

The Perceived Quality of Public Schools

By

**Brian Smith
Department of Economics
East Carolina University**

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Introduction

What value do we put on our public schools? There are many aspects to this question. The value of “good” schools is reflected in prices for owner occupied houses. Do the surrounding neighborhoods and communities help to determine what our schools are worth? Or is the quality of communities determined by how good our schools are? When buying a house, people usually consider the quality of the school in the surrounding areas. Therefore, parents typically attempt to purchase houses in the district with the “best” schools. Realtors apparently believe that school quality is important to buyers because most real estate guides prominently list school districts along with other housing characteristics. The consensus is that the higher quality public schools attract potential buyers better than the lower quality schools do. Therefore, the demand for houses in these areas is higher than it is in the communities and districts of schools with lower quality. This leads to the issue of how to best measure this premium on houses in better school districts.

Possible Elements of School Quality

When parents attempt to determine what school their child will attend they take many things into consideration. For instance, some parents may be more concerned by the average tests scores at the different schools. This would mean that education is the reason for the parent’s decision in purchasing a house in a particular school district. Another determining factor in purchasing a house would be the racial composition of the community and school. Some people may indulge a taste for discrimination by their willingness to pay a premium to avoid certain ethnic or racial groups. The student-teacher ratio is possibly another deciding factor in choosing one school over another.

Parents may feel that teachers who deal with fewer students do a better job of teaching them than teachers dealing with larger class sizes. Also, parents may feel that a lower teacher to student ratio is a good index of teaching resources, which will lead to better test scores for their child, which is related to test scores mentioned above. Another reason could possibly be independent information on the quality of staff at the different schools. Certain school staff members could be considered better at teaching students than others in different districts, conversely, some teachers may have a background to which some parents object. Any or all of these could be reasons for how people determine school quality.

Not only are parents interested in school quality for their children, but policy-makers and economist are also interested. If school quality does actually affect the value of houses in different school districts then we can assume that policy changes may also affect the price of houses in different school districts. In North Carolina school quality is a big issue. Officials have been working to improve the quality of schools, and more importantly on standardizing school quality, so it is important to know the effect of possible policy changes on communities overall.

This paper will look at several issues. First, it will see the change in housing prices for the two different years of data. Also, it will show how the elementary schools of Pitt County have either progressed or regressed based on tests scores. Finally, the paper will investigate the rate at which information about school quality becomes embodied in housing prices by introducing one and two-year lags of quality variables.

Literature Review

In Arizona, the State Supreme Court ruled the capital funding mechanism unconstitutional because it is based on property taxation that relies on property values in school districts. The court said it creates large disparities between facilities in "property rich" and "property poor" districts. A recent study of local school districts' needs across the state identified disparities. The report concluded that students have much less school space in poorer districts, and their schools often tend to be in worse condition than in wealthy districts (Flannery, 1995). There is substantial disagreement in the legislature not only over the significance of the findings, but how they affect academic achievement. This excerpt helps to show that there is concern over the disparities between schools with higher values and schools with lower values. How can children in poor schools compete against those in wealthier schools when they don't have the facilities that may enable them to receive adequate learning?

Researchers studying school quality and its effect on housing prices have generally used hedonic models of property value. These studies differ in the specification of the hedonic model by using different variables in estimating the house-price model.

In an older study by Donald Jud and James Watts, using data from residential areas in Charlotte, North Carolina from 1977, they found that the price of a house is decomposed into not only its physical characteristics but also the characteristics of its surrounding neighborhood. In determining the value of a house, Jud and Watts used several housing attributes including school quality and racial composition models. They used a measure of achievement level in neighborhood schools as a proxy for school quality. What Jud and Watts found is that when the grade level was increased by one

level in the achievement level the value of the average house in the surrounding neighborhood increased between five and six percent. The estimate from this study, as well as other earlier studies, have been found slightly biased upward because of omitting some neighborhood quality measures. Racial composition did have a negative effect on housing prices in their study until they controlled for achievement levels. After controlling for achievement level, the racial effect was significantly reduced.

A study by Kathy J. Taylor Hayes (1996) uses the hedonic model of housing values to determine which neighborhood school characteristics are considered by homebuyers. She looks at the marginal effects on students from schools as a quality indicator, and attempts to isolate it from other housing characteristics. No research measured the relationship between marginal school effects and housing values before the Hayes study. The possible reason is most economists have argued that the appropriate measure for school quality is to measure the marginal effect on students from the school.

Hayes used data from census and school district information in Dallas, Texas and merged it with housing data from the Dallas Independent School District. In an attempt to determine the values for northern and southern Dallas housing values, she sees if school quality is an important location characteristic. Hayes uses four possible indicators of school quality, which include: current expenditures per student, average sixth-grade mathematics achievement on the Iowa Test of Basic Skills, the marginal effect of the school on sixth-grade mathematics achievement, and the expected achievement of the student body in sixth-grade mathematics. In determining the sales price of houses, Hayes uses several different characteristics of a house as the explanatory variables. Included are: the age of the house, square footage of the living area, dummies for swimming pool

and fire place, and variables that control for nonlinearities between the sales prices and the age of the property.

Looking beyond school spending and student test scores, Hayes finds that homebuyers pay a premium for a school's marginal effect on student performance. Along with these findings she also finds other things about consumers willingness to pay for housing characteristics. For instance, people are willing to pay for a shorter commute and greater access to private schools. By comparing tax rates and school spending she is able to find differences in peoples' willingness to pay for education between northern and southern Dallas.

In a similar study by William Bogart and Brian Cromwell (1997), they studied overlapping jurisdictions in a metropolitan area of Cleveland, to isolate the effect of public schools on house prices from other neighborhood characteristics. Bogart and Cromwell discuss that one of the problems with previous research is that using dummy variables representing school districts does not control for possible interactions between local public services, like public schooling, and housing characteristics. They studied small homogenous neighborhoods and were able to minimize the omitted variable biases encountered by other researchers.

To identify the impact of the public sector on the value of houses they looked at three areas of Cleveland, Ohio. They looked at detailed housing characteristics coupled with neighborhood information, such as lot size and traffic flow on surrounding streets. Bogart and Cromwell examine the effect of omitting school variables on the observed variables since they did not have a good measure of school quality, such as standardized tests scores. Their main finding was that high quality school districts provide services

valued in excess of higher taxes that are levied. Not only did they study the effect of school quality on housing values but they also looked at the effect on rental rates for apartments. What they found was rental rates in areas of consideration for schooling reflected school quality as much as housing prices did.

A study by Sandra Black (1988) uses information within school districts for houses located on attendance district boundaries to control for neighborhood effects. The effect of public schools is easily isolated from other effects on housing prices since the houses only differ by school districts. By controlling for property tax rates and levels of school spending, Black avoids problems of omitted variable bias.

Black used data consisting of 22,679 single-family homes in Massachusetts and used very detailed information on state standardized tests for elementary school students. Her main findings were that a five percent increase in elementary school tests score resulted in an increase of a little over two percent in consumers' willingness to pay for houses. In her conclusion she states that test scores are one of the most important factors consumers look at when valuing public education, and this provides implications about school quality reforms.

The Andy Deininger (1999) study used the hedonic-price model, in which the price of a house is a function of its physical characteristics as well as neighborhood characteristics, including public school attendance areas. He attempted to isolate the effects of public schools on the price of houses in Pitt County, North Carolina. He controlled for different types of omitted variable bias by using data from one county where property taxes and school spending did not vary from district to district. Deininger also attempted to control for omitted neighborhood characteristics by using a variable

representing the age of a house. His paper found that there was a positive and significant relationship between the performance composite for elementary schools and housing prices, suggesting that homebuyers are aware of standardized proficiency as a proxy for school quality.

The results of the Deininger paper show that student proficiency is the primary measure that consumers look at when valuing public schools. He states that his estimates may have overestimated the effect of school quality because of some omitted variables. Therefore, school quality does matter to homebuyers. Other quality measures, such as student-teacher ratios and racial composition did not have a significant effect on housing value. Several other variables were found to affect housing prices. For our purposes, schooling is the variable we are concerned with and based on his results it does have a significant effect when controlling for other things.

This paper will build on the research by Deininger. His paper looked at the effect of tests scores from the 1996-1997 school year on 1999 housing prices, which is a two-year lag from the tests scores to the housing prices. This paper will not only work with his data, but it will also see how a one-year lag compares to the two-year difference. It is possible that any effect in housing prices from changes in school quality occurs over a period of time, rather than occurring immediately

This paper will look at more than one year of data for housing prices and testing scores. Deininger used only one year of data for housing prices and one year of data for schools. One year of data is good to see how tests scores affected housing prices for the next year, but that is all that can be taken from his research is the effect in one year. This paper helps to see if the same variables change from one year to the next.

Methodology

This study will use the hedonic-price model. In this model, the price of a house is a function of its physical characteristics, neighborhood characteristics and other external characteristics such as public school attendance areas. This means that housing prices change when different characteristics change, such as the square footage, what building materials are used, whether the house is in the city limits or not, number of bedrooms, if it has a garage and many other characteristics. Homebuyers receive utility from the different characteristics of the house they intend on purchasing.

The hedonic model assumes that certain products are a composite of several characteristics, which can be represented by a vector $z = (z_1, z_2, z_3, \dots, z_n)$. The price is a function of the different characteristics of the product which is the hedonic function $P=P(z)$. The hedonic price model allows us to isolate the effects of individual characteristics on a composite good.

The behavior of both consumers and firms helps to explain the determination of the hedonic price schedule in the market. Coefficient estimates of the hedonic models can be translated as the consumer's willingness to pay for different characteristics.

In this study we are trying to see what effects public schools have on the price of houses for the Pitt County area. Since the characteristics of houses can be separated, it can be seen how much each varies independently. The hedonic price function is assumed to be linear. The model is as follows:

$$\ln(PRICE_i) = \alpha + \beta X_i + \gamma Z_i + \varepsilon \quad (1)$$

Where $\ln(PRICE_i)$ is the natural log of the list price for house i , X is a set of observable housing characteristics such as square footage, wood floors, double garage, and Z is a

vector of neighborhood characteristics. The model is in semi-log form because price cannot be negative and the form provides a better fit, which is consistent with earlier research.

A problem with this model is it is subject to omitted variable bias. One of the possible omitted variables is due to the neighborhood characteristics. The age variable is used in an attempt to control for this omission. It is assumed that houses built in the same neighborhood are of approximately the same age and style. Even though this isn't a perfect control for neighborhood characteristics, it is the best available variable to use as a control. Another possible bias is due to omitted variables that may vary at the school district level. Luckily, property taxes and school spending do not vary from district to district in Pitt County. Therefore, a bias due to "rich" and "poor" districts is unlikely in this sample. Location, city versus rural, is another characteristic that varies across school districts. By creating a city dummy variable using Greenville, Winterville and Ayden, which are the most central locations of Pitt County, city effects on housing prices can be controlled for. There will be problems with omitted variables in this analysis because of the data being used. Fortunately the methodology works well with this study. It shows the effects of standardized tests scores on the price of a house. From this, it is possible to infer the value people place on public education from their consumption of housing.

Data and Summary Statistics

The housing data come from a multiple-listing service (MLS) of houses for sale in the Pitt County area. The data used are from the March 1999 edition and from the April 2000 edition. The MLS is tabulated monthly by the Association of Realtors, Inc. and includes explanatory variables for housing such as age, square footage, number of

bathrooms and bedrooms, type of garage or carport, type of heating, as well as other characteristics. For the data from 1999 there are 450 single-family homes with twenty-one variables for each house. The number of observations has been trimmed to 391 single-family homes. This has been done in order to clean the data. If an observation had a missing variable it was deleted from the sample. The data from 2000 has 459 single-family homes with twenty-three variables for each house. The number of observations for the 2000 data has been lowered to 339 due to the same reason as mentioned for 1999. The summary statistics for each of these years can be seen in Table 1.

Mean housing prices for 1999 and 2000 are \$152,794 and \$174,938 respectively. Also, mean square footage is 1956 for 1999 and 2074 for year 2000. Houses in 1999 had an average of 3.25 bedrooms and 2.25 bathrooms. In 2000, there were an average of 3.29 bedrooms and 2.34 bathrooms. The mean age of a house in 1999 was 13.62 while in 2000 it is 11.86. Over forty percent of the houses in 1999 and 2000 had a double garage.

Information on public schools is obtained from Pitt County Schools Report Cards for the years of 1997 to 1999. These report cards include student information as well as school system information. Also, information such as racial composition, student-teacher ratios and students eligible for free lunch can be found on these report cards. The main piece of information found on these report cards is the test scores for the ABCs.

The State Board of Education developed the ABCs of Public Education in response to the School-Based Management and Accountability Program enacted by the General Assembly in June 1996. The accountability model for elementary and middle schools was implemented in 1996-1997. The ABCs of Public Education is a

comprehensive plan to reorganize public schools in North Carolina. This plan focuses on: (1) strong accountability, (2) emphasis on the basics and on high educational standards and (3) maximum local control. A key component to the ABCs of Public Education is a new accountability program, which focuses on the performance of individual public schools, rather than school systems, in the basics of reading, writing and mathematics. Rather than comparing different students from one year to the next, this plan holds schools accountable for the educational growth of the same groups of students over time. The important score is the performance composite. This score is calculated from the reading and math scores for grades three through eight and then measured against the national average.

The ABCs are computed beginning with a pretest for grade 3. The pretest is a multiple-choice reading and mathematics test. It is administered to students at the beginning (within the first three weeks of school) of grade 3. This test provides pre-scores for third graders for the ABCs accountability program because there are no test scores from grade 2 to provide pre-data for the growth analysis from pre- and posttest. The grade 3 pretest measures the knowledge and skills specified for grade 2 from the reading and mathematics goals and objectives of the North Carolina Standard Course of Study. At the end of each school year there is an End-of-Grade Tests. These tests are multiple choice tests that measure the achievement of curricular competencies described in the North Carolina Standard Course of Study. The tests and curricular competencies have a strong emphasis on the application of knowledge and skills. The curricular competencies measured by end-of-grade tests are closely aligned with national curriculum standards. End-of-grade tests are administered to all eligible students in

grades 3-8 within the final three weeks of school. There are several end-of-grade tests, but the two we are interested in are the reading comprehension and the math tests. These tests, reading and math, assess not only the knowledge of the students in these subjects, but also the growth students have made from one grade level to the next. The performance composite uses the scores from the pretest to set the standard of a particular school then uses the end-of-grade tests to see the amount of improvement each school has made. The performance composite shows the percentage of students that are proficient in both math and reading at levels III and IV. If students grades increase on these tests by a certain percentage then the school will receive expected ABC growth status. This occurs even if the school ABC proficiency level is around fifty percent. Appendix 1 shows how expected growth for a school is calculated. Even if the composite score is low, a school can still achieve expected or exemplary status for a growth/gain in the overall scores. An example of this would be Pactolus. Even though the performance composite score was as low as 53.2 in 1998, the school received exemplary status from the gains it made from the previous year.

As seen in Table 2, there has been a gradual rise in the tests scores for the performance composite, reading proficiency and math proficiency. Also in Table 2 there are statistics for student-teacher ratios, the percentage of blacks and the percentage of the elementary schools making exemplary status. In order for schools to receive exemplary status in the ABCs they must improve by ten percent more than what was expected based on calculations from the State formula. The percentages are based on the seventeen elementary schools in Pitt County. From the 96-97 to 97-98 school years the amount of

exemplary schools doubled. Unfortunately, from 97-98 to 98-99 the amount declined from 47 percent to 29 percent.

Table 3 shows the elementary schools ABC Performance Composite scores individually. The schools with the highest scores for 1997 through 1999 were Sam D. Bundy (72.9), Wahl-Coates (80.9) and Eastern (81.8) respectively. In 1998, Wahl-Coates received recognition as being a School of Distinction. In 1999, Eastern received the same distinction. A school of distinction has at least 80 percent of its students performing at or above levels III or IV and may or may not have met expected or exemplary status.

Results

In order to determine the effects of the housing variables and school district variables on house prices, I ran several regressions for both 1999 and 2000. The first regressions, in Table 4, are for 1999 and 2000 housing data including only the school districts. Tables 5 and 6 will include school data for the 1997-1998 and 1998-1999 school years. This will show how one year of knowledge about testing causes housing prices to change. Tables 7 and 8 will include the 1996-1997 and 1997-1998 schools years. This will test to see the how two years of knowledge about testing might change housing prices in comparison to just one year of knowledge.

Table 4 gives information for the years of 1999 and 2000. For both sets of years we find that square footage is positive and significant. This is expected since square footage is one of the main sources in determining housing prices. Also, age affects prices negatively and significantly for each of the regressions. As a house gets older, it loses value. The number of bathrooms is positive on housing prices but is only significant in 1999. A two-car garage had a positive and significant effect for both years.

This is a utility that people are willing to pay more for so they are able to better protect their vehicles, as well as protecting themselves in certain weather conditions. Thermal doors and windows were positive and significant for housing prices. People are willing to pay more now for a good that will save them money later. Finally, as far as housing characteristics are concerned central air conditioning had a positive and significant effect on housing prices. Its effect increased the price by a larger percentage than any other variable when compared to houses with window units or even no air conditioning.

What effects did the school districts have on houses? Before this can be discussed, the reader needs to know that Stokes Elementary had no observations in the sample. Therefore, it was not included in the regression. Also, each of the schools is compared to Wintergreen. The reason Wintergreen was chosen is that it had exemplary growth for the years 1997 and 1998 and expected growth/gain in 1999. One final reason for picking Wintergreen is there were more observations in that school district than in any other.

In 1999, the schools that were significant are Ayden, Pactolus and Sadie Saulter. Ayden showed a negative effect on housing prices. The negative effect could be due to the school's low ABC test scores. On the other hand, Pactolus had a positive and significant coefficient. This is unexpected since Pactolus received no recognition in two of the three years, although in 1998 it did receive exemplary status. One possible reason for Pactolus having a surprising coefficient is that only four of the observations came from the district. With such a low number, the estimates could easily be thrown off. The average price for the four houses in Pactolus is \$279,462. This is the highest average price for all of the school districts. It is likely that the residents of these houses are not

sending children to public schools. Finally, Sadie Saulter is negative and significant at the ten percent level. The possible reason could be based on the schools low tests scores.

In 2000, housing prices were significantly different for several school districts. The schools that had a negative effect on housing prices when compared to Wintergreen were Ayden (at the 10 percent level), H. B. Suggs and Pactolus (each at the 5 percent level). A factor that may be causing this is that each of these schools had lower tests scores than did Wintergreen. Also, Pactolus was the only school to receive exemplary status for its gains in at least one of the three years.

The school districts that were positive on house prices and significantly different from Wintergreen were Elmhurst, S. Greenville and Wahl-Coates. The first two districts were significantly different at the one percent level while Wahl-Coates was different at the five percent level. Elmhurst may be explained since its test scores went from 68.7 in 1997 to between 77 and 78 for both 1998 and 1999. Even though S. Greenville's scores were not as high as Wintergreen's for any year, it did go from not being recognized in 1997 to exemplary in 1998 and expected status in 1999. S. Greenville has shown gains and the difference between Wintergreen and S. Greenville is only nine percentage-points. Wahl-Coates' coefficient is significantly different and positive at the five percent level. Based on the ABC results, Wintergreen and Wahl-Coates have a similar pattern but Wahl-Coates increased its tests scores at a higher percentage than Wintergreen and received the school of distinction honors in 1998. These could be the deciding factors in the price difference between the two.

So, is it the actual school districts that make the difference or is it the ABC scores that have an effect on housing prices? Table 5 shows the effect of replacing the actual

schools with the ABC results from 1997-1998 and 1998-1999 for the housing data in 1999 and 2000 respectively. What we find in 1999 is that all the housing characteristics included do have a significant effect. Also, the positive and negative effects are similar to those in the earlier regression that based on the school district dummies.

From the results it can be seen that the performance composite does have a positive and significant effect on housing prices from 2000. With each one-point increase, housing prices increase by one-tenth of a percentage-point. The results do show some unexpected things though. The student-teacher ratio showed that as the ratio increases housing prices increase. This is unusual since common thought is that lower student-teacher ratios increase the amount of learning for students. Finally for 1999, the city dummy, which includes Greenville, Ayden and Winterville, significant and positive. This means that if a house is in this area it will have a higher value than houses in other areas.

In the year 2000 housing data the results remain similar as those for the 1999 data. The only change in the housing characteristics is the number of bathrooms became significant only at the ten percent level, instead of the five percent level.

The price of houses for 2000 increased based on the performance composite compared to 1999. The 2000 results show that the composite almost doubles what has been found in 1999. This could indicate increased knowledge of the tests, which may affect housing prices either upward or downward depending on whether the scores were good or bad.

In Table 6, the school district dummies have been added to the ABC results to see if this helps to correct for the neighborhood effects. The school districts that stand

out in 1999 are Bethel, Falkland, G. R. Whitfield, Pactolus, Sam Bundy and S. Greenville. These schools are being compared not only to Wintergreen but also to Wahl-Coates. The only school that doesn't have a positive effect on housing prices is Bethel. Of the schools that do have positive coefficients, Falkland and Pactolus are strange. The reason is that the two schools scores have not been up to par.

The performance composite is positive and significant. The city dummy does show similar results as before. It is positive and significant. The student-teacher ratio is negative, but insignificant in explaining housing prices.

For the 1998-1999 school year data there is no variable for student-teacher ratio. As for the school districts, Eastern has a negative effect and is significant. This is unexpected because Eastern was scored as exemplary and also received the School of Distinction honors. One reason for the coefficient being negative is that it may be picking up some omitted variable bias due to some neighborhood effects. Falkland, G.R. Whitfield, Sadie Saulter, Sam Bundy and S. Greenville show positive effects on housing prices.

The performance composite is positive and almost doubles the amount of increase in housing prices as 1999. The city dummy is insignificant.

Since Eastern has a negative coefficient for the year 2000 housing prices maybe it would be best to see the effects of a two year lag in information from schools to home-buyers. Table 7 shows the results for 1999 housing prices using 1996-1997 school data and 2000 housing prices using 1997-1998 school data. These tables are testing to see what causes housing prices to change based on tests scores, student-teacher ratios and whether someone lives in the three city area of Ayden, Greenville and Winterville.

As for the housing characteristics, again there are no major changes. Each coefficient sign remains the same as the earlier regressions for both 1999 and 2000. Also, the performance composite is positive for both years of housing data, as well as the student-teacher ratio and the city dummy. It is expected of the composite score and the city dummy but not the student-teacher ratio. As mentioned before, typically the ratio should lower to have a positive effect on housing prices.

In Table 8 the school district dummies are added once more. What we find is that with a two-year lag in knowledge certain schools remain the same. Bethel is the only school that is negative with any significance while Falkland, G.R. Whitfield, Pactolus and S. Greenville are positive. As for the performance composite it is positive and significant along with the city dummy. The student-teacher ratio makes more sense now with a negative coefficient even though it is only significant at the 15 percent level.

Looking at the 2000 housing price effect of data from 1997-1998 we see that more schools are significant than in 1999. Now, Bethel and Eastern have negative coefficients while Chicod, Elmhurst, Falkland, G.R. Whitfield, Sam Bundy, S. Greenville and W.H. Robinson are all positive and significant.

The performance composite, which is the main variable we are interested in, is positive and highly significant as expected. The student-teacher ratio is negative and significant, as we would anticipate it being. The city dummy is insignificant in this regression.

Conclusion

So, with all the statistics and results produced in this paper, what does it all mean? The performance composite is a major factor that changes housing prices and therefore, it

can be said is a good measure of school quality. As the scores increase, housing prices increase and school quality increases. Since many people including parents, policy makers and realtors want this type of information it would make sense that it does have some effect on the value of a house. These results are consistent, maybe somewhat lower, with the results achieved by other researchers on this subject. The results from other researchers show that housing prices increased between two and five percent with a ten percent increase in tests scores.

Other quality measures that were looked at were student-teacher ratios and racial composition. The student-teacher ratio did have significance, but depending on which regression you look at, it may either be positive or negative. If the coefficient does have a negative sign that is understandable. Lower ratios supposedly increase learning. The racial composition didn't have doesn't play a major role in the perceived quality of our schools. Maybe the schools are so diversified that this would not have as large an effect as it would seem.

This paper shows that performance tests are good measures of perceived school quality. The problems with this paper are that it doesn't include many variables that may help to explain our perceived quality of schools a little better. The school district variables help with location, but they aren't an exact measure of whether someone living in that area is going to attend that particular school. Better students may commute to the schools that have the better facilities even if there is a school in the vicinity of their home. This is definitely one of the problems that this research can't determine.

Another problem is the neighborhood characteristics that are missing. An important factor to keep in mind in thinking about these "neighborhood" characteristics is

that the attendance area of each school includes more than one neighborhood and these neighborhoods can be very different. This complicates the measurement of neighborhood effects even more. The age variable is one way to attempt to control for this but there could be a better variable or variables such as neighborhood crime rates or actual neighborhoods.

It is unknown whether families may send their children to private schools as well. If this is the case then the house price is not a good measure of the public schools.

So, does perceived quality affect housing values? If perceived quality is based on performance tests then the answer seems to be yes.

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