Adolescent mental health services utilization: influences of family and social context

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Adolescent mental health services utilization:
Influences of family and social context

by

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A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Department: Sociology
Major: Sociology
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For the Graduate College
In memory of my father, Bernie, who taught me the importance of honesty, integrity, concern for the well-being of neighbor and environment, and faithfulness to friends and family. May this spirit of love-in-deed continue to grow within us all.
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ABSTRACT

Over the past decade the problems of rural America have become increasingly apparent as part of the national political agenda. A major focus has been the concerns regarding mental health services for rural children and adolescents. The present study uses a four-wave panel design to examine the influences of the family and social context on adolescent mental health services use. Structural equation modeling and logistic regression techniques are used to test the viability of different methods of analysis when the primary dependent variables are dichotomous and badly skewed. Results show the importance of parental warmth and supportiveness, and the crucial role that mothers play in the mental health treatment of their children. Adolescents in families having mothers expressing high levels of mental health services stigma were significantly less likely to seek professional care for depressed mood or antisocial behavior, versus adolescents in families where the mother expressed low levels of mental health services stigma. Similarly, families with high perceived economic pressure were less likely to seek professional mental health care for their children than were families having low perceived economic pressure. Policy implications include the need to address family and social issues in the debate over health care reform, and to move beyond the present political fixation on cost containment.
CHAPTER ONE

INTRODUCTION

Over the past decade the problems of rural America have become increasingly apparent as part of the national political agenda. With the farm crisis of the 1980s continuing into the 1990s, numerous myths about a benign and pastoral rural life have been exploded. The responses of health and human service organizations to rural concerns, particularly regarding mental health, have come under greater congressional scrutiny, resulting in the establishment of the Office of Rural Mental Health Research by the National Institute of Mental Health (NIMH) to oversee research on the special problems of rural populations. A major focus of this effort concerns mental health services for rural children and adolescents.

A recent report from the National Advisory Mental Health Council (NAMHC) notes that, although approximately 15% of the 7.5 million children and adolescents in the United States have serious emotional disturbances, only about 10 to 15% of these youth receive adequate treatment (NAMHC 1990). This same report also notes that, until recently, research on child and adolescent mental health service delivery and systems of care was virtually nonexistent. It calls for an expansion of NIMH support of research on mental health services for adolescents and children.

A commonly held belief among the public is that general medical practitioners fill this gap in mental health services by providing specialty mental health care. In a review of findings
from major health services research studies, Mechanic (1990) argues that this so-called “de facto mental health system” provides superficial care. He notes, for example, that more than half of the patients with significant depressive symptoms do not have their symptoms detected nor receive any psychosocial care from their examining general practitioners. Mechanic points to the inadequacies and deficiencies of the mental health care system as primary reasons, and calls for greater collaboration and cooperation between the primary medical care and specialized mental health care systems. Yet the mental health care system has recently undergone significant changes.

The past 10 to 15 years have seen four significant developments within the mental health services delivery system for youth (Friedman 1993). First, the primary locus of treatment has shifted from hospitals to community settings, through the expansion of residential treatment centers and community mental health centers. Second, top priority has been given to the treatment of individuals with severe and persistent problems. This has brought the accompanying recognition that a variety of agencies are needed, and not just mental health specialists. Third, the role of the state has grown in planning and administering mental health services, resulting in a somewhat more centralized structure to the mental health system of care for adolescents. Finally, there has been a rapid escalation of costs for health care and social services in general. A result of this cost increase for health care has often been reduced access to specialty health services, particularly mental health services.

The Child and Adolescent Service System Program (CASSP), an NIMH program that provides grants to states for enhancing their mental health service systems of care for adolescents and children, has had a strong influence on these changes (Friedman 1993).
program has contributed to the shift in treatment emphasis toward community-based systems of care. The result has been a wider range of services, a stronger partnership between parents and professionals, multiagency collaboration, and a focus on the interrelatedness of all parts of the system. However, difficulties still remain, both in the provision of services for adolescents and children, and in mental health services research.

One of the most fundamental difficulties is that a clear definition of a mental health service is not easily obtained, particularly for adolescent services. This has led to a research area that is broad, disjointed, and complex. In a more practical sense, it has produced a service system that is equally complex and poorly integrated (Lourie and Katz-Leavy 1991; Tuma 1989). An adolescent has multiple points of entry into the mental health care system; that includes a wide variety of service options. For professional, licensed care an adolescent can utilize inpatient and outpatient psychiatric services at a psychiatric hospital or at a general medical facility. Key nonphysician mental health providers can be found among marriage and family therapists, social workers, counselors, and psychologists. Unlicensed mental health providers, such as pastors and ministers, peers, family, teachers, and self-help groups also form an important portion of the mental health service system for adolescents. The number of agencies involved, organization of public sector services, adolescent maturation and development, and the lack of consensus on diagnostic categories and treatment modalities all lead to a sometimes wildly confusing service system. In addition to these sources of formal and informal services, rural youth can also obtain services in a wide array of physical settings including schools, social service agencies, clinics, offices, mental health centers, and the juvenile justice system (Kelleher et al. 1992).
Overview of the Present Study

The present study addresses the issue of rural adolescent mental health services utilization, particularly the relations between family processes and the decision to seek professional mental health care. Chapter Two briefly presents an overall conceptual model that depicts three broad contexts that influence adolescent mental health services use, as well as some of the specific variables forming those contexts. From within this broader framework, a smaller model is proposed for empirical testing, along with a short series of possible moderating constructs.

Along with descriptions of the sample and measures used in the analyses, two important methodological issues are presented in Chapter Three. First, of particular importance in elucidating the mechanisms proposed for study is the use of more dynamic modeling techniques than have been previously used in mental health services research. The datasets and analysis techniques typically used in examining the dynamics of these relations remain too coarse and limited to model adequately the complexity involved. Cross-sectional models are clearly inadequate, but longitudinal designs are just as poor when data collection points occur infrequently (e.g., two years apart or longer). Data analysis techniques that use change scores or autocorrelative modeling do not consider the critical patterns of change that occur within individuals, nor do they consider what might be predictive of different patterns of change between individuals. Newer modeling techniques should be employed, using datasets better suited to capturing the unfolding complexities of the relations found among family processes, adolescent development, and help-seeking behavior. The methodological approach
proposed here involves the use of structural equation modeling with a panel-style dataset obtained over the course of a four-year time period.

The second critical, and probably more important, methodological issue addressed in the present study is the use of structural equation modeling in the analysis of nonnormal observed variables. A major source of inappropriate usage of structural equation modeling programs, such as LISREL (Jöreskog and Sörbom 1993), is the failure of investigators to satisfy the scaling and normality assumptions upon which the model estimation and evaluation techniques are based. In an examination of 72 articles in personality and social psychology journals in which structural equation modeling techniques were used, Breckler (1990) found that only 19% of the articles acknowledged the presence of assumptions of multivariate normality, and less than 10% explicitly considered whether those assumptions had been violated.

There has been a growing interest in examining the robustness of structural equation modeling techniques to violations of scaling and normality assumptions. Numerous techniques have been developed for dealing with the rather common empirical situation of violations of these assumptions. The present study, along with the substantive interest in examining family influences on mental health services use by rural adolescents, takes an important methodological step by examining the possibility of bringing one of these more sophisticated analysis techniques to the study of the very complex and dynamic relations found in research on adolescent mental health services use. Results of these analyses are presented in Chapter Four, with Chapter Five providing a discussion of the findings, policy implications, and conclusions.
CHAPTER TWO
LITERATURE REVIEW

During the past twenty-five years, much of the research on services utilization has been based upon the Socio-Behavioral Model (SBM) proposed by Andersen and his colleagues (Aday, Andersen, and Fleming 1980; Andersen 1995; Andersen and Newman 1973). In this approach, medical care decision-making operates within three broad factors: (1) accessibility of resources; (2) nature and severity of the illness; and (3) predisposing characteristics associated with utilization (e.g., education, gender, attitudes about doctors). Fundamentally, this model locates decision-making within the individual, using an economic-style rationality as the basis for choice regarding the decision to seek out or reject formal health and mental health care.

Like other rational choice approaches (Coleman 1986; Friedman and Hechter 1988; Ostrom 1990), the SBM assumes consistency in individual attitudes and beliefs, complete knowledge, and the ability of individuals to make probability calculations clearly and coolly. Social context is included as an additional factor considered by individuals in their rational calculations. Groups and interpersonal networks act as situational variables affecting individual judgements regarding costs, benefits, and internal norms. In approaches based within these individually focused, rational action frameworks, choice depends on how
individuals learn about a particular action strategy, and on how they evaluate the costs and benefits of the expected outcomes. However, many actions are chosen without complete knowledge of the outcomes, and many action strategies are contingent on external conditions, with individuals sometimes engaging in trial-and-error sequences of action (Ostrom 1990).

In the context of service utilization research, many criticisms have been raised about the predominant use of the SBM, particularly in its overemphasis on the need for care factor, the inadequate incorporation within the model of social relationships, and its inability to explain much more than 10% of the variation in service use (Bass and Noelker 1987; Coulton and Frost 1982; Mechanic 1979; Wolinsky and Johnson 1991). In examining decision-making regarding mental health service utilization, concerns about the rational choice aspects of this perspective become even more critical. For example, complete knowledge about mental health service options and outcomes is highly unlikely for the seriously and chronically mentally ill. The rational calculation and evaluation of costs and benefits may require a drastic shift in the definition of "rational" for studies involving schizophrenic or clinically depressed persons. The influence of social context clearly extends well beyond what is postulated in the SBM, most notably in that "mental illness" is very much a socially constructed state. The perception of what serves as adequate and effective mental health treatment varies quite dramatically across space, time, and culture. Involvement of lay "experts" in the decision to seek mental health care must be considered more carefully, not simply as contextual factors that influence internal norms and evaluations of costs and benefits. Overall, these concerns imply the need to shift the research focus from individual choice to socially constructed patterns of decisions.
An approach recently proposed by Pescosolido (1991; 1992) has much potential (beyond a cute acronym for a model of help-seeking) for examining how people seek mental health care: the Social Organization Strategy (SOS) framework. This framework emphasizes a social network and event-based (i.e., illness episode) perspective. It has roots in both rational choice theory and social network theory, and provides a more dynamic conceptualization of help-seeking. A fundamental principle in the SOS perspective is that social interaction provides the basis within which individuals learn about and attempt to handle difficulties. The structure and function of social networks interact with the cultural context, to influence health and mental health care decisions reached by an individual. The mental health care decision is embedded within a social process, such that the individual's social network not only provides support and advice, but is also the source of beliefs, attitudes, and knowledge about medical and mental health options.

Two key assumptions are that the decision-making process is dynamic, and that the underlying mechanism is interaction within social networks. The individual forms a strategy of coping that is socially organized, with both affect and rationality driving the social interactions. People generally do not make a single choice about seeking care, but will continue to seek advice and help from a variety of sources. In the SOS framework, the illness career starts with an event, setting into motion the process of attempting to cope with the particular problem, within a particular system of social relations. Network interactions become a key unit of analysis, and the course of the illness episode becomes the primary research focus.
Sociodemographic characteristics are conceptualized in the SOS perspective as influencing decisions by constraining or facilitating network ties. Networks then determine how individuals evaluate need and service options. The illness episodes and social networks are viewed as intermingling trajectories and processes. The basic research concern becomes a search for discernible sets of patterns and combinations of options or strategies that individuals use during an illness episode, and the examination of the social construction of these patterns, combinations, and strategies. The focus is on the process of decision-making for mental health care, and the study of the social organization of the patterns of interaction involved in this process.

The present study, based on the SOS perspective, recognizes the importance of social context in determining both service needs and use by youth. Figure 1 shows that the broader social environment provides the context within which family and adolescent concerns and issues arise, and will thereby influence adolescent mental health service use. The interdependence between adolescent behavior and family processes necessarily means that a reciprocal relationship will exist between adolescent and family characteristics, which then impact the mental health service use patterns of the adolescent.

In the model tested in the present investigation, presented in Figure 2, the family provides a basic context from which arise changes in adolescent mental health, conceptualized here as depression and antisocial behavior. In turn, adolescent mental health service use will be responsive to both adolescent mental health problems and family problems. Mental health service use is then expected to influence subsequent adolescent mental health. Thus, the focus of the basic model is on a particular process and sequence of events: Problems and conflict
Figure 1: Conceptual Model of Adolescent Mental Health Service Use
Figure 2: Hypothesized Path Model of Adolescent Mental Health Service Use
within the family lead to adolescent mental health problems, which then result in mental health service use by the adolescents, which leads to subsequent changes in adolescent mental health. Aspects of the social and family context are expected to provide moderating influences to the basic path model, as are certain individual characteristics of the adolescents. The literature described below will show the importance of these processes, and will propose a number of moderators of the basic model.

Family Context

Families provide the most important microsystemic influences on adolescent mental health and mental health service utilization. Several key aspects of family structures and relationships have been shown to be important risk factors for adolescent mental health status: parental depression, parental employment, low SES, divorce, family and/or marital conflict, and parental substance abuse (Garbarino 1992; Tuma 1989). The number of other family members receiving mental health services has also been found to predict future psychopathological syndromes in children and adolescents (Stanger et al. 1992). In addition, the difficulties experienced by the child can influence family relationships. A child’s admission to a psychiatric hospital can have a significant impact on both the child and the family (Frank and Dewa 1992). Parents of depressed children and adolescents experience elevated levels of depression, anxiety, substance abuse, and antisocial behavior (Kaslow et al. 1994).

In a review of the literature on depressed children and their families, Kaslow et al. (1994) describe several key family variables and interaction processes, including familial psychopathology, negative life events, and family environment, that are associated with the
development and maintenance of depression in children and adolescents. Family cohesion and support protect against child and adolescent depression, in particular through their moderation of the negative impact of stressful life events. Conversely, autocratic and coercive parenting was positively associated with child depression, as were parent-child conflict and marital conflict. Unfortunately, very little research has examined explicitly the linkages between these family process variables and subsequent adolescent mental health service use.

Parental education level has been found to predict adolescent mental health service use. Users of a school-based mental health clinic tended to have mothers with more advanced education than non-users of the clinic (Brindis et al. 1995). From an examination of Blue Cross-Blue Shield claims data, Padgett et al. (1993) found that parental education significantly predicted both the probability of at least one outpatient mental health visit by an adolescent and the number of outpatient mental health visits made by the adolescent.

Greenley et al. (1987) found that confiding support differentiated mental health service users from non-users, and that patients who knew other mental health users were more likely to seek services. They also stressed that it is important to recognize the impact of this "subculture of users" when examining mental health service use. Grusky et al. (1985) found that participants in the NIMH Community Support Program (CSP) had three types of social bonding that affected mental health service use: Community bonding had a positive relationship, whereas family and work bonding both had negative relationships with use. Sommers (1989) found that family involvement had a positive relation with use of family support services by CSP clients, although there was considerable variation across location
types (rural, suburban, urban) in the proportion of clients needing these particular services who actually received them.

From a 3-year prospective study of 2,466 subjects drawn from a nationally representative sample of 4- to 16-year-old American children (Stanger et al. 1993), parent-reported family variables, problems, and stress were tested as predictors of the child's receipt of mental health services. Two predictors were consistent across age and sex: stressful family experiences and other family members' use of mental health services. A change in family composition and parent ratings of attention problems were also predictive for older subjects and boys. Initial SES and stressful experiences predicted a change in family composition, and thus were significant indirect predictors of mental health service use for older subjects and boys. There was a significant correlation between child mental health service use and suicidal ideation, and also between child mental health service use and school behavior problems. Of the family variables, however, parent-reported stress and family mental health service use were the strongest predictors.

In a sample from the general population of children aged 4 to 16-years-old in the Netherlands, parental reports of child internalizing and externalizing problems and persistence of these problems were predictive of child mental health service use (Koot and Verhulst 1992). Coming from a lower socioeconomic background was slightly associated with increased child mental health service use, but having a Child Behavior Checklist (Achenbach and Edelbrock 1983) total problem score above the 90th percentile was strongly associated with subsequent child mental health service use. Using logistic regression, it was found that scores on the Child Behavior Checklist subscales of internalizing, externalizing, aggressive,
and attention problems above the 90th percentile were all significantly associated with increased likelihood of child mental health service use. Persistent problem behavior was especially important, in that only those children whose levels of problem behavior remained high during the course of the study were subsequently referred to mental health services, whereas those children whose problem behavior levels dropped were not referred for mental health care.

**Individual Characteristics**

For most studies of mental health service utilization, the best predictor of demand for services is psychological distress (Cleary 1989). However, recent estimates show that less than 50% of children needing mental health services ever receive them and, of those receiving services, only about 20 to 30% receive adequate treatment (Tarnowski and Rohrbeck 1993). Other estimates show more starkly the tremendous unmet needs of children and adolescents; Costello et al. (1993) declare that 1 child in 5 may have a diagnosable psychiatric disorder, 1 in 10 have significantly impaired functioning, yet only 1 in 20 receive any kind of mental health care, and only 1 or 2 in 100 are treated in a specialty mental health setting.

Achenbach and Howell (1993) showed that child and adolescent need for services has increased significantly over the past 13 years. Teacher reports of problem behavior have increased for children in 1989 versus 1976, regardless of age, gender, SES, or ethnicity. They conclude that more children in 1989 than in 1976 needed mental health services, but few were receiving them. Adolescents dramatically increased their use of mental health services from the mid-1970s to the mid-1980s, yet less than 2% of adolescents in the U.S. received any type
of mental health service in 1986 (Burns 1991). Most adolescents with mental disorders are inappropriately or underserved by the current system. Inadequate personnel, limited facilities, strained payment resources, and little coordination of service delivery are common problems, but they are particularly evident in rural areas (Kelleher et al. 1992).

Among the general population, one of the most consistent findings across all types of help-seeking research concerns gender. Females tend to score more positively than males on help-seeking attitudes and behavior (Garland and Zigler 1994). Likewise, women are more likely than men to use mental health services (Cleary 1989). Leaf and Bruce (1987) found that gender differences were dependent on the treatment setting; women with positive attitudes toward help-seeking used general medical practitioners more often than did men with positive attitudes, regardless of disorder type, whereas no differences were found in the use of mental health specialists.

Social and Personal Resources and Vulnerabilities:

Moderators of the Basic Model

A number of factors have been found to promote resilience among adolescents: stable care from a competent adult, good learning and problem-solving abilities, social responsiveness to others, and competence and perceived self-efficacy (Kazdin 1993; Masten, Best, and Garmezy 1990). Other research has shown the importance of social and community factors in buffering the effects of stress on well-being (Lin and Ensel 1989). These factors can be considered within two broad categories of resources and vulnerabilities: social and personal. Social resources/vulnerabilities will be examined first, such as the availability and
accessibility of mental health services, after which several personal resources/vulnerabilities will be considered.

In examining mental health service use, a primary community-level resource is the availability, accessibility, and suitability of mental health services such as local community mental health centers (CMHCs). Many child and adolescent mental health providers decry the quantity and quality of services available at CMHCs. Long waiting lists and poor staff-client ratios appear to be typical, and function to diminish both professional and consumer confidence in, and perhaps propensity to utilize, such services (Tamowski and Rohrbeck 1993). Tuma (1989) concluded that the nation's CMHCs have failed to meet the needs of children and families, and thus have effectively denied access to care for children from low-income families, who depend on public services for outpatient care. In rural areas, these problems are compounded in that even when services are available, the evaluation and treatment of mental disorders for rural children and adolescents are provided by professional staff with less training, limited child expertise, and few available referral services (Kelleher et al. 1992).

Inadequate adolescent service availability in rural areas has been well reviewed and documented (Kelleher et al. 1992). Less than 15% of non-metropolitan counties have any inpatient psychiatric services for adults or children; only when rural communities have a large component of governmental services or university facilities are psychiatric hospitals more common. Less than 5% of CMHCs report providing programs or treatments specific to rural children and adolescents. In general, rural areas are more dependent than metropolitan areas on psychiatric beds in general hospitals. With the closure of many rural community hospitals,
a further restriction in the number of available rural psychiatric beds results. Murray and Keller (1991) found that the typical rural mental health service delivery area is 5000 square miles. Clearly, a significant barrier for rural adolescents is simply finding and getting to a service provider.

A large body of research indicates that a person's values and beliefs influence the definition of a problem in mental health terms and the likelihood that he or she will seek either informal or formal help (Wagenfeld et al. 1994). Cultural issues have special relevance in rural areas for mental health service providers. Rural residents tend to have a high regard for autonomy and self-help. Stigma and beliefs about mental disorders can discourage seeking professional help (Kelleher et al. 1992). As a result, rural residents are more likely to seek help from clergy or in the general medical setting, rather than from professional mental health care providers such as psychologists or social workers. Rural residents report frequently resorting to prayer or waiting for extended periods of time to deal with symptoms of psychopathology, behaviors that are particularly pronounced among farmers (Linn and Husaini 1987).

Gift and Zastowny (1990) found that for initial visits to their community mental health center in western New York state, the ratio of males to females was significantly lower in the rural than in the non-rural setting. The continuation of treatment also had a lower male to female ratio in the rural setting, although it did not achieve statistical significance. Age influenced these ratios, with the pattern of female preponderance of service use beginning with the 18 to 21 year-old age group. They attribute this to the underlying importance of social roles, in which the traditional adult male social role, which has a strong emphasis on
independence, is contrary to the dependency relationship in which a person must place himself when seeking help. By contrast, women have a traditional social role that is more conducive of seeking mental health care. These traditional roles will have a stronger effect on rural people than for urban dwellers, where a greater population density is associated with a greater diversity in attitudes and behaviors.

Economic considerations play a larger role in decisions to purchase mental health care than in general medical decisions (Cleary 1989). Direct mental health benefits to Medicaid-assisted children are minimal. With about 80% of available Medicaid funds for mental health being expended on state hospital programs, little money is left for community-based interventions (Tarnowski and Rohrbeck 1993). Children from families with incomes greater than $50,000 are much more likely to obtain both brief mental health consultations and more extensive treatments than are children from either middle- or low-income families (Cohen and Hesselbart 1993). Even when treatment is available, it has been demonstrated that SES is positively correlated with treatment success (Cohen and Hesselbart 1993). This may reflect unrealistic expectations of treatment held by lower SES families, or that middle-class therapists tend to have lower expectations for low-income clients.

Recent research on risk and resilience in the development of psychopathology among adolescents has indicated some important social and personal aspects to consider. Werner (1993) reports finding several clusters of protective factors in a prospective study of the developmental paths of a cohort of children who had been exposed to perinatal stress, chronic poverty, and a family environment that involved chronic conflict and the presence of parental psychopathology. Key personal resiliency resources identified in this study included
temperamental characteristics of the individual that aided in eliciting positive and supportive responses from others, and a sense of self-sufficiency and mastery. Important environmental resources included the characteristics and caregiving styles of the parents, the openings of opportunities at major life transitions, and the presence of supportive "surrogate" parents, such as grandparents, teachers, youth leaders, and church group members.

The complexity of the resiliency process has been noted by researchers (Egeland, Carlson, and Sroufe 1993; Lin and Ensel 1989; Staudinger, Marsiske, and Baltes 1993). For example, Radke-Yarrow and Brown (1993) demonstrated the wide range of methods that children use for coping with parental and family pathology, while noting that resiliency appeared either robust or fragile depending on the combination of risk and supportive factors. They note that the characteristics of resilience that have been emphasized most in the research literature has involved aspects of social competence and achievement. However, to limit the definition of resilience to these personal dimensions provides only a partial picture. Indeed, protective and risk effects can sometimes be found within the same variables (Stouthamer-Loeber et al. 1993). It is important to consider how risk and protective factors interact, and in which situations and environments.

Based on the above research, several moderators of the basic model will be tested, examining in particular the effects on the paths between adolescent mental health and adolescent mental health service use. First, gender effects will be examined by testing separate models for boys and girls. Among the social-level variables, parental support and involvement should indicate the importance of family processes. Likewise, the presence of a community mental health center and the level of parental stigma regarding mental health
services will be indicative of broader, community-level vulnerabilities. Finally, among the personal variables, adolescent mastery, coping, and problem-solving styles should be indicative of individual resilience. The fundamental illness process of family conflict leading to adolescent emotional and behavioral problems, which then leads to service use, rests within these individual, familial, and social contexts. As indicated by the SOS framework, social interactions are the key focus of this study, particularly the interactions within the family.
CHAPTER THREE

METHODOLOGY

Sample

At the initial interviews, conducted in 1989, the sample for these analyses consisted of 451 families living in eight contiguous rural counties in the Midwest. Of these families, about one-half (54%) lived in small towns (populations under 6500), about one-third (34%) lived on farms, and about one-sixth (12%) lived in rural areas but not on a farm. The primary reason for selecting these families was the tremendous economic changes in the rural economy produced by the farm crises of the prior decade. The median family income in 1988 was $33,700, with slightly more than 11% of the families (N=42) having incomes below the federal poverty line, about twice the proportion (5.6%) for married-couple families nationally in 1988 (Bureau of the Census 1989).

Each family included two parents, a seventh-grade adolescent (198 girls, 180 boys) and a sibling within 4 years of age of the seventh grader. The median ages of fathers and mothers were 39 and 37 years, respectively, whereas the median number of years of schooling was one year beyond high school for both parents. Each family member was compensated $10 per hour for her/his time in the study. Families were visited twice in their home by trained interviewers, with the visits usually lasting about two hours each and occurring within a two week period early in each study year.
Measures

Adolescent Mental Health Service Utilization

The main dependent variables were adolescent mental health service use during the second and fourth waves of data collection. As can be seen from the tables, the adolescent service use variables were dichotomous and badly skewed (means of .12 or less). These particular items suffer from many of the problems found in other studies of mental health services use, particularly in the poor specificity of services and problems addressed. Improved measures have been developed for future waves of data collection with this sample, which more completely and carefully examine the possible sources of formal and informal mental health care for adolescents and their families.

Adolescent Depression, Antisocial Behavior, and Mastery

Depressed mood was assessed using self-reports of depression from the SCL-90-R (Derogatis, 1983), with a Cronbach alpha value of .89 in this sample. This scale has been widely used and has demonstrated adequate reliability and validity among both adolescents and adults (e.g., Kandel and Davies 1986). Previous research using the present sample has shown that these adolescents may be less distressed than their urban adolescent counterparts (Ge et al. 1995), when comparing raw scores on this depression scale with normative values reported by Derogatis (1983). Note that this is the only scale used in this study for which normative data are available for this age group. All other scales used in the study were either modified from pre-existing scales, or developed specifically for this study.
Nine items selected from the Buss and Durkee (1957) hostility scale that most reflect overt aggression were used to assess antisocial behaviors, with a resulting Cronbach alpha value of .86 in this sample. Originally this scale consisted of 75 items, but was condensed considerably in the present study to focus primarily on overt aggression. Adolescent mastery was assessed using Pearlin's Mastery Scale (Pearlin et al. 1981), which is a self-report scale consisting of eight items. Chronbach alpha was .71 in this sample. This scale is intended to measure the extent to which individuals perceive themselves as being in control of important forces in their lives. Each of these scales also has proven reliability and validity from previous research, but not for a similar sample.

**Family Problems**

Parental reports of family problems were assessed from a listing of topics, which are typically sources of disagreement between parents and their children. Twenty items were used, including arguments over money, curfews, dating, choice of friends, and discipline. Respondents indicated how often they and their children argued over these topics (0 = never; 5 = all the time). Cronbach alpha values were .88 for both the paternal and maternal reports.

**Parental Mental Health Services Stigma**

Parental mental health services stigma was obtained from four items assessing the receptivity of mothers and fathers to their own use of mental health services. Parents were asked whether they agreed or not (1 = strongly agree; 5 = strongly disagree) with items such as, “If I had a serious emotional problem, I would not go for professional help;” “I would be
embarrassed if my friends knew I was getting professional help for an emotional problem;” and “Most people with an emotional problem get better even without professional help.” Cronbach alpha values were .69 for mothers and .71 for fathers. The scales were summed for each parent, forming two indicators of parental mental health services stigma, one for each parent.

**Adolescent Problem-Solving Style**

Fourteen items were summed from each parent to form an overall report of the adolescent’s problem-solving style. Parents were asked whether they agreed or not (1 = always; 7 = never) with items such as, “When the two of you have a problem to solve, how often does this child” ... “have good ideas about how to solve the problem?” ... “show a real interest in helping to solve the problem?” ... “consider your ideas for solving the problem?” Chronbach alpha value was .87 for both fathers and mothers, with a single indicator of adolescent problem-solving style being formed by summing together paternal and maternal ratings. This construct examines the parents’ perceptions of the target adolescent’s ability and willingness to engage in discussion, compromise, and work towards solutions to problems within the family.

**Parental Warmth and Support**

Parental support for the adolescent was taken from self-report measures by mother and father. Nine items were summed for each parent, with Chronbach alpha values of .87 for fathers and .88 for mothers. Sample items are: “During the past month, how often did you” ...
"let the child know you really care about him/her?" … "act loving and affectionate toward him/her?" A single measure of parental warmth and support for the target adolescent was then constructed by summing the paternal and maternal self-reports.

**Perceived Economic Pressure**

Perceived economic pressure was assessed with three indicators, which were then summed to form a single, family-level index. Two items assessed whether parents felt they could not make ends meet. Each spouse reported on the difficulty of paying bills each month (1 = no difficulty at all; 5 = a great deal of difficulty) and whether they had money left over at the end of the month (1 = more than enough money left over; 4 = not enough to make ends meet). Each spouse's responses were standardized and summed to form a single, family-level indicator. Each parent also responded to seven items asking whether they had the money they needed for maintaining their home, for clothing, household items, a car, food, medical care, and recreational activities (1 = strongly agree; 5 = strongly disagree). The summed scales for each parent (alpha=.87 for mothers and .88 for fathers) were averaged to create the family-level material needs indicator of economic pressure. The final indicator of economic pressure consisted of parent reports of cutbacks they made in response to financial difficulties in the previous year. Each parent noted (yes/no) whether their family had made any of 16 possible cutbacks in expenditures or assets during the previous year, including giving up medical insurance, reducing utility costs, etc. A single index was formed, such that if either or both parents responded yes to an item the index increased by one (alpha = .89).
Timing of Measures

The measures of family problems were from Wave A (1989). The measures of adolescent depression and antisocial behavior were from Waves A and C (1989 and 1991). The measures of perceived economic pressure, adolescent mastery, and adolescent problem-solving style were from Wave B (1990). The measures of mother and father mental health stigma, and parental warmth and supportiveness were from Wave C (1991). Adolescent mental health service use was measured at Waves B and D (see Table 1).

Table 1: Time collection points for model variables

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wave A</td>
<td>Wave B</td>
<td>Wave C</td>
<td>Wave D</td>
</tr>
<tr>
<td>Family Problems: Parent Report</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adolescent Depression</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adolescent Antisocial Behavior</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adolescent MH Service Use</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Parental MH Service Stigma</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Parental Warmth/Support</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adolescent Mastery</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adolescent Problem Solving</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Perceived Economic Pressure</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Structural Equation Modeling

To test the models proposed in this study, structural equation modeling (SEM) was used. A key assumption underlying most SEM procedures is that the indicator variables in the model obey a multivariate normal distribution. Based on this assumption, the most common estimation technique, maximum likelihood (ML), provides parameter estimates that have several desirable statistical properties. The estimates are consistent, asymptotically unbiased,
and efficient, and \((N-1)F_{ML}\) approximates a chi-square distribution in large samples (Bollen 1989). When the assumption of multivariate normality is not met, there is no guarantee that these desirable properties will hold. Indeed, this assumption appears to be violated in most investigations that use SEM. Micceri (1989) found, in examining over 400 large data sets, that the great majority of data collected in behavioral research do not follow univariate normal distributions, let alone multivariate normal distributions.

When the variables are continuous but nonnormal, the parameter estimates may remain unbiased and consistent, but they will likely no longer be efficient (i.e., have minimum variance with increasing \(N\)). Two problems in particular will result: (a) the \(\chi^2\) goodness-of-fit test is not expected to produce accurate assessments of fit, rejecting too many true models; and (b) tests of the parameter estimates will be biased, yielding too many significant results (Hu, Bentler, and Kano 1992; West, Finch, and Curran 1995). When the variables are coarsely categorized, investigations have shown that the Pearson correlation coefficient is attenuated somewhat, as compared with what would be obtained had the variables been continuous, with the greatest attenuation occurring when few categories are employed and the variables are skewed in opposite directions (Bollen and Barb 1981). Thus, coarsely categorized variables will likely lead to biased parameter estimates, as well as biased \(\chi^2\) goodness-of-fit tests and standard errors.

One approach to the resolution of these difficulties has been the use of asymptotic distribution-free (ADF) methods, in which the normality assumptions are not required (Browne 1984). This is the approach taken by the LISREL program in dealing with nonnormal data. An optimal weight matrix is constructed using the PRELIS program, the
matrix of polychoric or tetrachoric correlations is then obtained, and a weighted least squares estimation technique is used in the LISREL analyses. One major limitation of this treatment has been the large sample size needed in computing the asymptotic covariance matrices, with a minimum recommended sample size of \( k(k+1)/2 \), where \( k \) equals the number of variables in a given model. For example, for a moderately sized model of 20 variables, the minimum sample size necessary to compute an asymptotic covariance matrix is \((20)*(21)/2 = 210\). Even with such large samples, the question of whether this approach is superior to one that uses maximum likelihood estimation is still open (Jöreskog and Sörbom 1993).

A related issue arises in the overall evaluation of model fit. As noted above, the \( \chi^2 \) goodness-of-fit test is not expected to produce accurate goodness of fit estimates. Specifically, this test will result in the rejection of too many true models when the data are not multivariate normal (Hu and Bentler 1995). Many of the goodness of fit indices typically used in SEM are based upon the \( \chi^2 \) goodness-of-fit measure, and will thus suffer similar difficulties in the presence of nonnormal data. For these situations, it has been recommended that multiple indices of overall fit be reported (Bollen 1989; Hu and Bentler 1995; Tanaka 1993).

Two basic categories of fit indices are available. **Absolute** fit concerns the closeness by which the covariances implied in the specified model match the covariances found in the data. A comparison may be made to a completely saturated model, which exactly reproduces the observed covariance matrix. Optimal fit for absolute indices can therefore be indicated by larger values, implying closer fit with the observed covariances. **Incremental** fit compares the ability to reproduce observed covariances by the specified model with an alternative model, usually the "null" or independence model, in which no covariances among variables are
specified. Optimal fit for incremental indices is indicated by larger values, implying greater improvement of the specified model over the alternative model. One of each type of fit indicator was selected for use in the present study, in addition to $\chi^2$.

As an indicator of absolute fit, the goodness-of-fit index (GFI; Jöreskog and Sörbom 1993) was selected. GFI has been shown to perform better than any other absolute fit index (Hu and Bentler 1995). Intuitively, GFI can be interpreted analogously to the $R^2$ value commonly used in multiple regression models, in that it indicates the relative proportion of the observed variances and covariances accounted for by the specified model. The incremental fit index chosen for the present study, the comparative fit index (CFI; Bentler 1990), indicates the relative reduction in lack of fit, when comparing the specified model with a baseline model. The noncentral $\chi^2$ is used in calculating CFI, rather than the central $\chi^2$. This is expected to address some of the above noted difficulties in fit indices based upon the central $\chi^2$ (Hoyle 1995). However, it should be noted that very few empirical studies have examined the impact of violations of multivariate normality on these indices.

**Logistic Regression**

The typical analysis technique used in mental health services research is the logistic regression. In this approach, in which the dependent variable is binary (has values of 0 or 1) and takes the value of 1 relatively rarely, the dependent variable is log-transformed to give it better balance. When the data contain continuous-level predictor variables, maximum likelihood procedures are used to estimate the particular path coefficients. The primary measure of association derived from these analyses is the odds ratio, that is the ratio of two
odds. In turn, these odds are themselves ratios of the number of events to the number on
nonevents, where in this study the “event” is mental health service use by the adolescent. The
odds ratio is interpreted as the multiplicative change required to move from one odds to
another. An odds ratio greater than 1.00 indicates an increased likelihood of the event
occurring, while an odds ratio less than 1.00 indicates a decreased likelihood of the event
occurring.

Because of the dichotomous and badly skewed nature of the primary dependent
variable in this study, adolescent mental health service use, a particular interest is the
comparison of this approach to structural equation modeling in the presence of nonnormal
data with the analytical approach typically taken in health services research (i.e., logistic
regression). It was hoped that the aspects of the robustness of SEM to violations of the
multivariate normality assumptions could be examined by comparing the SEM results with
those obtained from a logistic regression analysis.

**Hypotheses**

In the context of the model presented in Figure 2 and described in the previous
chapter, adolescent depression and antisocial behavior in Wave A are hypothesized to
significantly predict subsequent adolescent mental health service use (Wave B). Further, it is
expected that depression will be a stronger predictor of service use for girls, and antisocial
behavior will be a stronger predictor for boys. Family problems experienced at Wave A are
hypothesized to significantly predict adolescent mental health service use at Wave B.
Adolescent mental health service use at Wave B is in turn expected to significantly predict
adolescent depression and antisocial behavior at Wave C, after controlling for Wave A depression and antisocial behavior. Finally, adolescent depression and antisocial behavior at Wave C are hypothesized to significantly predict adolescent mental health service use at Wave D, after controlling for Wave B adolescent mental health service use. Several other variables are expected to moderate these relations within the basic model, including presence of a community mental health center, parental mental health service stigma, parental warmth and support, adolescent mastery, and adolescent problem-solving style.
CHAPTER FOUR
RESULTS

In this chapter, tests of the hypothesized path model (Figure 2) are presented, following a presentation of the descriptive statistics for the model variables, as well as their correlations for the total sample. Results of the structural equation models are then presented for each of the separate moderator variable models. With listwise deletion of missing data, 374 families were included in the following models, out of the 451 families present at Wave A. No significant mean differences among the model variables at Wave A were found between those families included in the analyses, versus those families who dropped out during the four years of the study.

Distribution of Variables and Descriptive Statistics

Descriptive statistics for the model variables are presented in Table 2. With the exception of adolescent depression, it appears that the variables obey a univariate normal distribution. Adolescent reports of depression at Wave A and Wave C show significant positive kurtosis, indicative of a strong peak near zero in each of the distributions. Mother reports of family problems at Wave A show some kurtosis, but very little skewness, indicating a bit of a peak at the median of the distribution. Aside from the obvious problems in the mental health use variables, none of the model variables show drastic violations of univariate normality assumptions.
Table 2: Descriptive statistics of model variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Problems: A Father Report</td>
<td>29.086</td>
<td>8.825</td>
<td>0.287</td>
<td>0.0926</td>
</tr>
<tr>
<td>Family Problems: A Mother Report</td>
<td>28.679</td>
<td>8.765</td>
<td>0.695</td>
<td>2.109*</td>
</tr>
<tr>
<td>Adolescent Depression: A</td>
<td>7.184</td>
<td>6.892</td>
<td>1.656*</td>
<td>3.307*</td>
</tr>
<tr>
<td>Adolescent Depression: C</td>
<td>6.011</td>
<td>6.396</td>
<td>1.748*</td>
<td>3.389*</td>
</tr>
<tr>
<td>Adolescent Antisocial Beh: A</td>
<td>18.441</td>
<td>5.064</td>
<td>0.486</td>
<td>-0.039</td>
</tr>
<tr>
<td>Adolescent Antisocial Beh: C</td>
<td>22.201</td>
<td>6.643</td>
<td>0.337</td>
<td>-0.371</td>
</tr>
<tr>
<td>Parental Warmth/Support: C</td>
<td>94.806</td>
<td>9.684</td>
<td>-0.098</td>
<td>-0.078</td>
</tr>
<tr>
<td>Mother MHS Stigma: C</td>
<td>13.781</td>
<td>3.284</td>
<td>0.009</td>
<td>-0.041</td>
</tr>
<tr>
<td>Father MHS Stigma: C</td>
<td>15.554</td>
<td>3.126</td>
<td>0.160</td>
<td>0.268</td>
</tr>
<tr>
<td>Economic Pressure: A</td>
<td>-0.022</td>
<td>2.670</td>
<td>0.103</td>
<td>-0.497</td>
</tr>
<tr>
<td>Adolescent Mastery: A</td>
<td>26.093</td>
<td>4.082</td>
<td>-0.126</td>
<td>0.052</td>
</tr>
<tr>
<td>Adolescent Problem Solving: C</td>
<td>160.065</td>
<td>21.940</td>
<td>-0.446</td>
<td>0.221</td>
</tr>
</tbody>
</table>

* p < .05

Correlations among the model variables are presented in Table 3. Examination of these show some significant patterns for the entire sample. The largest correlation was between parental warmth/support and adolescent problem solving (r = .69). This correlation was likely somewhat inflated, since both of these variables came from parental reports, but also indicated that families which express high warmth and support for their children are likely to result in children who have good problem-solving skills. Similarly, the correlations between adolescent mastery and parental warmth/support and adolescent problem solving
were positive and significant \( t = .22 \) for each), again indicative of the importance of a warm and supportive family environment.

The correlations between parental warmth and support, and economic pressure and family problems were significant and negative \( (r = -.15 \) and \( r = -.36 \), respectively). This indicates the importance of social context for family relations, in that parental warmth and supportiveness declines or is inhibited in the presence of strong economic and family difficulties. It should be noted that, although these relations are bivariate correlations, they are consistent with previous research (Conger and Elder 1994).

The expected skewed nature of adolescent mental health services utilization can be seen in Table 4. Of the 374 adolescents in the sample, 17 (4.5%) sought professional mental health care during the year prior to Wave B and 37 (9.9%) sought care during the year prior to Wave D. Using crosstabs tests, no significant differences in the rate of mental health use

| Table 3: Bivariate correlations among model variables for the entire sample. |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1. Economic Pressure        | 1.00            |                 |                 |                 |                 |                 |                 |                 |                 |
| 2. Family Problems          | .24             | 1.00            |                 |                 |                 |                 |                 |                 |                 |
| 3. Father MHS Stigma        | .02             | .04             | 1.00            |                 |                 |                 |                 |                 |                 |
| 4. Mother MHS Stigma        | -.01            | -.06            | .29             | 1.00            |                 |                 |                 |                 |                 |
| 5. Parental Warmth          | -.15            | .36             | -.21            | -.16            | 1.00            |                 |                 |                 |                 |
| 6. Adol. Depr: A            | .11             | .16             | -.05            | -.01            | -.15            | 1.00            |                 |                 |                 |
| 7. Adol. Mastery            | -.23            | -.11            | -.01            | .01             | .22             | -.42            | 1.00            |                 |                 |
| 8. Adol. AS Beh: A          | .05             | .09             | -.01            | -.05            | -.08            | .23             | -.23            | 1.00            |                 |
| 9. Adol. AS Beh: C          | .05             | .11             | .03             | .03             | -.14            | .09             | -.15            | .59             | 1.00            |
| 10. Adol. Depr: C           | .04             | .17             | .05             | .01             | -.20            | .42             | -.20            | .14             | .22             | 1.00            |
| 11. Adol. Prob. Solving     | -.10            | -.37            | -.17            | -.11            | .69             | -.17            | .22             | -.09            | -.17            | -.29            |

\( p < .01 \) for \( r > .14 \); \( p < .05 \) for \( .10 < r < .14 \)
Table 4: Sample sizes for each subsample, and number (percent) of mental health service utilizers at Waves B and D.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Total N</th>
<th>MHSU Wave B: N</th>
<th>MHSU Wave D: N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Sample</td>
<td>374</td>
<td>17 (4.5)</td>
<td>37 (9.9)</td>
</tr>
<tr>
<td>Boys</td>
<td>175</td>
<td>5 (2.9)</td>
<td>13 (7.4)</td>
</tr>
<tr>
<td>Girls</td>
<td>199</td>
<td>12 (6.0)</td>
<td>24 (12.1)</td>
</tr>
<tr>
<td>CMHC</td>
<td>73</td>
<td>3 (4.1)</td>
<td>8 (11.0)</td>
</tr>
<tr>
<td>No CMHC</td>
<td>301</td>
<td>14 (4.7)</td>
<td>29 (9.6)</td>
</tr>
<tr>
<td>Low Parental Warmth/Support</td>
<td>210</td>
<td>10 (4.8)</td>
<td>26 (12.4)</td>
</tr>
<tr>
<td>High Parental Warmth/Support</td>
<td>181</td>
<td>7 (3.9)</td>
<td>12 (6.6)</td>
</tr>
<tr>
<td>Low Mother MHS Stigma</td>
<td>172</td>
<td>11 (6.4)</td>
<td>20 (11.6)</td>
</tr>
<tr>
<td>High Mother MHS Stigma</td>
<td>202</td>
<td>6 (3.0)</td>
<td>17 (8.4)</td>
</tr>
<tr>
<td>Low Father MHS Stigma</td>
<td>150</td>
<td>9 (6.0)</td>
<td>13 (8.7)</td>
</tr>
<tr>
<td>High Father MHS Stigma</td>
<td>224</td>
<td>8 (3.6)</td>
<td>24 (10.7)</td>
</tr>
<tr>
<td>Low Economic Pressure</td>
<td>185</td>
<td>7 (3.8)</td>
<td>17 (9.2)</td>
</tr>
<tr>
<td>High Economic Pressure</td>
<td>189</td>
<td>10 (5.3)</td>
<td>20 (10.6)</td>
</tr>
<tr>
<td>Low Adolescent Problem-Solving</td>
<td>184</td>
<td>10 (5.4)</td>
<td>29 (15.8)</td>
</tr>
<tr>
<td>High Adolescent Problem-Solving</td>
<td>190</td>
<td>7 (3.7)</td>
<td>8 (4.2)</td>
</tr>
<tr>
<td>Low Adolescent Mastery</td>
<td>166</td>
<td>13 (7.8)</td>
<td>19 (11.4)</td>
</tr>
<tr>
<td>High Adolescent Mastery</td>
<td>208</td>
<td>4 (1.9)</td>
<td>18 (8.7)</td>
</tr>
</tbody>
</table>

MHSU = Mental Health Service Use
were found between boys and girls (Wave B: $\chi^2(1) = 2.02, p = .16$; Wave D: $\chi^2(1) = 2.22, p = .14$), nor for adolescents living in a county having a community mental health center versus those living in a county not having a community mental health center (Wave B: $\chi^2(1) = 0.18, p = .67$; Wave B: $\chi^2(1) = 0.57, p = .45$).

Tests of mean differences on the key adolescent variables for those adolescents using professional mental health services at Wave B or Wave D versus those not using professional mental health services are shown in Table 5. Significant differences were found for each of the adolescent variables: Depressed mood, antisocial behavior, mastery, and problem-solving.

Table 5: Tests of differences in means, for adolescents using mental services in Waves B or D, and adolescents not using services in those waves. Means, standard deviations, and t-value of mean difference test -- utilizers above, non-utilizers below the line for each variable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent Depression: A</td>
<td>51</td>
<td>10.88</td>
<td>9.69</td>
<td>2.84*</td>
</tr>
<tr>
<td>Adolescent Depression: C</td>
<td>363</td>
<td>6.91</td>
<td>6.51</td>
<td></td>
</tr>
<tr>
<td>Adolescent Depression: C</td>
<td>49</td>
<td>9.80</td>
<td>8.08</td>
<td>3.66*</td>
</tr>
<tr>
<td>Adolescent Depression: C</td>
<td>342</td>
<td>5.42</td>
<td>5.91</td>
<td></td>
</tr>
<tr>
<td>Adolescent Antisocial Beh: A</td>
<td>51</td>
<td>19.86</td>
<td>5.11</td>
<td>1.93</td>
</tr>
<tr>
<td>Adolescent Antisocial Beh: C</td>
<td>50</td>
<td>24.88</td>
<td>7.01</td>
<td>3.01*</td>
</tr>
<tr>
<td>Adolescent Antisocial Beh: C</td>
<td>343</td>
<td>21.88</td>
<td>6.54</td>
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</tr>
<tr>
<td>Adolescent Mastery</td>
<td>51</td>
<td>24.06</td>
<td>4.01</td>
<td>3.93*</td>
</tr>
<tr>
<td>Adolescent Mastery</td>
<td>364</td>
<td>26.41</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>Adolescent Problem-Solving</td>
<td>50</td>
<td>146.28</td>
<td>24.11</td>
<td>4.90*</td>
</tr>
<tr>
<td>Adolescent Problem-Solving</td>
<td>344</td>
<td>162.10</td>
<td>20.90</td>
<td></td>
</tr>
<tr>
<td>Economic Pressure</td>
<td>51</td>
<td>.17</td>
<td>2.73</td>
<td>0.63</td>
</tr>
<tr>
<td>Economic Pressure</td>
<td>364</td>
<td>-.08</td>
<td>2.66</td>
<td></td>
</tr>
<tr>
<td>Father Stigma</td>
<td>50</td>
<td>15.14</td>
<td>3.12</td>
<td>0.95</td>
</tr>
<tr>
<td>Stigma</td>
<td>344</td>
<td>15.59</td>
<td>3.17</td>
<td></td>
</tr>
<tr>
<td>Mother Stigma</td>
<td>50</td>
<td>13.04</td>
<td>3.06</td>
<td>1.72</td>
</tr>
<tr>
<td>Stigma</td>
<td>344</td>
<td>13.89</td>
<td>3.30</td>
<td></td>
</tr>
<tr>
<td>Parental Warmth/Support</td>
<td>50</td>
<td>92.74</td>
<td>10.15</td>
<td>1.65</td>
</tr>
<tr>
<td>Parental Warmth/Support</td>
<td>344</td>
<td>95.16</td>
<td>9.59</td>
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</tbody>
</table>

* indicates t-value significant at the $p < .05$ level.
style. However, scores on none of the variables external to the adolescent (i.e., economic pressure, parental mental health services stigma, and parental warmth/support) were significantly different for families in which the adolescent sought mental health care versus families in which the adolescent did not seek mental health care.

**Structural Modeling Results**

The model presented in Figure 2 was first tested for the whole sample, and then for subgroups defined by several moderator variables. In testing the subgroups, main effects for the moderator variables were modeled by including the specific moderator variable as an exogenous variable, that was then allowed to predict all of the variables in the basic model. Results from the structural equation modeling with LISREL VIII are shown in Tables 6 through 14. In evaluating the moderating variables, stacked models were tested in which the factor loadings and path coefficients were constrained to be invariant across subgroups. Modification indices (MI), which are equivalent to a change in $\chi^2$ with one degree of freedom, were examined for possible differences in individual path coefficients across the groups.

**Results for the Entire Sample**

Overall fit of the model, when tested in the complete sample of 374 families, was satisfactory. LISREL results showed a $\chi^2 = 88.77$, with 13 degrees of freedom ($p < .001$), GFI = .97 and CFI = .96. Factor loadings for the Family Problems latent construct appear quite good, with .74 and .60 for the standardized loadings for paternal and maternal reports, respectively.
Parameter estimates, standard errors, and t-values are presented in Table 6. Basically the model can be examined in two sections. First, Family Problems, Depression, and Antisocial Behavior at Wave A were significant predictors of Mental Health Service Use at Wave B, with standardized path coefficients of \(-.52\), \(.46\), and \(.11\), respectively. Thus, even though emotional and behavioral problems lead to mental health care for the adolescents, when the family experiences greater conflicts and problems the adolescents are less likely to receive needed care. Second, after controlling for Mental Health Service Use at Wave B, adolescent Depression and Antisocial Behavior at Wave C were significant predictors of Mental Health Service Use at Wave D, with standardized path coefficients of \(.43\) and \(.22\), respectively. Also, the stability in service use was only marginally significant (\(\beta = .12; t = 1.67\)); very few adolescents received mental health care at both Wave B and Wave D (\(n = 5\)).

Finally, some rather unexpected results were obtained for the influence of mental health service use on subsequent adolescent depressed mood and antisocial behavior. Overall, it appears that those adolescents receiving professional mental health care are more likely to have greater levels of subsequent depressed mood and antisocial behavior. That is, the paths from Mental Health Service Use at Wave B to Depression and Antisocial Behavior at Wave C were significant and positive (\(\beta = .21\) and \(\beta = .14\), respectively). Due to these unexpected findings concerning the effects of mental health service use, further analyses were conducted.

In considering these results about the effectiveness of mental health care, it must be recognized that the measures of mental health services use were very broad and very limited. The Wave B measure of mental health service use was dichotomous and badly skewed. Even though the Wave D measure originally contained four response categories (never, once/twice,
a few times, many times), so few adolescents responded to anything greater than “once/twice” that this variable was also dichotomized to simply yes/no. Therefore, for these adolescents a “yes” on mental health service use may only be indicative of a single visit, perhaps two. It is unlikely that such limited contact with a mental health provider will produce improvements in the problems that led the adolescent to seek care.

The positive influence of seeking care on subsequent emotional and behavioral problems may be indicative of the more appropriate use of this variable as an indicator of

Table 6: Structural model results for entire sample -- unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values.
Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<td>.11 (.06)</td>
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<td>.30</td>
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<td>MHSU: B</td>
<td>-.52 6.66</td>
<td>.46 1.98</td>
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<td>Adolescent</td>
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<td>.77 10.72</td>
<td>.18 (.04)</td>
<td>.21 5.08</td>
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<td></td>
<td>.73</td>
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<td>Depression: C</td>
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<td>.64 11.47</td>
<td>.13 (.03)</td>
<td>.14 4.11</td>
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<td>.45</td>
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<td>AS Behavior: C</td>
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<tr>
<td>Adolescent</td>
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<td>.43 (.07)</td>
<td>.22 (.05)</td>
<td>.31 .167</td>
<td>5.94 .22</td>
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<td>MHSU: D</td>
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MHSU = Mental Health Service Use
overall mental health. Thus, in this model, a latent construct for adolescent mental health would have three indicators — depressed mood, antisocial behavior, and mental health services use. Likewise, the positive influence of seeking care on subsequent emotional and behavioral problems may be indicative of the broader social context within which these problems arise. Family environment is clearly important in promoting good adolescent mental health, particularly through aspects such as warm, supportive parenting and a stable economic environment (Conger and Elder 1994). The community environment is critical, especially in providing accessible and adequate mental health care. This is particularly difficult in rural areas, which is the basis of the sample for the present study. Thus, as measured here, seeking care may also be an indicator of the underlying community and family difficulties, which lead to the emotional and behavioral problems experienced by the adolescents.

Examination of scatter plots of Depression at Wave C and Antisocial Behavior at Wave C, versus Mental Health Service Use at Wave B (Figures 3 and 4), indicated the possibility of influential data points which may be responsible for the unexpected path coefficients. Specifically, the three data points that were considerably higher on Depression at Wave C for those adolescents who used mental health services at Wave B (see Figure 3) were identified as exerting excessive influence on the path coefficients from Mental Health Service Use at Wave B to Depression and Antisocial Behavior at Wave C. However when these points were removed from the dataset and the SEM analysis rerun for the entire sample, the results obtained were virtually identical with those reported here.
Mental Health Service Use at Wave B

Figure 3: Adolescent Depression at Wave C -- each petal indicates one case.

Mental Health Service Use at Wave B

Figure 4: Adolescent Antisocial Behavior at Wave C -- each petal indicates one case.
Plots of the means and standard errors for Depression and Antisocial Behavior at Waves A, B, and C (Figures 5 and 6) give some indication of a broader life course development for this sample of adolescents. Depression for those adolescents who did not seek professional mental health care at Wave B significantly declined between Waves A and B, and then remained constant. Depression for those adolescents who did seek professional mental health care at Wave B remained constant across the three years. Conversely, antisocial behavior for those adolescents who did not seek professional mental health care at Wave B significantly increased between Waves A and B, then remained constant between Waves B and C. Antisocial behavior for those adolescents who did seek professional mental health care at Wave B showed a similar trend, but the differences were not significant.

Figure 5: Adolescent Depression at Waves A, B, and C -- means and standard errors (SE).
Figure 6: Adolescent Antisocial Behavior at Waves A, B, and C — means and standard errors (SE).

From these plots it is apparent that, for this sample and these measures of mental health service use, Mental Health Service Use at Wave B may be appropriately considered as an indicator of extreme emotional and behavioral problems at Wave B. The resultant increases in emotional and behavioral problems experienced by those adolescents who sought professional mental health care at Wave B were most likely due to developmental trajectories of these difficulties for those particular adolescents.

Gender Moderation

In comparing the model results for the two sexes, the boys model consisted of 175 families, and the girls model consisted of 199 families. Overall fit of the model testing gender
moderation was satisfactory. LISREL results showed an overall $\chi^2 = 232.76$, with 37 degrees of freedom ($p < .001$), GFI = .93 and CFI = .91. Common metric, standardized factor loadings for the Family Problems latent construct appear satisfactory, with .71 and .46 for paternal and maternal reports, respectively.

Parameter estimates, standard errors, and t-values for the girls subsample are presented in Table 7, with the results showing patterns similar to the results for the complete sample. Several relationships, however, were significantly different for girls and boys. The path from Antisocial Behavior at Wave A to Mental Health Service Use at Wave B was significantly different ($MI = 9.97$) for boys ($\beta = .62$) and girls ($\beta = .42$), as was the path from Depression at Wave A to Mental Health Service Use at Wave B ($MI = 4.88$; $\beta_{boys} = .61$; $\beta_{girls} = .43$). The paths from Mental Health Service Use at Wave B to Depression and Antisocial Behavior at Wave C were significantly different for girls and boys ($MI = 35.80$ and $MI = 26.56$, respectively). The girls who made at least one visit to a professional mental health provider became more depressed and more antisocial ($\beta = .23$ and $\beta = .25$, respectively) after controlling for previous depression and antisocial behavior. By contrast, boys became less depressed ($\beta = -.23$) and showed no change in their antisocial behavior ($\beta = -.07$), after receiving professional mental health care. Recall, from Table 4, that only 5 boys and 12 girls used mental health services at Wave B. Thus, these differential effects of mental health care on boys and girls are based on very small samples.

Overall, these results indicate that boys are significantly more likely than girls to seek professional mental health care for both emotional and behavioral problems. However, these differences between boys and girls disappear in the subsequent section of the model. That is,
Table 7: Structural model results for girls sample -- unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<td>Adolescent MHSU: B</td>
<td>- .86 (.15)</td>
<td>.49 (.08)</td>
<td>.44 (.08)</td>
<td>.42</td>
<td>5.77</td>
<td>6.26</td>
<td>5.78</td>
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<tr>
<td>Adolescent Depression: C</td>
<td>.69 (.06)</td>
<td>.65 (10.95)</td>
<td>.21 (.04)</td>
<td>.23</td>
<td>5.76</td>
<td></td>
<td></td>
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<tr>
<td>Adolescent AS Behavior: C</td>
<td>.57 (.05)</td>
<td>.57 (11.69)</td>
<td>.24 (.04)</td>
<td>.25</td>
<td>6.25</td>
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<tr>
<td>Adolescent MHSU: D</td>
<td>.02 (.08)</td>
<td>.02 (.07)</td>
<td>.46 (.07)</td>
<td>.41</td>
<td>.02</td>
<td>.44</td>
<td>.39</td>
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MHSU = Mental Health Service Use

boys and girls were equally likely to seek professional mental health care at Wave D for emotional and behavioral problems experienced at Wave C, after controlling for previous mental health service use.

Presence of a Community Mental Health Center (CMHC) moderation

The influence of the availability of mental health services was tested by examining the effect of residing in a county having a CMHC versus living in a county without a CMHC. In this sample only 73 families lived in counties having a CMHC, whereas the non-CMHC
subsample consisted of 301 families. Overall fit of the model testing for presence of CMHC moderation was satisfactory. LISREL results showed a $\chi^2 = 276.34$, with 37 degrees of freedom ($p < .001$), GFI = .91 and CFI = .96. Common metric, standardized factor loadings for the Family Problems latent construct were satisfactory, with .88 and .47 for paternal and maternal reports, respectively.

Results from the model of the non-CMHC group are presented in Table 8. Depression and Antisocial Behavior at Wave A were significantly related to Mental Health Service Use at Wave B ($\beta = .16$ and $\beta = -.09$, respectively), but Family Problems at Wave A was not ($\beta = -.02$). A significant difference between the CMHC and non-CMHC groups was found for the path from Family Problems at Wave A to Mental Health Service Use at Wave B ($MI = 6.58$), such that adolescents in families living in a county having a CMHC were significantly more likely to seek mental health care as a result of family conflicts ($\beta = .09$), after controlling for the adolescent’s emotional and behavioral problems, than were adolescents in families living in a county that did not have a CMHC ($\beta = -.02$). The paths from Depression and Antisocial Behavior at Wave A to Mental Health Service Use at Wave B were not significantly different between the two groups ($MI = 0.96$ and $MI = 0.15$, respectively).

Likewise, Depression and Antisocial Behavior at Wave C were significantly related to Mental Health Service Use at Wave D for the non-CMHC group ($\beta = .04$ and $\beta = .05$, respectively). However, adolescents living in counties having a CMHC were significantly more likely to seek professional mental health care for behavioral problems, after controlling for previous mental health service use, than were adolescents living counties that did not have
Table 8: Structural model results for non-CMHC sample — unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<td>Family</td>
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<td>A</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>C</td>
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<tr>
<td>Adolessent MHSU: B</td>
<td>-.02 (.04)</td>
<td>.17 (.06)</td>
<td>-.09 (.05)</td>
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<td>.02</td>
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<tr>
<td>Adolescent Depression: C</td>
<td></td>
<td>.56 (.07)</td>
<td>.53 (.05)</td>
<td>.05 (.04)</td>
<td>.05</td>
<td></td>
<td>.22</td>
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<tr>
<td>Adolescent AS Behavior: C</td>
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<td>.59 (.05)</td>
<td>.60 (.04)</td>
<td>.04 (.04)</td>
<td>.04</td>
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<td>.37</td>
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<tr>
<td>Adolescent MHSU: D</td>
<td></td>
<td></td>
<td>.79 (.06)</td>
<td>.04 (.02)</td>
<td>.05</td>
<td>.77</td>
<td></td>
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<td></td>
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<td></td>
<td>13.48 (.02)</td>
<td>.81 (.04)</td>
<td>.05</td>
<td>.74</td>
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MHSU = Mental Health Service Use

a CMHC (MI = 4.06; \( \beta_{CMHC} = .12; \beta_{nonCMHC} = .05 \)). Thus, availability of mental health services significantly increases the likelihood of adolescents receiving mental health care for behavioral problems. Note from Table 4 that only 3 adolescents, out of 73 adolescents living in a county having a CMHC, used mental health services at Wave B. Once again, it should be emphasized that these differences in predictors of mental health service use are based on very small numbers of actual users of services.
Parental Warmth/Support Moderation

The low parental warmth/support subsample consisted of 210 families, whereas the high parental warmth/support subsample consisted of 181 families. Overall fit of the models testing for parental warmth/support moderation was satisfactory. LISREL results showed an overall $\chi^2 = 215.39$, with 46 degrees of freedom ($p < .001$), GFI = .95 and CFI = .95. Common metric, standardized factor loadings for the Family Problems latent construct were good, with .65 and .58 for paternal and maternal reports, respectively. For this and subsequent models, the direct effects of the moderator variables were included by entering the moderator variable as an exogenous variable predicting all of the variables in the basic model. Thus, in this model, parental warmth and support for the target adolescent was included as a predictor of family problems at Wave A, adolescent depression and antisocial behavior at Waves A and C, and adolescent mental health service use at Waves B and D.

Parameter estimates, standard errors, and t-values for the structural paths from the low parental warmth/support group are presented in Table 9. As in the results for the complete sample, all of the paths were significant and positive, with the exception of the path from Family Problems at Wave A to Mental Health Service Use at Wave B, which was significant and negative. Parental Warmth and Support significantly predicted Family Problems at Wave A ($\beta = -.34$), adolescent Depression at Wave C ($\beta = -.13$), and Mental Health Service Use at Wave B ($\beta = -.13$). Thus, families in which the parents expressed more warmth and support for their children were less likely to experience family conflict than will families in which the parents expressed less warmth and support for their children. Not surprisingly, adolescents
with more supportive families experienced less depression, and were less likely to seek mental health care after controlling for emotional and behavioral problems.

Two paths were significantly different in the two groups of high and low parental warmth/support. Family Problems at Wave A to Mental Health Service Use at Wave B was

Table 9: Structural model results for low parental warmth/support sample -- unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<td></td>
<td>-.23 (.04)</td>
<td>-.34 5.22</td>
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<tr>
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<td></td>
<td>-.06 (.04)</td>
<td>-.06 1.39</td>
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<td>Adolescent AS Behavior: A</td>
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<td></td>
<td>.03 (.04)</td>
<td>.03 0.65</td>
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<tr>
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<td>-.13 2.71</td>
<td>-.13 2.71</td>
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<td></td>
<td>.11 (.03)</td>
<td>.12 3.77</td>
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<td>-.02 (.04)</td>
<td>-.02 0.54</td>
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<tr>
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<td>.65 (.06)</td>
<td>.65 11.72</td>
<td>.11 .13</td>
<td>-.02 .40</td>
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<td></td>
<td>.11 (.03)</td>
<td>.13 4.16</td>
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<tr>
<td>Adolescent MHSU: D</td>
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<td>.45 9.79</td>
<td>.11 .18</td>
<td>-.06 (.04)</td>
<td>-.02 .54</td>
<td>-.05 1.43</td>
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<td>.24</td>
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MHSU = Mental Health Service Use
significant in the low parental warmth/support group, but was weaker in the high parental warmth/support group (MI = 9.50; \( \beta_{\text{high}} = .16; \beta_{\text{low}} = .46 \)). Conversely, the path from Antisocial Behavior at Wave C to Mental Health Service Use at Wave D was significant and positive for the low parental warmth/support group, but was significantly more positive for the high parental warmth/support group group (MI = 6.70; \( \beta_{\text{high}} = .25; \beta_{\text{low}} = .17 \)). Thus, the presence of family conflict inhibited mental health service use by the adolescents, but was much stronger in the less supportive families, whereas the positive relationship between antisocial behavior and subsequent mental health service use was stronger in the more supportive families.

**Parental Mental Health Services Stigma Moderation**

The next set of analyses examined the possible moderating effects of mental health services stigma. Families low in maternal mental health services stigma consisted of 172 families; the high maternal mental health services stigma subsample consisted of 202 families. The low paternal mental health services stigma subsample consisted of 150 families; the high paternal mental health services stigma subsample consisted of 224 families. Overall fit of the models testing parental mental health services stigma moderation was satisfactory. Results for the maternal model showed an overall \( \chi^2 = 327.86 \), with 46 degrees of freedom (\( p < .001 \)), \( \text{GFI} = .93 \) and \( \text{CFI} = .93 \). Results for the paternal model showed an overall \( \chi^2 = 261.82 \), with 46 degrees of freedom (\( p < .001 \)), \( \text{GFI} = .96 \) and \( \text{CFI} = .96 \). Factor loadings for the Family Problems latent construct were satisfactory, with .87 and .51 for common metric, standardized loadings for paternal and maternal reports, respectively, in the maternal mental health services
stigma model, and .63 and .66 for paternal and maternal reports, respectively, in the paternal mental health services stigma model.

Parameter estimates, standard errors, and t-values for the parental mental health services stigma models are presented in Tables 10 and 11. Two paths, beyond the usually

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<td>.07 (.05)</td>
<td>.01 (.05)</td>
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<td>.01 (.05)</td>
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<td>-0.16 3.01</td>
<td>.06 .144</td>
<td>.01 .16</td>
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<td>.01 .16</td>
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<td>.02 (.03)</td>
<td>.02 (.03)</td>
<td>.02 (.03)</td>
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<td>.01 (.04)</td>
<td>.42</td>
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<td>.08 (.02)</td>
<td>.04 (.02)</td>
<td>.04 (.02)</td>
<td>.04 (.02)</td>
<td>.04 (.02)</td>
<td>.69</td>
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MHSU = Mental Health Service Use
Table 11: Structural model results for low paternal MHS stigma sample — unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<tr>
<td>R²</td>
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<td>MHSU = Mental Health Service Use</td>
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significant stability paths for depression and antisocial behavior, were significant in the low maternal stigma model: Antisocial Behavior at Wave C to Mental Health Service Use at Wave D ($\beta = .08$), and Family Problems at Wave A to Mental Health Service Use at Wave B ($\beta = -.16$). Significant direct effects for maternal mental health services stigma were found for
Mental Health Service Use at Wave B ($\beta = .04$) and Depression at Wave C ($\beta = -.10$).

Significant differences in the maternal stigma groups were found for the path from Antisocial Behavior at Wave A to Mental Health Service Use at Wave B ($MI = 4.35; \beta_{\text{high}} = -.08; \beta_{\text{low}} = .01$) and for the path from Depression at Wave C to Mental Health Service Use at Wave D ($MI = 10.05; \beta_{\text{high}} = -.06; \beta_{\text{low}} = -.01$).

No significant differences in the paths for the basic model were found for the two groups of fathers. The model parameters were the same for adolescents living in families in which the father expressed high mental health services stigma versus adolescents living in families in which the father expressed low mental health services stigma. Thus, the attitudes of the mother towards mental health services significantly influenced the likelihood of adolescents receiving professional care, whereas the attitudes of fathers did not. That is, maternal mental health services stigma inhibited adolescent mental health treatment for emotional and behavioral problems, but paternal attitudes did not influence the likelihood of treatment for these problems experienced by adolescents. Note from Table 3, that father and mother mental health services stigma are only moderately correlated ($r = .29$), indicating only a moderate relationship between parental attitudes mental health services.

**Perceived Economic Pressure Moderation**

Analyses next focussed on possible moderation by economic pressure experienced by the families. The low economic pressure subsample consisted of 185 families, whereas the high economic pressure subsample involved 189 families. Overall fit for the model testing perceived economic pressure moderation was satisfactory. LISREL results showed an overall
\(\chi^2 = 195.23\), with 46 degrees of freedom \((p < .001)\), GFI = .96 and CFI = .96. Common metric, standardized factor loadings for the Family Problems latent construct were good, with .74 and .57 for paternal and maternal reports, respectively.

Parameter estimates, standard errors, and t-values for the structural paths in the low economic pressure group are presented in Table 12. Some problems in the SEM results are apparent, particularly in the value of \(R^2\) for Depression at Wave C (1.10) and the extremely high path coefficients leading to Mental Health Service Use at Wave B. Thus, the results given here should be considered with more caution than for the other models presented.

Depression at Waves B and C significantly predicted Mental Health Service Use at Waves B and D \((\beta = .78 \text{ and } \beta = .58, \text{ respectively})\). However, Antisocial Behavior was only a significant predictor of Mental Health Service Use at Wave D \((\beta = .14)\). Family Problems at Wave A was a significant, negative predictor of Mental Health Service Use at Wave B \((\beta = -.71)\). Significant direct effects of Economic Pressure were found for Mental Health Service Use at Wave B \((\beta = .54)\), Mental Health Service Use at Wave C \((\beta = .23)\), Depression at Wave C \((\beta = .11)\), and Family Problems at Wave A \((\beta = .33)\).

Adolescents living in families experiencing high perceived economic stress were significantly less likely to seek professional mental health care at Wave B for Depression \((MI = 25.01; \beta_{\text{high}} = .34; \beta_{\text{low}} = .78)\) and Antisocial Behavior \((MI = 9.38; \beta_{\text{high}} = -.23; \beta_{\text{low}} = .03)\) at Wave A, than were adolescents living in families experiencing low economic stress. The presence of Family Problems at Wave A inhibited Mental Health Service Use at Wave B for the high economic pressure families significantly more than for the low economic pressure
families (MI = 11.32; $\beta_{\text{high}} = -.90; \beta_{\text{low}} = -.71$). Thus, adolescents living in families experiencing high economic stress were less likely to receive mental health care for emotional and behavioral problems than were adolescents living in families experiencing low economic pressure. Likewise, the presence of family conflict had a stronger negative influence on the

Table 12: Structural model results for low economic pressure sample -- unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<tr>
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<td>0.90 (0.57)</td>
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<tr>
<td>Adolescent Depression: A</td>
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<td>.03 (.06)</td>
<td>.16 (.05)</td>
<td>.14 (.05)</td>
<td>.02 (.05)</td>
<td>0.57 (.09)</td>
<td>.12 (.07)</td>
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<td>.87 (.03)</td>
<td>.16 (.03)</td>
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<td>0.57 (.09)</td>
<td>.12 (.07)</td>
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<tr>
<td>Adolescent Depression: B</td>
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<td>.16 (.04)</td>
<td>.14 (.10)</td>
<td>.67 (.07)</td>
<td>.24 (.09)</td>
<td>0.49 (.39)</td>
<td>.12 (.07)</td>
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<td>.62 (.10)</td>
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<td>0.42 (.39)</td>
<td>.12 (.07)</td>
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MHSU = Mental Health Service Use
likelihood of adolescents seeking care in the high economic pressure families versus adolescents in the low economic pressure families.

Adolescent Problem-Solving Moderation

The next set of analyses examined the possible moderation by adolescent problem-solving abilities. On the basis of median split, the low adolescent problem-solving subsample consisted of 184 families, whereas the high adolescent problem-solving subsample involved 190 families. Overall fit for the models testing adolescent problem-solving moderation was satisfactory. LISREL results showed an overall $\chi^2 = 244.61$, with 46 degrees of freedom ($p < .001$), GFI = .94 and CFI = .91. Common metric, standardized factor loadings for the Family Problems latent construct were satisfactory, with .60 and .58 for paternal and maternal reports, respectively.

Parameter estimates, standard errors, and t-values for the structural paths for the low adolescent problem-solving group are presented in Table 13. All of the paths were significant in the basic model. Significant direct effects for adolescent problem-solving were found for Mental Health Service Use at Wave B ($\beta = -.23$), Depression at Wave C ($\beta = -.18$), and Family Problems at Wave A ($\beta = -.30$). Thus, adolescents identified by their parents as having good problem-solving skills were less likely to seek mental health care at Wave B, were less depressed at Wave C, and lived in families having fewer family problems and conflicts than adolescents having poor problem-solving skills.

Significant differences in the two groups were found for several structural paths: Family Problems (MI = 5.48; $\beta_{\text{high}} = -.22$; $\beta_{\text{low}} = -.44$) and Antisocial Behavior (MI = 5.06;
Table 13: Structural model results for low adolescent problem-solving sample -- unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<td>.09 (.05)</td>
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<td>3.99</td>
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<tr>
<td>Adolescent Depression: C</td>
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<td>.48 8.72</td>
<td>.14 (.03)</td>
<td>-0.18</td>
<td>(0.04)</td>
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<td>4.00</td>
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<tr>
<td>Adolescent AS Behavior: C</td>
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<td>.59 11.94</td>
<td>.10 (.03)</td>
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<td>(0.04)</td>
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<td>0.43</td>
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<td>Adolescent MHSU: D</td>
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<td>.47 9.65</td>
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<td>.10 (.03)</td>
<td>.01 (.03)</td>
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<td>0.21</td>
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MHSU = Mental Health Service Use

$\beta_{\text{high}} = .19; \beta_{\text{low}} = .09$ at Wave A to Mental Health Service Use at Wave B; Mental Health Service Use at Wave B to Depression ($MI = 21.33; \beta_{\text{high}} = -.18; \beta_{\text{low}} = .14$) and Antisocial Behavior ($MI = 4.28; \beta_{\text{high}} = .00; \beta_{\text{low}} = .10$) at Wave C; Mental Health Service Use at Wave B to Mental Health Service Use at Wave D ($MI = 18.22; \beta_{\text{high}} = .16; \beta_{\text{low}} = .47$); and
Antisocial Behavior at Wave C to Mental Health Service Use at Wave D (MI = 10.83; \( \beta_{\text{high}} = 0.01; \beta_{\text{low}} = .10 \)).

In summary, adolescents low in problem-solving skills, as reported by their parents, were thus less likely to seek mental health care due to family problems, after controlling for their mental health status, than were adolescents high in problem-solving skills. These same adolescents were also more likely to seek mental health care at both Waves B and D, and were more likely to seek mental health care for behavioral problems than were adolescents high in problem-solving skills.

Adolescent Mastery Moderation

A second adolescent characteristic that was examined involved her/his sense of mastery. Again, based on a median split, the low adolescent mastery subsample consisted of 166 families; the high adolescent mastery subsample consisted of 208 families. Overall fit the model testing adolescent mastery moderation was satisfactory. LISREL results showed an overall \( \chi^2 = 269.96 \), with 46 degrees of freedom (\( p < .001 \)), GFI = .94 and CFI = .94. Common metric, standardized factor loadings for the Family Problems latent construct were satisfactory, with .93 and .54 for paternal and maternal reports, respectively.

Parameter estimates, standard errors, and t-values for the structural paths in the low adolescent mastery group are presented in Table 14. Depression at Wave A was not significantly related to Mental Health Service Use at Wave B, but Depression at Wave C was a significant, positive predictor of Mental Health Service Use at Wave D (\( \beta = -.03 \) and \( \beta = \))
.14, respectively). Several direct effects of adolescent mastery were also found to be significant: Mental Health Service Use at Wave B (β = -.66), Mental Health Service Use at Wave D (β = -.44), Depression at Wave A (β = -.39), Antisocial Behavior at Wave A (β = -.34), and Family Problems at Wave A (β = -.31). Thus, adolescents expressing high mastery

Table 14: Structural model results for low adolescent mastery sample -- unstandardized path coefficients, (standard errors), standardized path coefficients, and t-values. Predictor variables for paths shown in columns; dependent variables for paths shown in rows.

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<td>- .35 ( .06)</td>
<td>- .48 ( .07)</td>
<td>- .41 ( .06)</td>
<td>- .85 ( .09)</td>
<td>- .43 ( .06)</td>
<td>- .61 ( .06)</td>
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<td>.18 ( 6.20)</td>
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less likely to show emotional and behavioral problems, and were also less likely to seek mental health care after controlling for their mental health status.

Several paths in the basic model were significantly different for the high and low adolescent mastery groups. The path from Antisocial Behavior at Wave A to Mental Health Service Use at Wave B was significantly more negative for the high adolescent mastery group (MI = 16.97; $\beta_{\text{high}} = -.40; \beta_{\text{low}} = -.20$), whereas the path from Antisocial Behavior at Wave C to Mental Health Service Use at Wave D was significantly more positive for the high adolescent mastery group (MI = 20.20; $\beta_{\text{high}} = .12; \beta_{\text{low}} = -.01$). However, the change in the structural paths from behavioral problems to utilization are in opposite directions. When controlling for family problems and adolescent emotional problems, adolescents with high mastery were significantly less likely to utilize professional care for behavioral problems than were adolescents with low mastery. When controlling for previous service use, adolescents with high mastery were significantly more likely to utilize professional care for behavioral problems than were adolescents with low mastery. Three other paths were significantly different in these two groups: Mental Health Service Use at Wave B to Depression at Wave C (MI = 5.06; $\beta_{\text{high}} = .07; \beta_{\text{low}} = .12$), Family Problems at Wave A to Mental Health Service Use at Wave B (MI = 7.04; $\beta_{\text{high}} = -.54; \beta_{\text{low}} = -.39$), and Mental Health Service Use at Wave B to Mental Health Service Use at Wave D (MI = 7.40; $\beta_{\text{high}} = .57; \beta_{\text{low}} = .32$).

**Logistic Regression Results**

Since most studies of health service utilization use logistic regression to examine predictors of use, the basic model and its moderating variables were tested using this statistical
procedure to facilitate comparison with the results obtained with the structural equation models. Only the paths leading to service use at Waves B and D were tested with logistic regression. The results of these analyses are presented in Table 15. The value of b reported below is converted from the logistic regression output to make it interpretable as an ordinary least squares regression coefficient:

\[ b = b_{\text{logistic}} \cdot \frac{N_0 \cdot N_1}{N_{\text{total}}} \]

where \( N_0 \) is the observed number of adolescents not using mental health services, \( N_1 \) is the observed number of adolescents using mental health services, and \( N_{\text{total}} \) is the total number of adolescents in the model.

A couple of patterns emerged from the results of the logistic regression analyses. First, depression and antisocial behavior were found to be significant predictors of mental health service use, particularly in the second section of the model, which controls for previous service use. Second, very few predictors were statistically significant. Group differences in the logistic regression coefficients, \( b_{\text{logistic}} \), were tested using Z scores:

\[ Z = \frac{(b_1 - b_2)}{(SE_1^2 + SE_2^2)^{1/2}} \]

where \( b_i \) is the unstandardized parameter estimate and \( SE_i \) is the corresponding standard error. No significant differences in the b-weights associated with the various moderating variables were found for any of the predictor variables.

Goodness of fit for the various logistic regression models revealed slight differences across the regression models, from \( \chi^2 = 22.99 \) (p < .001) for the model predicting Mental Health Service Use at Wave D in the total sample to \( \chi^2 = 1.391 \) (p = .708) for the model predicting Mental Health Service Use at Wave B in the high adolescent mastery subsample.
Table 15: Logistic regression results – b, (standard errors), t-values, and odds ratios.

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<td>-.08</td>
<td>-.27</td>
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<td>ASBc to MHSUd</td>
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<td>1.11</td>
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MHSU = Mental Health Service Use; DEP = Depression; ASB = Antisocial Behavior; FAMPROB = Family Problems

The percent correctly predicted by the models was uniformly high, ranging from 87% for the model predicting Mental Health Service Use at Wave D in low parental warmth/support subsample to 98% for the model predicting Mental Health Service Use at Wave D in the high mother stigma subsample. Closer examination of the prediction tables produced by the logistic regression analyses showed that these very high percentages were primarily due to the skewness of the dependent variables. The probability of correct prediction due simply to
chance was very high as well: 90% for the model predicting Mental Health Service Use at Wave B and 84% for the model predicting Mental Health Service Use at Wave D. Very few of the models actually predicted that anyone would use a mental health service, but since so few adolescents were observed to use mental health services the resultant percentages correctly predicted were biased upward.

A summary of the results for the various models and moderators is shown in Tables 16 through 20. If a predictor variable was significant or moderated in the logistic regression for a particular model, LR is listed; if a path was significant or moderated in the LISREL solution for a particular model, WLS is listed. In examining these tables, some distinct patterns begin to appear. First, the logistic regressions analyses tended to indicate that many fewer predictor variables were statistically significant than did the LISREL results. This makes sense for the Family Problems variable at Wave A, since this is a latent construct and the LISREL models

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Table 17: Significance and direction of path from Depression at Wave A to MHSU at Wave B for the various moderator models and analysis techniques. WLS = LISREL result; LR = logistic regression result.

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Table 18: Significance and direction of path from Antisocial Behavior at Wave A to MHSU at Wave B for the various moderator models and analysis techniques. WLS = LISREL result; LR = logistic regression result.

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<th>Sample</th>
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<td>Adolescent Mastery</td>
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Table 19: Significance and direction of path from Depression at Wave C to MHSU at Wave D for the various moderator models and analysis techniques. WLS = LISREL result; LR = logistic regression result.

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<td>Adolescent Mastery</td>
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Table 20: Significance and direction of path from Antisocial Behavior at Wave C to MHSU at Wave D for the various moderator models and analysis techniques. WLS = LISREL result; LR = logistic regression result.

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will correct for attenuation of the path coefficient due to measurement error (Bollen 1989). However, the rest of the paths involved only manifest variables, and thus assume perfect measurement, both in the LISREL and the logistic regression analyses.

Some overall tendencies in the moderation of different paths can be seen from Tables 16 through 20. For example, the LISREL solutions indicated that all of the paths were significant, in all models, with the exception of the path from Antisocial Behavior at Wave A to Mental Health Service Use at Wave B in the model for adolescent problem-solving skills. Conversely, the logistic regression analyses indicated no moderating effects, for any of the variables. By contrast, in the SEM analyses, perceived economic pressure, adolescent problem-solving, and mastery each moderated three paths; gender, community mental health center, and maternal mental health services stigma each moderated two paths.
CHAPTER FIVE
DISCUSSION AND CONCLUSIONS

Both the modeling and substantive aspects of the present study indicate important considerations for mental health services research. First, the modeling results will be discussed, with an emphasis on future research on the modeling of nonnormal data. Second, the substantive issues for adolescent mental health service utilization will be examined in light of the findings of this study. Finally, policy implications that arise from these findings will be discussed.

Structural Equation Modeling of Nonnormal Data

In the area of health services research, the usual analytic technique is logistic regression analysis. However, most studies find very few significant results concerning the influence of social relations on service use. Need for care is typically found to be the strongest predictor of use, but it predicts very little of the variation in use. These findings were confirmed in the logistic regression analyses performed in the present study. An improvement may be derived by the use of structural equation modeling with latent variables. To examine the potential for using structural equation modeling techniques when the primary dependent variables are badly skewed and dichotomous, the present study use the typically
recommended approach: weighted least squares estimation, with an asymptotic covariance weight matrix. This was then tested against the logistic regression analyses.

Overall, the LISREL-WLS results from the present investigation appeared to be fairly stable and consistent; however, they showed some distinct differences with results of the logistic regression analyses. For example, a strong negative path from family problems and conflict to adolescent mental service use consistently appeared in the various LISREL models. However, this relationship never achieved statistical significance in the logistic regression analyses. Two very different conclusions would therefore be reached about the influence of family conflict on adolescent mental health service use from these data, depending on the analytical approach that is chosen. A structural equation model approach, using a latent variable, would indicate that family problems and conflicts act as an inhibitory influence on adolescent service use. Adolescents in families that experience greater conflict between parent and child appear to be less likely to receive needed mental health care than adolescents in families which experience less conflict between parent and child. As in most previous services utilization research, this important social interaction had no significant influence on adolescent service use when tested via logistic regression analysis. Similarly, the lack of any moderating effects from the logistic regression analyses would indicate very little influence from other important social and familial relationships. The overall conclusion from the logistic regression analyses would be that need for care alone determines adolescent mental health service use. Due to these differences in results, the issue becomes which analytic technique provides a more accurate description of what actually happens within these families. An
important direction for future research is a more extensive examination of the robustness of these techniques to data distribution problems displayed in the present sample.

The structural equation modeling approach used in the present study has some serious limitations. Perhaps the most critical limitation is the large sample size necessary for estimating the asymptotic covariance weight matrix. The simplicity of the basic model used in the present study helped to alleviate the consequences of this limitation. However, the simplicity of the basic model is itself a limitation. Need for mental health care is the primary predictor in this model. Important mediating processes were not included in the model to allow for the testing of critical moderating variables. In addressing these issues, some other structural equation modeling approaches to the analysis of nonnormal data have been proposed.

Bentler and his associates have recently argued that a more appropriate approach in modeling nonnormal data is to correct the test statistic rather than use a different method of estimation (Bentler 1995; Chou, Bentler, and Satorra 1991; Hu et al. 1992). As a result, a SCALED $\chi^2$ statistic has been developed, which incorporates a scaling correction for the normal-theory $\chi^2$ statistic when distributional assumptions are violated (Satorra and Bentler 1988). The scaling correction is a function of the model-implied residual matrix, the observed multivariate kurtosis, and the degrees of freedom for the model; as the multivariate kurtosis increases, so does the scaling correction, leading to a downward adjustment of the normal-theory $\chi^2$. The same underlying theory can be applied to obtain robust standard errors. In a Monte Carlo study of six test statistics under seven distributional conditions, Hu et al. (1992) reported the SCALED $\chi^2$ to be the most reliable. This is the approach taken in the EQS
program, with the procedure using an estimation technique that assumes the data are multivariate normal (e.g., maximum likelihood), but basing the assessment of model fit on statistics that have been corrected for their degree of nonnormality.

In dealing with categorical variables, Lee, Poon, and Bentler (1992; 1995) have proposed and tested a two-stage estimation procedure. First, partition maximum likelihood estimates (PML) of the variable thresholds are derived, and the matrix containing the polychoric and polyserial correlations is obtained. Then, using an asymptotic weight matrix and a generalized least-squares approach (GLS), the second stage estimates the structural model parameters. Simulation studies were performed, indicating that the asymptotic behaviors of the parameter estimates were reasonably close to multivariate normal and were quite robust, even for sample sizes as small as 100. This two-stage, PML-GLS, approach has been implemented in the most recent version of EQS/Windows (Bentler 1995).

Computational limitations in the approach arise for larger, more complex models, involving more than 20 variables.

A third approach has been the development of the CVM (continuous/categorical variable methodology) estimator by Muthén (1984, 1988). This estimator permits the analysis of any combination of dichotomous, ordered polytomous, and interval-scaled measured variables, yielding unbiased, consistent, and efficient parameter estimates. This approach is based on a strong assumption: a continuous, normally distributed ($M=0, \sigma^2=1$) latent response variable, $y^*$, is assumed to underlie each measured variable, $y$. Associations between the $y^*$'s are based on polychoric, tetrachoric, and polyserial correlations among the measured $y$ variables. A distinction is drawn between the covariance structure of the $y$'s and the
covariance structure of the underlying y*'s. When one or more of the observed variables are categorical, differences between these covariance structures can become important. A computer program has been developed, LISCOMP, that incorporates this approach in a very general manner (Muthén 1988). As in the ADF approach, a weighted least squares estimator is used. Like the ADF estimator, the estimation of a weight matrix places severe practical limits on the number of variables that can be considered (a maximum of about 25), as well as requiring rather large samples (500-1000, depending on model complexity). Simulation studies have shown the CVM estimator to perform better than the maximum likelihood and generalized least squares estimators, particularly when the observed variables have a small number of categories and are highly skewed (Muthén and Kaplan 1987; Schoenberg and Arminger 1989).

These various structural equation modeling techniques have very different fundamental philosophies regarding the best approach to analyzing nonnormal data. An important direction for future research will be to compare and contrast these approaches using data such as that found in the present study. Likewise, it is important to examine how these approaches differ from those typically used in services utilization research, and whether some consistency arises among the substantive conclusions reached in the different approaches. Clearly the very strong skew of mental health service use in the present sample taxed the analysis techniques used in this study, perhaps beyond their appropriate usefulness. Even the logistic regression analyses indicated difficulties in estimation and prediction. Future research should be undertaken to further examine the foundations upon which the different analytic techniques are formed, particularly to better understand their robustness to extremes in data distributions,
such as those found in this sample. This should include Monte Carlo simulation studies of the different SEM approaches, and bootstrap sampling techniques for testing the robustness of the logistic regression analyses.

**Adolescent Mental Health Services Utilization**

Some broad patterns were found across the various moderating models that were tested. First, family problems, as reported by the parents, significantly decreased the likelihood of an adolescent seeking professional mental health care, after controlling for the presence of depressed mood and antisocial behavior in the adolescent. Similarly, adolescent depressed mood was significantly and positively related to subsequent seeking of professional mental health care. As expected, the relationship between depressed mood and mental health service use was stronger for boys than it was for girls. Two other moderators effectively inhibited use of services resulting from adolescent depressed mood -- high economic pressure and high maternal mental health services stigma. In these subgroups of the sample, adolescent depressed mood was not significantly related to seeking care.

For antisocial behavior, the results were more mixed. Boys were more likely to seek mental health care at Wave B due to behavioral problems at Wave A than were girls, but this gender difference disappeared for mental health service use at Wave D. This could be a developmental shift for the girls, in that acting out aggressively becomes more likely to result in professional mental health care for older adolescent girls than for younger adolescent girls. Related to this point, it should be noted that the target adolescents in this study were in the eighth grade at Wave B and in the tenth grade at Wave D.
Maternal mental health services stigma and family perceived economic pressure were also significant moderators of the influence of antisocial behavior at Wave A on mental health service use at Wave B. As with the depression results, those adolescents living in families in which the mother expressed more negative views toward mental health services were less likely to seek professional care due to antisocial behavior, versus those adolescents having mothers with low mental health services stigma. Adolescents living in families experiencing low perceived economic pressure were significantly more likely to seek care for antisocial behavior problems than were adolescents living in families experiencing high perceived economic pressure. The perception of economic stress within a family therefore appears to inhibit the likelihood of an adolescent receiving needed care for emotional and behavioral problems.

The presence of a community mental health center significantly increased the likelihood of an adolescent seeking professional mental health care. This finding cannot be attributed to the influence of the community mental health center on the attitudes of parents toward mental health services, as no significant differences in parental mental health services stigma was found between those families living in a county having a community mental health center and those living in a county without a community mental health center. Thus, the availability of the service increased the likelihood of use. This is critical for rural families such as those in this sample, particularly given the very common lack of accessible mental health services in these areas.

Likewise, it was not just the attitudes about mental health services that led to choices of using or rejecting the service, but also the simple practicality of service availability. Thus,
when considering theoretical approaches to modeling decision-making processes, social structural factors do not simply act as situational factors that influence attitudes and social norms, but appear to be critically important in their own right. This stands very strongly within the SOS perspective, specifically in its focus on the interrelationship between social networks, social structures, and the individual.

The importance of individual coping characteristics were apparent in the results for adolescent mastery and problem-solving skills. Adolescents who were high in mastery and problem-solving skills were less likely to seek professional mental health care for behavioral problems, after controlling for previous levels of mental health service use, than were adolescents who were low in mastery and problem-solving skills. The influence of family problems on adolescent service use was also moderated by adolescent problem-solving skills: those adolescents high in problem-solving skills were significantly more likely to seek professional mental health care due to family problems, after controlling for their levels of emotional and behavioral problems, than were adolescents who were low in problem-solving skills. Thus, when the family environment is less conducive to help with emotional and behavioral problems, those adolescents with high problem-solving skills sought care outside of the family.

The broad picture to be taken from these results should focus on the importance of family relationships in the decision to seek professional mental health care. Individual coping resources, such as adequate problem-solving skills and a personal sense of mastery, clearly impact the need for mental health care, and the processes involved in this decision. However, these individual characteristics are formed within the family context, as indicated by the
influence of parental warmth and supportiveness for the adolescent on the need for mental health care, the presence of family problems and conflict, and the decision to seek professional mental health care. The critical role of mothers as caregivers and gatekeepers to professional care was indicated by the moderating influences of mother mental health services stigma on the adolescents’ use of mental health services. This contrasts with the lack of impact of fathers’ mental health services attitudes on these processes.

Thus, in accord with the SOS perspective, social interactions appear to form the key to understanding the decision-making processes regarding professional mental health care. In addition, certain social relations are more important than others, even within a given family setting. Broadly, however, the family context of warmth, supportive parenting, encouragement of discussion, compromise, and other good problem-solving skills, and the development of a sense of mastery, leads to a reduction in the need for mental health care, but also influences the decision-making process. Similarly, structural aspects are important, as indicated by the influence of a family living in a county having a community mental health center, and by the importance of economic pressure, both on the need for, and decision to seek, mental health care.

Strong support for the SOS perspective is presented here, particularly in the importance of social and family context on adolescent mental health services use. Not only do these factors directly influence the decision process, but the dynamics of the illness episode are apparent. The decision about mental health care involved family and social input, over an extended period of time, and in different ways for different individuals. The “black box” notions found in traditional rational choice perspectives on service use do not adequately
address these complexities. The SOS perspective is an important step towards a more satisfactory understanding of this process of making help-seeking decisions.

But the support for the SOS perspective provided by the present study is also limited in important ways. The actual process of the decision to seek or reject mental health care cannot be truly explored to the necessary depth with the present data. Not only are better measures of utilization needed, but so are measures of the processes involved in help-seeking decisions. One of the strongest limitations of this study concerns the measure for mental health service use. For example, the conclusion just presented about adolescent problem-solving skills can only be rather weakly defended, since the process of help-seeking was not more intricately examined. Did these adolescents seek care on self-initiation, or were they sent to treatment by somebody (e.g., school counselor, minister, parent)? Did these adolescents seek advice from peers, parents, or other adults about seeking treatment? The service use variables available in this study give only hints about these aspects of the decision-making process. The question of the rationality of the decision about mental health care also remains open. To address these issues, the data need to be more closely spaced in time, and must involve more intricate and intensive measures of how the decision to seek care was reached.

Policy Implications

Recent analyses of the economic impact of mental illnesses, excluding substance abuse problems, placed the total costs at over $100 billion in 1985 (Rochefort 1994). This was then broken down into direct treatment ($40 billion), lost economic productivity ($56 billion), and
family caregiving and other costs ($4 billion). But mental illnesses are not only economically expensive for the public, they also play various roles in social disorder and community disruption, having been linked with homelessness and criminal activities (Rochefort 1994). Indeed, social problems cannot be adequately addressed without also considering mental health care policies.

Among the mental health policy themes recently identified by the Intergovernmental Health Policy Project (Child Mental Health 1993) as being particularly important is the need for family support and preservation in making mental health and social services more family-friendly and child-focused. As shown in the present study, family processes and characteristics are critical aspects of the social relationships that lead to adolescent mental health service use. Thus, it is especially important to consider families as the central component of any mental health treatment program, helping families provide important resources for their child's problems and treatment. These concerns are particularly critical in rural areas, in which, as indicated in the above literature review, mental health services tend to be much less accessible and more inadequate, especially for treating the problems of rural children and adolescents.

In the present political environment of broad cutbacks in federal funding for social programs, it is especially important to understand the social context of the family. The present study showed the value of strong emotional support and economic stability within the family in helping adolescents grow and learn to cope with emotional and behavioral difficulties. However, these are issues that typically get quickly dropped from the public agenda. Indeed, much of the recent health care reform debate has focused on economic
issues, particularly cost containment. When the overriding concern is to save money for various levels of government, particularly through combining human service programs into block grants to the states, accompanied by reductions in federal funding, the social costs within communities and families can become quite large. Also contributing to these difficulties, the collapsing of child and adolescent mental health programs into mental health block grants to states has taken place primarily at the bureaucratic level, and not through consolidating and coordinating the actual mental health programs (Koyanagi 1994).

If a family is unable to meet the costs of mental health treatment for their children, treatment will not be obtained. If a family feels that the mental health services in their community are inadequate or inaccessible, they will not seek needed care for their children. If a family is not supported in raising emotionally healthy children, the economic costs for the public will become even greater than the present high levels discussed above. Some programs recently proposed have the potential for addressing these issues. Unfortunately, the present, tentative efforts to develop collaborative treatment plans and common mental health care agendas at the federal level may be ending, even before they have really started (Koyanagi 1994).

Problems will arise for all of us. To be able to address them adequately, we each must learn appropriate ways of coping and help-seeking. From the present study, it is apparent that adolescents need to have a family and social environment that is conducive to the development of these skills. This involves a stable economic foundation for the family, warm and supportive parenting, and an accessible and effective social service system. Policies that
support these goals, empowering and encouraging adolescents and their families, providing a strong foundation for healthy growth into adulthood, and working towards an adequate, affordable, and accessible system of mental health care, should themselves be strongly supported.
APPENDIX

MEASURES USED IN THE STUDY

*Adolescent Mental Health Service Use (self report)*

During the past 12 months, have you been to see someone to help you with a personal or emotional problem like a doctor, counselor, therapist, psychologist, psychiatrist or someone like that?

1 - yes  
2 - no

*Adolescent Depression (self report)*

Indicate how much discomfort that each problem has caused you during the past week including today. During the past week, how much were you distressed or bothered by ...

1 - not at all  
2 - a little bit  
3 - a moderate amount  
4 - quite a bit  
5 - extremely

Feeling low in energy or slowed down.  
Thoughts of ending your life.  
Poor appetite.  
Feelings of being trapped or caught.  
Blaming yourself for things.  
Feeling lonely.  
Feeling blue.  
Worrying too much about things.  
Feeling no interest in things.  
Feeling hopeless about the future.  
Feeling everything is an effort.  
Feelings of worthlessness.
Adolescent Antisocial Behavior (self report)

Please circle the number which tells how much each statement is like you.

1 - not at all  
2 - a little  
3 - somewhat  
4 - a lot  
5 - exactly  

If someone hits me first, I let him have it.  
When someone makes a rule I don't like, I want to break it.  
When I get mad, I say nasty things.  
When people yell at me, I yell back.  
If someone annoys me, I tell him what I think of him.  
When someone is bossy, I do the opposite of what he/she asks.  
If I have to use physical violence to defend my rights, I will.

Adolescent Mastery (self report)

How strongly do you agree or disagree with these statements about yourself?

1 - strongly agree  
2 - agree  
3 - neutral/mixed  
4 - disagree  
5 - strongly disagree  

There is really no way I can solve some of the problems I have.  
Sometimes I feel that I'm being pushed around in life.  
I have little control over the things that happen to me.  
I can do just about anything I really set my mind to.  
I often feel helpless in dealing with the problems of life.  
What happens to me in the future mostly depends on me.  
There is little I can do to change many of the important things in my life.
Adolescent Problem Solving (Parent Reports)

Now think about what usually happens when you and the target child have a problem to solve. Think about what he or she does. When the two of you have a problem to solve, how often does the target child...

1 - always
2 - almost always
3 - fairly often
4 - about half the time
5 - not too often
6 - almost never
7 - never

Listen to your ideas about how to solve the problem.
Ask what you would like to do to solve the problem.
Just seem to get angry.
Have good ideas about how to solve the problem.
Agree with you about how to solve the problem.
Criticize you or your ideas for solving the problem.
Ignore the problem.
Show real interest in helping to solve the problem.
Willingly consider many alternatives for solving the problem.
Refuse, even after discussion, to work out a solution to the problem.
Blame others for the problem.
Insist that you agree to his or her solution to the problem.
Compromise or change his or her point of view to help solve the problem.

Parental Warmth/Support to the Target Child (Self Report)

During the past month, when you and the target child have spent time talking or doing things together, how often did you...

1 - always
2 - almost always
3 - fairly often
4 - about half the time
5 - not too often
6 - almost never
7 - never
Get angry at him/her.
Let him/her know you really care about him/her.
Criticize him/her or his/her ideas.
Shout or yell at him/her because you were mad at him/her.
Act loving and affectionate toward him/her.
Let the target child know that you appreciate him/her, his/her ideas, or the things he/she does.
Help him/her do something that was important to him/her.
Argue with him/her whenever you disagreed about something.
Hit, push, grab, or shove him/her.

**Parental Mental Health Services Stigma (self report)**

How much do you agree or disagree with the following statements about your feelings regarding professional help for emotional problems?

1 - strongly agree
2 - agree
3 - neutral/mixed
4 - disagree
5 - strongly disagree

If I had a serious emotional problem, I would not go for professional help.
I would feel comfortable talking to a professional if I had a personal problem.
I would be embarrassed if my friends knew I was getting professional help for an emotional problem.
Most people with emotional problems who see a professional don’t get very much help.
Most people with an emotional problem get better even without professional help.
If anyone in my family needed professional help for an emotional problem, we could find the help we need close by.

**Family Problems (parent reports)**

Please circle the number which indicates how often you and your children in the study disagree or get upset about the following topics:

0 - never
1 - hardly ever
2 - only sometimes
3 - quite often
4 - all the time
Money
School grades/homework
Choice of friends
How they spend their free time
Curfews
Chores at home
School activities
Family time together
Alcohol
Drugs
Tobacco
Clothes and/or appearance
Movies/TV
Church
Fighting with brothers/sisters
Dating
Outside jobs
Attitudes/respect
Discipline
Transportation to places/use of family car
Eating habits.

Economic Pressure (parent reports)

Indicate how much you agree or disagree with each of the following statements.

1 - strongly agree
2 - agree
3 - neutral/mixed
4 - disagree
5 - strongly disagree

My family has enough money to afford the kind of home we would like to have.
We have enough money to afford the kind of clothing we should have.
We have enough money to afford the kind of furniture or household equipment we should have.
We have enough money to afford the kind of car we need.
We have enough money to afford the kind of food we should have.
We have enough money to afford the kind of medical care we should have.
My family has enough money to afford the kind of leisure and recreational activities we want to participate in.
Our income never seems to catch up with our expenses.
Think back over the past year and tell us how much difficulty you had with paying your bills. Would you say you had...

1 - a great deal of difficulty
2 - quite a bit of difficulty
3 - some difficulty
4 - a little difficulty
5 - no difficulty at all

Think again over the past 12 months. Generally, at the end of each month do you end up with

1 - more than enough money left over
2 - some money left over
3 - just enough to make ends meet
4 - not enough to make ends meet

In the last 12 months, has your family made any of the following adjustments because of financial need?

1 - yes
2 - no

Your children dropped plans for going to college?
Postponed major household purchase(s)?
Changed residence to save money?
Reduced charitable contributions?
Reduced or let life insurance lapse?
Reduced or eliminated medical insurance?
Reduced or eliminated auto or household insurance?
Changed food shopping or eating habits to save money?
Reduced driving the car to save money?
Reduced household utility use?
Cut back on social activities and entertainment expenses?
Postponed medical/dental care?
Fallen behind in paying bills?
Postponed a planned vacation?
Postponed or delayed paying property tax?
Forfeited a contract for land or other property?
REFERENCES


ACKNOWLEDGEMENTS

It has been a privilege to work with an excellent committee, both professionally and personally: Professors Rand D. Conger, Meg Gerrard, Gloria Jones Johnson, and Mack Shelley. Each of the members has helped me focus and refine my often terribly disjointed ideas. I especially appreciate the gentle encouragement, guidance, and strong support given me by my major professor, Daniel W. Russell. I have very much come to enjoy the times he has said to me, "Now, if you want to try something really bizarre..." Many friends helped me along this journey, and I am left humbled and very grateful for their continued support and friendship. Finally, my family has been especially encouraging to this "career student," to move beyond the security of a student's life, and to join the so-called real world. Hey, I'm gettin' there. Special thanks go to my mother, Jean, my brother, Dave, and my sisters, Carol and Leann. They have provided the foundation from which arises any success that I experience, and the grace and courage to face with a peaceful heart the difficulties that also come.