Michelle Obama and an English school: the power of inspiration

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Introduction

Something extraordinary happened to the pupils of Elizabeth Garrett Anderson School in London in 2009, and in 2011, and again in 2012. Or rather, someone extraordinary: Michelle Obama visited the school in April 2009[1], then asked pupils from the school to meet her in Oxford two years later, and finally invited a dozen pupils to visit her in the White House[2] in 2012[3]. Despite her title as First Lady of the United States, the identity of her spouse is not the only remarkable thing about her. She grew up in a poor neighbourhood in Chicago's South Shore, but made it to Princeton and then Harvard Law School before taking a job in a prestigious law firm. She credits education and hard work as the reasons for her successful career[4]: "there was nothing in my story that would land me here. I wasn't raised with wealth or resources or any social standing to speak of. If you want to know the reason why I'm standing here, it's because of education. I never cut class. I liked being smart. I loved being on time. I loved getting my work done. I thought being smart was cooler than anything in the world." She also has a more general and long-standing interest in education[5], particularly for girls of colour[6], and runs a mentoring programme to encourage those from less privileged backgrounds, such as her own on Chicago's South Side, to set their sights high[7].

Having Michelle Obama visit your school would be exciting enough even if she simply waved and gave a general speech. But she didn't; she talked about how the pupils of Elizabeth Garrett Anderson School (EGA) had the capacity to do as she did, to use education to really get on in life. In general terms: "I did this; you could too", which can be a very powerful message if delivered by the 'right' person. When she invited the pupils up to meet her in the hall of Christ Church Oxford, she said: "it's important that you know this – all of us believe that you belong here."

You only need to watch the news videos[8] to see that the pupils were genuinely inspired. The Guardian reported that this had a powerful effect on the goals and intentions of the students.[9] One said: "We're coming here. There's no doubt in my mind. I don't care what anyone says. I'm going to go to Oxford University. I'm going to work really hard, believe me. I am going to work so hard."

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[1] http://www.guardian.co.uk/education/2009/apr/05/michelle-obama-school-london
[2] http://www.egaschool.co.uk/media/galleries/images/41/ega-trip-to-washington-march-2012
[3] http://www.telegraph.co.uk/news/worldnews/michelle-obama/9167373/The-ultimate-school-trip-visiting-the-Obamas-at-the-White-House.html
[4] http://www.theguardian.com/education/2009/apr/05/michelle-obama-school-london
[5] http://www.bbc.co.uk/news/world-us-canada-35719997
[6] http://www.bbc.co.uk/news/entertainment-arts-35819687
[7] http://www.telegraph.co.uk/news/worldnews/michelle-obama/9167373/The-ultimate-school-trip-visiting-the-Obamas-at-the-White-House.html
[8] For example https://www.youtube.com/watch?v=1fEOWFHtozU ; other examples below.
[9] http://www.guardian.co.uk/world/2011/may/29/michelleobama-elizabeth-garrettanderson-school

These events represent a dramatic external shock to the aspirations and beliefs of the students in Elizabeth Garrett Anderson. While researchers and policy-makers debate the importance of aspirations in influencing attainment[10], it is generally very difficult to think of an analysis that could uncover a truly causal effect. It seems very likely that aspirations and attainment co-evolve in an interwoven, complex and hidden way, and so disentangling the role of aspirations *per se* is challenging. This episode has the potential to inform this debate. Do we see anything in the subsequent performance of this school's pupils to support the hypothesis that aspirations matter?

Analysis

Questions like "what was the consequence of this intervention?" can only be answered if we have a sense of what would have happened without the intervention: we need a counterfactual. This is completely unknowable, so we have to make assumptions. The most common are: "what would have happened was what happened before, so look at the change through time"; "what would have happened was what happened in other schools, so compare EGA with others"; and then combining the two: comparing the change in EGA with the change in other schools. This is generally the most secure and this is what I do here. Often researchers will look for 'matched' schools, essentially statistical clones of the school of interest. In this case, finding close comparator schools for EGA was not straightforward; as an all-girls school with mostly non-white pupils, it is quite unusual. In the absence of that, I took London state secondary schools as the comparator group[11].

We have plenty of outcome data for schools in England. This can be both a curse and a blessing. With so many measures, there are almost bound to be some that "fit" a hypothesis even if it's wrong; and equally some measures are likely to contradict a true story. For transparency then, I present a wide range of different measures here. Most of them tell the same story, but some go the other way.

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[10] See for example Goodman, A., Gregg, P. and Washbrook, E. (2011) Children's educational attainment and the aspirations, attitudes and behaviours of parents and children through childhood. Longitudinal and Life Course Studies. vol 2, No 1 (2011). http://www.llcsjournal.org/index.php/llcs/issue/view/14 and Gutman, L.M. and Akerman, R. (2008) Determinants of Aspirations. Centre for Research on the the Wider Benefits of Learning Research Report 27. http://eprints.ioe.ac.uk/2052/1/Gutman2008Determinants.pdf

[11] It might seem odd to go for a relatively broad group, but I am asking a rather unusual question of the data here. Instead of the normal case of looking for a sustained change following some intervention, the issue here is whether there was an immediate but short-lived impact in one school. There is no reason why there would be such a shock in the same year in, say, other all girls schools, or other Outstanding schools, or whatever.

The best way of capturing pupils' achievement is by the total GCSE score they achieve, adding up the points of all their GCSEs. A widely used similar alternative is the capped GCSE score, adding the points in their best 8 qualifications, focussing more on quality than quantity. In this case, it is also interesting to focus on high achievement, which is obviously important for those newly-inspired to aim for university. For this, I use the number of A*, A, or B grades that a pupil achieved. I also present results using the benchmarks presented in school league tables. These measures are thresholds rather than overall performance; best known is whether a pupil achieves at least 5 A*-C grades, or at least 5 A*-C grades including in English and Maths. These are clearly less comprehensive measures of any potential impact; for example, if all pupils who would have got mostly C's and B's instead got As and A*s then this dramatic change would be missed entirely by this measure. And in fact, most EGA pupils were already over the 5 A*-C threshold (81% in 2012) making it harder to pick up any change.

We often look at progress and conditional progress to identify the contribution of the school, to see if high scores are due more to the excellence of the teaching or the ability and circumstances of the pupils. While that's not really the question here, it is important to check whether outcome scores are driven by pupil abilities. Comparing the GCSE scores of one cohort of EGA pupils with the next, the raw scores are only going to show a different story to the progress scores if the characteristics of the intake of pupils vary substantially from one year to the next, five years before the GSCE exams. That seems unlikely, but nevertheless I show both progress and conditional progress for all the measures shown as well as the raw measures[12].

I present all these outcome measures in graphs, showing the achievement of EGA pupils relative to London pupils over the past decade including the two FLOTUS visits. These allow a visual analysis of the counterfactual: was there a change in the EGA score following Michelle Obama's visit relative to the change in the London score? This is a picture of the difference-in-difference. Obviously I am also interested in whether any patterns arise just from chance or whether they are sufficiently unusual that they can only have arisen from some outside event like Michelle Obama's visits. This is a discussion about statistical significance which I present after the graphs.

There are three final preparatory issues that require some thought. First, why was EGA chosen as the lucky school? If we want to estimate a truly causal effect, that would be compromised if EGA was chosen for some outcome-related reason. For example, if it was doing very badly, decided to change

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[12] These are computed by accounting for Keystage 2 test scores at age 11 (Keystage 2 scores in English, Maths and Science all included separately); and for personal characteristics such as poverty status, gender, ethnicity, first language, month of birth, and statemented special needs. I ran these regressions just for schools in London, for a closer comparison of like with like.

policies or personnel, and was about to experience a growth in performance then any relationship with the visit simply reflects that underlying trend. In fact, the visit seems to have been a shock to the school. Given the background, it shouldn't be a surprise that Michelle Obama would choose to visit an all-girls school where most of the students were not white British[13]; in fact EGA is one of only about half a dozen such secondary schools, and one consistently rated Outstanding by Ofsted[14]. I am inclined to believe this straightforward story rather than one of a crack team of education data crunchers in the US Embassy in London optimising the school to visit. Second, which pupils were involved in the visit? It is impossible for me to know using this data. But in any case, pupils talk to each other, watch the video of their friends meeting FLOTUS, and pass the inspiration on. So it's very likely that all pupils got larger or smaller doses of the inspiration[15]. Hence the focus here is on the average GCSE performance across the school. Thirdly, the timing. The 2009 visit was too late in the school year to generate the "hard work" for that year, so we might expect to see that effect in 2010. There were two events that might affect the 2012 score: the Oxford visit near the end of the 2011 academic year, and the Washington trip mid-way through the 2012 academic year. So in terms of what to look for in the results, any impact would show up in 2010 results being higher than 2009, and the 2012 results being higher than 2011.

Results

The bulk of the evidence reported here supports the idea that GCSE performance at EGA improved substantially following Michelle Obama's visits, although there are some counter-instances.

The first piece of evidence is in Figure 1, showing total GCSE points achieved in EGA compared with the average over all other London schools. The top panel shows simply the basic scores themselves. It is clear that the 2010 result is somewhat higher than 2009, though not dramatically so, while the 2012 score is substantially above the 2011. That difference, over 0.5 standard deviation units is huge, equivalent to each pupil moving from 8 'B' grades to 4 'A*' grades and 4 'A' grades. It is clearly

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[13] "… the school had, apparently, been deliberately chosen: girls-only, inner-city, its pupils, of whom 20% are the children of refugees or asylum seekers, speak a total of 55 different languages and 92% of whom are from a black or minority background." http://www.guardian.co.uk/education/2009/apr/05/michelle-obama-school-london

[14] An interview with the then and current Headteacher can be found here along with a sense of what the school was like in 2005/6: http://www.theguardian.com/education/2006/sep/19/schools.schoolbranding.

[15] Maybe ambitious parents would have immediately switched their children into this school, artificially boosting scores? The first visit was a surprise to everyone, so definitely not for that; the further visits were also unpredicted and switching schools in the middle of the GCSE programme just on the off-chance of another FLOTUS visit would have been foolhardy not ambitious. In fact, numbers taking GCSEs in EGA declined slightly over the period 2009 – 2013.

well outside the normal range of variation for EGA. Nothing similar happened in the rest of London, so it looks like it is unique to EGA. In Panel B of the Figure, I measure the GSCE total points score relative to the prior attainment of the pupils, picking up the progress they make through secondary school. The pattern is the same: the 2010 score somewhat above 2009, the 2012 score substantially above 2011. Finally, in Panel C, I also take into account some personal characteristics of the pupils that may affect their scores, and the same pattern remains.

Figure 2 shows the same set of graphs for GCSE Capped points score, counting each pupil's best 8 subjects. The results are the same: 2010 higher than 2009, and 2012 dramatically higher than 2011. Similarly, looking at pupil progress and conditional progress for this measure, results in 2010 and 2012 both substantially exceed the prior year.

Those results focus on the overall effect, but since Michelle Obama was encouraging very high performance and aspirations it is important to look specifically at high performance too. Figure 3 shows the school averages of the number of A*, A or B grades its pupils achieve. The first panel in particular is striking: a sharp increase in EGA relative to the rest of London in 2012. If this is really a result of Michelle Obama's interventions then it is a big effect. Again the progress score matches up, though the conditional progress score is flat.

As I noted above, the threshold measures of achieving at least 5 good passes are very important for schools and as summary measures of pupil achievement, but do not capture the full range of achievement. Figure 4 shows the school fraction of pupils achieving this benchmark, both with and without the restriction to include English and Maths. For this metric too, the 2012 score is substantially above 2011, and 2010 above 2009. While the latter change more-or-less mirrors the all-London change, the jump in 2012 is just EGA. Without the restriction to include English and Maths, this same pattern is retained once I control for prior attainment and pupil characteristics, but that is only partly true for the restricted measure, both showing 2010 higher than 2009 but 2012 below 2011.

Of course, the big jumps up in performance in EGA in 2012 might just be chance. One way of looking at this is to ask just how unusual the scores are in that school in that year. Generally in statistics, we take 5% as the standard benchmark: if something is likely to happen less than 5% of the time just by chance, then this is counted as strongly significant evidence of a real underlying cause. The less likely something is to be chance, the more significant it is. Taking account of all school factors and all year

factors[16], the residuals can be directly compared. For total GCSE points, the EGA residual in 2012 is extremely high, only 1% of observations in London are higher – so this is very significant[17]. Similarly for capped GCSE scores, the EGA residual is at the 94th percentile. And also for the number of A* - B grades, EGA is above the 98th percentile. As shown in the graphs, the results for the two threshold measures are less dramatic; in both cases the EGA residual is around the 76th percentile.

Finally, I present the results in a more formal statistical way in regression tables. These contrast the performance in EGA with all the other London schools, and give a precise estimate of the impact of the two visits, labelled FLOTUS 1 (in 2010) and FLOTUS 2 (in 2012) in the table. The results also report statistical significance. The data are at pupil level, and cover the same sample as the Figures, all mainstream state secondary schools in London. The regressions confirm that the 2012 visit had a substantial impact, which was extremely unlikely to have been generated just by chance. To improve further the sense of comparing like with like, I repeated the analyses using only schools that had been in existence for at least 8 out of the ten years in my data; this is over 60% of all the London schools in my data. The results, in Table 2, are the same.

These results are reported as 'effect sizes', in the metric of the standard internationally-comparable fractions of a standard deviation of the outcome measure[18]. Converting these to GCSE grades shows just how substantial they are. The impact on total GCSE points in 2012 is truly huge: an effect size of 75% translates into moving up each pupil in EGA up two grades (for example, a 'C' to an 'A') in each of 8 subjects. Looking just at the best 8 scores, the effect size is 50% of an SD of this outcome measure, in this equivalent to an improvement of a whole grade in each of the 8 subjects.

It is clear from the graphs that the impact of the visits does not persist for long. But why would it? It is the pupils who are inspired and they react, and there is no obvious mechanism for that to influence subsequent generations. While for the school the effect is transient, for the pupils involved the impact persists. Doing much better at GCSEs, getting more top grades, hitting key benchmarks stays on their CVs and opens the doors to A levels, degrees and top jobs.

What about the difference in impact between the visits? Given that the 2012 impact was greater than the 2010 impact, the question arises: was it Obama or was it Oxford? Or maybe the transatlantic trip? It is perhaps puzzling why the 2010 intervention had a lesser effect, and it would

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[16] Technically, school fixed effects and year fixed effects.
[17] These can be thought of as empirical p-values.
[18] Note that the progress and conditional progress effect sizes are in SDs of the residuals, not in SDs of the raw variable, which are about 75% smaller. So while the coefficients for the progress measures are smaller than for the raw measures, when they are all expressed in the same metric, they are roughly equivalent in size.

be useful to learn more about the circumstances of that trip. The media attention around all the visits may also have contributed. Strictly speaking, the different components of the intervention cannot be separated. But many schools have visits to Oxford University which would have a much less dramatic effect; and the White House trip only involved a dozen pupils. So my money is on Michelle Obama being the true catalyst for inspiration.

Conclusions

It is clear that the pupils of Elizabeth Garrett Anderson School were hugely inspired by meeting Michelle Obama and her words to them about the importance of education and hard work. For example, a journalist reports[19]: "If they had to sum it up in one word, I ask, what would it be? Their answers range from "Inspirational" to "Indescribable", from "Awesome" to a simple but exuberant "Wow!" … "I can still hear her saying to us: 'You have to push yourself hard, because if it feels easy, you're not trying hard enough'," remembers Jennifer Duong. "I won't forget that."". Also some students said that they were inspired to stay in education longer than they would have done[20].

Most of the evidence I've brought together here shows that that inspiration translated into substantially higher performance in GCSEs. This is what the students think too[21]. To be clear, establishing a robust causal relationship is hard, probably not possible for just two events as analysed here. But I think the results do provide strong suggestive evidence that the clear inspiration the pupils received from the visits did raise achievement.

What can we learn from this? First in terms of what matters for achievement, this supports the idea that inspiration and aspiration and effort are important, potentially very important. EGA was by no means a low performing school, and yet this injection of inspiration made a big difference.

Second, if pupil effort is important, then we need a much better understanding of pupil motivations – how do we inspire pupils? This seems to be me to be a key question, one deserving much more quantitative research. The traditional motivation was "work hard … get better qualifications … earn a higher salary". And while that is still clearly true, it may not be believed by some pupils, and in any case, it feels very distant in time to many adolescents. Another sort of motivation might come from shared aspirations of parents and their children. A leading example is the children of immigrants,

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[19] http://www.telegraph.co.uk/news/worldnews/michelle-obama/9167373/The-ultimate-school-trip-visiting-the-Obamas-at-the-White-House.html
[20] https://www.youtube.com/watch?v=rJIQQJDM8h0
[21] "Students at Elizabeth Garrett Anderson school in London say Michelle Obama inspired their best ever GCSE results" : see https://www.youtube.com/watch?v=QambYxd0AnM

arriving to a new country with high hopes and a strong determination to succeed in their new home. Often great stress is put on education as a key channel to that success.

In the case of the visits by Michelle Obama, the motivation comes from a strongly inspirational figure saying "I was like you; you can be like me". It is this personal connection that surely matters centrally. One of the pupils said[22]: "She told us she could relate to us because she'd had a childhood similar to ours." Just any random Important Person turning up and saying similar things about education would be unlikely to have similar effects.

Finally, the policy implications are both easy and hard. We need to get inspirational role models[23] into schools to talk to pupils about the importance of education. And of course this already happens[24]. For example the Inspiring Women Campaign does precisely that on a large scale[25], including one meeting at EGA in 2014[26]. The hard bit is finding speakers with that close connection to the specific pupils, to make it believable to say "I was like you; you can be like me". Harder still of course is to find speakers with the same inspirational power as Michelle Obama.

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[22] http://www.telegraph.co.uk/news/worldnews/michelle-obama/9167373/The-ultimate-school-trip-visiting-the-Obamas-at-the-White-House.html

[23] What role models do young people cite? In some interesting qualitative work, Fletcher-Wood (2015) has shown that most frequently they named relatives or local community members, highlighting their resilience in dealing with life. One other example is a year 11 student: "included a dance teacher who "Has done the career that I want to do and I have always wanted to do. So looking up to her is like… they are the footsteps I want to follow and go in". " (p. 17). All of these are salient to their situation and so might be effective. https://www.teachfirst.org.uk/sites/default/files/Areas_of_greatest_need_Blackpool.pdf
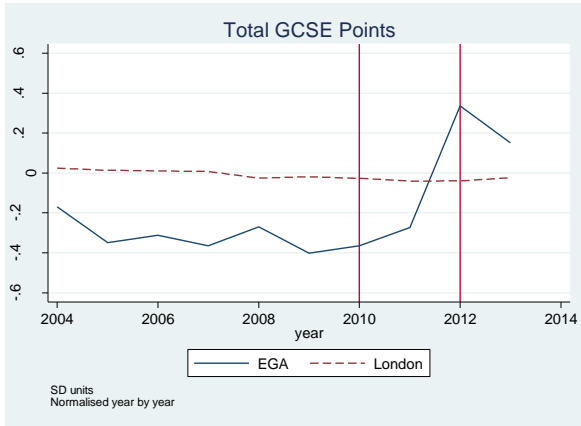
[24] Including the organisation Speakers for Schools, http://www.speakers4schools.org/.

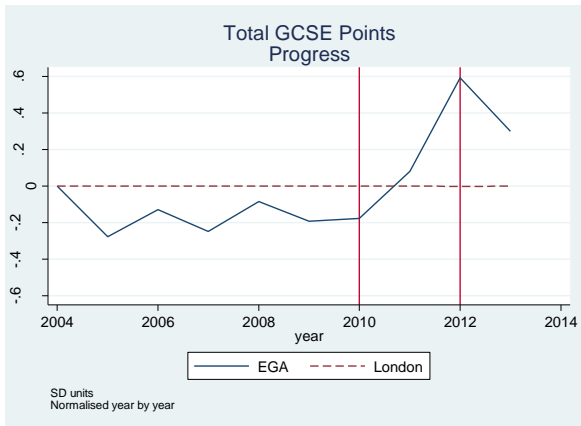[25] http://www.inspiringthefuture.org/inspiring-women/

[26] http://www.standard.co.uk/news/london/high-fliers-from-london-inspire-girls-to-dream-big-9600275.html

Figure 1: Total GCSE Points Score

A. Raw attainment score

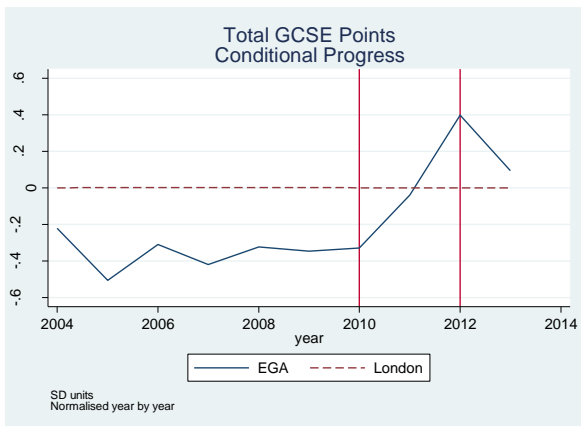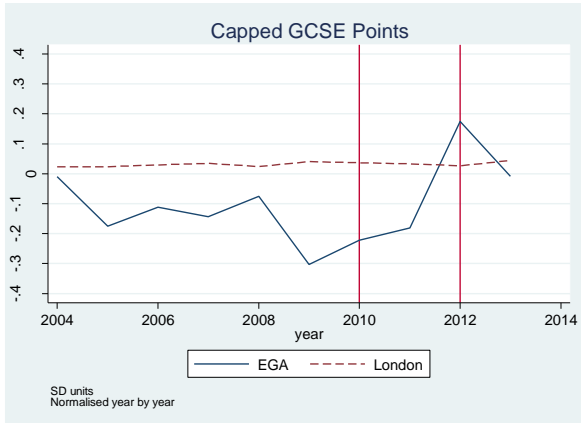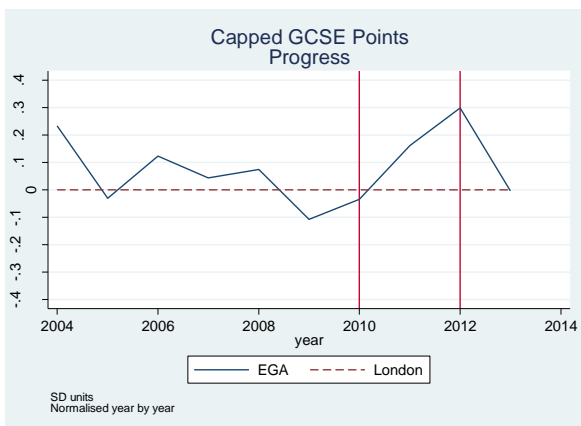B. Progress score

C. Conditional Progress score

Figure 2: Capped GCSE Points Score

A. Raw attainment score

B. Progress score

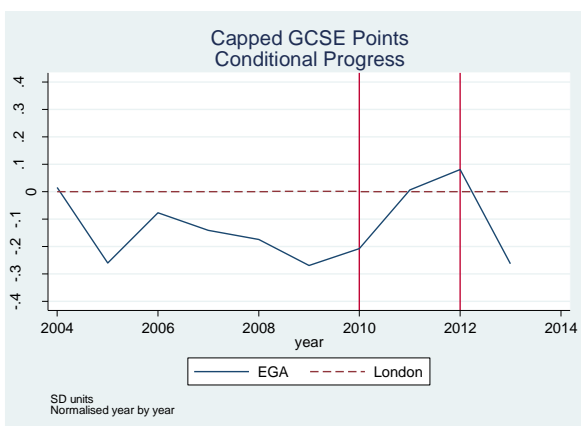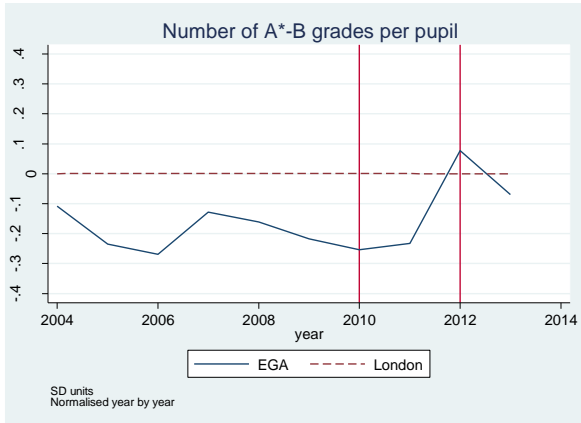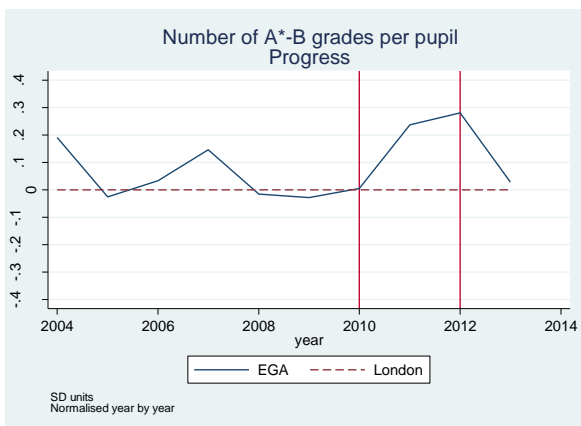## C. Conditional progress score

Figure 3: The number of A*, A, B grades per pupil
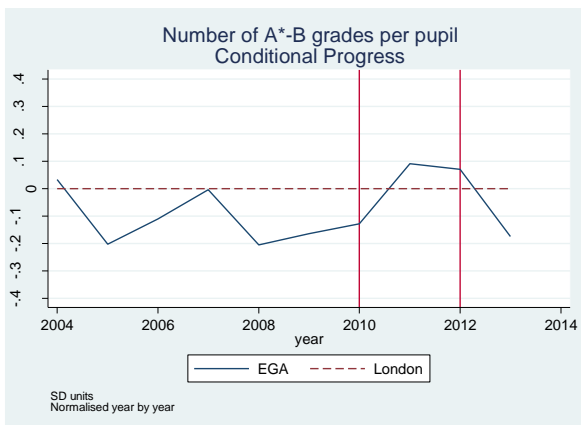
A. Raw attainment score
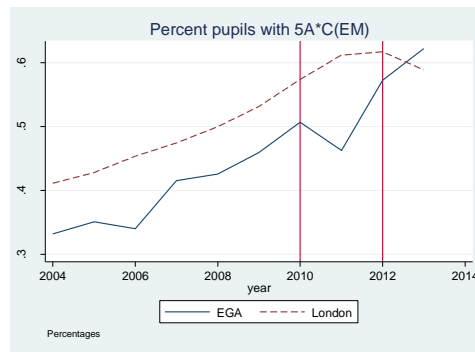

B. Progress score
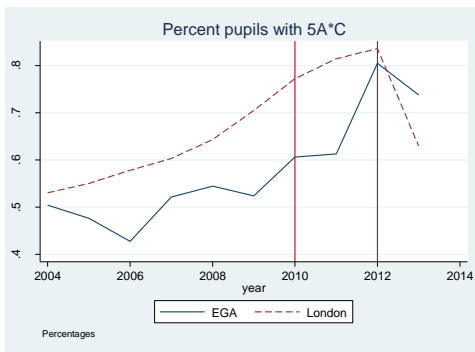

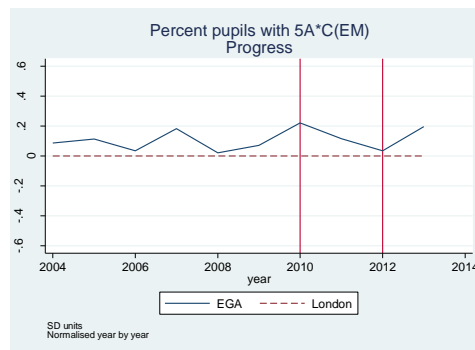### C. Conditional progress score

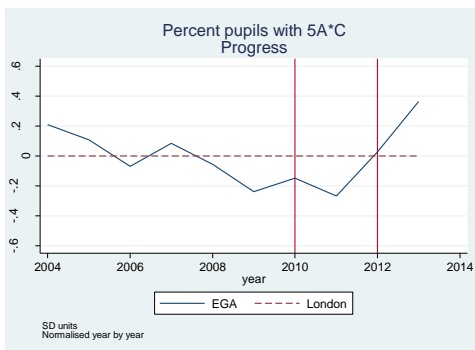# Figure 4: Threshold GCSE scores

% Pupils with at least 5 A-C grades   **% Pupils with at least 5 A-C grades including E&M**

A. Raw attainment score

B. Progress score
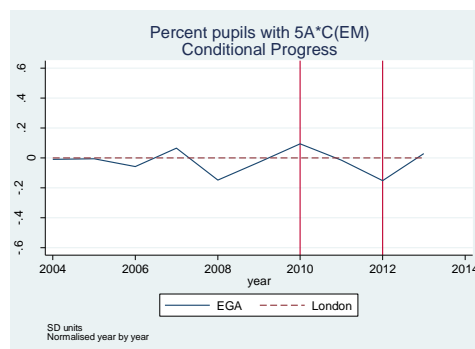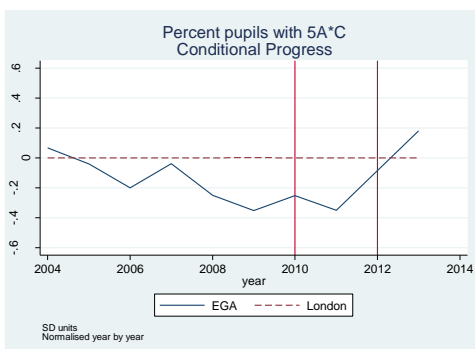

C. Conditional progress score

Table 1: Results – all observations in London

Raw attainment measures

	Total GCSE points	Capped GCSE points	Number of A*, A or B grades per pupil	% 5AC*(EM)	% 5AC*
FLOTUS 1	-0.035	-0.027	-0.060**	0.024	-0.047
	(0.084)	(0.055)	(0.028)	(0.021)	(0.034)
FLOTUS 2	0.758***	0.508***	0.286***	0.056***	0.104***
	(0.084)	(0.057)	(0.028)	(0.021)	(0.034)
Observations	5061	5061	5144	5142	5142

Progress attainment measures

FLOTUS 1	-0.060	-0.033	-0.040	0.164***	-0.065
	(0.074)	(0.047)	(0.070)	(0.045)	(0.044)
FLOTUS 2	0.743***	0.356***	0.142**	-0.096**	0.109**
	(0.075)	(0.051)	(0.070)	(0.046)	(0.048)
Observations	4770	4770	4833	4829	4829

Conditional Progress attainment measures

FLOTUS 1	-0.010	0.020	-0.000	0.157***	-0.045
	(0.078)	(0.053)	(0.055)	(0.029)	(0.053)
FLOTUS 2	0.749***	0.355***	0.137**	-0.136***	0.138**
	(0.079)	(0.057)	(0.055)	(0.029)	(0.055)
Observations	4770	4770	4833	4829	4829

An observation is a pupil. Full set of school dummies and year dummies included. Robust standard errors in parentheses, clustered at school*year level; * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The progress measures are computed by accounting for Keystage 2 test scores at age 11 (Keystage 2 scores in English, Maths and Science all included separately). The conditional progress measures also account for poverty status, gender, ethnicity, first language, month of birth, and statemented special needs. These regressions were run on schools in London. See a comment on data cleaning on the EAL variable: http://bit.ly/296p4n0

Table 2: Results – only schools (URNs) with at least 8 years of data

Raw attainment measures

	Total GCSE points	Capped GCSE points	Number of A*, A or B grades per pupil	% 5AC*(EM)	% 5AC*
FLOTUS 1	-0.038	-0.035	-0.062**	0.023	-0.047
	(0.081)	(0.050)	(0.028)	(0.020)	(0.032)
FLOTUS 2	0.764***	0.486***	0.287***	0.058***	0.109***
	(0.082)	(0.053)	(0.028)	(0.021)	(0.033)
Observations	4120	4120	4131	4131	4131

Progress attainment measures

FLOTUS 1	-0.051	-0.025	-0.038	0.171***	-0.046
	(0.073)	(0.047)	(0.061)	(0.038)	(0.041)
FLOTUS 2	0.800***	0.397***	0.208***	-0.025	0.230***
	(0.076)	(0.055)	(0.062)	(0.040)	(0.047)
Observations	3983	3983	3998	3996	3996

Conditional Progress attainment measures

FLOTUS 1	-0.002	0.030	-0.001	0.161***	-0.031
	(0.078)	(0.054)	(0.050)	(0.026)	(0.052)
FLOTUS 2	0.801***	0.399***	0.178***	-0.089***	0.222***
	(0.081)	(0.061)	(0.051)	(0.029)	(0.056)
Observations	3983	3983	3998	3996	3996

An observation is a pupil. Full set of school dummies and year dummies included. Robust standard errors in parentheses, clustered at school*year level; * $p<0.10$, ** $p<0.05$, *** $p<0.01$. The progress measures are computed by accounting for Keystage 2 test scores at age 11 (Keystage 2 scores in English, Maths and Science all included separately. The conditional progress measures also account for poverty status, gender, ethnicity, first language, month of birth, and statemented special needs. These regressions were run on schools in London. . See a comment on data cleaning on the EAL variable: http://bit.ly/296p4n0