Article

Family Predictors of Child Mental Health Conditions

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Abstract

Research suggests that minority children with one mental health condition are more likely than White children to have a secondary mental health condition. However, there are no current studies that test the interaction between race and family resources to examine this apparent racial difference in mental health conditions in children. Yet research suggests that family resources vary by race/ ethnicity. This study examines the interaction between family structure and socioeconomic status by race and ethnicity to understand how it predicts the number of mental health conditions among children. Our findings are consistent with the existing literature that children in resource-poor families (single parent, step-parent families, and lower income families) have higher counts of mental health conditions. Yet we also found that children in resource-rich families (two-parent biological families with higher levels of income) in some cases also had higher counts of mental health conditions and this varied by race/ethnicity.

Keywords

family health, race/ethnicity, quantitative, children mental health, negative binomial

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Introduction

Millions of children in the United States live with one or more mental health disorders, which are chronic and present throughout the life span. Mental health disorders among children are defined as "serious deviations from expected cognitive, social, and emotional development" (U.S. Department of Health and Human Services, 1999). The literature has identified racial and ethnic disparities in the rates of mental health diagnosis and subsequent treatment. Black and Latino children are less likely to receive a mental health diagnosis across all races. When they are diagnosed, they are more likely to be diagnosed at a time when symptoms are more severe and are more likely to be diagnosed with more than one mental health condition (Flores & Committee on Pediatric Research, 2010). Furthermore, as the traditional two-parent family becomes less common (especially among lower income and minority families) and other family types become more prevalent (Carlson & Corcoran, 2001), it is important to examine the relationship between race and ethnicity, families, resources, and mental health disorders among children.

Different family structure patterns across races and among Hispanics and non-Hispanics make race and ethnicity important factors to consider when examining mental health diagnoses in children. More than two thirds of Black families in the United States are made up of unmarried female-headed households, compared with less than one quarter of White families and two fifths of Hispanic families (Kennedy & Bumpass, 2008; McLanahan & Percheski, 2008; Ventura & Bachrach, 2000). These studies suggest that Black children are much more likely to reside in single-mother households compared with White and Hispanic children, which could mean fewer resources to attend to the difficulty of managing mental health conditions in children and/or higher levels of stress and family dysfunction that may affect mental health outcomes. In this way, family structure and race and ethnicity need to be considered when understanding why certain groups of children maintain higher or lower rates of mental health condition diagnosis (Manning & Lamb, 2003). Therefore, the purpose of this study is to examine the relationship between family structure, family resources, and the number of mental health conditions for which a child has been diagnosed by race and ethnicity using a nationally representative sample of U.S. children.

Family Structure, Resources, and Strain

Understanding the role of the family in the context of changes in the modern family structure has been the focus of social and behavioral scientists in recent years (Blanchard, Gurka, & Blackman, 2006; Duchovic, Gerkensmeyer,

& Wu, 2009). The structure of the family refers to the number of adults in the home and their relationship to the children. The family is the primary agent of socialization for children. Childhood experiences in families shape their health and well-being, and the structure of the family plays a significant role in both physical and mental health outcomes for children (Barrett & Turner, 2005; Bramlett & Blumberg, 2007; Fairbrother, Kenney, Hanson, & Dubay, 2005; Gilman, Kawachi, Fitzmaurice, & Buka, 2014; Gorman & Braverman, 2008; Heck & Parker, 2002; Spruijt & De Goede, 1997). Parents and family members are most often the primary caretakers of children with mental health disorders, and the resources at their disposal can influence how care is provided. There are a few ways that the family can affect the mental health of children including household family structure, resources available to families, and traumatic events, stress, or strain in the family.

The number of children living in two-parent families has declined over the past 50 years. In 1960, 85% of children lived in two-parent households compared with 68% of children today (Bank, 2015). Children in families where two parents live in the home and are married report fewer mental and physical health conditions compared with those in nonmarried cohabiting families (Gorman & Braverman, 2008). Children in single-parent households and other household arrangements (nonparental homes), on the other hand, tend to have a greater number of mental health conditions compared with children in two-parent households (Manning & Lamb, 2003). The differences in mental health outcomes between two-parent households and single-parent households may be due to varying levels of social resources within different family structures. In single-parent families, there may be less opportunity for more than one adult to be present to support children in their growth and development, whereas married and cohabiting two-parent households provide greater emotional and instrumental support for the children through assistance with schoolwork, mentorship, and promotion of personal development (Blackwell, 2010).

In addition, single parent households generally earn lower incomes compared with two-parent households (S. Brown, 2004; Urban Institute, 2006), which can lead to decreased access to health insurance, preventive care, and mental health services (Bramlett & Blumberg, 2007). Children in single-parent households also have overall higher rates of exposure to certain adverse childhood experiences (ACEs). ACEs may include witnessing domestic violence, substance use/abuse, parental death, parental incarceration, or exposure to serious mental illness in the household. Not all children in single-parent homes experience adverse events, of course, but for those that do, research suggests that ACEs contribute to an increased number of mental health and other disorders in children, adolescents, and adults (Anda

et al., 2014; Bright, Knapp, Hinojosa, Alford, & Bonner, 2016; Kerker et al., 2015; Mock & Arai, 2011).

General stress and strain within families stemming from parenting stress, household dysfunction, or issues related to child health play important roles in the mental health outcomes of children and varies between single- and two-parent households. Evidence suggests there is more parental stress among single parents compared with two-parent families and that stress can influence the mental health of children in the household (Manning & Lamb, 2003). In addition to the everyday stressors of family life, parents of children with diagnosed mental health conditions face higher levels of stress and strain as managing the mental health condition can result in added stress within the household (Blanchard et al., 2006; Duchovic et al., 2009). This is because children with mental health disorders often require frequent visits to primary and specialty care providers, extensive behavioral modification plans, and management of comorbid mental and physical health conditions (Merikangas et al., 2011). Parents of children with mental health disorders may have difficulty finding appropriate child care and flexible employment arrangements to support their child's well-being. Parents may also experience conflict within the parent–child relationship as well as overall increased family strain or burden (Blanchard et al., 2006; Duchovic et al., 2009; Hinojosa et al., 2012). In the end, having a two-parent family structure may provide the additional resources necessary to assist with the burden of mental health conditions in children. While some single-parent families have resources in their neighborhood or communities that can assist with strain, this also depends largely on the socioeconomic status of the neighborhood (Flouri, Midouhas, Joshi, & Tzavidis, 2014).

Mental Health in Children: Diagnosis by Race and Ethnicity

According to a report released by the Center for Disease Control (Perou et al., 2013), in a given year, between 13% and 20% of children (below 18 years) experience a mental health disorder (Perou et al., 2013). In the same report, the researchers indicate that rates of mental health diagnoses vary by type of mental health condition and by race and ethnicity. For example, ever having attention-deficit/hyperactivity disorder (ADHD) occurred most often in the lowest poverty-income ratio group. But once that category was examined across race and ethnicity, they found rates were "highest among White non-Hispanic children and Black non-Hispanic children" in this lowest income-poverty ratio group (Perou et al., 2013, p. 9). In terms of conduct disorders, the highest prevalence overall was found in Black children though rates increased as household income decreased for all races. Finally, "Black

non-Hispanic children were less likely than White non-Hispanic children to have ever had anxiety or have current anxiety" (Perou et al., 2013, p. 12).

In addition to variation in type of mental health condition each race and ethnicity is diagnosed with, the number of mental health conditions diagnosed varies dramatically by race and ethnicity. For example, one of the fastest growing segments of the U.S. population are individuals who identify as more than one race or ethnicity (U.S. Census, 2010). As Fisher, Reynolds, Hsu, Barnes, and Tyler (2014) noted, research on this group, often identified as "multiracial," is lagging behind research on other racial and ethnic groups, especially related to mental health outcomes, because of the complexity and great diversity within this group. Fisher et al. (2014) suggest that multiracial children for many reasons may differ from monoracial and face different challenges. Studies suggest that non-Hispanic children of multiple races have higher reported rates of depression compared with White non-Hispanic children (Perou et al., 2013). Data from the National Survey on Drug and Health (NSDUH) suggested that White non-Hispanics and multiracial non-Hispanic "adolescents" were more likely to have a major depressive episode "in their lifetime or in the past year than Black non-Hispanic adolescents" (Perou et al., 2013, p. 12). Furthermore, depending on study, multiracial youths also have significantly higher levels of anxiety than Blacks (Fisher et al., 2014).

Black and Hispanic children tend to be underdiagnosed with mental health conditions because of lower access to insurance, general health care, and mental health services compared with White children (Cheung & Snowden, 1990; Samaan, 2000). Once diagnosed, however, Black and Hispanic children are diagnosed with greater severity of illness yet are ultimately less likely to obtain recommended specialty care, behavioral, and pharmacological treatments (Chavez, Shrout, Alegría, Lapatin, & Canino, 2010; Hough et al., 2002; Kataoka, Zhang, & Wells, 2002). At the same time, Whites are more likely to perceive mental health care needs, seek out earlier diagnosis, and use mental health services compared with non-Whites (Abe-Kim et al., 2007; Chang et al., 2014; Lin, Inui, Kleinman, & Womack, 1982; Wang et al., 2005).

Comorbid Health Conditions

In addition to the racial and ethnic disparities in diagnosis and treatment of mental health conditions, there are also racial and ethnic disparities in the number of health conditions diagnosed in children (Chang et al., 2014; Chow, Jaffe, & Snowden, 2003; Harris, Edlund, & Larson, 2005; Hinojosa et al., 2012). Any child with a mental health condition is at higher risk of experiencing one or more comorbid (co-occurring) mental, developmental, or physical

health condition (Merikangas et al., 2010), but this is more pronounced for minority children. For example, among a sample of children with ADHD, Black, Hispanic, and Other race children were more likely to experience a comorbid mental health condition compared with Whites (Hinojosa et al., 2012). Furthermore, poor mental health outcomes can be exacerbated by racial discrimination leading to distress, lower self-esteem, depression, and other mental health conditions (T. N. Brown et al., 2000; Karlsen & Nazroo, 2002; Kessler, Mickelson., & Williams, 1999).

Family structure, economic resources, family stress/strain, and minority status all play a role in the number of mental health conditions with which a child is diagnosed. A family with more resources to draw on, or a "resource-rich" family, would be one with two parents in the household, that are married, with average or higher than average incomes with less family dysfunction, less strain, and better neighborhood resources. These resources can be pulled on to improve a child's health. A "resource-poor" family would consist of a single-parent household with lower levels of income, higher levels of family strain and dysfunction, and lower levels of neighborhood resources. It is, therefore, important to understand disparities in mental health outcomes of children across racial groups because of its far-reaching consequences for their health, social, and educational outcomes.

The current body of literature related to childhood mental illness is limited in two important ways. First, previous work identifies children in single-parent families as having a higher likelihood of having more diagnosed mental health conditions compared with two-parent families. Less is known, however, about how this differs when there are other resources present like neighborhood support, greater economic resources, or low levels of family strain. Second, the literature identifies minority children as more likely to have higher numbers of diagnosed mental health conditions (as well as other comorbid conditions), but less is known about how this variation in number of diagnosed conditions across races and ethnicity is linked to family structure, family resources, or family strain. This article addresses these two important gaps in our current knowledge by examining the relationship between family structure, resources, and stress/strain on the number of mental health conditions in children by race and ethnicity in a nationally representative sample of U.S. children.

Data and Sample

The National Survey of Children's Health (NSCH) 2011-2012 consisted of 95,677 phone interviews conducted by the Centers for Disease Control and Prevention and was primarily funded by the US Department of Health and

Human Services. Random digit dialing was used to obtain a random sample (through a screening process that determined whether or not household had a child present) of household phone numbers with children ages 0 to 17. Random digit dialing was also used independently for cell phones but was used only in cases where households did not have a landline. For each household, a random child was selected to be the focus of the interview. While interview questions focused on the sample child, a parent or caregiver was asked to answer questions about the child's health and health care. From the overall sample, children age 2 to 17 were selected to examine mental health conditions ($N = 69,029$). Children younger than age 2 were omitted from the data because of the difficulty of accurate mental health diagnosis for children of this age.

Variables

Mental Health Conditions. This study focused on four mental health conditions identified in the NSCH: ADHD, depression, anxiety, and behavioral or conduct problems. Parents were asked whether a health professional had ever diagnosed their child with each mental health condition. A composite variable was created to represent the count of current mental health conditions that ranged from 0 (*no mental health condition*) to 4 (*child has all four mental health conditions*).

Child's Age. Child's age was measured in years and ranged from 2 to 17 years. We opted to include children as young as 2 years of age because the diagnostic criteria for behavioral conditions and anxiety disorders include children as young as 18 months of age. Additionally, the NSCH allows for parents of children as young as 2 years of age to answer questions about mental health diagnoses.

Family Structure. This study followed Montgomery et al.'s (1996) definition of family structure, which includes child living arrangements. Family structure was measured by the marital/cohabitation status of the sample child's parent(s) within the household. The seven categories were the following: two parent currently married, two parent cohabiting, two parent step currently married, two parent step cohabiting, single mother married living apart or formerly married, single mother never married, other-either currently married or formerly married, other-never married, and other-no parents in household. After careful consideration and an examination of the seven categories in preliminary analyses, we decided to collapse these seven categories to three categories: two parent biological/adoptive cohabit/married, two parent

step cohabit/married, and single mother households. Collapsing the categories allows for a more robust examination of the interaction between family structure and poverty in our multivariate models.

Race/Ethnicity. The race and ethnicity of the child is categorized through four groups: White (non-Hispanic), Hispanic, Black (non-Hispanic), and Multiracial/Other (non-Hispanic). Groups included in the Multiracial/Other category included sample of non-Hispanic children who are Asian, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander, or more than one race. We recognize that multiracial children and "Other race" children may follow different patterns of mental health counts as they are very different in their constitution. Unfortunately, due to the small sample of "Other race" and multiracial children at the state level, NSCH recommends that they be collapsed into one single group called Multiracial/other. The reference category for the analysis was White.

Sex of Child. The sex of the child is categorized as "Male" and "Female," with male as the reference category.

Poverty Level. Poverty level was measured using the federal poverty level guidelines set by the U.S. Department of Health and Human Services. There were eight categories: at or below 100%, above 100% to at or below 133%, above 133% to at or below 150%, above 150% to at or below 185%, above 185% to at or below 200%, above 200% to at or below 300%, above 300% to at or below 400%, and above 400% federal poverty level. Following Hinojosa et al. (2012), these eight categories were collapsed and recoded into the following four categories:

    At or below poverty level: At or below 100%
    Just above poverty level: Above 100% to at or below 200%
    Average income level: Above 200% to at or below 400%
    Above average income level: Above 400%

The reference category for analysis was Average Income Level "above 200% to at or below 400%." For purposes of interpretation, within the tables, we labeled poverty in four levels: At or Below Poverty Level, Just Above Poverty Level, Average Income Level, and Above Average Income Level.

Mother's Education. This item was collapsed into three categories: less than high school, high school graduate, and more than high school.

Does Not Live in Supportive Neighborhood. This variable was a dichotomous dummy-coded indicator coded as 0 = lives in supportive neighborhood and 1 = Does not live supportive neighborhood, created by NSCH that sums the responses for the following questions: "People help each other out," "Watch each other's children," "People I can count on," "Adults I can trust." The responses are coded so that 1 = *definitely disagree*, 2 = *somewhat disagree*, 3 = *somewhat agree*, and 4 = *definitely agree*. According to the codebook, the threshold for living in a supportive neighborhood was a mean score of 2.25 or higher in the responses.

Health Insurance. Type of insurance coverage was measured through three categories: public insurance such as Medicaid or State Children's Health Insurance Program, Private Health Insurance, and Currently Uninsured.

Neighborhood Amenities. An indicator was created to count how many of four neighborhood amenities the sample child has access to. These amenities included park, recreation centers, sidewalks, and/or libraries. Therefore, numbers ranged from 0 (*No amenities*) to 4 (*Neighborhood has all four amenities*).

Adverse Childhood Events. This variable included nine items that measured ACEs: socioeconomic hardship, divorce/separation of parent, death of parent, parent served time in jail, witness to domestic violence, victim of neighborhood violence, lived with someone who was mentally ill or suicidal, lived with someone with alcohol/drug problem, and treated or judged unfairly due to race/ethnicity. Therefore, numbers ranged from 0 (*Child experienced no ACEs*) to 9 (*Experienced all nine*).

Analytic Strategy

To determine the type of regression used in this analysis, we examined the characteristics of the dependent variable number of mental health conditions on the main independent variables. The dependent variable is coded as a count of mental health conditions, and as we expected, there were a high number of zeros, which indicated an absence of mental health diagnoses among children in the sample. Two types of distributions are appropriate for this type of data. The first is a Poisson distribution. To use a Poisson regression with count data, there needs to be evidence of equidispersion, which means that the conditional mean and variance of the dependent variable are equal. If equidispersion is not evident and there is overdispersion (the conditional variance is larger than the mean) then negative binomial regression

is a more appropriate method as negative binomial regression follows a Poisson–Gamma mixture distribution (more appropriate for overdispersed data). Overdispersion is identified through simple cross-tabulations between dependent and categorical independent variables and comparison of means test for continuous independent variables. We found evidence of overdispersion in our initial bivariate tests and concluded that negative binomial was the most appropriate regression analyses to examine the relationship between family structure, poverty level, race/ethnicity, and the number of mental health conditions reported. Our conclusion was confirmed through a test of the dispersion parameter in the negative binomial model. We found that the dispersion parameter was significantly different than zero further indicating that the negative binomial model was the best fit.

To understand the relationship between family structure, poverty level, and race and ethnicity, we included a product term for family structure and poverty and stratified the sample by race and ethnicity. This was done to examine the moderating effect of poverty level on the relationship between family structure and the count of mental health conditions among children in the sample. The stratified regression models were meant to understand how different child, family, and neighborhood contextual variables could predict mental health counts for each racial and ethnic group. To account for the complex sampling design of the NSCH, data in this analysis were weighted to represent the national population with the sample weight "NSCHWT" using the following syntax: svyset idnumr [pweight=nschwt], strata (sample). All analyses were conducted using Stata Version 13.1 (Stata Corp., College Station, TX).

Results

Table 1 illustrates the descriptive characteristics by race/ethnicity. The *F* statistic "is equivalent to the test of homogeneity of row (or column) proportions" (STATA Manual 13). On the case of poverty level, for example, we can conclude that a larger proportion of Hispanics live at or below poverty level than do Whites, Blacks, or persons in "Other Category." Of the four mental health diagnoses examined, ADHD had the highest prevalence (8%), with rates of anxiety (3.41%), behavior/conduct (2.94%), and depression (2.08%) following. White children had the highest rates of ADHD (9.22%) and anxiety (4.33%) diagnoses while Black children had the highest rates of behavioral/conduct (3.99%) and depression (2.77%) diagnoses. Hispanics hold the lowest rates across all four diagnoses.

A large majority of children in the total sample (68.59%) lived in two-parent biological/adopted households. These rates stayed mostly constant for

Table 1. Descriptive Statistics by Race.

	% Total (N = 69,029)	% White (N = 46,796)	% Hispanic (N = 8,828)	% Black (N = 6,030)	% Other (N = 7,375)	F statistic
Mental health conditions						15.30***
ADHD	7.98	9.22	5.27	8.79	6.21	
Anxiety	3.41	4.33	1.97	2.45	2.81	16.73***
Behavioral/conduct	2.94	2.83	2.63	3.99	2.82	2.65*
Depression	2.08	2.24	1.68	2.27	1.91	1.06
Female	48.96	48.34	48.41	51.64	50.01	2.08
Poverty level						183.98***
At or below poverty level	20.09	10.20	37.58	33.24	18.44	
Just above poverty level	21.69	17.91	29.59	25.10	20.44	
Average income	29.47	34.64	20.12	26.05	26.25	
Above average income	28.76	37.24	12.70	15.61	34.87	
Family structure						151.08***
Two-parent bio/adopt cohabit/married	68.59	75.18	68.08	40.43	70.25	
Two-parent step cohabit/married	10.83	11.00	10.14	12.08	9.79	
Single mother	20.59	13.82	21.78	47.49	19.97	
Region						147.91***
Northeast	16.38	18.50	11.66	15.40	16.51	
Midwest	22.31	28.55	10.71	18.60	18.71	
West	23.88	18.53	41.98	7.48	34.38	
South	37.43	34.42	35.66	58.52	30.40	
Type of insurance						242.44***
Public	34.07	21.48	54.60	53.92	31.78	
Private	60.38	74.59	35.14	41.01	63.56	
Uninsured	5.55	3.93	10.26	5.07	4.66	

(continued)

Table 1. (continued)

	% Total (N = 69,029)	% White (N = 46,796)	% Hispanic (N = 8,828)	% Black (N = 6,030)	% Other (N = 7,375)	F statistic
Mother's education						332.07***
Less than high school	13.17	5.11	36.92	10.15	8.71	
High school graduate	21.71	19.55	25.05	26.71	19.63	
More than high school	65.12	75.35	38.03	63.13	71.66	
Does not live in supportive neighborhood	17.20	11.27	25.13	27.64	18.58	134.14***

	Total, M (SD)	White, M (SD)	Hispanic, M (SD)	Black, M (SD)	Other, M (SD)	F statistic
Age	9.56 (4.58)	9.77 (4.62)	9.13 (4.48)	9.71 (4.53)	9.14 (4.56)	15.34***
Number of adverse family experiences	0.94 (1.34)	0.86 (1.32)	0.97 (1.31)	1.21 (1.37)	0.98 (1.47)	30.62***
Number of neighborhood amenities	3.19 (1.09)	3.17 (1.10)	3.13 (1.14)	3.28 (1.04)	3.29 (1.01)	12.53***

Note. Weighted data from National Survey of Children's Health 2011/2012. A post hoc test (pairwise comparison) was conducted: Whites, Blacks, Hispanics, and Multi-racial/Others are significantly different within groups at $p < .05$ for all comparisons. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

each race except Black children who lived in single-mother households more than twice as often as the total population (47.49%). White children had the highest rates of private insurance with 3 out of every 4 White child privately insured (74.59%). In comparison, 41.01% of Black children and 35.14% of Hispanic children were privately insured. Hispanic children were uninsured at the highest rates, nearly twice as frequently (10.26%) as the total population (5.55%). Rates of poverty are highest among Hispanic (37.58%) and Black (33.24%) children, and mothers' education levels are lowest among Hispanic mothers with 36.92% holding less than a high school degree. The number of adverse family events across races ranges from 0.86 ($SD = 1.32$) among White children to 1.21 ($SD = 1.37$) among Black children. As further noted in Table 1, a post hoc test (pairwise comparison) was also conducted which showed that Whites, Blacks, Hispanics, and Multiracial/Others are significantly different within groups at $p < .05$ for all comparisons.

Table 2 illustrates the results from the negative binomial models by race/ethnicity. Incidence rate ratios (IRRs) were obtained by Stata and are interpreted below. The regression coefficients are the logs of expected counts of mental health conditions. We asked Stata to provide us with the calculations that take these coefficients and create rate ratios. This is done by the following formula: $\beta = \log(\mu_{x0+1}/\mu_{x0})$, where β is the regression coefficient, μ is the expected count of mental health conditions, and the subscripts represent where the predictor variable X is evaluated at X_0 and X_{0+1} (representing a one unit change in X). The IRR then is the difference in the log of expected counts for a one unit change in X controlling for all other variables in the model (Hilbe, 2011). We will use the IRR to discuss our regression model results in the context of expected rates of mental health conditions.

Hispanic females compared with their male counterparts are expected to have a 0.43 times lower rate of mental health conditions. For every year increase in age, rate of mental health conditions increased by a factor of 1.14 for Hispanic children. The level of the mother's education was also a significant predictor for expected rate of mental health conditions among Hispanic children. For instance, a Hispanic child whose mother's education level was less than a high school degree would have an expected rate of mental health conditions that is .42 times lower than a Hispanic child whose mother's education was higher than a high school degree. Additionally, Hispanic children who receive public health insurance have an expected rate of mental health conditions that is 2.44 times greater than Hispanic children who receive private health care. Finally, as the number of adverse family experiences increase for Hispanic children, expected rate of mental health conditions also increase (IRR = 1.45, 95% confidence interval [CI] = 1.32-1.59).

Table 2. Weighted Negative Binomial Predicting Expected Rates of Mental Health Conditions.

	White (N = 46,796)		Hispanic (N = 8,828)		Black (N = 6,030)		Other (N = 7,375)	
	IRR	CIs	IRR	CIs	IRR	CIs	IRR	CIs
Age	1.11***	1.10, 1.13	1.14***	1.10, 1.18	1.10***	1.06, 1.13	1.11***	1.07, 1.14
Female	0.58***	0.50, 0.66	0.43***	0.31, 0.59	0.49***	0.36, 0.64	0.52***	0.39, 0.69
Poverty level[a]								
At or below poverty	1.24*	0.88, 1.76	0.61	0.33, 1.13	0.97	0.42, 2.19	0.85	0.46, 1.55
Just above poverty	0.88	0.69, 1.13	0.59	0.30, 1.13	1.06	0.46, 2.40	0.87	0.46, 1.65
Above average income	0.97	0.78, 1.20	1.07	0.50, 2.28	0.84	0.43, 1.59	1.05	0.59, 1.85
Mother's education[b]								
Less than high school	0.94	0.75, 1.18	0.42***	0.26, 0.65	0.79	0.49, 1.24	0.60*	0.36, 0.99
High school graduate	0.91	0.78, 1.06	0.67**	0.44, 1.00	1.09	0.78, 1.51	0.94	0.67, 1.31
Family structure[c]								
Two-parent step cohabit/married	0.84	0.59, 1.19	1.16	0.44, 3.00	0.42*	0.19, 0.92	0.81	0.33, 1.96
Single mother	1.08	0.77, 1.50	0.75	0.37, 1.48	1.46	0.81, 2.60	1.45	0.74, 2.82
Family structure × Poverty								
At or below poverty								
Two-parent step cohabit/married	1.62	0.95, 2.75	0.92	0.26, 3.15	5.31**	0.74, 16.18	2.38	0.74, 7.59
Single mother	0.98	0.61, 1.55	1.61	0.71, 3.64	0.85	0.34, 2.14	1.35	0.58, 3.10
Just above poverty								
Two parent step cohabit/married	2.14**	1.33, 3.40	0.43	0.12, 1.44	1.81	0.53, 6.13	1.76	0.53, 5.81
Single-mother	1.14	0.75, 1.72	1.81	0.70, 4.64	0.66	0.26, 1.66	0.82	0.31, 2.14

(continued)

Table 2. (continued)

	White (N = 46,796)		Hispanic (N = 8,828)		Black (N = 6,030)		Other (N = 7,375)	
	IRR	CIs	IRR	CIs	IRR	CIs	IRR	CIs
Above average income								
Two parent step cohabit/married	1.32*	0.74, 2.32	0.90	0.24, 3.26	1.69	0.49, 5.80	1.05	0.31, 3.56
Single mother	1.21*	0.78, 1.85	0.48	0.14, 1.55	2.10*	0.69, 5.40	1.37	0.45, 4.15
Regions[d]								
Northeast	0.89	0.74, 1.06	1.65*	1.08, 2.52	0.79	0.48, 1.29	0.83	0.54, 1.25
Midwest	0.80**	0.68, 0.93	0.90	0.57, 1.44	1.28	0.92, 1.76	1.26	0.86, 1.83
West	0.70**	0.56, 0.87	0.82	0.54, 1.25	0.92	0.49, 1.71	0.44***	0.31, 0.63
Type of health Insurance[e]								
Public (i.e., Medicaid or SCHIP)	1.64***	1.39, 1.93	2.44***	1.55, 3.83	1.91***	1.28, 2.83	1.24	0.87, 1.76
Uninsured	0.75	0.53, 1.05	0.64	0.34, 1.20	0.46	0.14, 1.48	1.32	0.73, 2.39
Does not live in supportive neighborhood[f]	1.46***	1.17, 1.81	1.25	1.10, 1.43	1.03	0.76, 1.38	1.39*	1.02, 1.89
Number of adverse family experiences	1.28***	1.22, 1.34	1.45***	1.32, 1.59	1.39***	1.27, 1.50	1.41***	1.28, 1.53
Number of neighborhood amenities	1.00	0.95, 1.06	0.95	0.81, 1.10	1.00	0.88, 1.12	0.85**	0.74, 0.96
Constant	0.44***	0.03, 0.59	0.02***	0.01, 0.05	0.03***	0.01, 0.05	0.06***	0.03, 0.10
F	47.51***		14.80***		11.22***		17.66***	

Note. IRR = incidence rate ratio; CI = confidence interval; SCHIP = State Children's Health Insurance Program.
References: [a]Average income level. [b]More than high school. [c]Two-parent bio/adopt/married/cohabit. [d]South. [e]Private. [f]Lives in supportive neighborhood. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

White females have an expected rate of mental health conditions that is 0.58 times lower than males, holding other variables constant (IRR = 0.58, 95% CI = 0.50-0.66). For every year increase in age for White children, expected rate of mental health conditions increased by a factor of 1.11. Additionally, White children who are at or below poverty level have an expected rate of mental health conditions that is 1.24 times higher than White children at average income level. White children who live in a two-parent step cohabitating/married family, that are just above poverty level, have an expected rate of mental health conditions that is 2.14 times higher than those whose parents are biological/adopted cohabiting/married and living at average income level. Furthermore, White children who live in a two-parent step cohabitating/married family (IRR = 1.32, 95% CI = 0.74-2.32) and those who live with a single-mother family, living at above average income (IRR = 1.21, 95% CI = 0.78-1.85), have higher expected rates of mental health conditions than those whose parents are biological/adopted cohabiting/married living at average income. White children who have public health insurance have an expected rate of mental health conditions that is 1.64 times higher than those who have private health care. White children who do not live in a supportive neighborhood have an expected rate of mental health conditions that is 1.46 times higher than their counterparts who live in a supportive neighborhood. Finally, as the number of adverse family experiences increases for White children, the expected rate of mental health conditions also increase (IRR = 1.28, 95% CI = 1.22-1.34).

Black females have lower expected rate of mental health conditions than their male counterparts (IRR = 0.49, 95% CI = 0.36-0.64). Additionally, for every year increase in age, expected rate of mental health conditions increase for Black children by a factor of 1.10. Black children whose family structure is composed of two-parent step cohabitating/married have an expected rate of mental health conditions that is 0.42 times lower than those who live in a family structure where the two parents are biological/adopted cohabiting/married. Black children who live in a two-parent step cohabitating/married family structure that is at or below poverty level have an expected rate of mental health conditions that is 5.31 times higher than those whose parents are biological/adopted cohabiting/married and living at average income level. Furthermore, Black children who live with a single mother that is living at above average income level (IRR = 2.10, 95% CI = 0.69-5.40) have higher rates of expected mental health conditions than those whose parents are biological/adopted cohabiting/married and living at average income. Black children who have public health insurance have an expected rate of mental health conditions that is 1.91 times higher than those who have private health care. Finally, as the number of adverse family experiences increases for Black
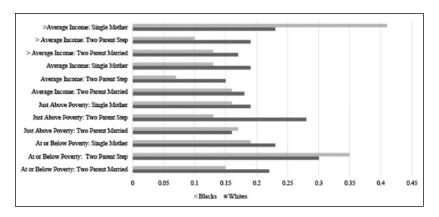
Figure 1. Predicted probabilities of mental health for Whites and Blacks: Family structure × Poverty level.

children, the expected rate of mental health conditions also increase (IRR = 1.39, 95% CI = 1.27-1.50).

Multiracial/Other females have a lower incidence rates of expected mental health conditions than their male counterparts (IRR = 0.52, 95% CI = 0.39-0.69). As age increases, the expected rate of mental health conditions also increase for children of Multiracial/Other (IRR = 1.11, 95% CI = 1.07-1.14). Multiracial/Other children with mothers with less than a high school degree have an expected rate of mental health conditions that is .60 times lower than those whose mother's education level was higher than a high school degree. Multiracial/Other children who do not live in a supportive neighborhood have an expected rate of mental health conditions that is 1.39 times higher than their counterparts who live in a supportive neighborhood. As the number of adverse family experiences increases for Multiracial/Other children, the IRR of expected mental health conditions also increase (IRR = 1.41, 95% CI = 1.28-1.53). Finally, as the amount of neighborhood amenities increase for Multiracial/Other children, the expected rate of mental health conditions decrease (IRR = 0.85, 95% CI = 0.74-0.96).

Figure 1 is a visual representation of the moderating effect of family structure and income for Black and White families. The figure illustrates the predicted probability of expected mental health conditions for Whites and Blacks. As seen in the figure, there is variation in the effect of family structure on mental health outcomes between Whites and Blacks. For example, while Whites have overall higher rates of predicted mental health outcomes, predicted rates stay consistent across White families with average to above average income. White families that are just above, at, or below the poverty level

have overall higher predicted probability of mental health conditions than their wealthier counterparts. Interestingly, the opposite seems to be happening among Black families. At the two income extremes, the highest rates of predicted mental health outcomes are at or below poverty and above average income levels. In addition, it is single Black mothers with above average income who hold the highest rate of predicted mental health outcomes with Black two-parent step families at the lowest income level holding the second highest predicted probability for Blacks. Between Blacks and Whites, the largest differences in predicted probabilities occur between Black and White single mothers where Black single mothers have two times the predicted probability of having a child with a mental health condition than White single mothers.

Discussion

This study explored the relationship between family structure and the IRR of mental illnesses among children stratified by race and ethnicity. Our findings are consistent with the existing literature that lower parent education levels, more ACEs, and less supportive neighborhoods lead to higher expected rates of mental health conditions. This study also examined the moderating effect of income on the relationship between family structure and the count of mental illnesses stratified by race and ethnicity. Our findings highlight the complex interactions between race, family structure, and socioeconomic status on mental health diagnosing among children. We found family structure and poverty to be a moderator within White and Black families, but not multiracial or Hispanic families. We found that resource-rich families (two-parent biological families with higher than average incomes) had higher incidences of mental conditions and resource poor families (families with incomes at, below, or just above federal poverty level, and single-parent families) also had higher counts of mental health conditions. This finding is a significant contribution to our understanding of the relationship between race/ethnicity, family structure, and socioeconomic status.

While it may seem contradictory that resource-rich and resource-poor children both have higher incidences of expected mental health conditions in White and Black families, it may represent the reality of how parent seek out services for children with symptoms consistent with mental health conditions. Resource-poor families are those with fewer economic resources (at, below, or just above federal poverty level) and fewer biological parents in the home (step families, single-parent families). Parents who are resource poor, and more strained (Brannan & Heflinger, 2005; Janicke & Finney, 2001), may be more likely to have their child assessed and/or treated for mental health issues. Parents who are stressed and having difficulty dealing with

their child's symptoms (Hinojosa et al., 2012) at home or perhaps at the behest of teachers and school officials (Bussing, Koro-Ljungberg, Gary, Mason, & Garvan, 2005; Zahner & Daskalakis, 1997) are more likely to seek out diagnosis and treatment. In low-income families, there may be less time to sort out the child's symptoms (Santiago, Kaltman, & Miranda, 2013), or child's symptoms may be related to the family situation, and therefore there may be a higher likelihood of seeking treatment. Low-income parents are also more likely to have public health insurance for their children and thus may be more likely to utilize it (Smith et al., 2012).

Resource-rich families have more economic resources (living above the average income level) and more home resources (two-parent family structure). Parents who are more resource rich and potentially less strained (Bussing et al., 2005; Conger, Conger, & Martin, 2010; Janicke & Finney, 2001) are also more likely to have their child assessed and/or treated for mental health issues (Horwitz, Gary, Briggs-Gowan, & Carter, 2003). In families with more financial resources children tend to have positive social emotional development (Gershoff, Aber, Raver, & Lennon, 2007). Parents that have access to more family resources and money (Hinojosa et al., 2012) may be better able to appraise their child's symptoms (Janicke & Finney, 2001) and take them in for diagnosis and treatment. Parents with more money are likely to have private insurance that pays for treatment (Janicke & Finney, 2001) in ways that public insurance, or smaller private insurance plans, do not. Therefore, these parents may be more likely to utilize care.

In addition to the moderating effects of income status on the relationship between family structure and incidences of mental health conditions, we also saw other predictive patterns of mental health counts that are consistent with the literature and fairly consistent across White, Hispanic, Black, and Multiracial families. Children that were older had higher counts of mental health conditions and girls had consistently lower counts of mental health conditions for all races/ethnicities. This is consistent with the literature that boys tend to have higher rates of certain mental health diagnoses and as children age, certain mental health conditions become symptomatic (Perou et al., 2013; Visser et al., 2014). Among all racial and ethnic groups, having public health insurance made it more likely that children had higher counts of mental health conditions. Public insurance is only available to those children with lower incomes, so this is consistent with our findings about higher counts within lower levels of socioeconomic status. Consistent with the current literature, children with higher numbers of ACEs were more likely to have higher counts of mental health conditions. ACEs such as abuse, neglect, and household dysfunction are linked to mental health conditions in children as well as a host of other physical health conditions (Bright et al., 2016).

There are several places where the predictors of mental health counts among White, Black, Hispanic, and Multiracial children do differ. When mother's educational level is lower, there is a higher count of mental health conditions, but only for Hispanic and Multiracial mothers. This is consistent with literature that suggests parental educational attainment acts as an indicator of family socioeconomic status—which has an inverse relationship mental health in children (Currie et al., 2008; Reiss, 2013).

Living in neighborhoods where there is little neighborhood social support—not having people who help each other out, watch each other's children, people to count on, or adults to trust in the neighborhood—was related to higher predicted mental health incidences for White and Multiracial children, but not Black or Hispanic children. Previous studies suggest that neighborhood support plays an important role in mental health in children because neighborhood support acts as a maternal coping mechanism that can alleviate some of the stress and strain of raising children (Boyd, 2002; Feldman & Steptoe, 2004; Zablotsky, Bradshaw, & Stuart, 2013). Past studies suggests that neighborhood amenities and physical environment can affect children's social behaviors, physical and mental health, and school performance (Odgers, Caspi, Bates, Sampson, & Moffitt, 2012; Pebley & Sastry, 2004; Singh & Ghandour, 2012; Singh & Kenney, 2013). In this study, neighborhood amenities such as having playgrounds, parks, recreational centers, libraries, and walking paths was related to lower incidences of mental health conditions among multiracial children, but not for White, Black, or Hispanic children.

Limitations and Summary

This study explored counts of mental health conditions through negative binomial regression models that examined the count of mental health conditions across racial groups by family structure and income. By stratifying the models by race/ethnicity, we found a moderating effect of poverty level on the relationship between family structure and count of mental health conditions among children. This moderating effect, however, only exists among White and Black families. Together, this study helps illustrate the intersection between family structure, income, race/ethnicity, and number of mental health conditions among children.

This study, however, is not without limitations. This study includes parent reports of current mental health conditions instead of using medical records or other verifiable diagnostic information, which may lead to biases within the results, although it is a standard practice for these types of national surveys. There is some level of social desirability to underreport mental health

conditions of children. Furthermore, while we recognize that there are many types of mental health conditions, we were limited by the data set to only four types of mental conditions within the analysis: ADHD, depression, anxiety, and behavioral or conduct problems.

Declaration of Conflicting Interests

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