

THE ROLE OF FAMILY HEALTH AND INCOME IN ATTENTION DEFICIT HYPERACTIVITY DISORDER DIAGNOSIS IN CHILDREN

Attention Deficit Hyperactivity Disorder (ADHD) is a disorder with far reaching social consequences. One study estimates that ADHD has a societal cost between \$36 and \$52 billion dollars a year (Pelham et. al. 2007). Another points out that children with this disorder are a rapidly increasing proportion of students in special education programs across the country (Schnoes et. al. 2006). We know from Link and Phelan (1995) that it is important to contextualize social risk factors for disease. ADHD has been examined using a number of paradigms, from an early neurological approach (Abrahamson 1920, Ebaugh 1923, Kennedy 1924, Strecker 1929, Stryker 1925), to a more environmental and psychological approach (Bender 1949, Greenacre 1941, Rank 1954). Some diet and food additives as fundamental causes of ADHD (Feingold 1974), and a recent move toward a biological explanation, claiming brain structure/ neurological abnormalities are the most seminal cause of ADHD (Barkley 1997, Castellanos, Giedd and Marsh 1996, Fisher 1996, Fuster 1997, Mataro 1997). Sociology provides insight into the uncertainty of the diagnosis. Rafalovich (2005) concludes from extensive interviews of clinicians that each diagnosis is highly contextualized. This contextualized diagnosis is framed using distal social factors such as socioeconomic status, which includes income (Link ad Phelan 1995). Several studies show that higher income leads to a lower risk for being diagnosed with ADHD (i.e Froehlich et al. 2007).

The data used in this study is the 2008 National Health Interview Survey (NHIS) Sample Child file. The Sample Child file is based on information on one child from each household interviewed in the larger NHIS household sample as represented by the most knowledgeable adult (NCHS 2009). The final sample size for the following analysis is 7439 children. The dependent variable for this analysis, ADHD, was measured by a question asking whether a doctor or health professional had told the respondent that their child had Attention Deficit Hyperactivity Disorder or Attention Deficit Disorder (ADD) (NCHS 2008). ADHD is also often referred to as ADD, but is considered the same disorder (Rafalovich 2005), which allows analysis of the response as having or not having been diagnosed as ADHD. The analysis includes independent control variables of sex, age, race/ethnicity, and birth weight. The causal variables of interest are family income and family health. Income is measured in dollars and is a self-report, while family health is measured by a set of variables indicating the respondents perception of number of people in the household with excellent, very good, good, fair, and poor health respectively.

A set progressive multivariate logistic regression models are built for the analysis to attempt to understand the causal pathways. The preliminary regression results, presented below, show that the health of the family entirely mediates the effect that income has on the likelihood of being diagnosed, indicating that the children being diagnosed are being selected from less healthy homes when compared to those who are not diagnosed. The final analysis will present a more complex picture of the relationship, especially testing for the robustness of the relationship, and other possible confounding variables.

Table 2 Odds Ratios from Logistic Regression Analyses of ADHD Diagnosis for Both Sexes

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	Odds Ratio	Robust s.e.	Odds Ratio	Robust s.e.	Odds Ratio	Robust s.e.	Odds Ratio	Robust s.e.	Odds Ratio	Robust s.e.
Sex ^a	.38***	0.046	.38***	0.046	.38***	0.05	.38***	0.05	.38***	0.05
Age										
2-5	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
6-9	5.66***	1.53	5.66***	1.53	5.68***	1.54	5.83***	1.58	5.73***	1.57
10-13	7.49***	1.96	7.53***	1.98	7.56***	1.98	7.88***	2.07	7.18***	1.90
14-17	9.56***	2.49	9.51***	2.48	9.58***	2.5	9.99***	2.62	9.02***	2.40
Race										
White	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Black			0.94	0.136	0.93	0.133	0.81	0.12	0.76	0.11
Asian			.28*	0.15	.28*	0.15	.29*	0.16	.29*	0.16
Hispanic			.46***	0.11	.46***	0.11	.39***	0.096	.40***	0.10
Birth Weight										
Normal (≥2500g)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Low (<2500g)					1.49*	0.25	1.46*	0.24	1.36	0.22
Income										
\$0-\$34,999					ref.	ref.	ref.	ref.	ref.	ref.
\$35,000-\$49,999					0.82	0.15	0.82	0.15	0.98	0.18
\$50,000-\$74,999					.59***	0.10	.59***	0.10	0.77	0.13
\$75,000-\$99,999					.66*	0.12	.66*	0.12	0.89	0.17
\$100,000+					.60**	0.10	.60**	0.10	0.91	0.15
Family Health										
Excellent									.80***	0.05
Very Good									.85***	0.05
Good									0.99	0.05
Fair									1.2*	0.11
Poor									1.45*	0.28
Wald X ² (df)	125.20 (4)***		137.88 (7)***		151.62 (8)***		164.97 (12)***		236.90 (17)***	
Pseudo R ²	0.0795		0.0854		0.0873		0.0933		0.1177	
Pseudo Log Likelihood	-1849.07		-1837.21		-1833.45		-1821.48		-1772.39	

Note: Results are weighted to correct for oversampling

^aMale=0 Female=1

N of persons=7439

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

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