. Missing data were quite low for Research Question #1 with 98% (18,441) of students responding and only 2% (453) failing to respond. Descriptive statistics were used to provide general information and student characteristics about respondents and non-respondents (see Table 4). In addition, independent chi-square tests were utilized to examine differences in respect to gender, grade, age, ethnicity, school size, and geographic location (see Table 5). Differences between the two groups were determined to be significant when p-values were less than .01. As seen in Table 4.2, significant differences between respondents and non-respondents were found in respect to gender, age, ethnicity, school size, and geographic location. To determine which cell or cells produced the statistically significant difference, standardized residuals were compared to the critical values that correspond to an alpha of 0.01 (+/- 2.58). In regard to the first research question, a comparison of standardized residuals reveals that the non-respondent cells contribute most to the significant chi-square.

Table 4

Characteristics of Respondents and Non-Respondents in Research Question #1

		Respondents N=18,441		Non-Respondent N=453		Total N=18,894	
		Number (N)	Percent (%)	Number (N)	Percent (%)	Number (N)	Percent (%)
Gender							
Male		8990	47.6	274	1.5	9264	49.0
Female		9451	50.0	179	.9	9630	51.0
	Total	18,441	97.6	453	2.4	18,894	100
Grade							
9th		10,598	56.1	243	1.3	10,841	57.4
12th		7843	41.5	210	1.1	8053	42.6
	Total	18,441	97.6	453	2.4	18,894	100
Age							
13-14		3322	17.7	56	.3	3378	18.0
15		6833	36.4	162	.9	6995	37.3
16		357	1.9	19	.1	376	2.0
17		2788	14.9	58	.3	2846	15.2
18		4842	25.8	140	.7	4982	26.5
19-20		184	1	10	.1	194	1.0
	Total	18,441	97.6	453	2.4	18,894	100
Geographic Location							
Urban		3280	17.4	171	.9	3451	18.3
Suburban		8828	46.7	180	1.0	9008	47.7
Rural		6333	33.5	102	.5	6435	34.1
	Total	18,441	97.6	453	2.4	18,894	100

Table 4 (continued)

Characteristics of Respondents and Non-Respondents in Research Question #1

	Respondents N=18,441		Non-Respondent N=453		Total N=18,894	
	Number (N)	Percent (%)	Number (N)	Percent (%)	Number (N)	Percent (%)
School Size						
<500	1487	7.9	18	.1	1505	8.0
<1000	3050	16.1	66	.3	3116	16.5
<1500	4693	24.8	180	1.0	4873	25.8
≥1500	9211	48.8	189	1.0	9400	49.8
Total	18,441	97.6	453	2.4	18,894	100
Ethnicity						
Unknown/Unreported	448	2.4	52	.3	500	2.6
White	13,016	68.9	184	1.0	13,200	69.9
Non-White	4977	26.3	217	1.1	5194	27.5
Total	18,441	97.6	453	2.4	18,894	100
Non-White						
American Indian	200	3.9	7	.1	207	4.0
Asian Amer., Pacific Island	1407	27.1	41	.8	1448	27.9
Black, African, Afr. Amer.	1262	24.3	99	1.9	1361	26.2
Mexican Amer., Chicano/a	527	10.1	16	.3	543	10.5
Multi-Racial	1401	27.0	50	1.0	1451	27.9
Puerto Rican, Latin Amer.	180	3.5	4	.1	184	3.5
Total	4977	95.9	217	4.2	5194	100

Table 5

Chi-Square Test for Respondents and Non-Respondents in Research Question #1

	Respondents N=18,441 Std. Residual	Non-Respondents N=453 Std. Residual	χ^2	df	p-value
Gender			24.37	1	***
Male	-.5	3.5			
Female	.5	-3.4			
Grade			2.65	1	.104
9^{th}	.2	-1.0			
12^{th}	-.2	1.2			
Age			31.21	5	***
13-14	.4	-2.7			
15	.0	-.3			
16	-.5	3.4			
17	.2	-1.2			
18	-.3	2.0			
19-20	-.4	2.5			
Ethnicity			264	2	***
Unreported/known	-1.8	11.6			
White	1.2	-7.4			
Non-White	-1.3	8.3			
School Size			51.33	3	***
<500	.5	-3.0			
<1000	.2	-1.0			
<1500	-.9	5.8			
≥1500	.4	-2.4			
Geographic Location			120.75	2	***
Urban	-1.5	9.7			
Suburban	.4	-2.4			
Rural	.7	-4.2			

**p <.01; ***p <.001

In regard to Research Question #2, students must have responded to all variables in the regression model to be included in the analysis. For variables comprised of multiple questions (i.e., Perceived Social Support and Symtomology Estimates), students must have answered at least 75% of the variable questions. Given the number of items in the regression model, missing data were low for Research Question #2 with 88.5% (16,717) of students responding to all of the questions and only 11.5% (2177) of students failing to respond to one or more items. Descriptive statistics were used to provide general information about students who utilize mental health services as well as those students denying mental health supports (see Table 6). In addition, independent chi-square tests were utilized to examine differences in respect to gender, grade, age, ethnicity, school size, and geographic location (see Table 7). Differences between the two groups were determined to be significant when p-values were less than .01. As seen in Table 7, significant differences between respondents and non-respondents were found in respect to gender, grade, age, ethnicity, school size, and geographic location. To determine which cell or cells produced the statistically significant difference, standardized residuals were compared to the critical values that correspond to an alpha of 0.01 (+/- 2.58). As seen in Table 7, both respondent and non-respondent cells contributed to the significant chi-square.

Table 6

Characteristics of Respondents and Non-Respondents in Research Question #2

		Respondents N=16,717		Non-Respondent N=2177		Total N=18,894	
		Number (N)	Percent (%)	Number (N)	Percent (%)	Number (N)	Percent (%)
Gender							
Male		7968	42.2	1296	6.9	9264	49.0
Female		8749	46.3	881	4.7	9630	51.0
	Total	16,717	88.5	2177	11.6	18,894	100
Grade							
9th		9495	50.3	1346	7.1	10,841	57.4
12th		7222	38.2	831	4.4	8053	42.6
	Total	16,717	88.5	2177	11.5	18894	100
Age							
13-14		3026	16.1	352	1.9	3378	18.0
15		6172	32.9	823	4.4	6995	37.3
16		293	1.6	83	.4	376	2.0
17		2619	14.0	227	1.2	2846	15.2
18		4458	23.7	524	2.8	4982	26.5
19-20		149	.8	45	.2	194	1.0
	Total	16,717	89.1	2054	10.9	18,771	100
Geographic Location							
Urban		2800	14.8	651	3.4	3451	18.3
Suburban		8040	42.6	968	5.1	9008	47.7
Rural		5877	31.1	558	3.0	6435	34.1
	Total	16,717	88.5	2177	11.5	18,894	100

Table 6 (continued)

Characteristics of Respondents and Non-Respondents in Research Question #2

	Respondents N=16,717		Non-Respondent N=2177		Total N=18,894	
	Number (N)	Percent (%)	Number (N)	Percent (%)	Number (N)	Percent (%)
School Size						
<500	1378	7.3	127	.7	1505	8.0
<1000	2797	14.8	319	1.7	3116	16.5
<1500	4172	22.1	701	3.7	4873	25.8
≥1500	8370	44.3	1030	5.5	9400	49.8
Total	16,717	88.5	2177	11.6	18,894	100
Ethnicity						
White	12,280	66.8	920	5.0	13,200	71.8
Non-White	4437	24.1	757	4.1	5194	28.2
Total	16717	90.9	1677	9.1	18394	100

Table 7
Chi-Square Test for Respondents and Non-Respondents in Research Question #2

	Respondents N=16,717 Std. Residual	Non-Respondents N=2177 Std. Residual	χ^2	df	p-value
Gender			108.55	1	***
Male	-2.5	7			
Female	2.5	-6.9			
Grade			19.93	1	***
9th	-1	2.7			
12th	1.1	-3.2			
Age			110.13	5	***
13-14	.3	-.9			
15	-.7	2.1			
16	-2.3	6.5			
17	1.7	-4.8			
18	.3	-.9			
19-20	-1.8	5.2			
Ethnicity			260.16	1	***
White	2.6	-8.2			
Non-White	-4.1	13			
School Size			61.21	3	***
<500	1.3	-3.5			
<1000	.8	-2.1			
<1500	-2.1	5.9			
≥1500	.6	-1.6			
Geographic Location			239.1	2	***
Urban	-4.6	12.7			
Suburban	.8	-2.2			
Rural	2.4	-6.7			

**p <.01; ***p <.001

In regard to Research Question #3, students must have responded to all variables in the regression model to be included in the analysis. For variables comprised of multiple questions (i.e., Perceived Social Support), students must have answered at least 75% of the variable questions. Given the number of items in the regression model, missing data were low for Research Question #3 with 91.7% (17,334) of students responding to all of the questions and only 8.3% (1560) of students failing to respond to one or more items. Descriptive statistics were used to provide general information about students who utilize mental health services as well as those students denying mental health supports (see Table 8). In addition, independent chi-square tests were utilized to examine differences in respect to gender, grade, age, ethnicity, school size, and geographic location (see Table 9). Differences between the two groups were determined to be significant when p-values were less than .01. As seen in Table 9, significant differences between respondents and non-respondents were found in respect to gender, grade, age, ethnicity, school size, and geographic location. To determine which cell or cells produced the statistically significant difference, standardized residuals were compared to the critical values that correspond to an alpha of 0.01 (+/- 2.58). A comparison of standardized residuals reveals the non-respondent cells were the primary contributors to the significant chi-square.

Table 8
Characteristics of Respondents and Non-Respondents in Research Question #3

		Respondents N=17,334		Non-Respondent N=1560		Total N=18,894	
		Number (N)	Percent (%)	Number (N)	Percent (%)	Number (N)	Percent (%)
Gender							
Male		8326	44.1	938	5.0	9264	49.0
Female		9008	47.7	622	3.3	9630	51.0
	Total	17,334	91.8	1560	8.3	18,894	100
Grade							
9th		9894	52.4	947	5.0	10,841	57.4
12th		7440	39.4	613	3.2	8053	42.6
	Total	17,334	91.8	1560	8.2	18,894	100
Age							
13-14		3139	16.7	239	1.3	3378	18.0
15		6427	34.2	568	3.0	6995	37.3
16		322	1.7	54	.3	376	2.0
17		2683	14.3	163	.9	2846	15.2
18		4603	24.5	379	2.0	4982	26.5
19-20		160	.9	34	.2	194	1.0
	Total	17,334	92.3	1437	7.7	18,771	100
Geographic Location							
Urban		2981	15.8	470	2.5	3451	18.3
Suburban		8328	44.1	680	3.6	9008	47.7
Rural		6025	31.9	410	2.2	6435	34.1
	Total	17,334	91.8	1560	8.3	18,894	100

Table 8 (continued)
Characteristics of Respondents and Non-Respondents in Research Question #3

	Respondents N=17,334		Non-Respondent N=1560		Total N=18,894	
	Number (N)	Percent (%)	Number (N)	Percent (%)	Number (N)	Percent (%)
School Size						
<500	1425	7.5	80	.4	1505	8.0
<1000	2886	15.3	230	1.2	3116	16.5
<1500	4357	23.1	516	2.7	4873	25.8
≥1500	8666	45.9	734	3.9	9400	49.8
Total	17,334	91.8	1560	8.2	18,894	100
Ethnicity						
White	12,623	68.6	577	3.1	13,200	71.8
Non-White	4711	25.6	483	2.6	5194	28.2
Total	17,334	94.2	1060	5.7	18,394	100

Table 9

Chi-Square Test for Respondents and Non-Respondents in Research Question #3

	Respondents N=17,334 Std. Residual	Non-Respondents N=1560 Std. Residual	χ^2	df	p-value
Gender			83.79	1	***
Male	-1.9	6.3			
Female	1.8	-6.1			
Grade			7.7	1	**
9th	-.5	1.7			
12th	.6	-2			
Age			69.38	5	***
13-14	.4	-1.2			
15	-.4	1.4			
16	-1.4	4.7			
17	1.1	-3.7			
18	0	-.1			
19-20	-1.4	5			
Ethnicity			166.68	1	***
White	1.6	-6.7			
Non-White	-2.6	10.6			
School Size			57.82	3	***
<500	1.2	-4			
<1000	.5	-1.7			
<1500	-1.7	5.7			
≥1500	.5	-1.5			
Geographic Location			167.17	2	***
Urban	-3.3	11			
Suburban	.7	-2.3			
Rural	1.6	-5.3			

$^{**}p < .01$; $^{***}p < .001$

Research Question #1: Description of Service Utilization

Descriptive statistics from the Survey of Social/Emotional Supports and Services and Minnesota Student Survey were utilized to provide broad-based information about the utilization of metal health supports and services by Minnesota high school students. Of the 18,984 participants, 18,441 (97.6%) students responded to the question “Have you ever been treated for a mental or emotional health problem?” 453 students (2.4%) did not respond to this question. Of the 18,441 respondents, 92.9% (17,124 students) denied being treated for a mental or emotional health problem during the past year. However, 7.1% (1317 students) reported being treated for a mental or emotional health problem in the last year. Mental health utilization was examined in respect to six student-level variables, including: gender, grade, ethnicity, age, geographic setting of school, and size of school attended (see Table 10). Chi-Square statistics were also performed to determine whether statistically significant differences existed. Differences between the two groups were determined to be significant when p-values were less than .01. Furthermore, to determine which cell or cells produced the statistically significant difference, standardized residuals were compared to the critical values that correspond to an alpha of 0.01 (+/- 2.58).

Table 10
Characteristics of Students Utilizing and Not Utilizing Mental Health Services

		Not Utilized in Past Year N=17,124		Utilized in Past Year N=1317		Total N=18,441	
		Number	Percent	Number	Percent	Number	Percent
Gender							
Male		8513	46.2	477	2.6	8990	48.8
Female		8611	46.7	840	4.6	9451	51.2
	Total	17,124	92.9	1317	7.1	18,441	100
Grade							
9th		9925	53.8	673	3.6	10,598	57.5
12th		7199	39	644	3.5	7843	42.5
	Total	17,124	92.9	1317	7.1	18,441	100
Age							
13-14		3141	17.1	181	1	3322	18.1
15		6381	34.8	452	2.5	6833	37.3
16		327	1.8	30	.2	357	1.9
17		2552	13.9	236	1.3	2788	15.2
18		4448	24.3	394	2.1	4842	26.4
19-20		170	.9	14	.1	184	1
	Total	17,019	92.9	1307	7.1	18,326	100
Geographic Location							
Urban		3055	16.6	225	1.2	3280	17.8
Suburban		8194	44.4	634	3.4	8828	47.9
Rural		5875	31.9	458	2.5	6333	34.3
	Total	17,124	92.9	1317	7.1	18,441	100

Table 10 (continued)

Characteristics of Students Utilizing and Not Utilizing Mental Health Services

	Not Utilized in Past Year N=17,124		Utilized in Past Year N=1317		Total N=18,441	
	Number	Percent	Number	Percent	Number	Percent
School Size						
<500	1385	7.5	102	.6	1487	8.1
<1000	2866	15.5	184	1	3050	16.5
<1500	4358	23.6	335	1.8	4693	25.4
≥1500	8515	46.2	696	3.8	9211	49.9
Total	17,124	92.9	1317	7.1	18,441	100
Ethnicity						
Unreported/Unknown	405	2.2	43	.2	448	2.4
White	12,066	65.4	950	5.2	13,016	70.6
Non-White	4653	25.2	324	1.8	4977	27
Total	17,124	92.9	1317	7.1	18,441	100
Non-White						
American Indian	175	3.5	25	.5	200	4
Asian Amer., Pacific Island	1360	27.3	47	.9	1407	28.3
Black, African, Afr. Amer.	1189	23.9	73	1.5	1262	25.4
Multi-Racial	1264	25.4	137	2.8	1401	28.1
Mexican Amer., Chicano/a	497	10	30	.6	527	10.6
Puerto Rican, Latin Amer.	168	3.4	12	.2	180	3.6
Total	4653	93.5	324	6.5	4977	100

Note. This table reflects percentage (%) of all schools in the sample. To derive sub-sample percentages (e.g., American Indian – Utilized in Past Year), divide sub-sample utilized (e.g., 25) by sub-sample total (i.e., 200) = 12.5%.

Gender

Approximately five percent of males and nine percent of females report accessing mental or emotional health services during the past year. A chi-square test of independence was performed to examine the relation between gender and mental health service utilization (see Table 11). The relation between these variables was significant, $\chi^2(1, N = 18{,}441) = 89.15$, $p < .001$. In order to determine which cell or cells contributed to the statically significant difference, the residual, or the difference, between the observed frequency and the expected frequency was examined. Compared to the expected frequency, female students were over-represented indicating they are more likely to utilize mental or emotional health services. Conversely, compared to the expected frequency, male students were under-represented indicating they are less likely to utilize mental or emotional health services.

Table 11
Chi-Square Test for Mental Health Utilization by Gender

	No N=17,124 Std. Residual	Yes N=1,317 Std. Residual	χ^2	df	p-value
Gender			89.15	1	< .001
Male	1.8	-6.5			
Female	-1.8	6.4			

Grade

Six percent of ninth graders and eight percent of twelfth graders report accessing mental or emotional health services during the past year. A chi-square test of independence was performed to examine the relation between grade and mental health service utilization (see Table 12). The relation between these variables was significant,

$\chi^2(1, N = 18{,}441) = 23.54$, $p < .001$. In order to determine which cell or cells contributed to the statically significant difference, the residual, or the difference, between the observed frequency and the expected frequency was examined. Compared to the expected frequency, twelfth grade students were over-represented indicating they are more likely to utilize mental or emotional health services. Conversely, compared to the expected frequency, ninth grade students were under-represented indicating they are less likely to utilize mental or emotional health services.

Table 12
Chi-Square Test for Mental Health Utilization by Grade

	No N=17,124 Std. Residual	Yes N=1,317 Std. Residual	χ^2	df	p-value
Grade			23.54	1	< .001
9^{th}	.8	-3.0			
12^{th}	-1.0	3.5			

Age

As reflected in Table 10, the percent of students utilizing mental or emotional health services varies based on age. A chi-square test of independence was performed to examine the relation between age and mental health service utilization (see Table 13). The relation between these variables was significant, $\chi^2(5, N = 18{,}441) = 32.77$, $p < .001$. In order to determine which cell or cells contributed to the statically significant difference, the residual, or the difference, between the observed frequency and the expected frequency was examined. Compared to the expected frequency, 13-14 year old students were under-represented indicating they are less likely to utilize mental or emotional health services. Conversely, compared to the expected frequency, 17 and 18 year old students were over-represented indicating they are more likely to utilize mental or emotional health services.

Table 13
Chi-Square Test for Mental Health Utilization by Age

	No N=17,124 Std. Residual	Yes N=1,317 Std. Residual	χ^2	df	p-value
Age			32.77	5	< .001
13-14	1	-3.6			
15	.4	-1.6			
16	-.2	.9			
17	-.7	2.6			
18	.7	2.6			
19-20	0	.2			

Ethnicity

Ethnic groups reporting the highest mental health utilization during the past year included American Indian (13%) and Multi-Racial (10%). High utilization was also noted among students with an unreported or unknown ethnicity (10%). Asian American or Pacific Island students reported the least mental health utilization (3%). A chi-square test of independence was performed to examine the relation between ethnicity and mental health service utilization (see Table 14). The relation between these variables was significant, $\chi^2(7, N = 18{,}441) = 63.8$, $p < .001$. In order to determine which cell or cells contributed to the statically significant difference, the residual, or the difference, between the observed frequency and the expected frequency was examined. Compared to the expected frequency, American Indian and Multi-Racial students were significantly over-represented indicating they are more likely to utilize mental or emotional health services. Conversely, compared to the expected frequency, Asian American or Pacific Island students were significantly under-represented indicating they are less likely to utilize mental or emotional health services.

Table 14
Chi-Square Test for Mental Health Utilization by Ethnicity

	No N=17,124 Std. Residual	Yes N=1,317 Std. Residual	χ^2	df	p-value
Ethnicity			63.8	8	< .001
American Indian	-.8	2.8			
Asian American	1.5	-5.3			
Black	.5	-1.8			
Mexican American	.3	-1.2			
Multi-Racial	-1.0	3.7			
Puerto Rican	.1	-.2			
Unknown/Unreported	-.5	1.9			
White	-.2	.7			

Geographic Setting

A chi-square test of independence was performed to examine the relation between a student's geographic setting and mental health service utilization. The relation between these variables was not significant, $\chi^2(2, N = 18{,}441) = .492, p = .782$.

School Size

In respect to school size, students attending the largest schools (i.e. $\geq$ 1500) report the highest utilization with nearly 8% of students accessing services within the past year. Students attending small to moderate sized schools (i.e. 500-999) were least likely to access services in the past year with only 6% of students reporting utilization. A chi-square test of independence was performed to examine the relation between the student's school size (i.e. student population) and mental health service utilization. The relation between these variables was significant at p > .05, $\chi^2(3, N = 18{,}441) = .8.22, p = .042$.

Comparing the size of the standardized residuals to the critical values that correspond to an alpha of .05 (i.e. +/- 1.96) provides information about which cell or cells contribute to the significant findings. As seen in Table 15, students attending small to moderate sized schools (i.e. 500-999) are less likely to utilize mental or emotional health services than expected.

Table 15
Chi-Square Test for Mental Health Utilization by School Size

	No N=17,124 Std. Residual	Yes N=1,317 Std. Residual	χ^2	df	p-value
Grade			8.22	3	< .05
<500	.1	-.4			
<1000	.6	**-2.3**			
<1500	0	0			
>1500	-.4	1.5			

Research Question #2: Predictors of Service Utilization

The first question provided valuable demographic information about student mental health utilization. However, it provides limited insight into what variables are most likely to predict mental health utilization. Using hierarchical logistic regression, the second research question examined predisposing, enabling, and need variables to determine the extent to which they predict utilization of mental health services among Minnesota high school students. Despite the increasing use of logistic regression, there is little consensus on exactly what should reported. Peng, Lee, and Ingersoll (2002) suggested researchers include sufficient information to address the following: 1) an overall evaluation of the logistic model, 2) statistical tests of individual predictors, and 3) goodness-of-fit statistics.

Appendix E describes the basic assumptions of logistic regression for this model. While logistic regression is immune to many of the restrictive linear regression assumptions, logistic regression is equally prone to the effects of collinearity. According to Field (2005) tolerance values less than .1 and/or Variance Inflation Factor (VIF) values greater than 10 suggest high multicollinearity. Garson (2009) suggested that multicollinearity is unproblematic in social science research at VIF $\leq$ 4. An examination of the collinearity diagnostics as part of the regression analysis indicated no significant multicollinearity or excessive correlation of the predictor variables (see Table 16). Such findings indicated that the derived model was likely to be unchanged by small changes in the measured variables, providing greater confidence in the accuracy of the regression model.

Table 16
Collinearity Diagnostics for Research Question #2

	Collinearity Statistics	
	Tolerance	VIF
Block 1		
Gender	.999	1.00
Ethnicity	.994	1.01
Age	.994	1.01
Block 2		
Gender	.992	1.01
Ethnicity	.826	1.21
Age	.992	1.01
Size	.786	1.27
Geographic Setting	.676	1.48
Social Support	.974	1.03
Block 3		
Gender	.900	1.11
Ethnicity	.825	1.21
Age	.977	1.02
Size	.786	1.27
Geographic Setting	.676	1.48
Social Support	.807	1.24
Mental Health Problem	.823	1.22
Symptomology 1	.606	1.65
Symptomology 2	.590	1.70

Overall Model Evaluation

The analysis only included variables that significantly contributed to the model. A Test of Individual Model Parameters was conducted to identify independent variables that failed to significantly improve the model. A non-significant likelihood ratio test indicates no difference between the full and the reduced model, providing justification to drop the given variable so as to have a more parsimonious model that works just as well (Garson, 2009). As seen in Table 17, the likelihood ratio test of individual parameters show that the model without Grade and SES is not significantly different from the final (full) model. As such, Grade and SES were removed from the model in order to provide a more parsimonious reduced model.

Table 17
Test of Individual Model Parameters for Research Question #2

	-2LL	χ^2	*df*	*Sig.*
Block 1				
Gender	258.66	95.90	1	***
Grade	163.83	1.07	1	.301
Age	170.04	7.28	1	**
Ethnicity	166.08	3.32	1	.069
Block 2				
Gender	4.85	137.91	1	***
Grade	4.72	.65	1	.420
Age	4.72	5.49	1	*
Ethnicity	4.73	12.49	1	***
SES	4.72	.97	1	.325
Size	4.73	11.58	1	**
Geographic Setting	4.72	8.29	2	*
Social Support	5.02	300.83	1	***
Block 3				
Gender	5.62	3.84	1	*
Grade	5.62	.38	1	.536
Age	5.62	.62	1	.429
Ethnicity	5.62	5.30	1	*
SES	5.62	.02	1	.903
Size	5.63	10.32	1	**
Geographic Setting	5.62	3.92	2	.141
Social Support	5.62	.43	1	.511
Mental Health Problem	7.10	1.48	1	***
Symptomology 1	5.65	32.74	1	***
Symptomology 2	5.64	21.91	1	***

*p <.05; **p <.01; ***p <.001

According to Peng and her colleagues (2002), a logistic model is said to provide a better fit to the data if it demonstrates an improvement over the intercept-only model (or null model). The Omnibus Test of Model Coefficients determines if the model with the predictors is significantly different from the model with only the intercept. More specifically, it examines whether the value of -2 x log-likelihood is significantly less than the value when only the constant is included in the model (because lower values of -2LL indicate that the model is predicting the outcome variable more accurately) (Field, 2005). As discussed by Garson (2009), it may be interpreted as a test of the capability of all predictors in the model jointly to predict the response (dependent) variable. For this study, because predictors are entered in blocks, the test of model coefficients also examines change in model significance when adding blocks of variables to the model. When the "block" improvement statistic is significant, it indicates that the new model now predicts the outcome significantly better than it did in the previous block. As seen in Table 18, the finding of significance for the model and each block corresponds to the research conclusion that there is adequate fit of the data in this model, and at least one of the predictors is significantly related to the response variable.

Table 18
Omnibus Test of Model Coefficients for Research Question #2

	-2LL	χ^2	*df*	*Sig.*
Block 1	8336.84			
Block		131.99	3	***
Model		131.99	3	***
Block 2	8024.9			
Block		311.94	4	***
Model		443.93	7	***
Block 3	5700.58			
Block		2324.32	3	***
Model		2768.25	10	***

*p <.05; **p <.01; ***p <.001

Statistical Test of Individual Predictors

As discussed, each block significantly improved the models ability to predict the utilization of mental health services among high school students (see Table 18). Once a block was found to be significant, the effects of individual predictors were assessed. Dummy coding was utilized for categorical predictors, where a specific category of each variable was set to zero to allow for statistical comparisons between the referent group and other groups chosen for the model. As seen in Table 19, the reference groups for each of the main effects were chosen by the researcher and designated with a coding of zero, whereas the comparison variables were designated with a one. To examine the significance of individual predictors, parameter significance was tested using the Wald's χ^2 test, which has a chi-square distribution and tells us whether the *b*-coefficient for that predictor is significantly different from zero. A coefficient significantly different from zero suggests that the predictor is making a significant contribution to the dependent variable (i.e., mental health utilization). As discussed by Field (2005), more crucial to the interpretation of logistic regression is the value of exp *b* (also abbreviated as Exp(b) or e^{β}), which is an indicator of the change in odds resulting from a unit change in the predictor.

Table 19
Dummy Coding of Categorical Variables

	Frequency	Parameter Coding (1)	Parameter Coding (2)
Gender			
Male	7968	1.000	
Female	8749	.000	
Ethnicity			
White	12280	1.000	
Non-White	4437	.000	
Geographic Location			
Urban	2800	1.000	.000
Suburban	8040	.000	1.000
Rural	5877	.000	.000
Mental Health Problem			
Yes	1801	1.000	
No	14916	.000	

Table 20 summarizes the regression results for the first model as recommended by Peng et al. (2002). In Block 1, two of the predisposing variables were identified as significant predictors of mental health service utilization. Controlling for the other predisposing variables, gender ($p<.001$; $\chi^2=102.15$; $df=1$) was identified as a significant predictor. By examining the odds ratio (i.e., exp *b*), the odds of utilizing mental health services compared to not utilizing services are decreased by a factor of .52 by being male rather than female. Age was also identified as a significant predictor of mental health utilization among high school students ($p<.001$; $\chi^2=24.23$; $df=1$). More specifically, as students get older, the odds of accessing mental health services increase by a factor of 1.14 for each year age increases. Controlling for gender and age, a student's ethnicity (i.e., white or non-white) was not a significant predictor of mental health utilization.

In Block 2, enabling variables (i.e., school size, geographic setting, social support) were added to the model. Controlling for predisposing and enabling variables, gender and age remained significant predictors (see Table 20). In addition, a student's ethnicity was also identified as a significant predictor of mental health utilization ($p<.01$; $\chi^2=10.49$; $df=1$). For students who are white, the odds of utilizing mental health services increase by a factor of 1.3 when compared to their non-white peers. In regard to enabling variables, school size ($p<.01$; $\chi^2=9.72$; $df=1$) and a student's perceived social support ($p<.001$; $\chi^2=312.79$; $df=1$) were significant predictors of mental health service utilization. As school size increases, the odds of mental health utilization among students also increase. Conversely, as a student's perceived social support increases, the odds of mental health utilization decreases. As a categorical variable, geographic setting must be interpreted in terms of a left-out reference category. Compared to students in a rural setting, an urban geographic setting was a significant predictor ($p<.05$; $\chi^2=5.41$; $df=1$). More specifically, when a student lives in an urban setting, the odds of utilizing mental health services are decreased by a factor of .772 compared to his/her peers from rural settings.

In Block 3, need variables (i.e., self-reported mental health concern and symptomology estimates) were added to the model. With the addition of these need variables and still controlling for all other variables in the model, the aforementioned predisposing variables (i.e., gender, ethnicity, and age) remained significant predictors of utilization (see Table 20). In regard to enabling variables, school size remained a significant predictor. However, with the addition of need variables, a student's geographic setting and perceived social support did not significantly predict mental health utilization. Finally, as reflected in Table 20, all three need variables significantly predicted utilization among high school students. Students who identified having a mental or emotional health problem were significantly more likely to utilize services ($p<.001$; $\chi^2=1341.25$; $df=1$). In fact, the odds of a student having used mental health services increased by over 120% when they reported having a mental health problem. In addition, Symptomology 1 ($p<.001$; $\chi^2=33.33$; $df=1$) and Symptomology 2 ($p<.001$; $\chi^2=24.42$; $df=1$) were strong predictors of utilization. As students reported more symptoms, the odds of utilization increased.

Goodness-of-Fit Statistics

As discussed by Peng and her colleagues (2002), goodness-of-fit statistics assess the fit of a logistic model against actual outcomes (i.e., whether a student utilizes mental health services). A common test for overall fit of a binary logistic regression model is the Hosmer and Lemeshow (H-L) goodness-of-fit test (Garson, 2009). If the H-L test statistic is greater than .05, we fail to reject the null hypothesis that there is no difference between observed and model-predicted values. Well-fitting models show non-significance, indicating model prediction is not significantly different from observed values. As reflected in Table 20, the H-L statistic is not significant in Block 1 of this model, but becomes significant in Block 2 and Block 3. While notable, a significant H-L statistic is not unexpected. As sample sizes get larger, any discrepancy between the model and the data is magnified, resulting in smaller p-values for a goodness-of-fit test. More specifically, when the sample is large, the H-L statistic can find smaller and smaller difference between observed and model-predicted values to be significant. Furthermore, other goodness-of-fit measures (i.e., Cox and Snell; Nagelkerke) suggest the percent of explained variance increases as each block is added. In the final model, the explained variance ranges from 15 to 38% (see Table 20).

Table 20

Regression Analysis Predicting Mental Health Utilization with Predisposing, Enabling, and Need Variables

	Block 1						**Block 2**						**Block 3**					
Predictor	***β***	***SE β***	χ^2	***df***	***p***	***e^β***	***β***	***SE β***	χ^2	***df***	***p***	***e^β***	***β***	***SE β***	χ^2	***df***	***p***	***e^β***
Constant	-3.97	.32	154.10	1	***	.02	-1.87	.36	26.56	1	***	.15	-5.87	.53	125.16	1	***	.003
Predisposing																		
Gender	-.65	.06	102.15	1	***	.52	-.76	.07	134.66	1	***	.47	-.15	.08	3.94	1	*	.86
Ethnicity	.12	.07	2.86	1	.091	1.13	.26	.08	10.49	1	**	1.30	.22	.09	5.60	1	**	1.24
Age	.10	.02	24.23	1	***	1.10	.09	.02	20.70	1	***	1.10	.10	.02	17.84	1	***	1.10
Enabling																		
Size							.12	.04	9.72	1	**	1.13	.142	.04	10.70	1	**	1.15
Setting (Rural)									5.99	2	.05				3.79	2	.15	
Setting (Urban)							-.26	.11	5.41	1	*	.77	-.15	.13	1.36	1	.24	.86
Setting (Suburban)							-.15	.08	3.37	1	.07	.86	-.18	.09	3.74	1	.05	.84
Social Support							-.65	.04	312.79	1	***	.52	.04	.05	.53	1	.49	1.04
Need																		
Self Reported Problem													3.01	.08	1341.25	1	***	20.30
Symptom Estimate 1													.40	.07	33.33	1	***	1.48
Symptom Estimate 2													-.23	.05	24.42	1	***	.80

*p <.05; **p <.01; ***p <.001

Cox & Snell R^2 = Block 1 (.008); Block 2 (.026); Block 3 (.153)

Nagelkerke R^2 = Block 1 (.02); Block 2 (.066); Block 3 (.384)

Table 20 (continued)

Regression Analysis Predicting Mental Health Utilization with Predisposing, Enabling, and Need Variables

	Block 1			Block 2			Block 3		
Test	χ^2	***df***	***p***	χ^2	***df***	***p***	χ^2	***df***	***p***
Overall Model Evaluation									
Likelihood Ratio Test	131.99	3	***	443.93	7	***	2768.25	10	***
Goodness-of-Fit Test									
Hosmer & Lemeshow	7.41	7	.39	19.13	8	*	27	8	**

*p <.05; **p <.01; ***p <.001

Cox & Snell R^2 = Block 1 (.008); Block 2 (.026); Block 3 (.153)

Nagelkerke R^2 = Block 1 (.02); Block 2 (.066); Block 3 (.384)

Research Question #3: School-Based Mental Health & Service Utilization

For the final research question, hierarchical logistic regression was used to determine whether service utilization among Minnesota high school students varies as a function of the availability of school-based mental health supports and services. As previously discussed, health utilization theory describes a linear order of predisposing, enabling, and need variables. As a result, this study controlled for the aforementioned predisposing and enabling variables by leaving them in the model. In the first block, predisposing variables were added (i.e., gender, age, ethnicity). In the second block, enabling variables were added (i.e., geographic setting, school-size, social support). In the third block, the school-based mental health variables were added (e.g., prevention and promotion, early identification). As discussed in the literature review, a strong argument can be made that school-based mental health services are important community-level enabling attributes. It should be pointed out that need variables were excluded from this model given the body of research that suggests need factors are the strongest predictors of utilization. The following logistic regression results are reported as recommended by Peng et al. (2002).

Appendix E describes the basic assumptions of logistic regression for this model. Like the previous model, an examination of the collinearity diagnostics as part of the regression analysis indicated no significant multicollinearity or excessive correlation of the predictor variables (see Table 21). Such findings indicated that the derived model was likely to be unchanged by small changes in the measured variables, providing greater confidence in the accuracy of the regression model.

Table 21
Collinearity Diagnostics for Research Question #3

	Collinearity Statistics	
	Tolerance	VIF
Block 1		
Gender	.999	1.00
Ethnicity	.994	1.01
Age	.994	1.01
Block 2		
Gender	.992	1.01
Ethnicity	.826	1.21
Age	.992	1.01
Size	.786	1.27
Geographic Setting	.676	1.48
Social Support	.974	1.03
Block 3		
Gender	.992	1.01
Ethnicity	.807	1.24
Age	.980	1.02
Size	.658	1.52
Geographic Setting	.597	1.68
Social Support	.973	1.03
Prevention & Promotion	.561	1.78
Early Identification	.611	1.64
Evaluation & Assessment	.779	1.28
Program Planning	.256	3.90
Coordination of Services	.409	2.45

Overall Model Evaluation

The analysis only included variables that significantly contributed to the model. As seen in Table 22, with Grade and SES removed, all of the predisposing and enabling variables significantly contribute to the final model.

Table 22
Test of Individual Model Parameters for Research Question #3

	-2LL	χ^2	*df*	*Sig.*
Block 1				
Gender	247.96	94.89	1	***
Age	179.25	26.18	1	***
Ethnicity	155.98	2.91	1	.088
Block 2				
Gender	4.23	140.19	1	***
Age	4.10	23.41	1	***
Ethnicity	4.09	11.96	1	**
Size	4.09	11.18	1	**
Geographic Setting	4.08	7.12	2	*
Social Support	4.38	308.19	1	***
Block 3				
Gender	6.52	139.56	1	***
Age	6.40	20.25	1	***
Ethnicity	6.39	10.17	1	**
Size	6.38	5.31	1	*
Geographic Setting	6.39	8.29	2	*
Social Support	6.69	308.10	1	***
Prevention & Promotion	6.38	5.30	1	*
Early Identification	6.38	.47	1	.491
Evaluation & Assessment	6.38	1.50	1	.221
Program Planning	6.38	.75	1	.386
Coordination of Services	6.38	1.27	1	.260

*p <.05; **p <.01; ***p <.001

For the final research question, because predictors were entered in blocks, the test of model coefficients examined the change in model significance when adding blocks of variables to the model. When the “block” improvement statistic is significant, it indicates that the new model now predicts the outcome significantly better than it did in the previous block. As seen in Table 23, the finding of significance for the model and each block corresponds to the research conclusion that there is adequate fit of the data in this model, and at least one of the predictors is significantly related to the response variable.

Table 23
Omnibus Test of Model Coefficients for Research Question #3

	-2LL	χ^2	*df*	*Sig.*
Block 1	8652.67			
Block		133.35	3	***
Model		133.35	3	***
Block 2	8332.70			
Block		319.97	4	***
Model		453.32	7	***
Block 3	8318.08			
Block		14.61	5	*
Model		467.93	12	***

*p <.05; **p <.01; ***p <.001

Statistical Test of Individual Predictors

Table 24 summarizes the results for the regression model as recommended by Peng et al. (2002). While slight variability exists, findings from Block 1 and Block 2 are consistent with those in Research Question #2. In Block 3, additional enabling variables (i.e., five measures of school-based mental health) were added to the model. With the addition of these need variables and still controlling for all other variables in the model, the aforementioned predisposing variables (i.e., gender, ethnicity, and age) and enabling variables (i.e., geographic setting, school size, and social support) remained significant predictors of utilization (see Table 24). In regard to new enabling variables, prevention and promotion was the only variable that significantly predicted utilization among high school students. Students attending schools that reported greater mental health prevention and health promotion were significantly less likely to report mental health utilization ($p<.05$; χ^2=5.34; *df*=1).

Goodness-of-Fit Statistics

As discussed earlier, goodness-of-fit statistics assess the fit of a logistic model against actual outcomes (i.e., whether a student utilizes mental health services). As reflected in Table 24, the H-L statistic is not significant in Block 1 or Block 3 of this model. It does become significant in Block 2. In addition, the other goodness-of-fit measures (i.e., Cox and Snell; Nagelkerke) suggest the percent of explained variance increases as each block is added. In the final model, the explained variance ranges from 3 to 7% (see Table 24). Overall, this appears to be a well-fitting model, suggesting that its prediction is not significantly different from the observed values.

Table 24

Regression Analysis Predicting Mental Health Utilization with Predisposing, Enabling, and School-Based Mental Health Variables

	Block 1						Block 2						Block 3					
Predictor	***β***	***SE β***	χ^2	***df***	***p***	e^{β}	***β***	***SE β***	χ^2	***df***	***p***	e^{β}	***β***	***SE β***	χ^2	***df***	***p***	e^{β}
Constant	-4.03	.31	165.20	1	***	.02	-1.98	.36	31.07	1	***	.14	-2.36	.41	32.59	1	***	.10
Predisposing																		
Gender	-.63	.06	100.49	1	***	.53	-.74	.06	133.07	1	***	.48	-.74	.06	132.49	1	***	.48
Ethnicity	.13	.07	3.63	1	.057	1.14	.27	.08	11.60	1	**	1.30	.25	.08	9.88	1	**	1.29
Age	.10	.02	26.86	1	***	1.12	.10	.02	23.44	1	***	1.10	.09	.02	20.28	1	***	1.09
Enabling																		
Size							.12	.04	10.96	1	**	1.13	.09	.04	5.25	1	*	1.10
Setting (Rural)							-	-	7.13	2	*	-	-	-	8.34	2	*	-
Setting (Urban)							-.28	.11	6.44	1	*	.76	-.31	.12	7.05	1	**	.74
Setting (Suburban)							-.16	.08	4.04	1	*	.85	-.19	.08	5.60	1	*	.83
Social Support							-.65	.04	319.88	1	***	.52	-.65	.04	379.58	1	***	.52

*p <.05; **p <.01; ***p <.001

Cox & Snell R^2 = Block 1 (.008); Block 2 (.026); Block 3 (.027)

Nagelkerke R^2 = Block 1 (.019); Block 2 (.065); Block 3 (.067)

Table 24 (continued)

Regression Analysis Predicting Mental Health Utilization with Predisposing, Enabling, and School-Based Mental Health Variables

	Block 1						Block 2						Block 3					
	β	***SE β***	χ^2	***df***	***p***	e^{β}	***β***	***SE β***	χ^2	***df***	***p***	e^{β}	***β***	***SE β***	χ^2	***df***	***p***	e^{β}
School-Based Mental Health Variables																		
Prevention & Promotion													-.01	.003	5.34	1	*	.99
Early Identification													.004	.01	.47	1	.491	1
Evaluation & Assessment													.02	.02	1.49	1	.222	1.02
Program Planning													.003	.003	.751	1	.386	1
Coordination of Services													.009	.008	1.27	1	.261	1.01
Test																		
Overall Model Evaluation																		
Likelihood Ratio Test	-	-	133.35	3	***	-	-	-	453.32	7	***	-	-	-	467.93	12	***	-
Goodness-of-Fit Test																		
Hosmer & Lemeshow	-	-	8.99	8	.344	-	-	-	19.92	8	*	-	-	-	12.54	8	.129	-

*p <.05; **p <.01; ***p <.001

Cox & Snell R^2 = Block 1 (.008); Block 2 (.026); Block 3 (.027)

Nagelkerke R^2 = Block 1 (.019); Block 2 (.065); Block 3 (.067)

CHAPTER FIVE

Discussion

Purpose of the Study

"Growing numbers of children are suffering needlessly because their emotional, behavioral, and developmental needs are not being met by the very institutions and systems that were created to take care of them" (U.S. Public Health Service, 2000, p. 1). Research has documented the unmet mental health needs of children and adolescents (Burns et al., 1995; Kataoka, Zhang, & Wells, 2002; Leaf et al., 1996). While estimates vary, it is safe to conclude that the overwhelming majority of youth with diagnosable disorders fail to receive any treatment. Furthermore, as highlighted by this study, there are measurable individual and community level disparities in respect to who does and does not receive services. Being such, continued research on service utilization, particularly among children and adolescents, is critical for improving our ability to prevent and treat mental health problems. The purpose of this dissertation was to explore the patterns and predictors of mental health service utilization among high school students in Minnesota. More specifically, this study investigated the following research questions:

1. What does mental health service utilization look like among Minnesota high school students?
2. What factors predict mental health service utilization among Minnesota high school students?
3. Does mental health utilization among Minnesota high school students vary as a function of school-based mental health supports and services?

Findings

Patterns of Utilization

By broadly examining the characteristics and patterns of service utilization among Minnesota high school students, this study provides a state-wide assessment of how many youth are receiving services, what subgroups of students are likely to access services, and most importantly, what subgroups of students are not likely to access services. Approximately 7% of adolescents in this study reported being treated for a mental or emotional health problem in the last year. Previous estimates of adolescent utilization vary significantly depending on how services are defined and whether a time frame is provided. However, this finding is consistent with the majority of existing research. For example, Kataoka and her colleagues (2002) examined data from three U.S. surveys to provide the first national estimate of mental health utilization. Based on this meta-analysis, between 7.4 and 8.6% of adolescents (ages 12-17 years) accessed mental health services. More recently, a NHIS study found 8.2% of adolescents (ages 12-18 years) had at least one visit with a mental health specialist within the last year (Knopf, Park, & Mulye, 2008). It should be pointed out that the current studies findings are slightly lower than Sturm et al. (2003) who reported 9.27% of an observed 3,179 Minnesota youth (ages 6-17 years) received mental health services during a 12-month period. Based on their findings, Minnesota was among five states with significantly higher utilization than the national average (7.5%). Given adolescents' resistance to treatment and greater autonomy over whether they follow through with utilization (Verhulst & Van der Ende, 1997), this discrepancy - in part - could be explained by the inclusion of younger children in Strum's sample. Furthermore, it seems plausible that Sturm and his colleagues may have more reliable reporters given their reliance on parent report of utilization - opposed to self-report as in this study. Regardless, this research finding adds to the mounting empirical evidence that the emotional and psychological needs of most children are not being met.

Predictors of Service Utilization

Using Andersen's Behavioral Model of Health Care Utilization as an organizing framework, this dissertation investigated the predictors of mental health utilization among Minnesota high school students. There is an expansive body of research describing Andersen's model as an appropriate and meaningful framework for organizing the factors that predict (and possibly explain) utilization in the medical field. As it relates to mental health utilization, however, fewer studies have investigated the appropriateness of this model, with only a handful focused on child/adolescent utilization. This study supports previous claims that the Behavioral Model of Health Care Utilization is an effective tool in predicting mental health utilization. Though not all of the variables were significant, as each block of predisposing, enabling, and need variables were added, the model's ability to predict utilization among Minnesota high school students improved. With all three blocks of variables included, the final model accounted for approximately 15% (Cox & Snell) to 40% (Nagelkerke) of the variance in service utilization.

Predisposing Variables & Utilization. Examining the significant predictors in the model provides important information about the factors that may influence which students utilized services. Predisposing variables are variables that describe an individual's propensity to utilize services. This study examined utilization in respect to four student-level predisposing variables (i.e., gender, grade, ethnicity, age). The predisposing factors were consistently significant predictors of mental health utilization.

More specifically, being female, older in age, and white predicted increased service utilization. In respect to gender, female students were significantly more likely to utilize mental health services. Nearly 9% of females, compared to 5.3% of males, reported accessing services. While a portion of existing research suggests utilization is higher among males, few of those studies examined adolescent populations exclusively. Longitudinal studies have described a shift in utilization among males and females in early adolescence (Cuffee et al., 2001). Such a shift was observed in this study. That is, the gender discrepancy became more obvious as youth got older. Differences in utilization were most notable at age 17, with nearly a 6% difference between males and females. Differences in utilization were least significant for 13-14 year old students, with less than a 1% difference between males and females. These findings are consistent with previous research that examined adolescent utilization, including the most recent National Survey of Drug Use and Health (SAMHSA, 2007). Similarly, despite having severe levels of dysfunction (often comparable to inpatient units), Mattison, Morales, and Bauer (1993) reported that male adolescents in special education programs were the most treatment resistant and least likely of all children in special education to utilize mental health services. A multitude of factors likely contribute to this disproportionate utilization, including mental health attitudes, knowledge, parental approval and/or beliefs, and perceived stigma.

A growing body of research suggests that the unmet need for services appears to be greatest among racial/ethnic minority groups (Kataoka et al., 2002; McCabe et al., 1999). Findings from this study were consistent with previous research, identifying non-white students as a significant predictor of underutilization compared to their white peers.

Asian American/Pacific Island students reported being least likely to access mental health services (3%), followed by Mexican American (5.7%), and African American (5.8%) students. Despite variability in how these data are collected (e.g., community vs. high-risk sample; regional vs. national sample), these three ethnic populations are consistently identified as underserved. For example, the findings from the current study are generally consistent with a recent analysis of high-risk adolescents, in which African American, Hispanic, and Asian American/Pacific Island youth had the lowest utilization rates (Garland et al., 2005). While this phenomenon is more noticeable among the ethnic minority poor (Temkin-Greener & Clark, 1988), studies have documented similar findings with non-poor populations for whom many socioeconomic and other differences are minimized or controlled. Such research would suggest that these disparities in utilization are not solely a function of resources (i.e., financial or insurance). A growing body of research suggests that cultural or attitudinal factors play a strong role in lower use by ethnic minorities. Undoubtedly, aspects of the service delivery system also play a role, including the absence of ethnic mental health practitioners. It should also be pointed out that this study found reported utilization among Native American and multi-racial youth to be considerably higher than expected. In this study, over 12% of Native American youth and nearly 10% of multi-racial youth reported utilizing mental health services. Very little research has been conducted regarding mental health utilization among Native American or multi-racial youth. As a result, it is difficult to make any generalizations about these populations and their mental health utilization. However, for Native American youth who are at increased risk for a host of psychological problems (Gone, 2004), the high utilization rate may likely be related to greater need.

As it relates to age and grade, mental health utilization among Minnesota high school students increases steadily as they get older. Approximately 5% of 13-14 year olds reported utilization in the past year compared to 8.5% of 17 year olds. In respect to grade, 6% of ninth graders and 8% of twelfth graders report accessing mental or emotional health services. While adolescents (especially older adolescents) have been identified as an underserved population due to their resistance to seek treatment, it is important to remember that the frequency and intensity of mental health problems multiply exponentially during adolescence. According to Kessler and his colleagues (2005) many mental health disorders first present during adolescence. In addition, existing but untreated mental health problems become increasingly complex as children transition into adolescence. The findings from this study are consistent with previous studies examining prevalence and utilization trends, and understandable given the complex web of mental, social, emotional, sexual, and physical development occurring between childhood and adulthood. There is growing evidence documenting the observable and measurable brain changes taking place throughout adolescence (Steinberg et al., 2004). Adolescents' developing brain, coupled with increased academic demands, interpersonal stressors, hormonal changes, and possible substance use makes adolescents highly prone to mental health disorders and more likely to engage in risky behaviors.

Enabling Variables & Utilization. Enabling variables are the means individuals have available to them for accessing mental health services, including individual attributes (e.g., financial resources, health insurance) and community attributes (e.g., geographic setting, availability of professionals). For this study, school size, geographic setting, and perceived social support were included as enabling variables. When controlling for predisposing variables only, all enabling variables significantly predicted mental health utilization. In the current study, as school size increased, predicted utilization among students also increased. To date, no other studies appear to examine broad-based mental health utilization (i.e., any community or school-based service) as a function of school size. However, there is a growing body of research that has examined the availability and utilization of school-based mental health services by various student and school characteristics. A study by Slade (2003) found larger schools significantly more likely to provide mental health counseling and related health services. Furthermore, the initial research which examined specific utilization differences according to school size found small-moderate sized schools (i.e., 500-1000) were significantly less likely to report utilization compared to all other school sizes. Data from SAMHSA's national survey of school mental health correspond closely with these findings. The percent of schools offering mental health services to all students was greater for small (<500) and large (1000+) schools compared to medium sized schools (501-1000) (Foster et al., 2005). Together, these findings may suggest that the availability of mental health services in schools has ability to influence overall utilization. The plausibility of this hypothesis is strengthened given the growing body of research that points to public schools as the major providers of mental health services (Rones & Hoagwood, 2000).

In respect to geographic location, being from an urban area was a significant predictor of underutilization. Given the frequent press and national publications documenting the significant need and limited resources in rural areas (U.S. Department of Health and Human Services, 1999), these findings were surprising. However, these findings appear to be relatively consistent with existing research. While a handful of previous studies have found no geographic differences in the use of mental health services (Grusky et al., 1985; Sommers, 1989), the majority of existing research identifies urban dwellers as slightly more likely to use services than rural residents (Goldstrom & Manderscheid, 1983; Watts et al., 1986). Most recently, Lambert and his colleagues (2009) examined three years of pooled data (1997, 1999, 2002) from the National Survey of America's Families (NSAF). Their analysis revealed that rural children are slightly less likely to have a mental health visit than are urban children (7% rural vs. 8% urban). Among children with an identified mental or behavioral health issue, rural and urban rates of mental health visits in the past year are the same (36.5%). It should be pointed out that, while significant, reported utilization among urban and rural youth only varied by .3% (6.9% vs. 7.2%). In reality, a foundation of research to adequately address this question is yet to be established. In the past 20 years, only a small number of studies have examined child/adolescent mental health utilization as a function of geographic setting. Even less is known about the factors that may mediate or reduce differences.

There is a growing interest in the importance of social support on mental health (Kawachi & Berkman, 2001) and mental health service utilization (Kang et al., 2007). Findings from this study suggest that there is an inverse relationship between an adolescents' social support, and reported mental health utilization. That is, as social support increases, mental health utilization decreases. These findings are consistent with previous research by (Kang et al.) who found consumers with higher social network index scores had lower expenditures for inpatient services in state hospitals and outpatient services than those who have lower scores. Various hypothesis could be drawn explain this phenomenon. Most plausible, however, is that the current study adds to a growing body of evidence that suggests social support may have a protective effect on people's mental health, ultimately decreasing the need for utilization. A strong body of research has documented the relationship between social support and health, functioning, and quality of life is well established in the literature (Cohen et al. 1985). In general, research has shown that social networks can act as social support systems to promote mental health and buffer psychological stress. On the other hand, the absence of social support appears related to greater psychiatric symptoms and poorer perceptions of overall health - resulting in increased utilization (Buchanan 1995; Goldberg et al. 2003).

Need Variables. Need variables include evaluated need and perceived need, and are the most immediate factors related to health service use. Findings from this study support existing research that suggest factors indicative of need emerge as the strongest predictors of utilization (Leaf et al., 1988). For the current study, even controlling for predisposing and enabling variables, all three measures of perceived need were significant predictors of mental health utilization. These findings are consistent with Burns et al. (2004) who found children with clinical levels of mental health need (as perceived by the parent) are much more likely to receive mental health services than lower scoring youth. These findings are also consistent with Leaf et al. (1996) who found having a psychiatric disorder and/or having impairment in functioning had a significant effect on reported use of specialized mental health services.

These findings and existing research suggest a strong link between adolescents' and their parents' beliefs about and acknowledgement of mental health need and reported utilization. Research by Adelman, Barker, and Nelson (1993) and Balassone, Bell, and Peterfreund (1991) found that the adolescents' belief about their need for treatment was a primary factor in determining utilization. In the study by Adelman et al., 471 seniors in a Los Angeles high school were surveyed about the mental health services that were available in the schools' health clinic. The most frequently endorsed reason for not using the clinic was they did not need help. Furthermore, despite measurable impairment, several researchers have suggested that parents underestimate thresholds for labeling youth's behaviors or symptoms as potential mental health problems (Richardson, 2001).

School-Based Mental Health and Utilization

A growing body of research points to public schools as the "major providers" of mental health services for school-aged children (Rones & Hoagwood, 2000, p. 223). School-based mental health offers the promise of preventing and treating the mental health needs of children and adolescents. As such, a strong argument can be made that schools may be the most important community-level enabling attribute. However, to date, no studies appear to have examined whether specific types of school-based services are effective at increasing broad-based mental health utilization among students. Findings from the current study indicate that prevention and promotion services were the only school-based mental health variable that significantly predicted utilization among high school students. Based on the findings from this study, students attending schools that reported greater mental health prevention and health promotion were significantly less likely to report mental health utilization. It should be pointed out that little is known about the nature or effectiveness of these prevention and/or promotion services being offered. However, there is increasing evidence on the effectiveness of school-based interventions to improve children's and adolescent's resilience, promote mental health and prevent more serious mental health problems and disorders.

Findings from this study add to a growing collection of research documenting the benefits of school-based mental health promotion and prevention activities. Durlak and Wells (1997) used meta-analysis to review 177 primary prevention programs designed to prevent behavioral and social problems in children and adolescents. The observed outcomes similar to or higher in magnitude than those obtained by many other established preventive and treatment interventions in the social sciences and medicine. More recently, Wells and her colleagues (2003) reviewed 17 studies on universal mental health promotion, and disease prevention programs or interventions in schools. They reported evidence that universal school mental health promotion programs can be effective, specifically long-term interventions promoting the positive mental health of all youth and involving changes to the school climate versus brief class-based mental illness prevention programs.

Merits and Limitations

Both merits and limitations were present in this study. An overwhelming merit of this study is that it provides the first comprehensive analysis of mental health service utilization for Minnesota high school students. To date, no study appears to have examined the patterns and predictors of adolescent utilization in this Midwestern state. The many implications for research, policy, and practice are discussed below. Another merit of this study relates to the integration of instrumentation and merger of two existing databases. Individually, the Survey of Social/Emotional Supports and Services and Minnesota Student Survey both provide valuable information. Combined, however, these tools provide unparalleled and comprehensive information about the state of Minnesota's schools and youth. Furthermore, because they are both replicated every three years, the merger of these extant databases will offer insight into trends in the patterns or predictors of utilization. The large sample and broad-based examination of adolescents is another merit of this study. The overwhelming majority of existing research has focused on smaller sub-samples of youth, often with specific demographic characteristics (e.g., African American males) or presenting disorders (e.g., ADHD). Finally, this study sought to incorporate school-based mental health service delivery into Andersen's Behavioral Model of Health Care Utilization. More than any other institution or organization, schools have unparalleled access to children and families. As such, the role of schools and school-based mental health services as community-level enabling attributes should be investigated further.

While the study provides important findings on the patterns and predictors of mental health utilization among Minnesota high school students, there were also clear limitations. First and foremost, it should be noted that while missing data in this study were quite low, significant differences between respondents and non-respondents were found in respect to various individual demographic (i.e., gender, age, grade, ethnicity) and community (i.e., school size and geographic setting) variables. Particularly concerning was the high likelihood of non-white, 9^{th} Grade, males from urban settings to be non-respondents. Secondly, the use of existing databases limited which variables could be included in the analysis and how the variables could be operationalized. For example, the literature consistently described insurance status as an important predictor of mental health utilization. By leaving it out of the current models, a large proportion of variance in service utilization may not be accounted for. Furthermore, at most, the strongest model in this study accounted for 40% of the variance in mental health utilization. It is important to note that an extensive collection of additional predisposing, enabling and need variables account for the remaining variance. The use of existing databases also excluded important sub-populations from this study, particularly youth from charter and magnet schools who may have different mental health needs than their peers in traditional high schools.

A final limitation of this study is that these data may only identify utilization in respect to problems treated by individual service providers. Students in this study were simply asked "Have you ever been treated for a mental or emotional health problem?" As documented in the mental health literature, there is a long history of mental health service being defined as specific individualized intervention for a specific, diagnosable problem. As such, most people (including adolescent consumers) are not aware of the spectrum of promotion, prevention and early intervention available and implemented in most schools. As such, while many adolescents are served by programs (e.g., after-school programs) that address mental and emotional problems and promote healthy development, these are not likely reflected in this study. This limitation is consistent with most of the existing literature on child and adolescent mental health utilization. Most available data on mental health services examine individual treatment, usually based on identified disorder or pathology. This focus excludes services outside the formal health care system, such as those provided in schools or other community programs.

Future Directions

In order to reduce the disparities in utilization of children's mental health services, three broad areas of research must continue. First, future research must continue to examine the patterns and predictors of mental health utilization among children and adolescents. As this review of the literature highlighted, there are many uncertainties in regard to who receives services and who does not. Very few states have broadly examined utilization patterns among their youth. Legitimate intervention or programming efforts cannot be considered without reliable information regarding existing patterns of utilization. In addition, researchers must find methods for examining utilization with a broader and more sensitive lens – one that captures health promotion, prevention, and treatment activities.

Secondly, future research must begin to investigate and better understand the potential causes of these disparities. Recognizing and acknowledging certain attributes (e.g., gender, ethnicity) that predict utilization is necessary, but not sufficient. Unfortunately, most of the research to date has focused on identifying predictors. Moving forward, researchers must begin to ask "why?" Particular emphasis should be placed on race/ethnicity disparities. The underutilization among ethnic minorities as identified in this study and previous research is staggering.

Finally, an emerging body of research has documented the need for and benefit of school-based services. There is growing recognition that these services are critical to the school's instructional mission because health, especially mental health, is a fundamental cornerstone for ensuring that all youth are ready to learn (Weist et al., 2005). Furthermore, in respect to utilization, schools offer programmatic or implementation benefits (e.g. increased accessibility, familiar setting, less stigmatizing, culturally acceptable) that increase the likelihood of youth and families accessing services. However, most of these school-based programs are not empirically based. Future research must continue to investigate the role of schools and school-based mental health as enabling attributes.

References

Aday, L. A., & Andersen, R. (1974). A framework for the study of access to medical care. *Health Services Research, 9*(3), 208.

Adelman, H. S., Barker, L. A., & Nelson, P. (1993). A study of a school-based clinic: Who uses it and who Doesn□t? *Journal of Clinical Child & Adolescent Psychology*, *22*(1), 52-59.

Adelman, H. S., & Taylor, L. (2000). Shaping the future of mental health in schools. *Psychology in the Schools, 37*(1).

American Academy of Pediatrids Committee on School Health (2004). *Pediatrics*, 113(6) June 2004, 1839-1845.

Andersen, R. (1968). A behavioral model of families' use of health services. research series no. 25. *Chicago: Center for Health Administration Studies, University of Chicago Press.*

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the united states. *The Milbank Memorial Fund Quarterly. Health and Society*, 95-124.

Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 1-10.

Andersen, R. M., & Davidson, P. L. (2001). Improving access to care in america. *Changing the US Health Care System*, 3–30.

Armbruster, P., Gerstein, S. H., & Fallon, T. (1997). Bridging the gap between service need and service utilization: A school-based mental health program. *Community Mental Health Journal, 33*(3), 199-211.

Armbruster, P., Sukhodolsky, D., & Michalsen, R. (2004). The impact of managed care on children's outpatient treatment: A comparison study of treatment outcome before and after managed care. *American Journal of Orthopsychiatry*, *74*(1), 5-13.

Balassone, M. L., Bell, M., & Peterfreund, N. (1991). A comparison of users and nonusers of a school-based health and mental health clinic. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 12*(3), 240-246.

Botman, S. L., Moore, T. F., Moriarity, C. L., & Parsons, V. L. (2000). Design and estimation for the national health interview survey, 1995–2004. *National Center for Health Statistics.Vital Health Stat*, *2*(130), 1-31.

Bourdon, K. H., Goodman, R., Rae, D. S., Simpson, G., & Koretz, D. S. (2005). The strengths and difficulties questionnaire: US normative data and psychometric properties. *Journal of American Academy of Child & Adolescent Psychiatry, 44*(6), 557.

Buchanan, J. (1995). Social support and schizophrenia: A review of the literature. *Archives of Psychiatric Nursing, 9*(2), 68–76.

Burns, B. J., Costello, E. J., Angold, A., Tweed, D., Stangl, D., Farmer, E. M., et al. (1995). Children's mental health service use across service sectors. *Health Affairs, 14*(3), 147-159.

Burns, B. J., Phillips, S. D., Wagner, H. R., Barth, R. P., Kolko, D. J., Campbell, Y., et al. (2004). Mental health need and access to mental health services by youths involved with child welfare: A national survey. *Journal of American Academy of Child & Adolescent Psychiatry, 43*(8), 960.

Center for Mental Health in Schools. (2007). *About mental health in schools.* Los Angeles, CA: Author. Retrieved 2/20/2008, from http://smhp.psych.ucla.edu/pdfdocs/aboutmh/aboutmhinschools.pdf.

Chandra, A., & Minkovitz, C. S. (2006). Stigma starts early: Gender differences in teen willingness to use mental health services. *Journal of Adolescent Health, 38*(6), 754-754.

Coalition for Juvenile Justice (2000). *Coalition for juvenile justice 2000 annual report.* Washington, DC: Coalition for Juvenile Justice.

Commission on Chronic Illness. (1957). *Chronic illness in the United States* (Vol. 1). Cambridge, MA: Harvard University Press.

Cohen, S., Mermelstein, R., Kamarck, T. E., & Hoberman, H. (1985). Measuring the functional components of social support. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research, and applications* (pp. 73–94). The Hague, The Netherlands: Martinus Nijhoff.

Conduct Problems Prevention Research Group. (1999). Initial impact of the fast track prevention trial for conduct problems: I. the high-risk sample. *Journal of Consulting and Clinical Psychology*, *67*, 631-647.

Costello, E. J., Angold, A., Burns, B. J., Erkanli, A., Stangl, D. K., & Tweed, D. L. (1996). The great smokey mountains study of youth: Functional impairment and serious emotional disturbance. *Archives of General Psychiatry, 53*(12), 1137-1143.

Costello, E. J., Egger, H., & Angold, A. M. R. C. (2005). 10-year research update review: The epidemiology of child and adolescent psychiatric disorders: I. methods and public health burden. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*(10), 972.

Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry, 60*(8), 837-844.

Cowen, E. L., Hightower, A. D., Work, W. C., Pedro-Carroll, J. A., & Wyman, P. A. (1996). *School-based prevention for children at risk: The primary mental health project* American Psychological Association Washington, DC.

Cuffe, S. P., Waller, J. L., Cuccaro, M. L., Pumariega, A. J., & Garrison, C. Z. (1995). Race and gender differences in the treatment of psychiatric disorders in young adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 34*(11), 1537.

Cuffe, S. P., Waller, J. L., Addy, C. L., McKeown, R. E., Jackson, K. L., Moloo, J., et al. (2001). A longitudinal study of adolescent mental health service use. *The Journal of Behavioral Health Services and Research, 28*(1), 1-11.

Cunningham, P. J., & Freiman, M. P. (1996). Determinants of ambulatory mental health services use for school-age children and adolescents. *Health Services Research, 31*(4), 409.

Cunningham, C.E., Cunningham, L.J., Martorelli, V., Tran, A., Young, J. & Zacharias, R. (1998). The effects of primary division, student-mediated conflict resolution programs on playground aggression. *The Journal of Child Psychology and Psychiatry, 39(5)*, 653-662.

Davis, M. Fryer, G.E., White, S. et al. (1995). A closer look: A report of select findings from the National School Health Survey 1993-1994. Retrieved 4/20/2006, from http://www.uchsc.edu/schoolhealth/closer_look_paper.htm.

DuPaul, G. J., McGoey, K. E., Eckert, T. L., & VanBrakle, J. (2001). Preschool children with attention-deficit/hyperactivity disorder: Impairments in behavioral, social, and school functioning. *Journal of American Academy of Child & Adolescent Psychiatry, 40*(5), 508.

Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology, 25*(2), 115-152.

Erickson, S. R., Munzenberger, P. J., Plante, M. J., Kirking, D. M., Hurwitz, M. E., & Vanuya, R. Z. (2002). Influence of sociodemographics on the health-related quality of life of pediatric patients with asthma and their caregivers. *Journal of Asthma, 39*(2), 107-117.

Evans, S. W. (1999). Mental health services in schools utilization, effectiveness, and consent. *Clinical Psychology Review, 19*(2), 165-178.

Field, A. (2009). *Discovering statistics using SPSS.* Sage Publications Ltd.

Fleming, C.B., Haggerty, K.P., Brown, E.C. Catalano, R.F., Harachi, T.W., Mazza, J.J., & Gruman, D.H. (2005). Do social and behavioral characteristics targeted by preventive interventions predict standardized test scores and grades? *Journal of School Health, 75*, 342-349.

Flisher, A. J., Kramer, R. A., Grosser, R. C., Alegria, M., Bird, H. R., Bourdon, K. H., et al. (1997). Correlates of unmet need for mental health services by children and adolescents. *Psychological Medicine, 27*(05), 1145-1154.

Foster, S., Rollefson, M., Doksum, T., Noonan, D., Robinson, G., & Teich, J. (2005). School mental health services in the united states, 2002-2003. *Substance Abuse and Mental Health Services Administration*, 163.

Friesen, B. J., & Huff, B. (1996). Family perspectives on systems of care. *Children's Mental Health: Creating Systems of Care in a Changing Society,* , 41-67.

Garland, A. F., & Besinger, B. A. (1997). Racial/ethnic differences in court referred pathways to mental health services for children in foster care. *Children and Youth Services Review, 19*(8), 651-666.

Garland, A. F., Hough, R. L., Landsverk, J. A., McCabe, K. M., Yeh, M., Ganger, W. C., et al. (2000). Racial and ethnic variations in mental health care utilization among children in foster care. *Children's Services, 3*(3), 133-146.

Garland, A. F., Lau, A. S., Yeh, M., McCabe, K. M., Hough, R. L., & Landsverk, J. A. (2005). Racial and ethnic differences in utilization of mental health services among high-risk youths. *American Journal of Psychiatry, 162*(7), 1336-1343.

Gilbert, G. H., Branch, L. G., & Longmate, J. (1993). Dental care use by U.S. veterans eligible for VA care. *Social Science & Medicine (1982), 36*(3), 361-370.

Goldberg, R. W., Rollins, A. L., & Lehman, A. F. (2003). Social network correlates among people with psychiatric disabilities. *Psychiatric Rehabilitation Journal, 26*(4), 393–402.

Goldstrom, I. D., & Manderscheid, R. W. (1983). A descriptive analysis of community support program case managers serving the chronically mentally ill. *Community Mental Health Journal, 19*(1), 17-26.

Gone, J. P. (2004). Mental health services for native americans in the 21st century united states. *Professional Psychology Research and Practice, 35*(1), 10-18.

Gordon, R. (1987). An operational classification of disease prevention. In J. A. Steinberg, & M. M. Silverman (Eds.), *Preventing mental disorders*, 20-26.

Greenberg, M. T., Weissberg, R. P., O'Brien, M. E., Zins, J. E., Fredericks, L., Resnik, H., et al. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist, 58*, 466-474.

Grusky, O., Tierney, K., Manderscheid, R. W., & Grusky, D. B. (1985). Social bonding and community adjustment of chronically mentally ill adults. *Journal of Health and Social Behavior,* 49-63.

Gyamfi, P. (2004). Children with serious emotional disturbance: The impact of poverty and receipt of public assistance on behavior, functioning, and service use. *Children and Youth Services Review, 26*(12), 1129-1139.

Heneghan, A.M. & Malakoff, M.E. (1997). Availability of school health services for young children. *Journal of School Health, 67*(8), 327-332.

Hoagwood, K., & Erwin, H. D. (1997). Effectiveness of school-based mental health services for children: A 10-year research review. *Journal of Child and Family Studies, 6*(4), 435-451.

Hogan, M. F. (2003). New freedom commission report: The president's new freedom commission: Recommendations to transform mental health care in america. *Psychiatric Services, 54*(11), 1467.

Hubner, J., & Wolfson, J. (2000). Handle with care: Serving the mental health needs of young offenders. Coalition for Juvenile Justice.

Hurlburt, M. S., Leslie, L. K., Landsverk, J., Barth, R. P., Burns, B. J., Gibbons, R. D., et al. (2004). Contextual predictors of mental health service use among children open to child welfare. *Archives of General Psychiatry, 61*(12), 1217-1224.

Kang, S. H., Wallace, N. T., Hyun, J. K., Morris, A., Coffman, J., & Bloom, J. R. (2007). Social networks and their relationship to mental health service use and expenditures among medicaid beneficiaries. *Psychiatric Services, 58*(5), 689-695.

Kataoka, S. H., Zhang, L., & Wells, K. B. (2002). Unmet need for mental health care among US children: Variation by ethnicity and insurance status. *American Journal of Psychiatry, 159*(9), 1548-1555.

Kaplan, D.W., Brindis, C., Naylor, K.E., Phibbs, S.L., Ahlstrand, K.R., and Melinkovich, P. (1998). Elementary school-based health center use. *Pediatrics 101 (6).* 12.

Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health, 78*(3), 458-467.

Kazdin, A. E., Holland, L., & Crowley, M. (1997). Family experience of barriers to treatment and premature termination from child therapy. *Journal of Consulting and Clinical Psychology, 65*(3), 453-463.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 593-602.

Klingman, A., & Hochdorf, Z. (1993). Coping with distress and self harm. The impact of a primary prevention program among adolescents. *Journal of Adolescence, 16*, 121-140.

Knopf, D., Park, M. J., & Mulye, T. P. (2008). *The mental health of adolescents: A national profile, 2008*. San Francisco, CA: National Adolescent Health Information Center, University of California, San Francisco.

Kouzis, A. C., & Eaton, W. W. (1998). Absence of social networks, social support and health services utilization. *Psychological Medicine, 28*(06), 1301-1310.

Kutash, K., Duchnowski, A. J., & Friedman, R. M. (2005). The system of care twenty years later. In M.H. Epstein, K. Kutash, & A. J. Duchnowski (Eds.), *Outcomes for* *children with emotional and behavioral disorders and their families: Program and evaluation best practices* (2nd ed., pp.3-22). Austin, TX: Pro-Ed.

Kutash, K., Duchnowski, A. J., & Lynn, N. (2006). *School-based mental health: An empirical guide for decision makers*. Tampa, FL: University of South Florida, The Louis de la Parte Florida Mental Health Institute, Department of Child and Family Studies, Research and Training Center for Children's Mental Health.

Lambert, D., Ziller, E. C., & Lenardson, J. D. (2009). Rural children don't receive the mental health care they need (research & policy brief). Portland, ME: University of Southern Maine, Maine Rural Health Research Center.

Landrum, T. J., Tankersley, M., & Kauffman, J. M. (2003). What is special about special education for students with emotional or behavioral disorders? *The Journal of Special Education, 37*(3), 148.

Leaf, P. J., Alegria, M., Cohen, P., Goodman, S. H., Horwitz, S. M. C., Hoven, C. W., et al. (1996). Mental health service use in the community and schools: Results from the four-community MECA study. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*(7), 889-897.

Leaf, P. J., Bruce, M. L., Tischler, G. L., Freeman Jr, D. H., Weissman, M. M., & Myers, J. K. (1988). Factors affecting the utilization of specialty and general medical mental health services. *Medical Care, 26*(1), 9.

Lemming, M. R., & Calsyn, R. J. (2006). Ability of the behavioral model to predict utilization of five services by individuals suffering from severe mental illness and homelessness. *Journal of Social Service Research, 32*(3), 153-172.

Leonard, N., Shevlin-Woodcock, C., Sander, M., Dona, D., and Christenson, S. (2007). *Survey of Social/Emotional Supports and Services in Minnesota Schools: Report of Findings, 2005–2006*. Roseville, MN: Minnesota Department of Education.

Leslie, L. K., Landsverk, J., Ezzet-Lofstrom, R., Tschann, J. M., Slymen, D. J., & Garland, A. F. (2000). Children in foster care: Factors influencing outpatient mental health service use. *Child Abuse & Neglect*, *24*(4), 465-476.

Markward, M., McMillan, L. S., & Markward, N. (2003). Social support among youth. *Children and Youth Services Review, 25*(7), 571-587.

Mattison, R. E., Morales, J., & Bauer, M. A. (1993). Adolescent schoolboys in SED classes: Implications for child psychiatry. *Journal of the American Academy of Child and Adolescent Psychiatry*, *32*(6), 1223-1228.

McCabe, K., Yeh, M., Hough, R. L., Landsverk, J., Hurlburt, M. S., Wells Culver, S., et al. (1999). Racial/ethnic representation across five public sectors of care for youth. *Journal of Emotional and Behavioral Disorders, 7*(2), 72.

McGee, R., Feehan, M., Williams, S., Partridge, F., Silva, P. A., & Kelly, J. (1990). DSM-III disorders in a large sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 29*, 611–619.

Mrazek, P. B., & Haggerty, R. J. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research* National Academy Press.

Murthy, R. S. (2001). *The world health report 2001: Mental health: New understanding, new hope.* World Health Organization.

National Institute of Mental Health. (2001). Blueprint for change: *Research on child and adolescent mental health, a report of the National Advisory Mental Health Council's Workgroup on Child and Adolescent Mental Health Intervention and Deployment*. Rockville, MD: Author.

Pandiani, J. A., Banks, S. M., Simon, M. M., Van Vleck, M. C., & Pomeroy, S. M. (2005). Access to child and adolescent mental health services. *Journal of Child and Family Studies, 14*(3), 431-441.

Paternite, C. E. (2005). School-based mental health programs and services: Overview and introduction to the special issue. *Journal of Abnormal Child Psychology, 33,* 657-663.

Peng, C. J., Lee, K. L., & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research, 96*, 3-14.

Pescosolido, B. A. (1992). Beyond rational choice: The social dynamics of how people seek help. *American Journal of Sociology,* 1096-1138.

Ping, W., Hoven, C. W., Bird, H. R., Moore, R. E., Cohen, P., Alegria, M., et al. (1999). Depressive and disruptive disorders and mental health service utilization in children and adolescents. *Journal of the Academy of Child & Adolescent Psychiatry, 38*(9), 1081.

Policy Leadership Cadre for Mental Health in Schools. (2001). *Mental health in schools: Guidelines, models, resources, and policy considerations.* Department of Psychology, University of California, Los Angeles.

Portes, A., Kyle, D., & Eaton, W. W. (1992). Mental illness and help-seeking behavior among mariel cuban and haitian refugees in south florida. *Journal of Health and Social Behavior*, 283-298.

Pottick, K. J., Bilder, S., Vander Stoep, A., Warner, L. A., & Alvarez, M. F. (2008). US patterns of mental health service utilization for transition-age youth and young adults. *The Journal of Behavioral Health Services and Research, 35*(4), 373-389.

Power, T. J. (2003). Promoting children's mental health: Reform through interdisciplinary and community partnerships. *School Psychology Review, 32*(1), 3-17.

Reis, O., Azmitia, M., Syed, M., Radmacher, K., & Gills, J. (2009). Patterns of social support and mental health among ethnically-diverse adolescents during school transitions. *European Journal of Developmental Science, 3*(1), 39-50.

Richardson, L.A. (2001). Seeking and obtaining mental health services: What do parents expect? *Archives of Psychiatric Nursing, 15*(5), 223-231.

Rones, M., & Hoagwood, K. (2000). School-based mental health services: A research review. *Clinical Child & Family Psychology Review, 3*(4), 223-241.

Shaffer, D., Fisher, P., Dulcan, M. K., Davies, M., Piacentini, J., Schwab-Stone, M. E., et al. (1996). The NIMH diagnostic interview schedule for children version 2.3 (DISC-2.3): Description, acceptability, prevalence rates, and performance in the MECA study. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*(7), 865-877.

Simpson, G. A., Scott, G., & Henderson, M. J. (2002). Estimates of attention, cognitive, and emotional problems, and health service use by U.S. school-aged children. In R. W. Manderscheid, & M. J. Henderson (Eds.) (Eds.), *Mental health, united states*. Rockville, MD: U.S. Department of Health & Human Services.

Slade, E. (2003). The relationship between school characteristics and the availability of mental health and related health services in middle and high schools in the united states. *The Journal of Behavioral Health Services and Research, 30*(4), 382-392.

Sommers, I. (1989). Geographic location and mental health services utilization among the chronically mentally ill. *Community Mental Health Journal, 25*(2), 132-144.

Steinberg, L., Dahl, R., Keating, D., Kupfer, D. J., Masten, A. S., & Pine, D. (2004). The study of developmental psychopathology in adolescence: Integrating affective neuroscience with the study of context. *Handbook of Developmental Psychopathology,* 1–96.

Sturm, R., Ringel, J. S., & Andreyeva, T. (2003). Geographic disparities in children's mental health care. *Pediatrics*, *112*(4), 308-315.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2007). *Detailed tables of 2006 national survey on drug use and health.*http://www.oas.samhsa.gov/NSDUHlatest.htm

Teplin, L. A., Abram, K. M., McClelland, G. M., Dulcan, M. K., & Mericle, A. A. (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry, 59*(12), 1133-1143.

Temkin-Greener, H., & Clark, K. T. (1988). Ethnicity, gender, and utilization of mental health services in a medicaid population. *Social Science & Medicine (1982), 26*(10), 989-996.

True, W. R., Romeis, J. C., Heath, A. C., Flick, L. H., Shaw, L., Eisen, S. A., et al. (1997). Genetic and environmental contributions to healthcare need and utilization: A twin analysis. *Health Services Research, 32*(1), 37-53.

Tucker, C. M. (2002). Expanding pediatric psychology beyond hospital walls to meet the health care needs of ethnic minority children. *Journal of Pediatric Psychology, 27*(4), 315-323.

U.S. Department of Education. (2002). *Twenty-third annual report to congress on the implementation of the individuals with disabilities education act*. Washington, DC.

U.S. Department of Health and Human Services. (1999). *Mental health: A report of the surgeon general*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health.

U.S. Public Health Service. (2000). *Report of the Surgeon General's Conference on Children's Mental Health: A national action agenda.* Washington, DC: U.S. Government Printing Office.

Verhulst, F. C., & Van Der Ende, J. (1997). Factors associated with child mental health service use in the community. *Journal of the American Academy of Child and Adolescent Psychiatry*, *36*(7), 901-909.

Vitanza, S., Cohen, R., Hall, L. L., Wechsler, H., Cohen, J., Rothrock, A., et al. (1999). Families on the brink: The impact of ignoring children with serious mental illness. *The National Alliance for the Mentally Ill.*

Walter, H. J., Vaughan, R. D., Armstrong, B., Krakoff, R. Y., Tiezzi, L., & McCarthy, J. F. (1996). Characteristics of users and nonusers of health clinics in inner-city junior high schools. *Journal of Adolescent Health, 18*(5), 344-348.

Watts, C. A., Scheffler, R. M., & Jewell, N. P. (1986). Demand for outpatient mental health services in a heavily insured population: The case of the blue cross and blue shield association's federal employees health benefits program. *Health Services Research*, *21*(2 Pt 2), 267-289.

Weist, M.D., Paternite, C.E., & Adelsheim, S. (2005). *School-based mental health services. Report to the Institute of Medicine, Board on Health Care Services, Crossing the Quality Chasm: Adaptation to Mental Health and Addictive Disorders Committee*. Washington, DC: Institute of Medicine.

Weisz, J. R., Sandler, I. N., Durlak, J. A., & Anton, B. S. (2005). Promoting and protecting youth mental health through evidence-based prevention and treatment. *American Psychologist, 60*(6), 628.

Wells, J., Barlow, J., & Stewart-Brown, S. (2003). A systematic review of universal approaches to mental health promotion in schools. *Health Education, 103*(4), 197-220.

Welsh, M., Parke, R. D., Widaman, K., and O'Neil, R. (2001). Linkages between children's social and academic competence: a longitudinal analysis. *Journal of School Psychology, 39,* 463-482.

Willcutt, E. G., & Pennington, B. F. (2000). Psychiatric comorbidity in children and adolescents with reading disability. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 41*(08), 1039-1048.

Wittchen, H. U., Stein, M. B., & Kessler, R. C. (1999). Social fears and social phobia in a community sample of adolescents and young adults: Prevalence, risk factors and co-morbidity. *Psychological Medicine, 29*(02), 309-323.

Wu, P., Hoven, C. W., Cohen, P., Liu, X., Moore, R. E., Tiet, Q., et al. (2001). Factors associated with use of mental health services for depression by children and adolescents. *Psychiatric Services, 52*(2), 189.

Yeh, M., McCabe, K., Hough, R. L., Dupuis, D., & Hazen, A. (2003). Racial/ethnic differences in parental endorsement of barriers to mental health services for youth. *Mental Health Services Research, 5*(2), 65-77.

Zahner, G., Pawelkiewicz, W., DeFrancesco, J. J., & Adnopoz, J. (1992). Children's mental health service needs and utilization patterns in an urban community: An epidemiological assessment. *Journal of the American Academy of Child and Adolescent Psychiatry*, *31*, 951–960.

Zins, J. E., Weissberg, R. P., Wang, M. C., & Walberg, H. J. (Eds.). (2004). *Building academic success on social and emotional learning: What does the research say?* New York: Teachers College Press.

Zwaanswijk, M., Van Der Ende, J., Verhaak, P., Bensing, J. M., & Verhulst, F. C. (2003). Factors associated with adolescent mental health service need and utilization. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(6), 692.

Appendix A

Survey of Social/Emotional Supports and Services

Survey of Social/Emotional Supports and Services Edit Title Edit Numbering Add Logo

Add Page

1. Consent Form Edit Page Delete Page Copy/Move Add Logic

You are invited to participate in the following research study: **"A Descriptive Analysis: Mental Health Service Delivery System in Minnesota Schools."**

This research will provide base-line data about the social/emotional support and services currently being provided in Minnesota schools. Your school was randomly selected from a pool of 1634 primary and secondary schools. Please read this page before agreeing to be in the study.

Primary Investigators:

This study is being conducted by the Department of Educational Psychology - University of Minnesota, in partnership with the Minnesota Department of Education.

Purpose:

This survey will provide valuable information about the range of services in Minnesota schools that meet the social/emotional development and learning of all students.

Minnesota schools serve the needs of students by promoting competence in social/emotional areas along a continuum of school-wide interventions (e.g. positive school climate, conflict resolution) to providing individualized supports for students with identifiable psychological disorders.

Benefits:

This survey will provide vital descriptive data for:

- Strategic planning for districts and schools.

- Establishing baselines related to the provision of social/emotional supports to students on a state, district, and school level.

- Strengthening future grant applications.

- Informing policy makers.

- Guiding staff development training.

In addition, all participants (i.e. schools) that complete the electronic survey before (DATE HERE) will be placed in a drawing for two $250 cash prizes.

Procedure:

As a participant in this study, you are asked to complete the Survey of Social/Emotional Supports and Services. The survey is online and will take approximately 30 - 45 minutes to complete.

Confidentiality:

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only shared with the Minnesota Department of Education as partners in this project.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or Minnesota Department of Education. If you decide to participate, you are free to not answer any question or withdraw at any time with out affecting those relationships.

Contacts and Questions:

The primary researchers conducting this study are: Sandra Christenson, Ph.D. and Nicholas Leonard. If you have questions, you are encouraged to contact them at (612) 625-7568 or leon0212@umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researchers, you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

Add Question | Add Page

Edit | Delete | Copy/Move | Add Logic

* **Statement of Consent:**

I have read the above information. I have contacted the researchers regarding any questions and have received answers. I consent to participate in the study.

Add Question | Add Page

2. Interventions & Supports Defined Edit Page | Delete Page | Copy/Move | Add Logic

Social/Emotional Interventions and supports are defined as:

Prevention & Promotion

• Strategies and programs for system-wide behavioral support, social-emotional learning and positive school climate.

• Strategies for teaching and reinforcing problem-solving, coping, social skills and character education.

Early Identification

• Early recognition and identification of mental health concerns including knowledge of related factors such as stress, chemical abuse, family/community or other environmental factors, history of school success or failure, etc.

• A referral process that facilitates family/parent/student access to services and support.

Evaluation & Assessment

• Coordinating with mental health professionals for diagnosis and assessment and the development of a comprehensive treatment plan.

Program Planning

• Direct intervention in the educational setting.

• Consultation with teachers regarding educational adaptations and classroom accomodations.

• Crisis planning and crisis management.

• Ongoing coordination with student, family/parent, educators and health care provider.

• Ongoing advocacy for the student with educators and health care providers in community settings.

• Medication management.

• Transition planning for students re-entering an education setting from a more restrictive placement.

Coordination of Services

• Partnering with community services to develop a network of prevention, assessment/intervention services and supports for students and families.

Adapted from Student Services Coalition for Effective Education (SSCEE) - Draft Position Statement (11/29/2004)

Add Question | Add Page

3. Interventions/Supports to Consider

Edit Page | Delete Page | Copy/Move | Add Logic

When answering questions about these social/emotional learning supports, include:

• Services provided by student support staff (e.g. school psychologist, social worker, nurse, counselors, chemical health).

• Services delivered in your school and/or in community settings provided through contract or formal agreements to serve your students.

• Instruction and intervention delivered by teachers to address students' social/emotional learning needs.

Adapted from the Survey of the Characteristics and Funding of School Mental Health Services (2002-2003) - Center for Mental Health Services/Office of Organization and Financing (Substance Abuse and Mental Health Services Administration - U.S. Department of Health and Human Services)

Add Question | Add Page

4. Participant Information

Edit Page | Delete Page | Copy/Move | Add Logic

Add Question | Add Page

Edit | Delete | Copy/Move

*** Please provide the following district/school information.**

School district number: ________

School building name: ________

Add Question | Add Page

Edit | Delete | Copy/Move | Add Logic

*** Who was involved in completing this survey? (Select all that apply)**

- [ ] Assistant Principal
- [ ] Behavior Management Administrative Assistant
- [ ] Chemical Health Staff
- [ ] Director of Special Education
- [ ] Director of Student Support Services
- [ ] Home/School Liaison
- [ ] Principal
- [ ] School Counselor
- [ ] School Nurse
- [ ] School Psychologist
- [ ] School Social Worker
- [ ] Special Education Coordinator
- [ ] Teacher (general education)
- [ ] Teacher (special education)
- [ ] Other(s) (List All)

Add Question | Add Page

Edit | Delete | Copy/Move

In your building, what is the FTE of the following support staff?

	FTE
Behavior Management Administrative Assistant	
Chemical Health Staff	

Home/School Liaison
School Counselor
School Nurse
School Psychologist
School Social Worker

Add Question | Add Page

5. School-Wide Social/Emotional Supports | Edit Page | Delete Page | Copy/Move | Add Logic

The following page pertains specifically to SCHOOL-WIDE social/emotional learning supports.

Add Question | Add Page

6. School-Wide Social/Emotional Supports | Edit Page | Delete Page | Copy/Move | Add Logic

Add Question | Add Page

Edit | Delete | Copy/Move

NOTE: When completing this survey think of the services available to students in YOUR SCHOOL (i.e. the school in which the participation request was sent).

Add Question | Add Page

Edit | Delete | Copy/Move

*** How often does your school provide the following SCHOOL-WIDE social/emotional learning supports, either directly or through a community based organizaion with which you have a contracted arrangement?**

	Frequency	Who provides these services?
Curriculum-based programs to enhance social and emotional learning		
School-wide program to prevent alcohol, tobacco or drug use		
Parent education regarding student social/emotional development		
Resorative Measures (e.g. peer counseling/mediation/conflict resolution)		
Strategies to promote positive school climate		
Health and safety education		
School-wide social skills curriculum program		
School-wide program to prevent violence		
Before/After school social/emotional learning opportunities		
Staff development around social/emotional learning		
Character education		
School-wide crisis planning		
Formal screening for behavioral or emotional problems		
Student assistance team		
Positive behavior interventions and supports		
Parent liasion		
Support groups for students		

Add Question | Add Page

Edit | Delete | Copy/Move | Add Logic

*** Identify the specific individuals who provide these SCHOOL-WIDE social/emotional learning supports? (Select all that apply)**

- Administrative Assistant
- Assistant Principal
- Chemical Health Staff
- Contracted Clinical Services (i.e. LICSW, licensed clinical psychologist, advanced practice nurse, psychiatrist)
- Dean
- Principal
- School Counselor
- School Nurse
- School Psychologist

School Social Worker
Teacher (general education)
Teacher (special education)
Other(s) (List All)

Add Question | Add Page

Edit | Delete | Copy/Move

List additional SCHOOL-WIDE social/emotional services, programs or strategies utilized by your school.

Other #1
Other #2
Other #3
Other #4
Other #5

Add Question | Add Page

7. Individualized General Education Social/Emotional Supports Edit Page | Delete Page | Copy/Move | Add Logic

The following page asks questions about the INDIVIDUALIZED social/emotional learning supports that your school provides to GENERAL EDUCATION students.

Add Question | Add Page

8. Individualized General Education Social/Emotional Supports Edit Page | Delete Page | Copy/Move | Add Logic

Add Question | Add Page

Edit | Delete | Copy/Move

NOTE: When completing this survey think of the services available to students in YOUR SCHOOL (i.e. the school in which the participation request was sent).

Add Question | Add Page

Edit | Delete | Copy/Move

*** How often does your school provide the following specific INDIVIDUALIZED social/emotional learning supports to GENERAL EDUCATION students, either directly or through a community based organization with which you have a contracated arrangement?**

	Frequency	Who provides these services?
Formal screening for high-risk youth		
Referral process to community-based programs or services for students		
Assessment for emotional or behavioral problems or disorders		
Disciplinary alternatives for suspension		
Behavior management consultation (with teachers, students, family)		
Systematic monitoring of student's functioning and/or school adjustment		
Crisis planning for student specific needs		
Crisis intervention		
Individual counseling for students		
Group counseling for students		
Monitoring of medication prescribed for psychological disorders		
Family support services (e.g. child/family advocacy, counseling)		
Individualized interventions for parent/family use		
Individualized interventions for classroom use (e.g. classroom accommodations)		
Day treatment		
Individualized skills training for students		
Reintegration from hospital, residential or juvenile corrections programming		
Planning for transitions (e.g. grade levels, buildings)		

Staff development for those who work with individual students
Coordination of services across systems

Add Question | Add Page

Edit | Delete | Copy/Move | Add Logic

*** Identify the specific individuals who provide these INDIVIDUALIZED GENERAL EDUCATION social/emotional learning supports? (Select all that apply)**

- Assistant Principal
- Chemical Health Staff
- Contracted Clinical Services (i.e. LICSW, licensed clinical psychologist, advanced practice nurse, psychiatrist)
- Dean
- Principal
- School Counselor
- School Nurse
- School Psychologist
- School Social Worker
- Teacher (general education)
- Teacher (special education)
- Other(s) (List All)

Add Question | Add Page

Edit | Delete | Copy/Move

List additional social/emotional services, programs or strategies provided to INDIVIDUAL GENERAL EDUCATION students.

Other #1
Other #2
Other #3
Other #4
Other #5

Add Question | Add Page

9. Individualized Special Education Social/Emotional Supports

Edit Page | Delete Page | Copy/Move | Add Logic

The following page asks questions about the INDIVIDUALIZED social/emotional learning supports that your school provides to SPECIAL EDUCATION students.

Add Question | Add Page

10. Individualized Special Education Social/Emotional Supports

Edit Page | Delete Page | Copy/Move | Add Logic

Add Question | Add Page

Edit | Delete | Copy/Move

NOTE: When completing this survey think of the services available to students in YOUR SCHOOL (i.e. the school in which the participation request was sent).

Add Question | Add Page

Edit | Delete | Copy/Move

*** How often does your school provide the following specific INDIVIDUALIZED SPECIAL EDUCATION social/emotional learning supports, either directly or through a community based organizaion with which you have a contracted arrangement?**

	Frequency	Who provides these services?
Child Find		
Pre-referral screening for social/emotional risk factors (e.g. chemical health)		
Evaluation and assessment for emotional and behavioral problems or disorders		

Mental health screening as part of an evaluation for emotional/behavioral problems		
Functional Behavioral Assessment		
Behavior management consultation (with teachers, students, family)		
Systematic monitoring of student's functioning and/or school adjustment		
Positive Behavior Interventions and Supports		
Crisis/Behavior intervention plan		
Related services to meet social/emotional needs included on IEP/IIIP/IFSP		
Individual counseling as a related service		
Group counseling as a related service		
Medication monitoring as a related service		
Family support services as a related service (e.g. child/family advocacy, counseling)		
Individualized interventions for parent/family use		
Individualized interventions/accommodations for classroom use		
Day treatment		
Training and teaching of social/emotional skills (i.e. Skills Training)		
Service coordination with interagency partners		
Referral to community-based programs or services for students		
Reintegration from hospital, residential or juvenile corrections programming		

Add Question Add Page

Edit Delete Copy/Move Add Logic

*** Identify the specific individuals who provide these INDIVIDUALIZED SPECIAL EDUCATION social/emotional learning supports? (Select all that apply)**

- Assistant Principal
- Chemical Health Staff
- Contracted Clinical Services (i.e. LICSW, licensed clinical psychologist, advanced practice nurse, psychiatrist)
- Dean
- Principal
- School Counselor
- School Nurse
- School Psychologist
- School Social Worker
- Teacher (general education)
- Teacher (special education)
- Other(s) (List All)

Add Question Add Page

Edit Delete Copy/Move

List additional social/emotional services, programs or strategies provided to INDIVIDUAL SPECIAL EDUCATION students.

Other #1

Other #2

Other #3

Other #4

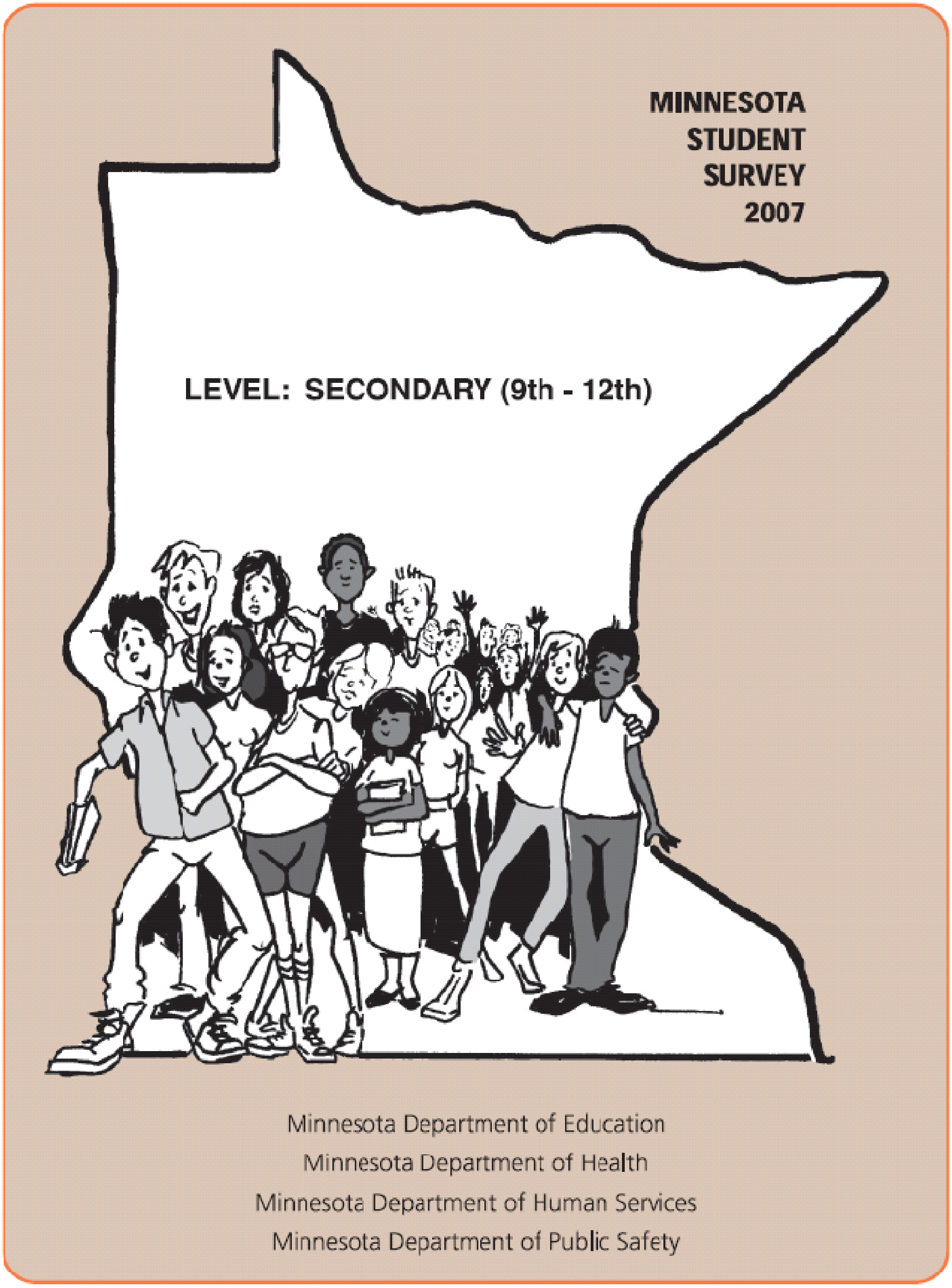
Other #5

Add Question Add Page

<< Back Preview

Appendix B

Minnesota Student Survey



Students: You can help us learn a lot more about how young people feel about themselves and their lives.

These questions cover many areas. Your answers will help us understand the experiences and concerns of people your age. Some questions might make you feel uncomfortable. You do not have to answer any question you don't want to. This survey is voluntary. You can choose not to complete this survey.

<u>No one will know your answers. Your name will not be on this survey. Your answers are confidential.</u>

Thank you for your help.

School/Program: ____________________

District Number			
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

School Bldg.		
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

BACKGROUND

1. Are you: ○ Male ○ Female

2. What is your grade in school right now?

- ○ 6th grade
- ○ 7th grade
- ○ 8th grade
- ○ 9th grade
- ○ 10th grade
- ○ 11th grade
- ○ 12th grade
- ○ Not applicable

3. How old are you?

- ○ 11 years old or younger
- ○ 12 years old
- ○ 13 years old
- ○ 14 years old
- ○ 15 years old
- ○ 16 years old
- ○ 17 years old
- ○ 18 years old
- ○ 19-20 years old
- ○ 21 years old or older

4. How do you describe yourself? *(If more than one describes you, mark <u>all</u> that apply)*

- ○ American Indian
- ○ Black, African or African American
- ○ Mexican American or Chicano/Chicana
- ○ Puerto Rican or other Latin American
- ○ Asian American or Pacific Islander (including Cambodian, Hmong, Korean, Laotian, Vietnamese)
- ○ White
- ○ I don't know

5. Which adults do you live with? ***(Mark all that apply)***

- ○ The woman who gave birth to me (my biological mother)
- ○ My biological father
- ○ Sometimes with my mother, sometimes with my father
- ○ The mother that adopted me
- ○ The father that adopted me
- ○ My stepmother
- ○ My stepfather
- ○ My foster parent(s)
- ○ My grandparent(s)
- ○ Other relative(s)
- ○ An adult or adults I am not related to
- ○ None

6. Can you talk to your father about problems you are having?

- ○ Yes, most of the time
- ○ Yes, some of the time
- ○ No, not very often
- ○ No, not at all
- ○ My father is not around

7. Can you talk to your mother about problems you are having?

- ○ Yes, most of the time
- ○ Yes, some of the time
- ○ No, not very often
- ○ No, not at all
- ○ My mother is not around

SCHOOL

8. How do you feel about going to school?

- ○ I like school very much
- ○ I like school quite a bit
- ○ I like school a little
- ○ I don't like school very much
- ○ I hate school

9. Which of these <u>best</u> describes your school plans?

- ○ I would like to quit school as soon as I can.
- ○ I plan to finish high school but don't think I'll go to college.
- ○ I'd like to go to some kind of trade school or vocational school after high school.
- ○ I'd like to go to college after high school.
- ○ I'd like to go to college and then go on after college to graduate or professional school.

10. Do you have or have you ever had an IEP (Individualized Education Plan)?

○ Yes ○ No

11. Do you currently get free or reduced-price lunch at school?

○ Yes ○ No

12. During the last 30 days, how often have you skipped or cut full days of school?

- ○ Never
- ○ Once or twice
- ○ 3 to 5 times
- ○ 6 to 10 times
- ○ More than 10 times

13. Since the beginning of this school year, how many times have you changed schools?

◯ 0 ◯ 1 ◯ 2 ◯ 3 or more times

14. Mark the <u>two</u> grades you get the most often.

◯ A
◯ B
◯ C
◯ D
◯ F or incomplete
◯ I don't get letter grades

15. How many students in your school . . .

	All	Most	Some	A few	None
are friendly?	◯	◯	◯	◯	◯
behave well in the hallways and lunchroom?	◯	◯	◯	◯	◯
have made fun of or threatened students of different races or backgrounds?	◯	◯	◯	◯	◯

16. How many of your teachers . . .

	All	Most	Some	A few	None
are interested in you as a person?	◯	◯	◯	◯	◯
show respect for the students?	◯	◯	◯	◯	◯

17. How much do you agree or disagree with the following statements?

	Strongly agree	Agree	Disagree	Strongly disagree
I feel safe going to and from school	◯	◯	◯	◯
I feel safe at school	◯	◯	◯	◯
I feel safe in my neighborhood	◯	◯	◯	◯
Bathrooms in this school are a safe place to be	◯	◯	◯	◯
Illegal gang activity is a problem at this school	◯	◯	◯	◯
Student use of alcohol or drugs is a problem at this school	◯	◯	◯	◯

18. During the last 12 months, which of the following has happened to you <u>on school property</u>?

Has a student . . .	Yes	No
threatened you?	◯	◯
pushed, shoved, or grabbed you?	◯	◯
kicked, bitten, or hit you?	◯	◯
stabbed you or fired a gun at you?	◯	◯
touched, grabbed, or pinched you in a sexual way?	◯	◯
made unwanted sexual comments, jokes, gestures, or looks towards you?	◯	◯

19. During the last 12 months, how many times has someone stolen or deliberately damaged your property such as your car, clothing, or books <u>on school property</u>?

◯ 0 times
◯ 1 time
◯ 2 or 3 times
◯ 4 or 5 times
◯ 6 or more times

20. During the last 12 months, has anyone offered, sold, or given you an illegal drug <u>on school property</u>?

◯ Yes ◯ No

21. During the last 30 days, how many days did you <u>not</u> go to school because you felt you would be unsafe at school or on your way to or from school?

◯ 0 days
◯ 1 day
◯ 2 or 3 days
◯ 4 or 5 days
◯ 6 or more days

22. During the last 30 days, on how many days did you carry a gun <u>on school property</u>?

◯ 0 days
◯ 1 day
◯ 2 or 3 days
◯ 4 or 5 days
◯ 6 or more days

23. During the last 30 days, on how many days did you carry a weapon (other than a gun) <u>on school property</u>?

◯ 0 days
◯ 1 day
◯ 2 or 3 days
◯ 4 or 5 days
◯ 6 or more days

24. During the last 30 days, how often has another student or group of students made fun of or teased you in a hurtful way, or excluded you from friends or activities?

◯ Never
◯ Once or twice
◯ About once a week
◯ Several times a week
◯ Every day

25. During the last 30 days, how often have you, on your own or as part of a group, made fun of or teased another student in a hurtful way or excluded another student from friends or activities?

◯ Never
◯ Once or twice
◯ About once a week
◯ Several times a week
◯ Every day

ACTIVITIES

26. In general, during the last 12 months, how often have you participated in the following activities?

	Not available in my community	Never	A few times a year	Monthly	1-2 times per week	3-4 times per week	Every day
Fine arts activities (band, choir, dance, drama, etc.)	◯	◯	◯	◯	◯	◯	◯
Private lessons (music, dance, etc.)	◯	◯	◯	◯	◯	◯	◯
Club or community sports teams	◯	◯	◯	◯	◯	◯	◯
School sports teams	◯	◯	◯	◯	◯	◯	◯
Hobby and academic clubs (chess, history, debate, math team, etc.)	◯	◯	◯	◯	◯	◯	◯
Community clubs and programs (4-H, Park & Rec, Community Ed., etc.)	◯	◯	◯	◯	◯	◯	◯
Mentoring programs	◯	◯	◯	◯	◯	◯	◯
Religious activities (religious services, education, youth group, etc.)	◯	◯	◯	◯	◯	◯	◯

27. In general, why do you participate in school-based or community-based activities and clubs? ***(Mark all that apply)***

◯ I don't participate in any activities
◯ To have fun
◯ To learn new skills
◯ My parents (or guardians) want me to
◯ My friends participate
◯ To help me get into college
◯ Other

28. In general, why don't you participate in any school-based or community-based activities and clubs? ***(Mark all that apply)***

◯ I do participate in at least one activity
◯ Activities are not available in my community
◯ Activities cost too much
◯ My parents (or guardians) won't let me
◯ My friends don't participate
◯ I'm not interested
◯ I am too busy with other things
◯ I didn't make the team/pass the audition, etc.
◯ I was kicked off or removed
◯ Other

29. During the school year, how many hours in a typical week do you spend doing the following?

	0 hours	1-2 hours	3-5 hours	6-10 hours	11-20 hours	21 hours or more
Homework/study	◯	◯	◯	◯	◯	◯
Reading for pleasure	◯	◯	◯	◯	◯	◯
Watching TV, DVDs or videos	◯	◯	◯	◯	◯	◯
Playing computer or video games	◯	◯	◯	◯	◯	◯
Talking on the phone or text messaging	◯	◯	◯	◯	◯	◯
Online activities (e-mail, instant messaging, blogging, web surfing, etc.)	◯	◯	◯	◯	◯	◯
Volunteer work or community service	◯	◯	◯	◯	◯	◯
Work for pay (including babysitting for others)	◯	◯	◯	◯	◯	◯
Hanging out	◯	◯	◯	◯	◯	◯

HEALTH

30. When was the last time you had a physical exam?

◯ Within the last 12 months
◯ 1-2 years ago
◯ 3-4 years ago
◯ More than 4 years ago
◯ I have never had a physical exam

31. How tall are you?

Feet	Inches
◯ 3	◯ 0
◯ 4	◯ 1
◯ 5	◯ 2
◯ 6	◯ 3
	◯ 4
	◯ 5
	◯ 6
	◯ 7
	◯ 8
	◯ 9
	◯ 10
	◯ 11

32. About how much do you weigh?

Write the numbers in the boxes and fill in the matching circle below each number.

Pounds		
⓪	⓪	⓪
①	①	①
②	②	②
③	③	③
	④	④
	⑤	⑤
	⑥	⑥
	⑦	⑦
	⑧	⑧
	⑨	⑨

33. Do you have a physical health condition or problem that has lasted at least 12 months?

◯ Yes ◯ No

34. Do you have a mental or emotional health problem that has lasted at least 12 months?

◯ Yes ◯ No

35. Have you ever been treated for a mental or emotional health problem?

- ◯ No
- ◯ Yes, during the last year
- ◯ Yes, more than a year ago

36. Have you ever been treated for an alcohol or other drug problem?

- ◯ No
- ◯ Yes, during the last year
- ◯ Yes, more than a year ago

37. On how many of the last 7 days did you exercise or participate in sports or other activities that made you sweat or breathe hard for at least 20 minutes?

- ◯ 0 days ◯ 2 days ◯ 4 days ◯ 6 days
- ◯ 1 day ◯ 3 days ◯ 5 days ◯ 7 days

38. On how many of the last 7 days were you physically active for a combined total of at least 30 minutes?

- ◯ 0 days ◯ 2 days ◯ 4 days ◯ 6 days
- ◯ 1 day ◯ 3 days ◯ 5 days ◯ 7 days

39. How many servings of fruits, fruit juices, or vegetables did you eat yesterday?

- ◯ 0 servings
- ◯ 1 serving
- ◯ 2 servings
- ◯ 3 servings
- ◯ 4 servings
- ◯ 5 servings
- ◯ 6 servings
- ◯ 7 servings
- ◯ 8 or more servings

40. How many glasses of each of the following did you drink yesterday?

	0	1-2	3-4	5-6	7 or more
Milk	◯	◯	◯	◯	◯
100% fruit juice	◯	◯	◯	◯	◯
Fruit juice drinks	◯	◯	◯	◯	◯
Pop or soda	◯	◯	◯	◯	◯
Sports drinks	◯	◯	◯	◯	◯
Water	◯	◯	◯	◯	◯

41. Has a doctor or nurse ever told you that you have asthma?

- ◯ Yes ◯ No

42. At the present time, do you think you are . . .

- ◯ Underweight?
- ◯ About the right weight?
- ◯ Overweight?

43. During the last 12 months, have you done any of the following to lose weight or control your weight? *(Mark all that apply)*

- ◯ I am not trying to lose weight or control my weight
- ◯ Fast or skip meals
- ◯ Smoke cigarettes
- ◯ Exercise
- ◯ Use diet pills, speed or other drugs
- ◯ Eat healthier
- ◯ Vomit (throw up) on purpose after eating
- ◯ Use laxatives

44. How often do you wear a seat belt when you . . .

	I never do this activity	Never	Sometimes	Often	Always
ride in a car?	◯	◯	◯	◯	◯
drive a car?	◯	◯	◯	◯	◯

45. Where have you received most of your information about alcohol and other drugs? *(Mark all that apply)*

- ◯ Friends/peers
- ◯ Parents
- ◯ Brothers or sisters
- ◯ School/teachers/counselors
- ◯ Clinics/doctors/nurses
- ◯ Religious/community groups
- ◯ Internet
- ◯ TV/radio/magazines/newspapers/books
- ◯ I do not know much about alcohol or other drugs

46. Where have you received most of your information about sex? *(Mark all that apply)*

- ◯ Friends/peers
- ◯ Parents
- ◯ Brothers or sisters
- ◯ School/teachers/counselors
- ◯ Clinics/doctors/nurses
- ◯ Religious/community groups
- ◯ Internet
- ◯ TV/radio/magazines/newspapers/books
- ◯ I do not know much about sex

47. How much do you feel . . .

	Not at all	A little	Some	Quite a bit	Very much
friends care about you?	◯	◯	◯	◯	◯
teachers/other adults at school care about you?	◯	◯	◯	◯	◯
religious or spiritual leaders care about you?	◯	◯	◯	◯	◯
other adults in your community care about you?	◯	◯	◯	◯	◯
your parents care about you?	◯	◯	◯	◯	◯
other adult relatives care about you?	◯	◯	◯	◯	◯

48. How much do you agree or disagree with the following statements?

	Agree	Mostly agree	Mostly disagree	Disagree
I get a lot of headaches, stomachaches or sickness	◯	◯	◯	◯
I am often irritable and angry	◯	◯	◯	◯
I have many fears and am easily scared	◯	◯	◯	◯
I often have trouble concentrating	◯	◯	◯	◯
I am restless and cannot stay still for long	◯	◯	◯	◯
I often have trouble getting to sleep and staying asleep	◯	◯	◯	◯
I do things before I think	◯	◯	◯	◯
I am often unhappy, depressed or tearful	◯	◯	◯	◯

49. During the last 30 days, have you felt you were under any stress or pressure?

- ◯ Yes, almost more than I could take
- ◯ Yes, quite a bit of pressure
- ◯ Yes, more than usual
- ◯ Yes, a little
- ◯ No

50. During the last 30 days, have you felt sad?

- ◯ All the time
- ◯ Most of the time
- ◯ Some of the time
- ◯ A little of the time
- ◯ None of the time

51. During the last 30 days, have you felt so discouraged or hopeless that you wondered if anything was worthwhile?

- ◯ Extremely so, to the point that I have just about given up
- ◯ Quite a bit
- ◯ Some, enough to bother me
- ◯ A little bit
- ◯ Not at all

52. During the last 30 days, have you felt nervous, worried, or upset?

- ◯ All the time
- ◯ Most of the time
- ◯ Some of the time
- ◯ A little of the time
- ◯ None of the time

53. Have you ever . . .

	No	Yes, during the last year	Yes, more than a year ago
hurt yourself on purpose ("cutting", burns, bruises)?	◯	◯	◯
thought about killing yourself?	◯	◯	◯
tried to kill yourself?	◯	◯	◯

54. Has someone you were going out with ever hit you, hurt you, threatened you or made you feel afraid?

◯ Yes ◯ No

55. Has someone you were going out with ever forced you to have sex or do something sexual when you didn't want to?

◯ Yes ◯ No

56. Have you ever physically or sexually hurt someone you were going out with? (This might include shoving, slapping, hitting, or forcing them into sexual activities. This also includes threatening to do these things.)

◯ Yes ◯ No

57. Has alcohol use by any family member repeatedly caused family, health, job, or legal problems?

◯ Yes ◯ No

58. Has drug use by any family member repeatedly caused family, health, job, or legal problems?

◯ Yes ◯ No

59. Has any adult in your household ever hit you so hard or so often that you had marks or were afraid of that person?

◯ Yes ◯ No

60. Has anyone in your family ever hit anyone else in the family so hard or so often that they had marks or were afraid of that person?

◯ Yes ◯ No

61. Has any adult or other person outside the family ever touched you sexually against your wishes or forced you to touch them sexually?

◯ Yes ◯ No

62. Has any older or stronger member of your family ever touched you sexually or had you touch them sexually?

◯ Yes ◯ No

BEHAVIOR

63. During the last 12 months, how often have you done these activities?

	Not at all	Less than once a month	About once a month	About once a week	Daily
Played cards for money	◯	◯	◯	◯	◯
Bet money on games of personal skill like pool, golf or bowling	◯	◯	◯	◯	◯
Bet money on sports teams or horseracing	◯	◯	◯	◯	◯
Bought lottery tickets or scratch offs	◯	◯	◯	◯	◯
Gambled in a casino	◯	◯	◯	◯	◯
Gambled for money online	◯	◯	◯	◯	◯

64. During the last 12 months, how often have you run away from home?
- ◯ Never
- ◯ Once or twice
- ◯ 3 to 5 times
- ◯ 6 to 10 times
- ◯ More than 10 times

65. During the last 12 months, how often have you damaged or destroyed property at school or somewhere else (for example: broken windows or furniture, put paint on walls or signs, put scratches or dents in a car)?
- ◯ Never
- ◯ Once or twice
- ◯ 3 to 5 times
- ◯ 6 to 10 times
- ◯ More than 10 times

66. During the last 12 months, how often have you hit or beat up another person?
- ◯ Never
- ◯ Once or twice
- ◯ 3 to 5 times
- ◯ 6 to 10 times
- ◯ More than 10 times

67. During the last 12 months, how often have you taken something from a store without paying for it?
- ◯ Never
- ◯ Once or twice
- ◯ 3 to 5 times
- ◯ 6 to 10 times
- ◯ More than 10 times

68. Do you ever ride with friends after they have been using alcohol or drugs?
- ◯ No
- ◯ Yes, but rarely
- ◯ Yes, often
- ◯ None of my friends use alcohol or other drugs

69. How old were you the first time you smoked part or all of a cigarette?
- ◯ I have never smoked part or all of a cigarette
- ◯ 10 years old or younger
- ◯ 11 years old
- ◯ 12 years old
- ◯ 13 years old
- ◯ 14 years old
- ◯ 15 years old
- ◯ 16 years old
- ◯ 17 years old or older

70. How old were you the first time you smoked a cigar or used chewing tobacco?
- ◯ I have never smoked a cigar or used chewing tobacco
- ◯ 10 years old or younger
- ◯ 11 years old
- ◯ 12 years old
- ◯ 13 years old
- ◯ 14 years old
- ◯ 15 years old
- ◯ 16 years old
- ◯ 17 years old or older

71. During the last 30 days, on how many days did you smoke a cigarette?
- ◯ 0 days
- ◯ 1 or 2 days
- ◯ 3 to 5 days
- ◯ 6 to 9 days
- ◯ 10 to 19 days
- ◯ 20 to 29 days
- ◯ All 30 days

72. During the last 30 days, on how many days did you smoke cigars, cigarillos or little cigars?
- ◯ 0 days
- ◯ 1 or 2 days
- ◯ 3 to 5 days
- ◯ 6 to 9 days
- ◯ 10 to 19 days
- ◯ 20 to 29 days
- ◯ All 30 days

73. During the last 30 days, on how many days did you use chewing tobacco, snuff or dip?
- ◯ 0 days
- ◯ 1 or 2 days
- ◯ 3 to 5 days
- ◯ 6 to 9 days
- ◯ 10 to 19 days
- ◯ 20 to 29 days
- ◯ All 30 days

If you have not used any tobacco product in the last 30 days, skip to Question 77.

74. During the last 30 days, how frequently have you smoked cigarettes?
- ◯ Never
- ◯ Less than one cigarette per day
- ◯ One to five cigarettes per day
- ◯ About one-half pack per day
- ◯ About one pack per day
- ◯ About one and one-half packs per day
- ◯ Two packs or more per day

75. If you used tobacco in the last 30 days, how did you get it? *(Mark all that apply)*

- I did not use tobacco in the last 30 days

I bought tobacco:
- at gas stations or convenience stores
- at bars or restaurants
- at grocery, discount, or drug stores
- at places like bowling alleys, video arcades, or pool halls
- from vending machines
- on the Internet

I got tobacco:
- from friends
- from my parents
- from other family members
- by getting someone else to buy for me

I took tobacco:
- from my home
- from a friend's home
- from stores

76. If you bought tobacco in the last 30 days, did you use a fake ID?

- I did not buy tobacco in the last 30 days
- Yes
- No

The next questions ask about drinking alcoholic beverages, including beer, wine, wine coolers, and liquor.

77. How old were you when you had your first drink of alcohol other than a few sips?

- I have never had a drink of alcohol other than a few sips
- 10 years old or younger
- 11 years old
- 12 years old
- 13 years old
- 14 years old
- 15 years old
- 16 years old
- 17 years old or older

78. During the last 12 months, have you had any alcoholic beverages?

- No → *If no, please skip to Question 85.*
- Yes

79. During the last 12 months, on how many occasions (if any) have you had alcoholic beverages (beer, wine, wine coolers, or liquor) to drink . . .

0	1-2	3-5	6-9	10-19	20-39	40+
○	○	○	○	○	○	○

80. During the last 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?

- 0 days
- 1 or 2 days
- 3 to 5 days
- 6 to 9 days
- 10 to 19 days
- 20 to 29 days
- All 30 days

81. If you drink beer/wine/wine coolers/hard liquor, generally, how much (if any) do you drink at one time?

- I don't drink beer/wine/wine coolers/hard liquor
- One glass/can/drink
- Two glasses/cans/drinks
- Three glasses/cans/drinks
- Four glasses/cans/drinks
- Five glasses/cans/drinks
- Six or more glasses/cans/drinks

82. Think back over the last two weeks. How many times (if any) have you had five or more drinks in a row? (A "drink" is a glass of wine, a bottle of beer, a wine cooler, a shot glass of liquor, or a mixed drink.)

- Never
- Once
- Twice
- 3 to 5 times
- 6 or more times

83. If you used alcohol in the last 30 days, how did you get it? *(Mark all that apply)*

- I did not use alcohol in the last 30 days

I bought alcohol:
- at gas stations or convenience stores
- at bars or restaurants
- at stores
- on the Internet

I got alcohol:
- from friends
- from my parents
- from other family members
- by getting someone else to buy for me
- at parties

I took alcohol:
- from my home
- from a friend's home
- from stores

84. If you bought alcohol in the last 30 days, did you use a fake ID?

- I did not buy alcohol in the last 30 days
- Yes
- No

85. How old were you when you tried marijuana for the first time?

- I have never tried marijuana
- 10 years old or younger
- 11 years old
- 12 years old
- 13 years old
- 14 years old
- 15 years old
- 16 years old
- 17 years old or older

86. During the last 12 months, on how many occasions (if any) have you used marijuana (bud, weed, pot) or hashish (hash, hash oil)?

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

87. During the last 30 days, on how many days did you use marijuana or hashish?

◯ 0 days
◯ 1 or 2 days
◯ 3 to 5 days
◯ 6 to 9 days
◯ 10 to 19 days
◯ 20 to 29 days
◯ All 30 days

The next questions ask about other drugs. By "other drugs" we mean drugs that are taken for non-medical reasons such as cocaine and crack, heroin, prescription drugs, stimulants, methamphetamine, MDMA (ecstasy), or LSD (acid)/ PCP. We also mean sniffing glue or breathing gases or contents of spray cans.

88. How old were you when you tried any of these "other drugs" for the first time?

◯ I have never tried "other drugs"
◯ 10 years old or younger
◯ 11 years old
◯ 12 years old
◯ 13 years old
◯ 14 years old
◯ 15 years old
◯ 16 years old
◯ 17 years old or older

89. During the last 12 months, have you used any of these "other drugs"?

◯ No → *If no, please skip to Question 101.*
◯ Yes

90. During the last 30 days, on how many days did you use any of these "other drugs"?

◯ 0 days
◯ 1 or 2 days
◯ 3 to 5 days
◯ 6 to 9 days
◯ 10 to 19 days
◯ 20 to 29 days
◯ All 30 days

91. During the last 12 months, on how many occasions (if any) have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any other gases or sprays in order to get high . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

92. During the last 12 months, on how many occasions (if any) have you used LSD ("acid"), PCP (wet sticks or dipped joints), or other psychedelics (like mescaline, mushrooms, peyote) . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

93. During the last 12 months, on how many occasions (if any) have you used MDMA (E, X, "ecstasy"), GHB (G, Liquid E, Liquid X) or Ketamine ("Special K") . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

94. During the last 12 months, on how many occasions (if any) have you used "crack" (cocaine in chunk or rock form), or cocaine in any other form . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

95. During the last 12 months, on how many occasions (if any) have you used heroin . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

96. During the last 12 months, on how many occasions (if any) have you used methamphetamine (meth, glass, crank, crystal meth, ice) by any method . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

97. During the last 12 months, on how many occasions (if any) have you used stimulants like Benzedrine or diet pills that were not prescribed for you by a doctor, or that you took only to get high . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

98. During the last 12 months, on how many occasions (if any) have you used your own or someone else's ADHD or ADD drugs like Ritalin (hyper pills) to get high . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

99. During the last 12 months, on how many occasions (if any) have you used OxyContin, Percocet, Percodan, Vicodin or other pain relievers that were not prescribed for you by a doctor, or that you took only to get high . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

100. During the last 12 months, on how many occasions (if any) have you used tranquilizers (Valium, Xanax, nerve pills) or sedatives or barbiturates that were not prescribed for you by a doctor, or that you took only to get high . . .

0 ◯ 1-2 ◯ 3-5 ◯ 6-9 ◯ 10-19 ◯ 20-39 ◯ 40+ ◯

101. Do you ever use alcohol or other drugs . . .

	Yes	No
before school?	○	○
during school?	○	○
right after you leave school?	○	○

102. How do you think your close friends would feel if you . . .

	They would approve	They would not care at all	They would disapprove	They would strongly disapprove
smoked one or more packs of cigarettes per day?	○	○	○	○
have five or more drinks of an alcoholic beverage once or twice a week?	○	○	○	○
smoked marijuana once or twice a week?	○	○	○	○
used other drugs once or twice a week?	○	○	○	○

103. During the last 12 months, have you talked with at least one of your parents (or guardians) about the dangers of tobacco, alcohol, or drug use?

○ Yes ○ No

104. How much do you think people risk harming themselves physically or in other ways if they . . .

	No Risk	Slight Risk	Moderate Risk	Great Risk
smoke one or more packs of cigarettes per day?	○	○	○	○
have five or more drinks of an alcoholic beverage once or twice a week?	○	○	○	○
smoke marijuana once or twice a week?	○	○	○	○

If you have not used alcohol or any other drug during the last 12 months, skip to Question 117.

105. During the last 12 months, have you found that you had to use a lot more alcohol or other drugs than before to get the same effect?

○ Yes ○ No

106. During the last 12 months, have you tried to cut down on your use of alcohol or other drugs but couldn't?

○ Yes ○ No

107. During the last 12 months, have you continued to use alcohol or other drugs even though you knew it was hurting your relationships with friends or family?

○ Yes ○ No

108. During the last 12 months, how many times have you spent all or most of the day using alcohol or other drugs, or getting over their effects?

○ 0 ○ 1 ○ 2 ○ 3 or more

109. During the last 12 months, how many times have you given up important social or recreational activities like sports or being with friends or relatives in order to use alcohol or other drugs, or to get over their effects?

○ 0 ○ 1 ○ 2 ○ 3 or more

110. During the last 12 months, how many times has alcohol or other drug use left you feeling depressed, agitated, paranoid, or unable to concentrate?

○ 0 ○ 1 ○ 2 ○ 3 or more

111. During the last 12 months, how many times have you missed work or school, or neglected other major responsibilities because of alcohol or other drug use?

○ 0 ○ 1 ○ 2 ○ 3 or more

112. During the last 12 months, how many times have you driven a motor vehicle after using alcohol or other drugs?

○ 0 ○ 1 ○ 2 ○ 3 or more

113. During the last 12 months, how many times has alcohol or other drug use caused you problems with the law?

○ 0 ○ 1 ○ 2 ○ 3 or more

114. During the last 12 months, how many times have you hit someone or become violent while using alcohol or other drugs?

○ 0 ○ 1 ○ 2 ○ 3 or more

115. During the last 12 months, how many times have you used so much alcohol or other drugs that the next day you could not remember what you had said or done?

○ 0 ○ 1 ○ 2 ○ 3 or more

116. During the last 12 months, how many times have you used more alcohol or other drugs than you intended to?

○ 0 ○ 1 ○ 2 ○ 3 or more

117. **Have you ever had sexual intercourse ("had sex")?**
- ◯ No ⟶ *If no, please skip to Question 126.*
- ◯ Yes, once or twice
- ◯ Yes, three times or more

118. **During the last 12 months, with how many different male partners have you had sexual intercourse?**
- ◯ None
- ◯ 1 person
- ◯ 2 persons
- ◯ 3 persons
- ◯ 4 persons
- ◯ 5 persons
- ◯ 6 or more persons

119. **During the last 12 months, with how many different female partners have you had sexual intercourse?**
- ◯ None
- ◯ 1 person
- ◯ 2 persons
- ◯ 3 persons
- ◯ 4 persons
- ◯ 5 persons
- ◯ 6 or more persons

120. **Have you talked with your partner(s) about protecting yourselves from getting sexually transmitted diseases/HIV/AIDS?**
- ◯ Never
- ◯ Not with every partner
- ◯ At least once with every partner

121. **Have you talked with your partner(s) about preventing pregnancy?**
- ◯ Never
- ◯ Not with every partner
- ◯ At least once with every partner

122. **How many times have you been pregnant or gotten someone pregnant?**
- ◯ 0 times
- ◯ 1 time
- ◯ 2 or more times
- ◯ Not sure

123. **If you have sexual intercourse, how often do you and/or your partner use any birth control method?**
- ◯ I don't have sexual intercourse
- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Usually
- ◯ Always

124. **If you have sexual intercourse, how often is a condom used?**
- ◯ I don't have sexual intercourse
- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Usually
- ◯ Always

125. **The last time you had sexual intercourse, did you or your partner use a condom?**
- ◯ Yes
- ◯ No
- ◯ I don't have sexual intercourse

126. **If you do not have sexual intercourse, what factors influence your choice not to have sexual intercourse?** *(Mark all that apply)*
- ◯ I do have sexual intercourse
- ◯ One or both of my parents would object
- ◯ I don't want to have sex
- ◯ Most students in my school don't have sex
- ◯ My friends don't have sex
- ◯ I don't think it's right for a person my age to have sex
- ◯ I'm afraid of getting caught
- ◯ My religious/spiritual beliefs
- ◯ Sex education at school taught me the advantages of waiting until I'm older
- ◯ I don't want to get a sexually transmitted disease
- ◯ Fear of pregnancy
- ◯ My parents have taught me the advantages of waiting until I'm older
- ◯ I have chosen to wait until I'm married
- ◯ Other reason(s)

Minnesota Department of Education
Minnesota Department of Health
Minnesota Department of Human Services
Minnesota Department of Public Safety

R23538-PIFI-54321

Appendix C

Study Variables and Instruments

Variables	**Instruments**
Mental Health Service Utilization	
• Service Utilization in Past Year	Minnesota Student Survey
Predisposing Variables	
• Gender of Youth • Grade of Youth • Age of Youth • Race/Ethnicity of Youth	Minnesota Student Survey
Enabling Variables	
• Social Support • Family Socioeconomic Status	Minnesota Student Survey
• Geographic Region of Residence • School Size	Survey of Social/Emotional Supports
Need Variables	
• Mental/Emotional Health Problem • Symptomology Estimate 1 • Symptomology Estimate 2	Minnesota Student Survey
School-Based Mental Health Variables	
• Prevention and Promotion • Early Identification • Evaluation and Assessment • Program Planning • Coordination of Services	Survey of Social/Emotional Supports

Appendix D

School-Based Mental Health Variables

School-Based Mental Health Variables
Prevention and Promotion
• Positive behavior interventions and supports • Strategies to promote positive school climate • Restorative Measures (e.g. peer counseling/mediation/conflict resolution) • Health and safety education • Curriculum-based programs to enhance social and emotional learning • Parent liaison • Character education • Before/After school social/emotional learning opportunities • School-wide social skills curriculum program • School-wide program to prevent violence • Parent education regarding student social/emotional development • School-wide program to prevent alcohol, tobacco or drug use • School-wide crisis planning • Staff development around social/emotional learning
Early Identification
• Student assistance team • Referral process to community-based programs or services for students • Systematic monitoring of student's functioning and/or school adjustment • Support groups for students • Pre-referral screening for social/emotional risk factors (e.g. chemical health) • Child Find • Formal screening for behavioral or emotional problems • Formal screening for high-risk youth
Evaluation and Assessment
• Assessment for emotional or behavioral problems or disorders • Evaluation and assessment for emotional and behavioral problems or disorders • Mental health screening as part of an evaluation for emotional/behavioral problems • Functional Behavioral Assessment
Program Planning
• Individual counseling for students • Individualized interventions for classroom use (e.g. classroom accommodations) • Behavior management consultation (with teachers, students, family) • Group counseling for students • Monitoring of medication prescribed for psychological disorders • Disciplinary alternatives for suspension • Individualized skills training for students

Appendix D (continued)

Program Planning (continued)
• Crisis planning for student specific needs • Crisis intervention • Individualized interventions for parent/family use • Family support services (e.g. child/family advocacy, counseling) • Staff development for those who work with individual students • Planning for transitions (e.g. grade levels, buildings) • Day treatment • Individualized interventions/accommodations for classroom use • Positive Behavior Interventions and Supports • Systematic monitoring of student's functioning and/or school adjustment • Behavior management consultation (with teachers, students, family) • Related services to meet social/emotional needs included on IEP/IIIP/IFSP • Individual counseling as a related service • Medication monitoring as a related service • Crisis/Behavior intervention plan • Group counseling as a related service • Individualized interventions for parent/family use • Family support services as a related service (e.g. child/family advocacy, counseling)
Coordination of Services
• Coordination of services across systems • Reintegration from hospital, residential or juvenile corrections programming • Training and teaching of social/emotional skills (i.e. Skills Training) • Referral to community-based programs or services for students • Service coordination with interagency partners • Reintegration from hospital, residential or juvenile corrections programming • Day treatment

Appendix E

Basic Assumptions of Logistic Regression

Data level - A dichotomous or polytomous dependent variable is assumed for binary or multinomial logistic regression, respectively.

Meaningful coding - Logistic coefficients will be difficult to interpret if not coded meaningfully.

Proper specification of the model - Parameters may change magnitude and even direction when variables are added to or removed from the model.

Independence of irrelevant alternatives - Adding or removing alternatives does not affect the odds associated with the remaining alternatives.

Independent sampling - Error terms are assumed to be independent.

Low error in the explanatory variables - Low measurement error and no missing cases.

Linearity - Linear relationship between the independents and the log odds (logit) of the dependent.

Additivity - Does not account for interaction effects except when interaction terms (usually products of standardized independents) are created as additional variables in the analysis.

Absence of perfect separation - If groups of the dependent are perfectly separated by an independent variable or set of variables, implausibly large b coefficients and effect sizes may be computed for the independent variable(s).

Absence of perfect multicollinearity - If one variable is a perfect linear function of another in the model, standard errors become infinite and the solution to the model becomes indeterminate.

Absence of high multicollinearity - As the independents increase in correlation with each other, the standard errors of the logit (effect) coefficients will become inflated.

Centered variables - Centering may be necessary either to reduce multicollinearity or to make interpretation of coefficients meaningful.

No outliers - Outliers can affect results significantly. The researcher should analyze standardized residuals for outliers and consider removing them or modeling them separately.

Large samples - In small samples one may get high standard errors.

Sampling adequacy - The presence of small or empty cells may cause the logistic model to become unstable.

Expected dispersion - The expected variance of the dependent can be compared to the observed variance, and discrepancies may be considered under- or over- dispersion.