

Social and Economic Determinants of Disparities in Professional Help-Seeking for Child Mental Health Problems: Evidence from a National Sample

Frederick J. Zimmerman

Objective. To test the role of social determinants—including race, education, income, and demographic factors—of child mental health services use, defined as having had a visit to a mental health professional for depression, attention-deficit, or for any reason.

Data Sources/Study Setting. National Longitudinal Survey of Youth and the Child/Young Adult supplement, a nationally representative sample of 7–14-year-old children born to women who were 14–22 years old at the start of data collection, in 1979. African Americans and Latinos were over-sampled, and population weights are available to make nationally representative inferences.

Study Design. Indicators of mental health service use were regressed on social and economic determinants, family structure variables, and insurance variables, controlling for need as captured by several different symptom scales.

Principal Findings. Girls are much less likely to obtain needed treatment for externalizing behavior disorders than are boys, and are somewhat less likely to obtain needed treatment for depression than boys. Middle children are less likely to obtain needed treatment for any mental health problem than are oldest, youngest, or only children. The presence of the father inhibits the likelihood that the child will receive treatment, particularly for depression. African Americans and Latinos are less likely than white children to receive treatment. In contrast to these rich results for the social and demographic determinants of children's specialty mental health utilization, the economic and insurance variables (including maternal education and income) seem to hold little predictive power.

Conclusions. These results argue for interventions to sensitize parents—especially fathers—to the need to pay attention to the mental health needs of their children, in particular girls and middle children. The analysis also suggests that the literature on intrahousehold decision making and on the gender dimensions of investment in children is worth extending to mental health treatment decisions.

Key Words. Child mental health, mental health services utilization, social determinants

Considerable evidence exists that children's mental health problems are undertreated, with fewer than half and as few as 11 percent of children who screen positive for some disorder actually receiving treatment (Zahner et al. 1992; Cohen and Hesselbart 1993; Leaf et al. 1996; Costello et al. 1997; Verhulst and van der Ende 1997; Farmer et al. 1999; Haines et al. 2002). Undertreatment for mental health problems is especially tragic, given that depression, attention-deficit, hyperactivity, and other mental health problems have been shown to interfere not only with children's current well-being, but also with educational attainment and future job performance, and therefore with future psychosocial and economic well-being (Mannuzza et al. 1997; Velting and Whitehurst 1997; Caspi et al. 1998; Fergusson and Horwood 1998). The importance of these problems is heightened by the fact that over the last 50 years, the trend has been for ever earlier onset of mental health problems, now reaching well into childhood (Burvill 1995).

The decisions to seek treatment for children's mental health issues occur in a peculiar environment, substantively unlike other health care decisions for children and even unlike adult mental health treatment decisions. For this reason, the study of the social and economic determinants of children's mental health services use is particularly important. Children's mental health problems may develop slowly, subtly, or be difficult to distinguish from normal—although at times difficult—child and adolescent development. Depression in children (as for some adults) can manifest as physical symptoms, sometimes without report of psychological symptoms (Stewart 2003). Moreover, children rarely seek treatment on their own; instead parents make decisions about whether and how to seek treatment. However, they do so in a social context that can be confusing. Parental perceptions or concern about stigma surrounding mental health problems continue to exist, and this stigma is strengthened by a belief on the part of many parents that effective treatments are not available, or that their child will not be well served by mental health providers (Richardson 2001; Starr, Campbell, and Herrick 2002). Finally, for most health issues the child's primary care provider can provide some clarity and insight for parents as to the best care for their child. For mental health issues, however, many primary care providers are unsure of appropriate treatments and not comfortable dealing with mental health (Geller 1999). School teachers and counselors exhibit some influence on the process (Farmer

Address correspondence to Frederick J. Zimmerman, Ph.D., Department of Health Services and Child Health Institute, University of Washington, 6200 NE 74th Street, Suite 210, Seattle, WA 98115-8160.

et al. 2003), and this influence may or may not align well with the parents' own perceptions of the child's need for treatment. At the same time, dedicated school mental health programs, which are becoming increasingly common, are potentially very important mechanisms for the identification and referral of needy students (Rones and Hoagwood 2000; Haynes 2002).

It is only a slight exaggeration to say that from the perspective of many parents, they must decide whether to seek a stigmatized solution that might not work for a problem that they are not sure exists, often with little help from their trusted health advisors. In this environment, the social context in which care decisions occur can become especially salient. Existing research has indeed identified important socioeconomic determinants of the decision to seek help, and in particular to seek help from a mental health professional.

Income has been shown in several studies to have an effect on seeking treatment, either independently (Cohen and Hesselbart 1993; Haines et al. 2002) or as an interaction with symptom severity (Cunningham and Freiman 1996), although the effect of income is considerably less or nonexistent in Europe (Gasquet et al. 1997; Verhulst and van der Ende 1997). Insurance effects in the U.S. have been shown to be modest: one study finds an effect for Medicaid as opposed to no insurance, but no effect for private insurance versus no insurance (Cunningham and Freiman 1996). Another study found that almost all of 98 insurance plans queried covered depression care for adolescents (Fox, McManus, and Reichman 2003). Interestingly, several studies have failed to find an effect for parental education, when income and insurance are controlled (Cunningham and Freiman 1996; Verhulst and van der Ende 1997).

Other demographic factors have been shown to have meaningful effects. Girls in Britain are less likely than boys to get treatment, conditional on morbidity (Haines et al. 2002), but girls in France and Québec are more likely to get treatment (Gasquet et al. 1997; Salomon and Strobel 1997). In the U.S. and the Netherlands, no effect of child gender was found in several studies (Cohen and Hesselbart 1993; Cunningham and Freiman 1996; Verhulst and van der Ende 1997; Witt, Kasper, and Riley 2003), while significant effects were found in other studies (Bussing, Zima, and Belin 1998; Bussing et al. 2003), particularly for treatment of Attention Deficit Hyperactivity Disorder (ADHD).

Mothers who themselves have used mental health services are more likely to seek mental health care for their children, controlling for the child's symptomology in some studies (Dulcan et al. 1990; Cunningham and Freiman 1996), but not in others (Riley et al. 1993). It is not clear whether this effect,

where it exists, is because of the mother's experience of mental health treatment, or to her experience of the mental health problem itself.

African Americans, and to a less pronounced extent, Hispanics, are less likely to obtain mental health services, controlling for symptomology (Cunningham and Freiman 1996; Kataoka, Zhang, and Wells 2002; Leslie et al. 2003; Richardson et al. 2003; Sturm, Ringel, and Andreyeva 2003; Slade 2004), as are Native Americans (Riley et al. 1993; Costello et al. 1997).

Some potentially important social variables have not been explored. For example, it has been shown in some studies (e.g., Mott, Kowaleski Jones, and Mehaghan 1997) that the presence of the father in the household is protective against behavioral problems in children—although other studies fail to find such an effect (e.g., Crockett, Eggebeen, and Hawkins 1993). Mother-only families have been found to be 70 percent more likely to treat mental health problems, controlling for the child's symptoms and functional status (Cunningham and Freiman 1996), but this may be because mother-only families are more likely to have experienced a recent divorce or separation, which sensitizes the mother to the need for psychological counseling for her children. Accordingly, it remains unclear whether the father's presence increases the likelihood of the child receiving mental health treatment when there is a need. Similarly, the number of adults in the household might be expected to influence the probability of treatment, especially if there are important time constraints in seeking out specialty treatment. This issue, too, has never been examined. Finally, birth order has been shown to have an impact on other forms of investment in children, such as education (Datcher Loury 1988; Hanushek 1992), but birth order, too, has not been examined in the context of children's mental health services use.

Much of the work that has been done on the determinants of children's mental health services use has not differentiated among types of disorders. Yet, the few studies that have made such distinctions have found differences. For example, in the Great Smoky Mountains study, girls were shown to be less likely than boys to have treatment for ADHD, conditional on need (Angold et al. 2000). Such results suggest that it would be useful to further the previous analyses by breaking out at least the two most common disorders in childhood, depression and ADHD.

The existing research can be profitably extended in several other dimensions, as well, most notably by contributing to greater understanding of outstanding questions such as the role of income, the child's gender and the mother's own mental health services use. Many of the previous studies have

used small clinic-based samples, or samples of children from a single community or geographical area.

This paper uses the National Longitudinal Survey of Youth and the Child/Young Adult supplement (NLSY-C/YA), a nationally representative sample of 7–14-year-old children to assess the social and economic determinants of the probability of seeking mental health specialty treatment for any mental health problems, and for depression and attention problems separately.

AN EMPIRICAL MODEL OF CHILDREN'S MENTAL HEALTH SERVICES USE

The above brief review of the literature suggests the following simple model of the determinants of the probability of treatment (T) for children's mental health problems. We assume that T is a function of the level of symptoms (S); of a series of socioeconomic status indicators (SES) including education, race, and income; of a series of insurance-status indicators (Ins); of traumatic events (E); of the child's genetic background (G), which includes the parental mental-health history; and of demographic characteristics (D) such as family structure, birth order, and gender of the child.

In the analysis here, the treatment probability was modeled in a logit regression:

$$T = \lambda(\alpha_0 + S\alpha_1 + SES\alpha_2 + Ins\alpha_3 + E\alpha_4 + G\alpha_5 + D\alpha_6) \quad (1)$$

where λ is the logit link function.

As a subanalysis, the potential reverse-causality of treatment on symptoms was controlled through the use of instrumental variables regression (Angrist, Imbens, and Rubin 1996; Greene 2000; Greenland 2000; Angrist and Krueger 2001), with the underlying risk of mental health problems instrumented by infant temperament scores and by grandparents' depression status. The results were substantially similar to those resulting from the estimation of equation (1): the signs, magnitudes, and patterns of significance in the coefficient estimates was the same, and none of the paper's conclusions was altered. Therefore, the simpler model is retained for presentation here. A full exposition of the instrumental variables estimation, with results, is available upon request from the author.

DATA SOURCE

Data for this study were drawn from the National Longitudinal Survey of Youth 1979 Children and Young Adults (NLSY-Child), an outgrowth of the original National Longitudinal Survey of Youth 1979 (NLSY79). The NLSY79, sponsored by the U.S. Department of Labor, began with a nationally representative sample of almost 12,700 individuals aged 14–22 years in 1979 who have been interviewed annually or biennially since. Blacks and Latinos were over-sampled to provide statistical power for analyses involving these important subgroups, and population weights are available to draw valid national inferences. In 1986, the biennial NLSY-Child was begun as an extensive collection of information for over 11,000 children of the female respondents to the NLSY79 regarding developmental assessment, family background, home environment, and health history (Center for Human Resource Research 2000). Information for the NLSY-Child is obtained from the mother, the interviewer, and sometimes the child (depending on the child's age). The records from NLSY79 and NLSY-Child are linkable via the mother's sample identification number. Data from both the NLSY-Child and NLSY79 were pulled for this study using the CHRR Database Investigator Software (Center for Human Resource Research, The Ohio State University, Build 1.4.1.57).

The initial cohort of respondents constituted a nationally representative sample of the U.S. population. Attrition has been low overall and evenly distributed across relevant subgroups (U.S. Department of Labor 2000). Follow-up rates for the NLSY range from 85 to 90 percent by the late 1990s, and these rates are similar across different ethnic groups (U.S. Department of Labor 2000). As a result, the analysis sample is highly representative of adults in the U.S. who are about 30 years old, not counting recent immigrants. Variables measured in the NLSY include a wide variety of high-quality health, demographic, and economic variables on both the parents and the children.

The sample included 2,487 children who were 7–14 years old in the year 2000, the most recent survey wave available. Because of missing data in the treatment or symptom data, the analytical sample included between 2,205 and 2,255 children depending on the sample. For one set of regressions, data on 1,252 children aged 10–14 years was used. Population weights were used to make nationally representative inferences, and the Huber–White estimator of variance was used to adjust the estimated standard errors to account for clustering of children within families.

Description of Variables

Table 1 presents descriptive statistics on the variables used in the study. The outcome of interest is maternal report of whether the child had seen a specialty mental health service provider since the previous interview (about two years before), including visits to psychiatrists, psychologists, or counselors for any emotional, behavioral, or mental health problem. A follow-up question asked the reason for the visit, so that we were able to analyze visits for depression and for externalizing behavior problems separately. In what follows, "behavior problems" will be used as shorthand for externalizing behavior problems, which included the following three possible reasons for seeking help: "Attention Deficit/Hyperactivity Disorder (ADHD, ADD)," "Behavior Problems in School/Preschool," "Unmanageable, Temper Tantrums, Disruptive, Hyperactive."

Symptoms were measured as the child's score on either the depression subscale, or the externalizing subscale, or the maximum of these two values, on the behavior problems index (BPI), specifically designed for the NLSY-Child. Each was a maternal report, and referred to the child's general behavior, not for any specific recent time period. The externalizing subscale was used (as opposed to, for example, the hyperactivity subscale) to capture the variety of externalizing behavior that might prompt parents to seek treatment for behavior problems. The BPI is a maternal-report instrument derived from the Achenbach child behavior checklist and other child behavior scores, from which comprehensive factor analysis was performed to determine which items to include in the BPI and in its subscales. The overall score was shown to have an α of 0.89 for children and 0.91 for adolescents. The 2-week test-retest reliability of the overall scale has been reported at 0.92. Cronbach's α for the overall scale has been reported to be 0.88; with α 's of 0.86 for the externalizing subscale (Rogers, Parcel, and Menaghan 1991); and 0.65 for the depressed subscale (Baker et al. 1993). Symptom scores were normed by dividing the raw scores by the standard deviation to facilitate interpretation of the results.

The internalizing symptoms are used to predict specialty visits for internalizing disorders; and the externalizing symptoms are used to predict specialty visits for externalizing disorders. A brief justification is in order for the use of the maximum of the internalizing and externalizing scales in the regression predicting any mental health visit. Often what is used is the full scale of the BPI, which is in effect an average of the two scales. Yet this is unsatisfactory as a driver of the need for a visit. A child may score very high on one subscale, and yet quite low on another subscale. Accordingly the child's

Table 1: Descriptive Statistics of Sample Variables

	<i>N</i>	<i>Mean</i>	<i>SD</i>
Dependent variables			
Any specialty mental health visit	2,487	6.17%	
Depression visit	2,487	2.98%	
ADHD visit	2,487	3.42%	
Explanatory variables			
Maximum of normed BPI depression score and normed BPI externalizing score	2,331	8.03	1.02
Normed BPI depression score	2,324	7.99	1.00
Child-assessed depression inventory	1,296	5.62	2.48
Normed BPI externalizing behavior score	2,267	7.04	1.00
Social and demographic variables			
Child is female	2,487	48.8%	
Child middle birth order	2,487	45.8%	
Child youngest birth order	2,487	23.1%	
Only child	2,487	15.4%	
Number of children in household	2,485	2.64	1.22
Number of adults in household	2,482	1.98	0.67
Father present	2,487	62.6%	
African American	2,482	0.24%	
Latino	2,482	0.15%	
Native American	2,482	0.05	
Parents divorced, etc., since last interview	2,487	6.4%	
Mother ever diagnosed with depression	2,487	2.4%	
Mother's CESD score	2,475	20.38	9.44
Mother's self-esteem score	2,473	32.73	3.67
Child is in private school	2,439	13.4%	
Socioeconomic status (SES) variables			
Mother's education (years)	2,486	13.36	2.36
Mother currently employed	2,487	0.72	0.45
Log of household income	2,472	10.60	0.98
Child covered by insurance	2,476	84.0%	
Child covered by medicaid	2,477	16.3%	
Parents have private insurance	2,487	77.4%	
Parents have government insurance	2,487	9.6%	
Parents belong to HMO	2,487	54.2%	
Whether an MH visit must be preauthorized	2,487	54.8%	
Control variables			
Child's age (in months)	2,487	127.07	28.84
West	2,487	17.7%	
South	2,487	37.4%	
Northeast	2,487	16.0%	
Suburban	2,487	68.6%	
Rural	2,487	5.4%	
Excluded variables			
Maternal report of whether any grandparent was depressed	2,487	0.7%	
Fearfulness at age 2 years	2,487	8.58	3.45
Negative hedonic affect at age 2 years	2,487	21.89	5.21
Inattentiveness at age 5 years	2,487	18.86	4.26
Depression at age 6 years	2,487	100.50	12.23

average score, or total symptom score, will be average or moderately high, yet his or her need might be much higher than average. Therefore, need is best represented by the maximum of the externalizing and internalizing scales—a high score in any domain constitutes need and should trigger a visit regardless of the child's score on any other domain measured.

For children aged 10 years and over, a child-report depression inventory was administered, including nine questions addressing such issues as how often the child feels sad or blue; how often the child feels tired; how often lonely; and so forth. Summing the scores yielded a depression score that ranges from 0 to 14.

Socioeconomic variables include the parent's income, the mother's education and employment status, and the parents self-reported race/ethnicity. A rich set of insurance variables were available, including dummy variables for whether the child had insurance, whether the child was covered by Medicaid, whether the parents had private insurance or government insurance (as opposed to no insurance), whether the parents were in an HMO, and whether prior authorization was required for a mental health visit. Variables for both the child's insurance status and the parents insurance status were included in the regressions because many children for whom no insurance was reported were in fact covered under their parents' policy.

Because schools are important in the identification, referral, and even treatment, it would be useful to have data on what kinds of mental health programs, if any, are in place in the child's school. Unfortunately, no such data are available in this data set. A single question on whether the child attends private or public school was asked, and is included here as a possible confounder of the socioeconomic variables.

Demographic characteristics of the child and household include the number of children and the number of adults in the household to control for the amount of time and financial resources available for specialty help-seeking. Whether the father was present in the household was included to control for possible gender-based differences in attitudes toward mental health treatment. Since both income and the number of adults in the household are independently controlled, the effect of the "father present" variable should indicate such preference effects, rather than a relaxation of resource constraints. Dummy variables were included for whether the child was a middle, youngest, or only child (oldest, but not only, child being the reference category).

Because parents may proactively seek specialty mental health treatment for their children in the event of major family disruption, a dummy variable was included indicating whether the child's parents had been

divorced, separated, or (for a very small number) widowed since the previous interview.

Two variables were used to represent the mother's mental health history and past treatment: her average score on the Center for Epidemiologic Studies Depression (CESD) instrument over the previous three survey waves represents her recent experience of depression; and her report of whether she had ever been formally diagnosed with depression represents her experience with mental health treatment. No information was available on other mental health issues, and no mental health information of any sort was available for the father. These are not perfect measures. For example, mother's CESD score may be only loosely correlated with depression. But they are reasonable proxies for the underlying constructs and far better than not controlling for these important constructs at all.

SOCIOECONOMIC DETERMINANTS OF CHILDREN'S SPECIALTY MENTAL HEALTH TREATMENT

Table 2 presents coefficient estimates from the logit regression equation (1). In each of the regressions, child's symptomology is strongly and meaningfully associated with the probability of receiving treatment. Controlling for household size, the presence of the father has a large, negative impact on the probability of receiving services, especially for depression. Girls are less likely to receive treatment overall, and the effect is strongest in the treatment for behavior problems. Middle children are less likely than oldest children to receive treatment for any reason, and for depression and behavior problems separately analyzed. Divorce in the recent past 2 years raises the probability of help-seeking, particularly for depression, and recent maternal experience with depression increases the probability of specialty help-seeking for depression; there is no effect of the mother's report of having been formally diagnosed for depression, a measure of her experience with depression treatment.

Children of employed mothers are more likely to get treatment overall and for depression in particular. None of the other socioeconomic status variables is significantly associated with treatment, and almost none of the insurance variables are—the sole exceptions being that having government insurance is associated with a greater probability of receiving treatment for behavior problems and private parental insurance with a reduced probability of treatment. Race/ethnicity is significant in several of the regressions: African Americans are less likely than whites, other things equal, to have treatment for

Table 2: Endogenous Logit Reduced-Form Logit Estimates of Children's Mental Health Specialty Visits

	1		2		3		4	
	Any Visit		Depression Visit		Depression Visit		Behavior Problem Visit	
	OR	p-value	OR	p-value	OR	p-value	OR	p-value
Maximum of depression score and externalizing score	2.888	.000						
Normed BPI depression score			2.971	.000				
Child-assessed depression inventory					1.219	.008		
Normed BPI externalizing behavior score							2.936	.000
Child is female	0.311	.000	0.576	.050	0.918	.827	0.188	.000
Child middle of birth order	0.471	.021	0.260	.005	0.278	.017	0.505	.100
Child youngest of birth order	0.997	.993	0.898	.765	0.748	.630	0.755	.553
Only child	1.010	.980	0.857	.740	0.350	.147	0.820	.725
Number of children in household	0.829	.117	0.839	.310	0.793	.293	0.795	.143
Number of adults in household	1.227	.294	1.518	.047	2.083	.000	1.281	.322
Father present	0.519	.030	0.463	.054	0.241	.005	0.564	.150
Child is in private school	1.706	.124	2.405	.050	0.977	.969	1.436	.489
African American	1.066	.850	0.276	.022	0.141	.001	1.368	.477
Latino	0.331	.017	0.276	.044	0.300	.084	0.153	.008
Native American	1.194	.634	1.062	.894	1.231	.744	0.872	.778
Parents divorced, etc.	2.782	.008	3.550	.005	2.644	.054	2.259	.117
Mother ever diagnosed with depression	1.558	.468	2.138	.241	2.189	.335	2.127	.292
Mother's CESD score	1.036	.007	1.055	.002	1.041	.061	1.008	.641
Mother's education (years)	1.274	.654	1.354	.762	0.687	.502	1.533	.483
Mother's education (years)-squared	0.994	.742	0.995	.876	1.019	.342	0.986	.505
Mother currently employed	1.728	.058	2.348	.015	1.742	.285	1.603	.249

Log of household income	1.170	.404	1.061	.805	0.724	.241	1.038	.893
Child covered by insurance	1.347	.478	0.785	.679	1.344	.596	1.147	.796
Child covered by medicaid	1.278	.526	0.904	.834	0.867	.791	1.005	.993
Parents have private insurance	0.409	.097	0.524	.361	0.428	.161	0.554	.395
Parents have government insurance	1.119	.822	0.989	.986	2.499	.195	2.755	.064
Parents belong to HMO	1.189	.601	0.917	.839	1.758	.391	1.519	.322
MH visit must be preauthorized	1.389	.314	1.405	.449	1.257	.708	1.409	.415
Child's age (in months)	1.064	.088	1.009	.856	0.840	.462	1.128	.015
Child's age (in months)-squared	1.000	.136	1.000	.960	1.001	.462	1.000	.017
West	1.596	.209	1.246	.674	1.100	.861	1.139	.787
South	1.017	.952	0.929	.841	1.358	.512	0.997	.994
Northeast	0.870	.734	0.780	.658	1.256	.723	0.876	.803
Suburban	1.064	.827	1.069	.847	1.461	.468	1.478	.397
Rural	0.332	.128	0.431	.386	0.724	.795	0.885	.886
<i>N</i>	2,255		2,248		1,252		2,205	
χ^2 (41)	237.70		250.44		97.55		187.71	
<i>p</i> -value of χ^2	.000		.000		.000		.000	
Pseudo- <i>R</i> ²	0.279		0.308		0.243		0.310	

depression, and the effect is quite large, whether symptomology is controlled through maternal report or through child report. Latinos are less likely than whites to obtain treatment for depression or behavior problems. This effect size too is large. These results corroborate a general sense in the literature, encapsulated for adults in the recent Surgeon General's report on minority mental health (U.S. Department of Health and Human Services 2001), that minority status places people at risk for inadequate treatment. Children who attend private school are more likely to get treatment for depression than are children who attend public school. Rural residents are no less likely to obtain treatment than nonrural residents, controlling for other factors.

It has been suggested in the literature that the failure to find an effect for SES or insurance on treatment probability might be because of having a large number of nonneedful people in the sample (Cunningham and Freiman 1996). For the reason the regression was also run on a subsample of children with high values of the symptom variables. The results (not reported) are quite similar to those for the full sample, although because of much smaller sample sizes, some results become insignificant. The symptomology variables are still significant, and of a similar magnitude. The SES and insurance variables continue to be insignificant, with very high p -values.

DISCUSSION

Much of the literature has found an association between needs and services use (Cunningham and Freiman 1996). However, the analysis here differs from most previous results in three important dimensions. First, this analysis covers only visits to specialty mental health providers, including psychiatrists, psychologists, and mental health counselors. To the extent that children's mental health concerns are addressed by primary care providers, such treatment is missed here. Second, most previous research has not broken down mental health needs and treatment by indication. Third, most previous research has focused on need as a dichotomous concept, whereas these regressions test whether increasing need leads to increasing likelihood of treatment.

Many of the family structure variables are highly significant and provide important insights into the social determinants of children's mental health services use. Girls are less likely to receive treatment overall, and much less likely to receive treatment for behavior problems in particular. Controlling for symptom level, girls are less than one-fifth as likely as boys to get needed

treatment for behavior problems such as ADHD. Since these results control for symptom severity, it would appear that parents are neglecting the behavioral problems of their daughters more than those of their sons. This result confirms some of the previous research in this area (Bussing et al. 1998, 2003), which as mentioned above is contradictory. A possible reason for gender differences is that parents may think of behavioral problems as particular to boys and therefore are not sensitized to the need for treatment for some girls. Unfortunately, this gender disparity is not reversed in depression care, where girls are about half as likely as boys to get needed treatment.

Children in the middle of the birth order are less likely than oldest children to receive treatment overall and for both depression and behavior problems in particular. This result is noteworthy and important in that it is on the one hand consistent with a literature in economics that shows differences by birth order in the investment in children's health and nutrition, while on the other hand it extends this literature quite meaningfully by finding such a result for the United States: previously the literature has focused on developing countries. By contrast, unlike this literature, we do not find an effect for the total number of children. This result would appear to place U.S. families closer to Dutch families, in which family size was found to not be significant in one study (Zwaanswijk et al. 2003) as opposed to Finnish families, in which an effect of family size was found (Sourander et al. 2001).

As expected, a larger number of adults in the household appears to relax time or other resource constraints and facilitates children receiving treatment for depression. Previous research has provocatively found that one-parent families are more likely to use services (controlling for recent changes in family structure), but not *less* likely to have unmet need (Zwaanswijk et al. 2003). This study enhances these results in two ways. First, the results here suggest that since the *number* of adults matters, not just having a two-parent family, the effect may be about resource constraints. Grandmothers may be just as effective as husbands at making sure children get needed treatment. Or indeed more so. Controlling for the number of adults, the presence of the father in the results here inhibits children getting treatment in general and for depression in particular. One possible explanation for this result may be that fathers are more inimical to the idea of treatment for mental health and favor an approach of "toughing it out."

The race/ethnicity variables are more significant than are the socioeconomic status variables. African American children are much less likely to get treatment for depression controlling for need and for a host of socioeconomic and demographic variables that one might expect to confound this

relationship. Accordingly, with odds ratios of 0.14–0.28 for the different depression measures, it appears that there are very meaningful barriers for African American children in obtaining depression care. By contrast, African American children are no less likely than white children to get treatment for behavior disorders, a result that probably also drives the result that overall, African Americans are no less likely to get treatment for any mental health problem. Latino children are significantly less likely to get treatment for behavior problems, for any condition overall, and for depression than white children. Here again the odds ratios of 0.33 for any visit, 0.28–0.30 for depression, and 0.15 for behavior problems are quite dramatic.

These results could reflect a referral effect, since it has been shown that African Americans adults who discuss depression with their primary care providers are less likely than whites to get a referral to a mental health specialist, controlling for severity (Borowsky et al. 2000). It could also be related to different mental health treatment preferences in the African American and Latino communities, whose members may prefer informal family- or community-based treatment to medicalized treatment (Scheffler and Miller 1989). Evidence has been reported, for example, that African Americans hold more negative views of treatment outcomes (Richardson 2001). Finally, race/ethnicity may interact with perceptions of need for treatment, particularly in parsing information from school teachers and counselors (Slade 2004). Clearly for both African Americans and for Latinos there are unmet needs that merit both action and further research to understand the reasons behind the lack of adequate care.

As shown in previous literature, children of depressed mothers are more likely to receive treatment. This analysis distinguishes between the mother's depressive symptoms (significant) and the mother's prior formal diagnosis of depression (not significant). These results would suggest that the reason parental experience with the mental health system is helpful in ensuring that children get treatment when needed is the parents' sensitization to the burden of mental illness, and not to familiarity with the system of mental health treatment.

The socioeconomic status and insurance variables are not in general significant predictors of mental health specialty treatment. Employed mothers are more likely to get their children into depression treatment, but neither income nor maternal education has a significant effect. Parents having some form of government insurance (Medicaid, Medicare, or CHAMPUS) as opposed to no insurance is associated with higher odds of treatment for behavior disorders. This result may reflect the relatively extensive coverage of Medicaid

for mental health services. Despite a considerable literature suggesting large shortages of rural mental health providers, rurality is not a significant variable in this analysis.

CONCLUSION

Considerable research suggests that children's specialty mental health treatment represents an unmet need for many children. This analysis has shed some light on the specific contours of this problem. Girls are less likely to obtain needed treatment for externalizing behavior disorders than are boys by a large margin, and by a smaller but still worrisome margin are less likely to get treatment for depression. Middle children are less likely to obtain needed treatment for any mental health problem than are oldest, youngest, or only children. Controlling for the number of adults in the household, the presence of the father inhibits the likelihood that the child will receive treatment, particularly for depression. African Americans and Latinos are less likely than white children to receive treatment. In contrast to these rich results for the social and demographic determinants of children's specialty mental health utilization, the economic and insurance variables (including maternal education and income) seem to hold little predictive power.

Taken together these results argue for interventions with a novel focus to improve the access of vulnerable children to specialty mental health care, and for more research into the reasons for parental reluctance or inability to obtain mental health care for their children. On the access side, much has been written about the lack of insurance and about socioeconomic status as barriers to care. Yet these results suggest that at least for children's mental health treatment, interventions to change attitudes toward care in minority communities and among fathers could prove equally useful in alleviating real barriers to greater services use. Interventions could also focus on sensitizing parents to the need to pay attention to the mental health needs of their children, in particular girls and middle children.

On the research side, the results of this analysis motivate exploration of how decisions are made in families about this important form of investment in children. The result that the presence of the father is an inhibiting factor and the result that girls and middle children are less likely to be adequately treated suggest that past work on intrahousehold decision making and on the gender dimensions of investment in children is worth extending to mental health treatment.

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REFERENCES

- Angold, A., A. Erkanli, H. L. Egger, and E. J. Costello. 2000. "Stimulant Treatment for Children: A Community Perspective." *Journal of the American Academy of Child Adolescence and Psychiatry* 39 (8): 975–84; discussion 84–94.
- Angrist, J. D., G. W. Imbens, and D. B. Rubin. 1996. "Identification of Causal Effects Using Instrumental Variables." *Journal of the American Statistical Association* 91 (434): 444–55.
- Angrist, J. D., and A. B. Krueger. 2001. "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." *Journal of Economic Perspectives* 15 (4): 69–85.
- Baker, P. C., C. K. Keck, F. L. Mott, and S. V. Quinlan. 1993. *NLSY Child Handbook, Revised Edition*. Columbus, OH: The Ohio State University, Center for Human Resource Research.
- Borowsky, S. J., L. V. Rubenstein, L. S. Meredith, P. Camp, M. Jackson-Triche, and K. B. Wells. 2000. "Who Is at Risk of Nondetection of Mental Health Problems in Primary Care?" *Journal of General Internal Medicine* 15 (6): 381–8.
- Burvill, P. W. 1995. "Recent Progress in the Epidemiology of Major Depression." *Epidemiological Review* 17 (1): 21–31.
- Bussing, R., B. T. Zima, and T. R. Belin. 1998. "Variations in ADHD Treatment among Special Education Students." *Journal of the American Academy of Child Adolescence and Psychiatry* 37 (9): 968–76.
- Bussing, R., B. T. Zima, F. A. Gary, and C. W. Garvan. 2003. "Barriers to Detection, Help-Seeking, and Service Use for Children with ADHD Symptoms." *Journal of Behavioral Health Services and Research* 30 (2): 176–89.
- Caspi, A., B. R. E. Wright, T. E. Moffitt, and P. Silva. 1998. "Early Failure in the Labor Market: Childhood and Adolescent Predictors of." *American Sociological Review* 63 (3): 424–51.
- Center for Human Resource Research. 2000. *Child and Young Adult Data Users Guide*. Columbus, OH: The Ohio State University.
- Cohen, P., and C. S. Hesselbart. 1993. "Demographic Factors in the Use of Children's Mental Health Services." *American Journal of Public Health* 83 (1): 49–52.
- Costello, E. J., E. M. Farmer, A. Angold, B. J. Burns, and A. Erkanli. 1997. "Psychiatric Disorders among American Indian and White Youth in Appalachia: The Great Smoky Mountains Study." *American Journal of Public Health* 87 (5): 827–32.

- Crockett, L. J., D. J. Eggebeen, and A. J. Hawkins. 1993. "Father's Presence and Young Children's Behavioral and Cognitive Adjustment." *Journal of Family Issues* 14 (3): 355-77.
- Cunningham, P. J., and M. P. Freiman. 1996. "Determinants of Ambulatory Mental Health Services Use for School-Age Children and Adolescents." *Health Services Research* 31 (4): 409-27.
- Datcher Loury, L. 1988. "Effects of Mother's Home Time on Children's Schooling." *Review of Economics and Statistics* 70 (3): 367-73.
- Dulcan, M. K., E. J. Costello, A. J. Costello, C. Edelbrock, D. Brent, and S. Janiszewski. 1990. "The Pediatrician as Gatekeeper to Mental Health Care for Children: Do Parents' Concerns Open the Gate?" *Journal of the American Academy of Child Adolescence and Psychiatry* 29 (3): 453-8.
- Farmer, E. M., B. J. Burns, S. D. Phillips, A. Angold, and E. J. Costello. 2003. "Pathways into and through Mental Health Services for Children and Adolescents." *Psychiatric Services* 54 (1): 60-6.
- Farmer, E. M., D. K. Stangl, B. J. Burns, E. J. Costello, and A. Angold. 1999. "Use, Persistence, and Intensity: Patterns of Care for Children's Mental Health across One Year." *Community Mental Health Journal* 35 (1): 31-46.
- Fergusson, D. M., and L. J. Horwood. 1998. "Early Conduct Problems and Later Life Opportunities." *Journal of Child Psychology and Psychiatry* 39 (8): 1097-108.
- Fox, H. B., M. A. McManus, and M. B. Reichman. 2003. "Private Health Insurance for Adolescents: Is It Adequate?" *Journal of Adolescent Health* 32 (6, suppl): 12-24.
- Gasquet, I., M. Chavance, S. Ledoux, and M. Choquet. 1997. "Psychosocial Factors Associated with Help Seeking Behavior among Depressive Adolescents." *European Child and Adolescent Psychiatry* 6 (3): 151-9.
- Geller, J. M. 1999. "Rural Primary Care Providers' Perceptions of Their Roles in the Provision of Mental Health Services: Voices from the Plains." *Journal of Rural Health* 15 (3): 326-34.
- Greene, W. H. 2000. *Econometric Analysis*. Upper Saddle River, NJ: Prentice Hall.
- Greenland, S. 2000. "An Introduction to Instrumental Variables for Epidemiologists." *International Journal of Epidemiology* 29 (4): 722-9.
- Haines, M. M., A. McMunn, J. Y. Nazroo, and Y. J. Kelly. 2002. "Social and Demographic Predictors of Parental Consultation for Child Psychological Difficulties." *Journal of Public Health and Medicine* 24 (4): 276-84.
- Haushek, E. A. 1992. "The Trade-Off between Child Quantity and Quality." *Journal of Political Economy* 100 (1): 84-117.
- Haynes, N. M. 2002. "Addressing Students' Social and Emotional Needs: The Role of Mental Health Teams in Schools." *Journal of Health and Social Policy* 16 (1-2): 109-23.
- Kataoka, S. H., L. Zhang, and K. B. Wells. 2002. "Unmet Need for Mental Health Care among U.S. Children: Variation by Ethnicity and Insurance Status." *American Journal of Psychiatry* 159 (9): 1548-55.
- Leaf, P. J., M. Alegria, P. Cohen, S. H. Goodman, S. M. Horwitz, C. W. Hoven, W. E. Narrow, M. Vaden-Kiernan, and D. A. Regier. 1996. "Mental Health Service

- Use in the Community and Schools: Results from the Four-Community MECA Study. Methods for the Epidemiology of Child and Adolescent Mental Disorders Study." *Journal of the American Academy of Child Adolescence and Psychiatry* 35 (7): 889-97.
- Leslie, L. K., J. Weckerly, J. Landsverk, R. L. Hough, M. S. Hurlburt, and P. A. Wood. 2003. "Racial/Ethnic Differences in the Use of Psychotropic Medication in High-Risk Children and Adolescents." *Journal of the American Academy of Child Adolescence and Psychiatry* 42 (12): 1433-42.
- Mannuzza, S., R. G. Klein, A. Bessler, P. Malloy, and M. E. Hynes. 1997. "Educational and Occupational Outcome of Hyperactive Boys Grown Up." *Journal of the American Academy of Child Adolescence and Psychiatry* 36 (9): 1222-7.
- Mott, F. L., L. Kowaleski Jones, and E. G. Mehaghan. 1997. "Paternal Absence and Child Behavior: Does a Child's Gender Make a Difference?" *Journal of Marriage and the Family* 59 (1): 103-18.
- Richardson, L. A. 2001. "Seeking and Obtaining Mental Health Services: What Do Parents Expect?" *Archives of Psychiatric Nursing* 15 (5): 223-31.
- Richardson, L. P., D. DiGiuseppe, M. Garrison, and D. A. Christakis. 2003. "Depression in Medicaid-Covered Youth: Differences by Race and Ethnicity." *Archives of Pediatric and Adolescent Medicine* 157 (10): 984-9.
- Riley, A. W., J. W. Finney, E. D. Mellits, B. Starfield, S. Kidwell, S. Quaskey, M. F. Cataldo, L. Filipp, and J. P. Shematek. 1993. "Determinants of Children's Health Care Use: An Investigation of Psychosocial Factors." *Medical Care* 31 (9): 767-83.
- Rogers, S. J., T. L. Parcel, and E. G. Menaghan. 1991. "The Effects of Maternal Working Conditions and Mastery on Child Behavior Problems: Studying the Intergenerational Transmission of Social Control." *Journal of Health and Social Behavior* 32 (2): 145-64.
- Rones, M., and K. Hoagwood. 2000. "School-Based Mental Health Services: A Research Review." *Clinical Child and Family Psychology Review* 3 (4): 223-41.
- Salomon, A., and M. G. Strobel. 1997. "Social Network, Interpersonal Concerns and Help Seeking in Primary Grade School Children as a Function of Sex, Performance and Economic Status." *European Journal of Psychology of Education* 12 (3): 331-47.
- Scheffler, R. M., and A. B. Miller. 1989. "Demand Analysis of Mental Health Service Use among Ethnic Subpopulations." *Inquiry* 26 (2): 202-15.
- Slade, E. P. 2004. "Racial/Ethnic Disparities in Parent Perception of Child Need for Mental Health Care following School Disciplinary Events." *Mental and Health Service Research* 6 (2): 75-92.
- Sourander, A., L. Helstela, T. Ristkari, K. Ikaheimo, H. Helenius, and J. Piha. 2001. "Child and Adolescent Mental Health Service Use in Finland." *Society of Psychiatry and Psychiatric Epidemiology* 36 (6): 294-8.
- Starr, S., L. R. Campbell, and C. A. Herrick. 2002. "Factors Affecting Use of the Mental Health System by Rural Children." *Issues in Mental Health Nursing* 23 (3): 291-304.
- Stewart, D. E. 2003. "Physical Symptoms of Depression: Unmet Needs in Special Populations." *Journal of Clinical Psychiatry* 64 (suppl 7): 12-6.

- Sturm, R., J. S. Ringel, and T. Andreyeva. 2003. "Geographic Disparities in Children's Mental Health Care." *Pediatrics* 112 (4): e308.
- U.S. Department of Health and Human Services. 2001. *Mental Health: Culture, Race, Ethnicity—A Supplement to Mental Health: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.
- U.S. Department of Labor. 2000. *NLS Handbook 2000*. Washington, D.C.: Bureau of Labor Statistics.
- Velting, O. N., and G. J. Whitehurst. 1997. "Inattention-Hyperactivity and Reading Achievement in Children from Low-Income Families: A Longitudinal Model." *Journal of Abnormal Child Psychology* 25 (4): 321–31.
- Verhulst, F. C., and J. van der Ende. 1997. "Factors Associated with Child Mental Health Service Use in the Community." *Journal of the American Academy of Child Adolescence and Psychiatry* 36 (7): 901–9.
- Witt, W. P., J. D. Kasper, and A. W. Riley. 2003. "Mental Health Services Use among School-Aged Children with Disabilities: The Role of Sociodemographics, Functional Limitations, Family Burdens, and Care Coordination." *Health Services Research* 38 (6, part 1): 1441–66.
- Zahner, G. E., W. Pawelkiewicz, J. J. DeFrancesco, and J. Adnopo. 1992. "Children's Mental Health Service Needs and Utilization Patterns in an Urban Community: An Epidemiological Assessment." *Journal of the American Academy of Child Adolescence and Psychiatry* 31 (5): 951–60.
- Zwaanswijk, M., J. Van der Ende, P. F. Verhaak, J. M. Bensing, and F. C. Verhulst. 2003. "Factors Associated with Adolescent Mental Health Service Need and Utilization." *Journal of the American Academy of Child Adolescence and Psychiatry* 42 (6): 692–700.