

Written Testimony of Michael Gilraine
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Public Hearing Committee
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Senate Bill 288: An Act Concerning Indoor Air Quality in Schools

Senator Abrams, Representative Steinberg and members of the Public Health committee:

Thank you for taking the time to consider the important issue of air quality in schools. My name is Michael Gilraine and I am an Assistant Professor of Economics at New York University. As a researcher, I have investigated the effect of air quality and air filters on students' test score performance and speak out in support of SB 288: An Act Concerning Indoor Air Quality in Schools.

My support for this bill comes from assessing and contributing to a long line of academic research that has clearly and convincingly linked pollution to student learning. In terms of outdoor air pollution, researchers have documented significant declines in test scores when students take tests on days with high levels of particulate pollution. Another study compared students attending schools downwind relative to upwind of highways and found that increased air pollution from being downwind lowered test scores and raised behavioral incidents and absences. Similarly, in a recent working paper, a co-author and I use year-to-year variation in power production combined with wind direction to show that pollution from coal-fired power plants lower students' test scores.

In addition, recent papers have been able to link **indoor** air quality to reduced cognitive performance. Research from chess tournaments found that a player's probability of making an erroneous chess move (as determined by a chess engine) increased when particulate matter at the tournament venue was higher. An economist at the London School of Economics also linked indoor air quality to test performance. To do so, he collected air particulate readings in exam rooms at a university in London. He found that exam rooms at the university varied considerably in terms of air quality, and that students performed worse when they were assigned to exam rooms with higher levels of air pollution.

In light of this evidence, improving the air quality within schools is of tantamount importance. Research has also indicated the value of doing so: one study in Texas, for instance, looked at mold and ventilation remediation projects and found that these renovations substantially raised test scores by about 0.1-0.15 of a standard deviation. Similar beneficial effects on test scores have also been found using new school construction.

In addition, I have conducted recent research as well that has highlighted the benefits of cleaner air in the classroom. In particular, I leveraged a unique setting arising from the largest gas leak in United States history, whereby the offending gas company installed air filters in every classroom, office and common area for all schools within five miles of the leak (but not beyond). Using this variation, I compared student achievement in schools just within five miles of the leak to those just beyond. Given their geographical proximity, these schools should be similar except for the presence of air filters, and so any difference in student achievement among these schools can be attributed to the air filters. I find substantial improvements in student achievement: air filter exposure led to a 0.10-0.20 standard deviation increase in mathematics and English scores.

The compelling evidence highlight above makes clear that improving school air quality greatly enhances student learning. In addition, given the relatively low costs of improving school air quality and the large benefits that they impart, school air quality improvements may be one of the most cost-effective education interventions that policymakers can implement.

I would like to thank the committee for taking up the important issue of air quality in schools. Senate Bill 288 is an important step in helping students succeed in the classroom and so I strongly endorse it. I would of course be happy to offer any additional expertise to the committee, if needed.

Thank you,

Michael Gilraine