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Usefulness of a home affluence scale administered to urban adolescents with asthma to estimate the family's socioeconomic status

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Abstract

Background—Measurement of Socioeconomic status (SES) is traditionally based on education, income and occupation. This information may not be readily available from adolescents participating in research.

Methods—Using data from school-based randomized trial of an asthma intervention targeting urban adolescents, we compared percent poverty in zip code of residence (% poverty), median housing value, and parental income and education, to teen responses on the Home Affluence Scale for Children (HASC), which included home, car and computer ownership for the family and eligibility for free school lunch. The association of HASC with measures of asthma control was also assessed.

Results—390/422 (92%) of adolescents responded to HASC items (mean HASC=2.5). HASC was associated with mother's education and household income (both $p < 0.001$), and significantly correlated with % poverty ($p < 0.0001$) and median home value ($p = 0.003$). The association of HASC < 2.0 to indicators of uncontrolled asthma was in the direction hypothesized, especially for nighttime symptoms, Odds Ratio (95% Confidence Interval)=1.59 (0.95–2.66) and restricted activity, OR=1.87(1.12–3.12).

Conclusions—HASC correlates well with more traditional measures of SES and the risk estimates for HASC < 2.0 and indicators of uncontrolled asthma were mostly in the hypothesized direction. Methods of obtaining SES indicators from youth are needed for research studies.

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Keywords

Social Class; Asthma; Adolescents; Socioeconomic Status; Income; Education; Affluence; Poverty; Census; Puff City

Introduction

Socioeconomic Status (SES) is a dynamic concept that changes over time, both for individuals and societies at large [1]. Measurement of SES is important for research studies, as it can have an impact on health related outcomes. Health care disparities are known to be affected by SES, through its regulation of access to healthcare, health behaviors and environmental exposures [2]. Traditional measures of socioeconomic status have included education, income and occupation and they have been shown to correlate with outcomes for several chronic health conditions, including asthma [3]. Certain census variables such as percentage of poverty in zip code of residence can also be used as indirect measures of SES [4].

Typically, self-report of variables used as indicators of SES are taken from adult respondents, but few papers describe methods for obtaining this information from youth. Obtaining accurate information from adolescent study participants about their parents' education, income and occupation is challenging and can limit the ability of researchers to study the impact of SES on adolescent health [5]. Adolescents, however, may be able to report certain surrogate measures of familial affluence more reliably [5]. The Family Affluence Scale (FAS), developed by Currie et al in mid-1990s [6], sought to overcome this limitation by using measures of income that adolescents are likely to report more accurately. In several analyses of the data from the multi-national Health Behavior in School-aged Children (HBSC) study, lower affluence measured by FAS was associated with lower risk for sports related injuries [7] and lower rates of participation in moderate to vigorous physical activity [8]; but higher risk for fighting injuries [9, 10]; and consumption of soft drinks and high-sugar foods [11]. These factors are known to be associated with low SES measured by traditional methods.

In addition, neighborhood level indicators of SES are important determinants of access to health care, as well as health related outcomes for many acute and chronic conditions [12]. Specifically for adolescents with asthma, neighborhood level low SES tends to correlate with immune dysfunction (skewed towards Th2 pathway), higher stress experiences and lower levels of belief regarding control over their health [13]. Since neighborhood level indicators of SES tend to correlate with family level SES as well [14], it is important to understand how these traditional and non-traditional measures of SES can affect adolescents with asthma and their outcomes.

There is reported discrepancy between parents and adolescents regarding their reports of adolescent asthma symptoms [15]. Since the adolescent report tends to correlate better with objective measures of asthma control (such as questionnaire scores or lung function) [16], it is reasonable for researchers to collect measures related to asthma outcomes from adolescents themselves. However, collection of SES data from adolescents can be

challenging given the reasons cited above, and researchers have used several surrogate measures of SES to collect SES data from adolescents. We are not aware of reports in the literature describing the usefulness of these alternative scales over the traditional measures of SES in studies involving adolescents with asthma. To address this gap, we analyzed the data collected from a school based randomized controlled trial of self-management intervention for urban teens with asthma (Puff City; [Clinicaltrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT00201058) identifier NCT00201058). Our aim was to compare measures of SES as reported by adolescents to parental reports of education and income, as well as census information; and to assess the association of SES indicators to selected asthma outcomes.

There is reported discrepancy between parents and adolescents regarding their reports of adolescent asthma symptoms [15]. Since the adolescent report tends to correlate better with objective measures of asthma control (such as questionnaire scores or lung function) [16], it is reasonable for researchers to collect measures related to asthma outcomes from adolescents themselves. However, collection of SES data from adolescents can be challenging given the reasons cited above, and researchers have used several surrogate measures of SES to collect SES data from adolescents. We are not aware of reports in the literature describing the usefulness of these alternative scales over the traditional measures of SES in studies involving adolescents with asthma. To address this gap, we analyzed the data collected from a school based randomized controlled trial of self-management intervention for urban teens with asthma (Puff City; [Clinicaltrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT00201058) identifier NCT00201058). Our aim was to compare measures of SES as reported by adolescents to parental reports of education and income, as well as census information; and to assess the association of SES indicators to selected asthma outcomes.

Materials and Methods

The data used for this analysis was collected as part of a randomized controlled trial of a web-based self-management intervention called Puff City for adolescents with asthma in a school based setting. Recruitment began in 2007 and ended in the summer of 2009. The Institutional Review Board at Henry Ford Health System approved this trial, and its details and outcomes have been described before [17, 18]. Briefly, the parents of adolescents enrolled in 9th through 12th grades at six Detroit high schools were sent a letter to obtain permission for administering a Lung Health Questionnaire (LHQ) to the students during English class. Among those students who opted to complete the LHQ, adolescents with asthma symptoms were considered eligible to participate (based on inclusion and exclusion criteria described before [19]). After obtaining parental informed consent and student's written assent, the adolescents were enrolled in a randomized controlled trial for an online asthma educational intervention called Puff City. The adolescents that were randomized into the treatment group received 4 sessions of computer based tailored education related to asthma self-management (Puff City), while the control group received 4 computer sessions of similar duration where they accessed generic asthma education websites. All participants used computers at their respective schools to complete these educational sessions. After completion of the study intervention, the participants completed follow up questionnaires at 6 and 12 months post-enrollment. Baseline measures of asthma control were also collected from all the participants and they included the number of days with asthma symptoms in the

last 30 days, number of nights with asthma symptoms in the last 30 days, number of school days missed in the last 30 days; and total number of days of restricted activity. For analysis, categorical variables corresponding to the cutoffs used in the EPR 3 [20] to represent indicators of uncontrolled asthma were used.

The 6- and 12-month follow-up included items from the Home Affluence Scale for Children (HASC). The HASC is a 4-question scale that was modified by Wardle et al [6] and includes 4 questions: 1) Do you own a computer at home? Yes=1, No=0 points. 2) Do you have a car or van at home? Yes=1, No=0 points. 3) Do you yourself have the option of free lunchtime meals at school? Yes=0, No=1 point. 4) Thinking about the house you live in at present, do your parents own it or rent it? Own=1, Rent=0 points. The responses for each of these 4 questions were added to give a total score (a range of 0 to 4). A higher score reflected higher SES. The parents of the study participants were also interviewed at baseline separately to collect information about their child's asthma, their demographic information, education, income, and home ownership. The parental education level was categorized into less than high school, high school graduate and greater than high school for any additional college education. Income was categorized into four groups - less than 15,000; 15001 to 40,000; 40,001 to 60,000; and greater than \$60,000 per annum. The data for percent poverty in zip code of residence and mean housing value was obtained from United States decennial census 2000 [21].

Statistical Analysis

In comparing the individual components of the HASC with the % poverty in zip code of residence and the median housing value, we used Mantel-Haenszel chi-square tests for categorical variables. This test incorporates the fact that there is inherent ordering in both the income and education variables, and it is sometimes referred to as a test for trend [22]. For the comparison of the HASC score across the income or education categories, we used the Jonckheere-Terpstra test for trend [23]. Spearman correlation coefficients were calculated to assess the rank-order correlation between ordinal variables such as HASC and income or education categories. To describe the association between HASC and indicators of asthma morbidity and between other SES indicators and asthma morbidity, we calculated odds ratios (OR) and 95% Confidence Intervals. For calculation of the odds ratios, the following variables were categorized: HASC score (≤ 2 versus > 2); mom's education ($<$ high school, high school, $>$ high school) and household income ($<$ \$15,000; \$15,001–40,000; \$40,001–60,000; $>$ \$60,000).

Results

Of the 422 participants enrolled in the Puff City-2 randomized controlled trial, the questions related to Home Affluence Scale (HAS) were answered by 390 adolescents. Subsequent analyses were done using data from these 390 participants only and the data from remaining 32 participants was excluded for this analysis. The demographics of the study population are shown in Table 1. Majority of the study participants were African-American (90%) and nearly 40% were males. In majority of the participants' families (83%), maternal education was at high school or greater, although the annual household income was less than \$40,000

for 85.5% of the respondents. The mean home value of the respondents by their zip code of residence (based on the 2000 US decennial Census data) was \$63976, while the percentage poverty in their zip code of residence was 24.5%. Among the measures used on HASC, car ownership was the highest (84.6%), followed by computer ownership (74.1%). Sixty-four percent reported eligibility for free school lunch (64.4%). Only 50.1% of youth reported parental home ownership. The mean HASC score was 2.5 for the study sample.

HASC was significantly correlated with median home value (Spearman's correlation coefficient $r = 0.15$, $p=0.003$) and the percentage below poverty in the zip code of residence (% poverty), Spearman's correlation coefficient $r = -0.21$, $p<0.001$ suggesting that higher level of poverty in zip code of residence is reflected in lower HASC scores. The more traditional measures of SES such as mother's education or household income also showed good correlation with HASC values (Table 2). HASC increased significantly across the education categories ($p<0.001$). When comparing the individual components of the HASC to maternal education categories, all components except owing a car/van were noted to have a significant increase across the traditional SES categories used to represent mother's education status. HASC increased significantly with increasing household income (Table 2). We also assessed the relationship between asthma morbidity and HASC to explore whether the association was similar to that of the more traditional measures of SES (Table 3). For functional status variables (symptom-days, symptom-nights, restricted activity and school days missed), we observed elevated OR, suggesting an inverse relationship between HASC score and asthma morbidity, with several associations reaching (or nearing) statistical significance (Table 3). This is similar to what was observed with our more traditional measures of SES, with some exceptions. The relationship between HASC and asthma morbidity was in a direction similar to that of mother's education and asthma morbidity with the exception of ED visits, although neither HASC or mother's education were significantly related to this indicator (Table 3). We also noted that household income was consistently related (not always significantly) to asthma morbidity with the exception of restricted activity, in which the OR for income $<15K$ versus $>60K = 1.08$ (0.47–2.48), $p=0.858$, although the OR for HASC and restricted activity was 1.87 (1.12–3.12), $p=0.016$ for HASC <2.0 versus 2.0 . ORs for the relationship of area-level indicators (%poverty and median home value) suggested little or no relationship to morbidity indicators.

Discussion

The definition of SES continues to evolve and may be related to the material possessions or the social prestige/position of an individual within a social hierarchy. It has long been felt that categorization of individuals into social groups based on these distinctions might provide an insight into the factors that are responsible for determining an individual's response to a certain disease state or its treatment. Asthma has been shown to preferentially impact economically disadvantaged minority population groups (such as African American and Hispanics), which besides genetic influences, may also be related to limited health care options and a lower level of control over their immediate microenvironment [24].

Several studies related to asthma in adolescents involve collection of clinical data directly from adolescents, but no previous studies have used adolescent responses to assign levels of

SES. We were interested in exploring if the use of parent/guardian or census-derived information to classify the study participants by SES is similar to specific information obtained directly from adolescent participants. If the latter is true, then accurate SES information could be collected from adolescents for large trials, when additional information is not collected from the parent and in areas for which detailed census data is not available. With the use of simple ownership questions in the HASC, our analysis showed good correlation of the total HASC score with the traditional measures of SES. We observed that mother's education and household income seem to yield the strongest associations with most indicators of asthma morbidity, and that ORs representing the association between HASC and asthma morbidity were similar and in the same direction, albeit not always as strong. We also noted that household income, although associated with most indicators of morbidity, was not associated with days of restricted activity in this analysis, while both mother's education and HASC were significantly associated. Interestingly, persons of low income were 4 times more likely to own a computer than youth whose mother's reported < high school education. The HASC includes the element of computer ownership, which may imply access to resources and information or represents some other factor unknown to us, but perhaps related to some component of asthma management manifested in restricted activity days. Perhaps HASC is more sensitive to this element of asthma management/control, but further studies are needed to support this supposition.

Compared to the national average, our study population from Detroit had similar rates of home and computer ownership, although car ownership was a bit higher. The rates of car ownership in Detroit are one of the highest in the country even among individuals with lower SES. This is despite the fact that Michigan ranks 24th among all the 50 US states (ranked highest to lowest) in terms of the annual cost of car ownership (data from Bankrate.com [25]).

Recently Harris et al [26] utilized a housing based index of SES called HOUSES derived from publicly available housing data from the local government for a group of children with asthma between the ages of 4 to 18 years that were being treated at a single institution. For the 58 subjects with available HOUSES and Asthma Control Test (ACT) data, the authors showed that it correlated with traditional measures of SES except for parental education, and also with asthma morbidity. Using it as a continuous variable, there was inverse correlation of the HOUSES index with asthma control and risk of persistent asthma. Other studies that use regional SES measures might be adequate for surveillance, but may not accurately reflect the health related outcomes for disease states such as asthma that are significantly impacted by the immediate local environment. The HOUSES index sought to overcome that limitation by developing a composite index of individual house level data to estimate SES, instead of using an entire region's characteristics. Besides the traditional measures such as parental education [27], other studies have also utilized census data and percent poverty in zip code of residence to categorize adolescents with asthma into low and high SES groups [13]. In our study, these area-level measures of SES were not associated with asthma morbidity.

A limitation to our study is that we used the HASC from the 6- or 12-month survey and looked for associations with indicators of uncontrolled asthma at baseline. The assumption

being that SES did not change appreciably during the 6 – 12 month study period. Since we have no way of knowing if this supposition is true, our results may be biased due to the misclassification of the SES for some respondents. We note, however, that healthcare utilization and other factors such as “unmet need” known to be influenced by SES are usually measured within a 12 month timeframe[28]. Other limitations in this study include its retrospective nature, unavailability of parental occupation data, and the missing household income data for 17% of participants. The utility of this measure in higher socioeconomic groups also needs to be validated to make it reliable across a wide spectrum of economic backgrounds. Our study was conducted among youth with asthma from schools in which the majority of students were African American and more than half qualified for school lunch free or at a reduced cost. Our results may be applicable only to populations with similar characteristics. It is also important to recognize that the use of scales such as HASC has to be reconsidered periodically, as ownership trends and preferences for populations may change. While home and car ownership may continue to remain significant indicators, this measure may vary from region to region. In Detroit, 26.2% of households did not own a car in 2012 (a 5% increase from 2007) according to one report from the University of Michigan Transportation Research Institute [29]. However, this may be because of Detroit’s economic hardships. According to the 2010 American Community Survey, median household income in the city was \$25,787, and the median income for a family was \$31,011. Sadly, 32.3% of families had income at or below the federally defined poverty level [30]. In addition, computer ownership may become less important (as computers become more ubiquitous) or may have to be replaced with another measure such as ownership of a smart phone or tablet computer. A recent Pew Research Center report, *Teens and Technology 2013* [31], showed high rates of smartphone use (37% of all teens, increased from 23% in 2011) and that 93% of teens either have a computer of their own or have access to one at home.

Overall this study adds to the existing literature regarding the usefulness of a composite measure of SES in adolescents by using data obtained directly from adolescents. Future studies on the use of additional methods to measure SES (such as HASC) may make it easier to collect such data.

Conclusions

Non-traditional measures of SES can be used in research with adolescents who may not be able to accurately report family income or education level. The Home Affluence Scale for Children correlates well with parent report of income and education and also with median home value and percentage poverty in zip code of residence. We found the scale to be positively related to indicators of uncontrolled asthma, as were traditional measures of SES. The HASC may be more sensitive to indicators of control than area-level measures. Finally, the components of HASC may need to be changed over time to reflect changes in ownership trends. Investigators should continue to explore accurate methods of obtaining information on socioeconomic status from youth, given the need to understand the role of social determinants in the health status and health behaviors of this population.

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List of Abbreviations used

SES	Socioeconomic Status
HASC	Home Affluence Scale for Children
LHQ	Lung Health Questionnaire

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Highlights

- Traditional measures of socioeconomic status (SES) include education, income and occupation.
- SES correlates with asthma-related outcomes in the children and adolescents.
- Adolescents in research studies may not be able to provide information about their family's SES.
- The Home Affluence Scale for Children (HASC) provides an estimate of the family's SES based on adolescent responses.
- Our analysis showed that HASC correlated well with traditional measures of SES
- The associations of HASC with asthma-related functional status and morbidity were in the hypothesized direction.
- Our results have implications for other research studies involving adolescents where SES data is to be collected.

Table 1The demographic data and characteristics at baseline for the study participants (n=390)¹

Characteristic			Missing
Age, mean (sd)	15.9	(1.2)	0
Black/African American, n (%)	353	(90.5)	0
Male, n (%)	153	(39.2)	0
Computer ownership, n (%)	289	(74.1)	0
Own transportation, n (%)	330	(84.6)	0
Eligible for free lunch, n (%)	251	(64.4)	0
Own house or condo, n (%)	199	(50.1)	0
HASC ² , n (%)			
0	19	(4.9)	0
1	55	(14.1)	
2	108	(27.7)	
3	146	(37.4)	
4	62	(15.9)	
Mean (sd) HASC, mean (sd)	2.5	(1.1)	0
Mom's education > High School, n (%)	173	(45.3)	8
Mom's education = High School, n (%)	144	(37.7)	
Mom's education < High School, n (%)	65	(17.0)	
Household Income < \$15,000, n (%)	154	(47.7)	67
\$15,001–40,000, n (%)	122	(37.8)	
\$40,001–60,000, n (%)	21	(6.5)	
> \$60,000, n (%)	26	(8.0)	
% poverty in zip code of residence, mean (sd)	24.5	(13.5)	2
Mean home value in zip code of residence ³ , mean (sd)	63976	(30736)	4
Symptom days, mean (sd)	6.8	(7.1)	0
Symptom nights, mean (sd)	3.8	(6.3)	9
School days missed, mean (sd)	3.6	(4.9)	8
School days missed: asthma, mean (sd)	1.6	(3.4)	9
Days restricted activity, mean (sd)	2.0	(4.4)	10
ED visits, mean (sd)	1.1	(2.6)	3
Hospitalizations, mean (sd)	0.6	(2.5)	0

¹ Includes participants that answered all four of the HASC questions;² Home Affluence Scale for Children;³ Median of the median home value = \$62,500

Table 2

Level of education and household income reported by caregiver to overall HASC score and components

	Mother's Education				Reported Household Income				<i>p</i>
	< High School n=65	High School n=144	> High School n=173	<i>p</i>	< 15,000 n=154	15,001–40,000 n=122	40,001–60,000 n=21	60,000 n=26	
Mean HASC ^I (sd)	2.2 (1.0)	2.3 (1.1)	2.7 (1.0)	<0.001	2.1 (1.0)	2.6 (1.0)	3.1 (0.8)	3.5 (0.7)	<0.001
Spearman correlation, <i>p</i>		0.21, <0.001				0.40, <0.001			
Yes	41 (63.1)	98 (68.1)	144 (83.2)	<0.001	107 (69.5)	92 (75.4)	18 (85.7)	26 (100)	0.001
No	24 (36.9)	46 (31.9)	29 (16.8)		47 (30.5)	30 (24.6)	3 (14.3)	0 (0)	
Own transportation, n (%)									
Yes	55 (84.6)	120 (83.3)	149 (86.1)	0.64	115 (74.7)	109 (89.3)	21 (100)	26 (100)	<0.001
No	10 (15.4)	24 (16.7)	24 (13.9)		39 (25.3)	13 (10.7)	0 (0)	0 (0)	
Free/reduced lunch, n (%)									
Yes	48 (73.8)	93 (64.6)	104 (60.1)	0.055	119 (77.3)	71 (58.2)	11 (52.4)	8 (30.8)	<0.001
No	17 (26.2)	51 (35.4)	69 (39.9)		35 (22.7)	51 (41.8)	10 (47.6)	18 (69.2)	
Own house/condo, n (%)									
Yes	29 (44.6)	62 (43.1)	104 (60.1)	0.006	61 (39.6)	68 (55.7)	16 (76.2)	21 (80.8)	<0.001
No	36 (55.4)	82 (56.9)	69 (39.9)		93 (60.4)	54 (44.3)	5 (23.8)	5 (19.2)	

^I Home Affluence Scale for Children

Table 3

Association of SES indicators to reported asthma morbidity

	Day symptoms			Nighttime symptoms			2 days/week			Restricted Activity > 4 days/30 days			
	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)	p
HASC ¹ score													
2.0	66	8	1.70 (0.77–3.75)	43	31	1.59 (0.95–2.66)	0.076	40	34	1.87 (1.12–3.12)	0.016		
> 2.0	262	54	Reference	143	164	Reference		122	194	Reference			
Spearman correlation, <i>p</i>			–0.07, 0.18			–0.09, 0.18						–0.12, 0.015	
Mom's education ²													
< High School	57	8	1.56 (0.67–3.59)	38	26	1.93 (1.07–3.46)	0.028	34	31	1.92 (1.08–3.41)	0.027		
High School	124	20	1.35 (0.73–2.50)	74	68	1.44 (0.92–2.25)	0.11	63	81	1.36 (0.86–2.13)	0.18		
> High School	142	31	Reference	72	95	Reference		63	110	Reference			
Spearman correlation, <i>p</i>			–0.07, 0.18			–0.09, 0.075						–0.12, 0.015	
% Poverty zip code													
25%	156	25	1.36 (0.78–2.36)	91	89	1.12 (0.75–1.68)	0.58	69	112	0.79 (0.52–1.18)	0.24		
< 25%	170	37	Reference	95	104	Reference		91	116	Reference			
Spearman correlation, <i>p</i>			0.06, 0.28			0.03, 0.59						–0.06, 0.24	
Household Income													
15000	136	18	2.27 (0.80–6.39)	84	69	2.78 (1.08–7.15)	0.029	74	80	1.08 (0.47–2.48)	0.86		
15001 – 40000	98	24	1.22 (0.44–3.38)	50	68	1.68 (0.64–4.39)	0.288	46	76	0.71 (0.30–1.66)	0.42		
40001 – 60000	19	2	2.85 (0.51–15.9)	9	12	1.71 (0.50–5.92)	0.398	7	14	0.58 (0.18–1.92)	0.37		
> 60000	20	6	Reference	7	16	Reference		12	14	Reference			
Spearman correlation, <i>p</i>			–0.09, 0.10			–0.15, 0.008						–0.08, 0.14	
Home value													
< Median ³	166	27	1.31 (0.76–2.28)	94	98	0.99 (0.66–1.48)	0.96	74	119	0.77 (0.52–1.16)	0.22		
Median	159	34	Reference	91	94	Reference		86	107	Reference			
Spearman correlation, <i>p</i>			–0.05, 0.33			0.002, 0.96						0.06, 0.22	
> 2 school days missed													
Yes	48	26	1.28 (0.75–2.17)	25	47	0.88 (0.51–1.50)	0.63	17	57	1.59 (0.85–2.95)	0.14		
HASC ¹ score													
2.0													

	Day symptoms			2 days/week/30 days			Nighttime symptoms			2 days/week			Restricted Activity > 4 days/30 days		
	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)	Yes	No	OR (95%CI)
> 2.0	182	126	Reference				119	196	Reference	50	266	Reference			
Spearman correlation, <i>p</i>			-0.05, 0.36						0.02, 0.63						-0.07, 0.14
Mom's education ²															
< High School	46	19	1.79 (0.97–3.32)	0.064	25	39	1.24 (0.68–2.24)	0.48	16	49	2.13 (1.04–4.35)	0.036			
High School	84	58	1.07 (0.68–1.69)	0.77	59	84	1.36 (0.86–2.15)	0.19	26	118	1.44 (0.78–2.65)	0.243			
> High School	96	71	Reference		59	114	Reference		23	150	Reference				
Spearman correlation, <i>p</i>			-0.05, 0.36				0.02, 0.63								-0.07, 0.14
% Poverty zip code															
25%	112	69	1.14 (0.75–1.72)	0.54	63	117	0.82 (0.54–1.25)	0.36	36	145	1.41 (0.83–2.38)	0.20			
< 25%	117	82	Reference		81	124	Reference		31	176	Reference				
Spearman correlation, <i>p</i>			0.03, 0.54				-0.05, 0.36					0.06, 0.20			
Household Income															
15000	93	60	2.41 (0.98–5.92)	0.055	60	92	2.74 (0.98–7.66)	0.055	36	118	3.66 (0.83–16.24)	0.088			
15001 – 40000	70	49	2.22 (0.89–5.54)	0.087	44	78	2.37 (0.83–6.72)	0.10	18	104	2.08 (0.45–9.56)	0.35			
40001 – 60000	14	7	3.11 (0.91–10.69)	0.072	8	13	2.58 (0.69–9.62)	0.16	3	18	2.00 (0.30–13.24)	0.47			
> 60000	9	14	Reference		5	21	Reference		2	24	Reference				
Spearman correlation, <i>p</i>			-0.05, 0.34				-0.08, 0.16					-0.13, 0.018			
Median home value															
< Median ³	115	78	0.96 (0.64–1.45)	0.85	71	121	0.97 (0.64–1.47)	0.88	35	158	1.16 (0.68–1.97)	0.59			
Median	112	73	Reference		72	119	Reference		31	162	Reference				
Spearman correlation, <i>p</i>			0.01, 0.85				0.01, 0.89					-0.03, 0.59			

¹ Home Affluence Scale for Children;² Mother's report of education;³ Median of the median home value = \$62,500