School Quality and Educational Attainment of Parenting and Non-Parenting Youth:

The Role of School Violence

Topic and Theoretical Focus

In this study we examine the relationship between school quality and the educational attainment of parenting and non-parenting adolescents attending public schools. Understanding this association is important for those who wish to craft evidence-based public policy that will improve the educational outcomes -- and subsequent wages and well-being -- of disadvantaged youth.

There is strong evidence that parenting teens have lower educational attainment than non-parenting teens. Female teens who have a birth are less likely to complete high school (Jones, Astone, Keyl, Kim & Alexander, 1999; Ribar, 1993). Looked at another way, parenting teens complete, on average, two fewer years of schooling than do their non-parenting peers (Keplinger, Lundberg & Plotnick, 1999) There is variation within this population however. Some parenting teens go further in their education than others.   This variation has been shown to be due in part to differences between individuals. Race, family structure, and geographic region all modify the likelihood that a parenting teen will complete high school (Jones, Astone, Keyl, Kim & Alexander, 1999). More relevant to education policy, however, is the preliminary evidence that some of the variation may also be due to differences between the schools the parenting teens attend. Unfortunately, the research in this specific area has been very limited. One study reported the statistically, but perhaps not practically, significant result that as the school's dropout rate increases, the relative risk ratios of teen birth/ diploma, no teen birth/no diploma, and teen birth/no diploma compared to no teen birth/diploma in that school increases by 2% (Jones, Astone, Keyl, Kim & Alexander, 1999).

Though specific evidence for the relationship between school characteristics and educational outcomes of parenting teens is limited, a broader base of research has begun to provide reasons to hypothesize that school quality does indeed make a difference for disadvantaged youth. The evidence that supports this hypothesis comes from two sources: examinations of interactions of traditional school quality indicators with individual risk factors, and examinations of new measures of school quality. The first body of research offers another perspective on the mixed evidence on the efficacy of improving traditionally-observed aspects of schools (i.e., raising teacher salaries, increasing per-pupil expenditure, and reducing class size) in order to improve educational outcomes. Hanushek and colleagues found that traditional measures of school quality (expenditures per pupil, student-teacher ratios, or teacher salaries) do not have consistently strong positive effects on school achievement (Hanushek & Rivkin, 1997; Hanushek, Rivkin & Taylor, 1996) Though others have found some evidence that small class sizes improve student achievement (Krueger, 1999), the weight of the evidence does not support an impact of funding allocation on student outcomes. Evidence is emerging, however, that the small impacts in the general population may hide larger impacts in disadvantaged populations. For example, there is some evidence that schools matter more to disadvantaged students, and thus school quality may be more important for them as well.   Studies have shown that while only high SES children make educational gains during the summer, both advantaged and disadvantaged children progress during the school year – and that progress is nearly equal in the two groups (Alexander, 1997). Schools therefore have the potential to compensate to some

extent for the limited resources available to children in disadvantaged families Evidence of this can be found in the results from Tennessee's project STAR, in which minority youth and youth in inner-city schools benefited the most from the smaller classes (Alexander, 1997). Together these studies suggest that school quality might have a larger impact on the educational attainment of teen parents, a relatively disadvantaged group, than it does on the population at large.

Even if this is not the case, however, there is still reason to suspect that school quality matters – though what matters may not be the aspects of the school that we have traditionally considered important. Though the commonly used measures of school quality cannot account for the association (Moffitt, 1996), scholarly research has indeed found that an association exists between the school a person attends and his or her outcomes (Betts, 1995). The research project ahead of us, therefore, is to identify what elements of schools are "doing the work" of improving or damaging their students' life chances.   School disorder, classroom climate, the prevalence of drug activity, the safety level and teacher attitudes all may play a role.   Violence in the schools may be a particularly important factor. There is of course substantial evidence that experiences of violence in childhood or adolescence, either at the hands of a parent or from another member of the community, diminishes educational attainment (e.g. Macmillan & Hagan, 2004; Perez & Widom, 1994) Violence in schools may be particularly pernicious, however. A study using data from High School and Beyond found that moderate levels of high school violence reduce the likelihood of high school graduation by 5.1 percentage points on average, and lower the likelihood that a student will attend college by 6.9 percentage points.(Grogger, 1997)

In summary, although there is mixed evidence regarding the relationship between educational attainment and traditional economic aspects of school quality, recent research suggests that attainment may be more strongly associated with other dimensions of school quality. These other dimensions – in particular those related to violence -- may be particularly important for at-risk populations – including adolescent parents. This research thus has the potential to inform public policy debates about the best ways to reduce disparities and improve the life chances of parenting and other disadvantaged teens.

<u>Sample</u>

We use data from the National Educational Longitudinal Survey of 1988 (NELS:88), which surveyed 8th grade students in 1988 and then followed up with them in 1990, 1992, 1994 and 2000. In 1988, 1990, and 1992, data were collected from the school administrators as well. In order to ensure that every member of our sample had an equal opportunity to report a birth before age 18, we limited the sample to respondents who met one of three criteria: participated in the 2000 survey, did not participate in the 2000 survey but did participate in 1994 and were 18 by 1994, did not participate in 2000 or 1994 but did participate in 1992 and were 18 by 1992 (N=17005).

The sample used in the analyses was further limited to those respondents who participated in the survey while attending a public school in the year the school quality indicators were measured, and who participated in the survey in the year the educational attainment was measured. We thus had four similar but distinct samples: Those who attended a public school in 1988, participated in the survey in 1988, and participated in the survey in 1994; those who attended a public school in 1988, participated in 1988, and participated in 2000; those who attended a public school in 1990, participated in 1990 and participated in 1994; and those who attended a public school in 1990, participated in 1990, and participated in 2000. We limited our analysis to public school students because only a minority of students in the United States attend

private schools and furthermore public schools are uniquely accessible to the affects of public policy.

Identification of the teen parent sample proceeded as follows: We calculated each respondent's date at first birth (if any) using information reported by the respondent. Respondents had the opportunity at each wave to report births. In some waves survey protocol directed the interviewers to record the birth dates imprecisely, however. In all cases, if precise information was available about date at first birth, we used that precise information to assign the respondent to either the birth-before-18 category or the no-birth-before-18 category. If no precise information was available then we used the estimated date. The estimates are all conservative. We may have missed respondents who had a birth before 18, but we can be sure that all respondents flagged as "had a birth before 18" did in fact have such a birth. 706 respondents reported a birth before 18 by giving a precise date, and an additional 114 respondents did not give a precise date for their first birth, but reported a birth whose date could be safely estimated to be before 18 (e.g. there are two possible dates, but both are before the respondent turned 18).

Method: Predictor and Outcome Measures

We obtained the demographic indicators, including gender, race-ethnicity, socioeconomic status, and family structure from the baseline survey.

We constructed our traditional school quality indicators using data from three sources. Per-pupil expenditures, student-teacher ratios, and base year salaries for starting teachers, all measured at the school level, were obtained from the NCES's Common Core of Data (CDC), the Quality Education Data of Denver, Colorado (QED), and the school administrators themselves.

In contrast, the new school quality measures were constructed using only data from NELS:88, most from the school administrator surveys. First we extracted geographic location (urban, suburban, or rural). Next, using factor analysis, we combined administrators' answers to individual questions to form the following scales: Violence, Drugs, Problems (e.g. vandalism and truancy), Learning Atmosphere, and Teacher Attitude. Finally, two new measures were constructed using data reported by students: school climate, and school safety. Using factor analysis, variables were combined to form these two scales. We then calculated the total score for each school, subtracted out for each student that student's score, and then divided this adjusted total by n-1 where n is the number of students in the school who answered the questions in the scale. The final score for each student was thus the student's school's mean score, adjusted to remove that student's bias.

All of these school quality measures, both traditional and innovative, were measured at baseline, in the respondent's 8th grade school, and again at the first follow-up, in the respondent's 10th grade school. Our final set of school quality variables thus contains two variables for each construct – one from 1988 and one from 1990. As a last step, these variables were transformed into sets of quartile dummy variables.

The outcomes of interest were dichotomous measures of educational attainment. We used student reports to determine whether or not the respondent graduated from high school, earned a GED, attended college, and/or earned a bachelors degree. We used two sets of reports, one from 1994 (when on-the-traditional-track students would be in their second year of college) and one from 2000 (when the respondents were about 25 years old).

Before conducting the analysis, the school-level variables were merged onto the student records by matching on school id.

Method: Analysis

We will first examine the demographic characteristics of the teen parent sample and compare them with those of the non-parenting respondents. We next will compare the school quality of the schools attended by these two groups in both 1988 (8th grade) and 1990 (10th grade). As the last step of descriptive analysis, we will compare the educational attainment of these two groups by 1994 and by 2000.

After these exploratory analyses, we move to the heart of the project. We will regress each of the outcomes of interest on the set of individual characteristics and then on each of the sets of variable quartiles, adjusting the standard errors for clustering within schools. For the non-parenting teen analysis we will use Hierarchical Generalized Linear Modeling to account for clustering within schools. However, we will not use this technique for the teen parent analysis because 5 is the standard cluster minimum for HGLM and fewer than 40 parenting students attended schools which four other NELS:88 teen parents attended. Next we will add the set of individual characteristics to each of the models in which the school quality quartile variables are statistically significant at conventional levels. By looking at the odds ratios associated with each of the quartile dummies, we will determine if we should continue to use the dummies, use the continuous version of the variable, or use a dichotomized version. We will repeat the analysis procedure again, using the modified forms of the school quality variables in the models. Finally we will create a single model incorporating all statistically significant regressors (i.e., the school quality variables which remain statistically significant when individual covariates are added to the model in which the attainment variable is regressed on that school quality variable). In this way we will determine which, if any, of the school quality variables are associated with educational attainment among parenting and non-parenting teens.

Preliminary Results
Three individual level covariates stand out as strongly associated with educational attainment among teen parents. First, teen mothers are nearly twice as likely to attend some college as teen fathers. Second, African American teen parents are two to three times as likely to attend some college as White teen parents. Third, base year SES is strongly and consistently positively associated with the odds of educational attainment. (These second two findings are, of course, consistent with previous research.) The relationship of school quality to educational attainment is to some extent different than what theory might have predicted.   Salary, student-teacher ratio, problems, and climate are inconsistently associated with educational attainment. Most striking, however, is the consistent association of high school violence with attainment. Teen parents attending high schools with low violence scores are two to three times as likely as similar students in the most violent high schools to obtain a high school degree and to attend some college.

This relationship will be explored further and the analysis will be repeated with the non-parenting sample. We expect that violence will be significantly associated with educational outcomes in that sample as well, but not as strongly. School violence-reduction programs may be one key to improving educational attainment among disadvantaged populations, particularly parenting teens.

Table 1. Parenting teens: Preliminary odds ratios from models regressing individual covariates and 1988 (8th grade) school predictor variables together on educational attainment in 2000

	Model 1 High School Diploma vs. None (N=333)	p>|z|	Model 2 High School Diploma or GED vs. None (N=330)	p>|z|	Model 3 Some college vs. No College (N=332)	p>|z|	Model 4 BA vs. No BA (N=300)	p>|z|
Female	0.90	0.68	1.39	0.28	**1.83**	0.02	0.43	0.10
Black	1.45	0.27	0.62	0.26	**2.04**	0.04	2.21	0.18
Latino	1.25	0.50	0.80	0.54	1.23	0.54	0.45	0.35
Asian	4.26	0.11	1.15	0.89	1.80	0.52	1.10	0.94
Native	1.22	0.79	3.14	0.29	1.99	0.28	dropped	
BYSES	**1.70**	0.01	**2.51**	0.00	**2.67**	0.00	**4.32**	0.00
Single Parent	0.91	0.76	1.04	0.91	**0.53**	0.04	0.32	0.20
Step Parent	0.70	0.26	**0.54**	0.07	0.81	0.45	0.38	0.24
No Parent	1.70	0.31	3.31	0.19	1.03	0.97	dropped	
Missing Parent	2.32	0.52	dropped		2.02	0.58	dropped	
High Salary	0.63	0.14	0.73	0.38	0.73	0.31	**0.08**	0.03
Unionized	1.23	0.40	1.51	0.20	1.11	0.67	2.79	0.18
Urban	0.63	0.15	0.69	0.34	0.86	0.63	2.09	0.36
Rural	0.81	0.48	1.25	0.61	1.03	0.93	2.35	0.22
Low student-teacher ratio	1.14	0.70	**2.06**	0.07	1.52	0.30	0.78	0.749
Low problem score	**0.55**	0.07	0.63	0.30	1.02	0.95	0.61	0.542
Low Violence	1.44	0.20	**1.83**	0.08	1.27	0.43	**0.22**	0.054

Table 2. Parenting teens: Preliminary odds ratios from models regressing individual covariates and 1990 (10th grade) school predictor variables together on educational attainment in 2000

	Model 1 High School Diploma vs.	p>|z|	Model 2 High School Diploma or GED vs.	p>|z|	Model 3 Some college vs. No College	p>|z|	Model 4 BA vs. No BA (N=219)	p>|z|

	None (N=249)		None (N=242)		(N=248)			
Female	0.96	0.91	1.44	0.41	1.28	0.43	0.45	0.28
Black	1.48	0.37	0.46	0.16	**3.22**	0.01	1.27	0.82
Latino	0.76	0.50	0.71	0.54	1.35	0.51	0.56	0.69
Asian	2.66	0.37	0.45	0.49	1.56	0.62	dropped	
Native	0.43	0.32	dropped		1.39	0.72	dropped	
BYSES	**1.72**	0.02	**2.81**	0.00	**1.75**	0.01	**5.86**	0.02
Single Parent	1.40	0.38	2.03	0.25	0.56	0.10	0.92	0.91
Step Parent	1.21	0.64	0.89	0.82	0.74	0.41	0.99	0.99
No Parent	0.90	0.85	1.99	0.40	0.59	0.40		
Missing Parent	dropped		dropped		dropped		dropped	
Low Student-teacher ratio	**0.52**	0.06	0.46	0.13	0.64	0.23	0.33	0.13
Good Climate	0.72	0.24	**0.41**	0.03	1.02	0.94	0.89	0.86
Good learning atmosphere	1.61	0.21	1.18	0.76	0.66	0.22	0.74	0.77
Low violence	**2.44**	**0.00**	**3.30**	**0.02**	**2.22**	**0.01**	1.58	0.51

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