PQA: pretty questionable assumptions

Anthony Hoare and Rebecca Aitchison

The intention to introduce a form of post qualification application (PQA) for entry to UK universities has provoked considerable interest, debate and controversy, not least over its impact on diversifying the intake of undergraduates gaining entry to the allegedly most prestigious universities and courses. We review the arguments and evidence advanced so far in this national debate and then subject its hoped-for impacts to empirical testing with a novel and extensive dataset of successful university applications. The results are discouraging for the supporters of the PQA initiative, although much rests on the validity of using current experience to predict the post-PQA outcomes. This underlying assumption is examined in detail and we conclude it is unlikely to be a major factor behind the ‘disappointing’ empirical results.

Keywords: university applications, widening participation, post-qualification applications, Russell Group

‘Students will soon be able to apply for university using their A level results rather than teachers’ predictions of grades, under a plan by vice-chancellors to end the ‘lottery’ of admissions’ (The Times, 5 July 1996).

Or perhaps not. It was another eight years before the Schwartz Committee’s report Fair Admissions to Higher Education (Admissions to Higher Education Review, 2004) offered its emphatic support for the principle that university applications should be made after their exam results were known to them and to the universities (hence ‘post-qualification applications’ or ‘PQA’) and was reinforced by the then Education Secretary of State (Charles Clarke) who called for action on it ‘immediately’ (anon, 2004). A year later a consultation programme was set up by another Education Secretary, following which, in May
2006, yet another one announced that a partial scheme would start in 2008-09. Some places would be reserved for applicants ‘trading up’ with better-than-expected results, with a possible ‘full-blown’ PQA scheme (no applications until results were known) operating from 2012, dependent on yet further review. (Deciding how this and many other practical aspects of PQA will work out in practice is the task of the (ex) DfES-appointed Delivery Partnership, consisting of representatives from the secondary and tertiary education sectors, under the Chairmanship of the Vice Chancellor of the University of London.) Our present purpose is to provide, for the first time, some analytical evidence we believe crucial in evaluating PQA in either of these variations.

The UK admissions system

The Universities and Colleges Admissions Service (UCAS) is responsible for the application process for UK full-time first-degree university courses. Up to and including the 2006-07 admissions cycle, university hopefuls applied for up to six courses (five from 2007-08). These are usually the same subject in six universities, but not necessarily so. Most apply before taking their school-leaving exams, so most offers received are ‘conditional’ on attaining pre-specified exam grades, though they might still be accepted, notwithstanding some exam result slippage. A very small number also receive unconditional offers prior to their A Level exams, but we have no way of identifying these in our analysis. Conditional offers are partly dependent on candidates’ predicted grades, as forecast by their schools. A minority apply post-results, with any offers received being ‘unconditional’. Each summer a ‘clearing’ process also operates to match unfilled places with still-unsuccessful applicants.

How applicants react in this uncertain environment is crucial for the success of the PQA project. For it assumes that a substantial number ‘under-bid’ first time around, and so could better themselves if they applied later, armed with exam-result evidence of their true academic market value for university places. Either a lack of confidence, poor (or no) advice from school, friends and family, or natural risk aversion may cause them to be unduly conservative in applying prior to their results, despite a plethora of published independent student guides and (anything but impartial) university prospectuses. They may thus end up with a course which they may regret, and even drop out of. To try again currently means treading water for a year.

A second important contextual feature of the PQA debate is the drive of national governments since the Dearing Report in 1997 not just to ‘deepen’ levels of higher education (HE) (with higher overall
participation rates – eg HEFCE, 2006a,b; NAO, 2002; Tapper, 2005; DfES 2003, 2006) but also to ‘widen’ it, into sectors of the population currently held to be under-represented (eg from state schools and lower socio-economic backgrounds). Defining what these are, their levels of under-representation, and hence the ‘catch-up’ needed is problematic. It presumes some independent way to specify the ‘natural’ levels of HE participation of different sub-groups of the population that would result from the transparently fair outcome of competition based solely on academic ability and potential to benefit from a first-degree course. These hoped-for participation levels have been variously called ‘benchmarks’ when generated centrally, by the main funding body (the Higher Education Funding Council for England – HEFCE) and since 2003 published annually by the Higher Education Statistics Agency (HESA, see http://www.hesa.ac.uk/index.php/content/category/2/32/141/oicshed), or ‘milestones’, ‘targets’ or other synonyms when specified by individual universities.

These two contextual components come unsurprisingly together with the belief, fundamental to PQA, that the ‘under-represented’ and the ‘under-bidders’ are likely to be one and the same. So those under-represented in HE as a whole are all the more so in universities commonly seen as the most prestigious, where entry standards are highest, and whose graduates command the best and most influential career positions, helping complete the cycle of intra-generational inequality.

Here PQA comes to the rescue. For while there are other ways to increase these general and place/course specific participation rates of widening participation (WP) candidates (for example see HEFCE, 2006), the admissions stage of the student life-cycle has the most potential quickly to change the composition of any university’s intake. Time is of the essence. The 2006 undergraduate intake brought enhanced ‘top up’ fee income to Britain’s universities, but only through Access Agreements struck with the Office for Fair Access (OFFA) whereby, in four or five years time, their achievements in widening intakes will be judged, and the extra income justified (or not).

All this is conducted in the full glare of public scrutiny. The Access Agreements are in the public domain, on the OFFA web site (http://www.offa.org.uk/access-agreements/), while the national press (if not the universities themselves) keeps close watch on levels of WP enrolments. As one university, Bristol, found to its discomfort in 2003, it can heap opprobrium on any university allegedly massaging its intake through ‘social engineering’. Just this same term has been applied to
PQA by its opponents, but the finger now points at ministers and a sector-wide agenda rather than beleaguered senior management and hapless admissions tutors on a particular campus.

**PQA’s supporters and their support**

For much of the past decade, press and parliamentary commentators on PQA spoke with one voice. 1 ‘The developing consensus’ (Price, 2002) seemed unstoppable; like motherhood, who could be against it? It apparently had powerful long-term supporters: ‘Universities have wanted PQA for 10 years’ according to Chris Price, former principal at Leeds Metropolitan University and chair of a government review of the school year (Langdon, 2002), while the Local Government Association noted they had ‘long been in favour’ (Thomson, 2001). Others strongly in favour in 2001 were 60 per cent of teachers, 64 per cent of parents and 63 per cent of school heads (Thomson, 2001), while by 2006, support among teachers had risen to 82 per cent. Every minister quoted in the national press from 1996 was supportive in principle and by 2005 so was the shadow minister for higher education (Smithers, 2005). The language often rang with the missionary zeal. For the then Director General of Higher Education (Sir Alan Wilson) it was ‘an idea whose time had come’ (Hill, 2004) while, for some, PQA was the ‘Holy Grail’, including Tony Higgins, the former chief of UCAS (Higgins, 1999) and Charles Clarke as Secretary of State (anon, 2004).

The PQA logic seemed unchallengeable. It removed the ‘lottery’ of the current admissions system, based on potentially inaccurate A level predictions. Surveys (often unspecified) revealed how inaccurate these were – 65 per cent were apparently wrong in 1998 (Higgins, 1998). Moreover, the main sufferers were what Paul Holmes MP, a member of the House of Commons Select Committee on Education, referred to as ‘non-professional students’ (House of Commons, 2005). They weren’t pushed enough by their schools (Holmes again) and lacked confidence, either believing their under-predicted grades (according to Richard Barnett, pro VC of Ulster (anon, 2004)), or plumping for safer options (Torney, 2004). So students who deserved ‘better’ places didn’t get them (Cassidy, 2005). This was all part of what the Sutton Trust (2001) has described as the ‘educational apartheid’ of the UK’s secondary schooling system. PQA would establish that most beloved of all democratic metaphors, the level playing-field (anon, 2005). For Tony Higgins, PQA was very much part of his (and hence UCAS’s) WP agenda (McClaren, 2004).

Pushing applications to a later date had other advantages for students too. At an age when their opinions were very fluid the later the university course choice the less likely the subsequent disappointment and dropping
out, according to the Head of Bury Girls’ Grammar (Hodges, 1997). This was then estimated to cost the national economy £90m. And more than ever before, students were choosing to apply before their results were known, at least to judge from the experience of an analysis of medical applications (McManus and Richards, 1995). Here this increased reliance by selectors on predicted rather than actual grades also introduced possible bias against minority ethnic group applicants.

Universities would gain too. Less uncertainty over student quality could justify fewer choices on the application form, producing a leaner administrative decision-making process. There would be less (or no) reliance on clearing, and more chance to hit planned entry numbers.

Opinions are one thing, evidence sometimes another. The main provider here is the Sutton Trust. Among its many commissioned and in-house reports is the monitoring of pro-PQA teacher opinion in secondary schools (Sutton Trust, 2003) and three that quantified the under-representation of state school students (Sutton Trust, 2000, 2004, 2005) among acceptances to the elite, Russell Group of research-focused universities. In the catchy title of its 2004 report – ‘the missing 3000’ – it encapsulated this shortfall of ‘state’ pupils eligible for Russell Group courses but who went elsewhere. This didn’t necessarily also mean a shortfall of applicants (maybe disproportionately fewer WP applicants survived the competition for places on Russell courses), while subject-mix needs to be borne in mind too. Less traditional applicants from low participation schools are disproportionately attracted to the ‘newer’, sometimes more vocational, courses and subjects taught predominantly outside the Russell Group. This is partly accommodated by the comparison of entry profiles with ‘benchmarks’, calculated for each university by HEFCE (until 2003, and since by HESA), showing its expected intake based on national profiles of HE entry weighted by subject mix, entry grades and, in some cases, regional location. The Sutton Trust surveys show non-traditional students still under-represented at Russell institutions when so ‘benchmarked’. But benchmark construction has itself proved controversial: we consider our way of controlling for subject mix (below) more transparent and straightforward. In its most recent report the Trust discloses the dominance of a small number of top schools (predominantly independent) in admissions to Oxbridge and 11 other ‘elites’ (mostly, but not all, Russell universities), over and above the levels expected based on A level scores (Sutton Trust, 2007). But no formal controls for academic subjects are included, nor does the research attempt to trace back such admissions biases to possibly similar differences in initial applications.
The only evidence we are familiar with directly on applications comes from the DfES (2003). Drawing on 2000-01 data, the latest then available, this shows in various ways, by social class and school type, that the ‘Russell shortfall’ of acceptances is also well entrenched at the applications stage, rather than being the creation of a ‘biased’ set of university decisions. This analysis is confined to ‘top quality’ applicants (with maximum or near maximum grades) and lacks any control for academic subject as a confounding variable (see above). So some of the apparent ‘Russell shortfall’ may be from applicants for subjects its member universities do not teach in the first place. Undaunted, the DfES nevertheless concludes ‘the main challenge lies in finding better ways to reach out to potential students from a wider range of backgrounds and encourage them to apply’ (DfES, 2003: 12).

The final pro-PQA evidence is more double-edged. The recent (and perhaps only) authoritative study of grade predictions (Hayward et al, no date) confirmed that the majority of school A level grade predictions were indeed ‘wrong’ – though at 55 per cent less so than some other estimates – and the more so for less advantaged candidates (from lower socio-economic groups, state schools, ethnic minority backgrounds). However, these inaccuracies are mostly within one grade of attainment, and for all the categories of applicants examined the clear majority of errors are over-predictions. The mean number of over-predicted grades for each under-predicted one was 5.4. While it was less for some WP categories (4.9 for the lowest socio-economic group, 5.1 for Asians, for example) it was also lowest for independent school applicants. Finally, no clear tendency was found for subsequent offers of university places to be sensitive to such inaccuracies.

The authors drew no inferences for the PQA debate, but others were less circumspect. The claim by Bill Rammell, then the Higher Education Minister, that this research supported some form of PQA to benefit ‘the poorest students’ was in turn reported by The Times under the heading of ‘Minister accused of twisting facts on university admission’ (Halpin, 2005), leaving the lead author ‘mystified and annoyed at the way DfES has presented the research’. A more justified inference would be that any impact of removing incorrect predictions would be a general lowering of the sights of all candidates, and without any clear advantage to WP candidates.

The sceptics reply
Despite this strong advocacy, opposition to PQA has also grown as the public debate has advanced, maybe as it has become a more realistic prospect and its details and implications more apparent. So, for the High
Master of the high-achieving St Paul’s School, PQA was previously ‘logical, sensible and fair’ (anon, 2005) but seven months later the scheme then revealed was ‘a dog’s dinner’ (Hayes, 2006).

At first glance the problems seem to focus on the technicality of timing. Critics claimed there simply would not be long enough to assess applications between school results and the start of the university year, even if both ‘gave’ a little. And the alternative – a significantly delayed (New Year) start – would be unduly disruptive to the sector’s seasonal rhythm.

Deeper issues lurked beneath. The then academic trades union among the older (pre-1992) universities, the Association of University Teachers (AUT), was concerned about ‘the impact on staff’ (Johnston et al, 2003) – presumably their research and/or family commitments – while also being unconvinced of the WP benefits. Others went further. A compressed decision-making period would be against the interests of WP candidates and those with non-conventional qualifications (eg mature applicants). Admissions tutors would be forced into a mechanistic reliance on exam grades to the exclusion of a wider agenda of (WP-friendly) considerations, simply to get the job done in time (Goddard and Hill, 2005). A delayed (January) start would also be anti-WP, by requiring intending students to kick their heels, and support themselves, for six months after school, which those from under-represented groups might be unable or unwilling to do. (This delay would also deter globally-mobile international students, which cash-strapped universities would be reluctant to lose). This view was recognised by Universities UK, and the funding council (HEFCE) in their separate evidence to House of Commons Select Committee on Education and Skills (anon, 2003; Goddard, 2003; House of Commons, 2005).

Not surprisingly, confusion and ambivalence started to replace clarity and uniformity. PQA was caught in the middle as the complexities mounted. As one Vice Chancellor wryly noted (Knight, 2005) the careful (‘WP-friendly’) sifting of applications that PQA threatened was a near relation of the previous post-A level selection system practised by Oxbridge, but abandoned when it was labelled ‘elitist’! The Independent Schools Association condemned any PQA movement as ‘social engineering’. The Campaign for Mainstream Universities (CMU – a group of post-1992 universities different in mission from the Russells) was reportedly in favour of PQA at the end of 2005 (Tysome, 2005; Hill, 2006) but against it some five months later (Halpin, 2006), fearful they would be net exporters of able, trading-up candidates armed with glowing A levels. Small wonder that the Vice-Chancellor of Southampton Solent University (a CMU member)
observed of PQA that ‘everyone says they are in favour but nobody wants it’ (Cassidy, 2005).

Finally, a different but potentially very pertinent line of criticism. Even if an elite university offers a better academic deal for all qualified WP applicants they may still choose not to go there. Without linking this to PQA as such, Alan Ryan, Warden of New College Oxford, noted that US Ivy League colleges often fail to lure African-American students with mega-dollar offers ‘for the good reason that they want to live in a big city, not a lily-white suburb.’ (Ryan, 2003). Similarly, and nearer home, Colin Rickwood, pro-VC at Birmingham noted that ‘ministers were…making the “bold assumption” that applicants who received better-than-predicted grades would want to change their initial choice’ (Hill, 2005).

This challenges the key assumption of PQA, seemingly accepted by most sceptics as well as faithful supporters, that students are ‘grade maximisers’ who will instinctively prefer the university place with the highest entry ‘price’ their qualifications can afford. Its persistence is all the more surprising given a by-now significant volume of academic work on other reasons why students, particularly non-traditional ones, decide what and where to study at university. Its overall message, highly relevant to the PQA debate, is that such decisions are heavily constrained for non-traditional applicants, both geographically and culturally (just as with the earlier decision of whether to apply or not: Forsyth and Furlong, 2003). The former may restrict such students to studying close to home, indeed from home (Patiniotis and Holdsworth, no date) while the latter can make the majority who do apply keen to study in surroundings where they will feel comfortable, in a social setting which may reflect their racial and/or class senses of identity (Archer and Yamashita, 2003; Leatherwood and O’Connell, 2003; Read et al 2003; Reay et al, 2001, 2005). Some may choose to ‘de-identify’ themselves from their previous contexts, but the majority of first-in-family HE aspirants (‘contingent choosers’ in Ball et al’s (2002) terminology) conform, and so reinforce the perceptual hierarchy of UK universities. An elite university may be the financially-sound decision but it is ‘not for them’ nor ‘they for it’. In the most thorough review of this literature to date Gorard et al (2006 : 39) pose two unresolved questions, noting that the evidence for each is weak – ‘should the [admissions] system change to accommodate different types of students?’ (a pro-PQA interpretation) ‘or would the changes entailed damage the HE experience that non-traditional students aspire to?’ (the opposite).

That these alternatives are both in play means the key ‘grade maximising’ assumption of the PQA thesis must, as yet, be considered
unproven. Its advocacy rests on the partial and uncritical reading of some limited evidence, with a good helping of wishful thinking. Our contention is that it demands and deserves better than this, and we agree with the AUT’s belief that there is little real evidence either way in the PQA debate (Johnston et al, 2003). Our intention is to expose it to some new and more analytical testing than has taken place so far.

Analysis
We examine the structure of successful university applications across a number of academic subjects to test their conformity with the expectations underlying PQA. In what ways can we claim this approach to be an advance on what has been reviewed above?

• our data are more recent than any analysed thus far
• we control for academic subject of application and acceptance
• we examine the role of key markers of the ‘WP-ness’ of candidates in combination rather than separately,
• we adopt a more fine-grained approach to applicant academic quality than hitherto…
• … and map this onto university entry requirements.
• we consider both broad groups of elite and other universities and the specifics of one institution
• we estimate the impact of PQA by subject and institution
• crucially, we compare applications made before and after exam results are known. This distinction, ignored in previous work on applications, is crucial since the case for PQA rests on there being substantial differences between the two, particularly for non-traditional (WP) applicants

We structure our analysis around three research questions, corresponding to three sequential stages of analysis:

Stage 1 – how far do pre-results applications conform to the premise of PQA, that WP candidates apply disproportionately to non-elite universities?

Stage 2 – how far is there support for the PQA prediction that WP candidates apply relatively more to elite universities after knowing their results than before?

Stage 3 – what estimates can be made of changes in the intake of elite and non-elite universities under PQA?
Through combinations of a variety of data sources (see Figure 1) we derived measures of the three key pre-requisites to answering these questions.

Applications
Prior to this project, the authors’ Russell Group university had acquired a large database of all UK-domiciled UCAS applications intending entry in autumn 2002 through to autumn 2004 for nine major science and social science subjects. For all such (anonymised) applicants this details the immediate outcomes of all their applications – the most frequent and important being ‘reject’, ‘conditional offer’ and ‘unconditional offer’ – and their final university of acceptance (where any). Conditional and unconditional offers are taken respectively to demarcate those applying...
before and after their school exam results. Our analysis focuses on the successful applications (those resulting in an offer) rather than on applicants. Each successful applicant could at this time produce up to six such applications. We ignore any that were rejected, withdrawals, those accepted through clearing and any candidates receiving both a conditional and unconditional offer for a given subject in the same UCAS year, since PQA is primarily concerned with re-sorting successful candidates.

Crucially, all applications were also tagged by their HE destination, and so fall into three categories:

- those to our own university (Bristol)
- those to Russell Group universities, then 19 in total, including Bristol (‘Russells’ hereafter)
- those to the 82 remaining UK universities (‘nationals’ hereafter)

Bristol and the other Russells together are the commonly depicted ‘elites’ of the PQA debate and, as the database also distinguishes pre-and post-results offers and acceptances, it is well suited for present purposes. Our study period is also free of significant structural changes in the UCAS process so we pooled data over the three years of applications to maximise the number of ‘post-offers’ for a more powerful subsequent analysis.

However, the database does have some limitations. First, only a small number of subjects are covered, though these still span the sciences and social sciences, are varied in their pre-requisite school backgrounds and their disposition across elite and non-elite universities. Second, we also have to omit some applications in these subjects for a variety of reasons – those allocated through the clearing process, with non-A level qualifications or with missing information on one or more of our four WP markers, crucial to the analysis (see below). Thus all International Baccalaureate (IB) applicants, and those from Wales and Northern Ireland will be excluded. Third, more such markers could have been included – mature students, ethnic minorities or the disabled – though at the cost of greater complexity. Finally, we would like to have been able to isolate candidates with both pre- and post-results applications, and to have information on candidates’ predicted grades and conditional offers, with or without a later repeat, to set against their later attainments. But our dataset provides none of this.

The 86,000 rejections these same applicants received in the relevant UCAS cycle are excluded. Overall, some 4.7 per cent of these successful applications were unconditional offers to post-results candidates, though
TABLE 1
Summary of applications included in the analysis

<table>
<thead>
<tr>
<th>Subject</th>
<th>Total successful applications</th>
<th>Unconditionals as % of all offers</th>
<th>% to Bristol</th>
<th>% to Russell</th>
<th>% to National</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>27013</td>
<td>3.2</td>
<td>5.9</td>
<td>49.5</td>
<td>44.5</td>
</tr>
<tr>
<td>Economics</td>
<td>40232</td>
<td>6</td>
<td>1.8</td>
<td>45.7</td>
<td>52.5</td>
</tr>
<tr>
<td>Geography (**)</td>
<td>64724</td>
<td>6.6</td>
<td>1.7</td>
<td>41.9</td>
<td>56.4</td>
</tr>
<tr>
<td>Geology</td>
<td>11707</td>
<td>5.1</td>
<td>5.9</td>
<td>50.9</td>
<td>43.3</td>
</tr>
<tr>
<td>Law</td>
<td>90624</td>
<td>4.4</td>
<td>1.6</td>
<td>34.3</td>
<td>64.1</td>
</tr>
<tr>
<td>Physics</td>
<td>30031</td>
<td>3.3</td>
<td>4.7</td>
<td>59</td>
<td>36.3</td>
</tr>
<tr>
<td>Politics</td>
<td>24067</td>
<td>10.2</td>
<td>2.1</td>
<td>42.5</td>
<td>55.4</td>
</tr>
<tr>
<td>Social Policy</td>
<td>2580</td>
<td>9.3</td>
<td>4.8</td>
<td>17.4</td>
<td>77.8</td>
</tr>
<tr>
<td>Sociology</td>
<td>30186</td>
<td>9.2</td>
<td>2.2</td>
<td>29.8</td>
<td>68</td>
</tr>
</tbody>
</table>

Notes: 'Total Applications' is the sum of all applications eventually receiving offers in the relevant UCAS cycle and for whose applicants both A Level scores and all WP markers are also available. It also excludes those withdrawing or transferring to a different course. ** Covers Social Sciences and Physical Sciences Geography entry – UCAS codes L700 and F800 respectively.
this varies by more than a factor of three across subjects. Some sharp differences arise too in the source of offers across the university groups (e.g., between Physics and Social Policy), reflecting differences in the availability of places for particular subjects across the sector. These inter-subject differences clearly underscore the importance of taking account of academic discipline for this type of investigation.

The database also recorded certain personal characteristics of applicants which we then transferred to their successful applications. We selected four markers of their WP status, seen as particularly important by Bristol and other Russell HEIs in their Access Agreements (OFFA, 2007). These, and their measurement for present purposes, are shown in Table 2.

Rather than examining each WP marker separately we preferred to consider them in combination. Applicants (and thus their applications) qualifying on none of them were rated as ‘WP0’, while those on all as ‘WP4’, so producing a 5-point scale. So any successful applications from an applicant from a high-performing state school, and a low socio-economic household in a high-participation neighbourhood would score ‘WP2’, along with all applications from a candidate qualifying on any pair of the quartet of markers.

The other key applicant characteristic is of academic quality, which we have to measure from the best three A level scores attained by each applicant (excluding General Studies, which is not widely accepted for entry purposes by Russell Group universities). These were separately obtained from UCAS and then aggregated via the now standard points scale (A = 120, B = 100…). When combined with the WP scale, and controlling for subject, we found that the attainment profiles were markedly different for each WP group, with a steady decline from WP0 through to WP4. We summarise this in Table 3 as the unweighted mean attainment profile for all nine subjects, though it also applies to each individual subject (not shown). This first finding makes it important to factor this ‘quality’ criterion into our later analyses. So for the ‘all subjects’ case, for example, 95 per cent of successful WP0 applications are from candidates scoring at least 200 points, and 70 per cent at least 300, whereas for the WP4s the equivalents are far lower, respectively 64 per cent and 23 per cent. However, the necessity now to include only applications assigned both a score (1 or 0) on all four WP markers and an A level profile meant that 35 per cent of our potential dataset was discarded (this discard-rate varied with subject too, from 26 per cent (Geography) to 66 per cent (Social Policy)).
<table>
<thead>
<tr>
<th>WP marker</th>
<th>Criterion</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>School type</td>
<td>Attendance at non-fee-paying school</td>
<td>Directly from UCAS database</td>
</tr>
<tr>
<td>School performance</td>
<td>Attendance at school of average A Level attainment in 2002-4 below 265 UCAS tariff points (equivalent to BCC at A-Level). 265 is the current such demarcator used by the authors’ university</td>
<td>School on UCAS database matched with University of Bristol school tariff records for 2002-2004 UCAS cycles</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>Applicant’s head of household falls within Groups 4-8 of the National Statistics Socio-economic Classification (used to denote low status households)</td>
<td>Directly from UCAS database</td>
</tr>
<tr>
<td>Low participation</td>
<td>Applicant lives in an area with a low HE participation rate (below 24% of relevant age groups)</td>
<td>HEFCE POLAR (Participation of local areas) data. Accessed online and matched to applicants through home postcodes.</td>
</tr>
</tbody>
</table>
TABLE 3
Attainment profiles by number of WP markers

<table>
<thead>
<tr>
<th>Applicants’ number of WP markers</th>
<th>Four</th>
<th>Three</th>
<th>Two</th>
<th>One</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>% with 360 points</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>20</td>
<td>33</td>
</tr>
<tr>
<td>% with at least 300 points</td>
<td>23</td>
<td>30</td>
<td>41</td>
<td>56</td>
<td>70</td>
</tr>
<tr>
<td>% with at least 200 points</td>
<td>64</td>
<td>72</td>
<td>82</td>
<td>90</td>
<td>95</td>
</tr>
</tbody>
</table>

University places
Finally, we need to match the quantity and quality of offered applications to the quantity and ‘quality’ (entry standards) of university places available across the three key groups – Bristol, Russell and national HE institutions. We used two sources in combination for this. First, the UCAS *University and College Entrance: The Official Guide* for our survey’s mid year (2003) shows both course length (three year, four year or a mixture) and minimum entry standards (converted to total A level points) by university and subject. Second, the HESA statistics record first-degree students by subject and institution for the 2003-04 academic session (HESA, 2005). From these we constructed the cumulative profile of subject-places by minimum specified entry level for the Russell and national groups and the known, specified levels for Bristol as in Figure 2a). The ‘median’ entry level was then plotted for each subject in the Russell and national sets. For Chemistry in the Russell Group, for example, this emerged as 260 points, so 50 per cent of their Chemistry places are available at or above this level, and 50 per cent at or below, whereas the national equivalent is lower (at 220).

For the first time, to our knowledge, this quantifies, rather than just assumes untested, the differences in entry standards between ‘elite’ and ‘non-elite’ universities. For every individual subject the Russells, with the ‘black’ box plots in Figure 2a), always have more demanding, and at times much more demanding, entry standards than their ‘white’ paired national equivalents, plotted to their left. Alongside, (in Figure 2b)) we show how a different approach to this same division produces a very similar outcome. The subject-specific league-table positions of Russells and nationals in the 2003 *Times Good University Guide* (O’Leary, 2002) embrace a much wider range of criteria, but again there is abundant support for the hierarchy of UK universities which so exercises the supporters of PQA; the black box plot of the Russell rankings is again clearly higher than their white-box national pair for each subject, for
Figure 2: a) Minimum entry standards box plots and b) The Times Good University Guide Positions

Note: For Russell (dark bars) and National (light bars) university groups. Figures show medians for each bar and outliers as asterisks.
example, averaging 14 for Russell Chemistry schools and a much lower 39.5 for the national equivalents.

Results
Stage 1 - do WP candidates apply relatively less to elite universities than other candidates before their results are known?
The PQA argument assumes that ‘non-traditional’ applicants (i.e., with higher WP scores) apply less frequently to Bristol and other Russell universities than to nationals, compared to traditional applicants, and particularly so the high-performing ones. For the present, our calculations amalgamate applications to Bristol and the other Russells. As Figure 3 shows, the profile of these successful pre-results applications across the WP profile is a \textit{prima facie} fit to these predictions of PQA, both for the nine separate subjects and their ‘unweighted’ average: the higher the WP score the more are successful applications directed to national over Russell universities (lines A-A1). So nearly 60 per cent of successful applications from WP0 candidates are to Russell universities compared to under 30 per cent from WP4 equivalents. This is clearly consistent with the view of the PQA supporters that those under-represented in higher education are also likely to ‘under-bid’ when they do apply to university.

However, the rightwards decline of these lines could reflect not only an earlier parallel distribution of all applications, successful or otherwise, but also higher rejection rates of Russell applications as WP scores increase. So WP4 candidates may apply to Russells as frequently as WP0s, but be rejected more often. If we dismiss as improbable any collective bias on non-academic criteria against them by Russell Group admissions tutors we still must recognise that the lower average qualifications of WP4 candidates noted earlier (Table 3) might make them less attractive applicants for offers from the most academically demanding courses.

Ideally, to resolve this, we would separate out pre- from post-results candidates among the rejections in our database, but we have no way of doing so. However, comparison with the results for just those with A levels scores matching or exceeding the median Russell place (lines M-M1) is helpful here. A clear divergence of the two lines plotted in Figure 3 becomes evident as we move from WP0 to WP4, showing that Russell-quality students (M-M1) are less sensitive in their profile of applications to rising WP scores than when we also include their lower quality counterparts (A-A1). Predictably, these higher-quality candidates are more likely to hold Russell offers than their ‘all
Figure 3: Percentage of successful offers to pre-results candidates which came from Russell Group universities
applicants’ equivalent across the WP-score range (so the M-M1 lines lie well above their A-A1 counterparts). But the gentler rightwards dip of M-M1 as compared to A-A1 is also consistent with the interpretation that, with this quality threshold imposed, the rejection rate of Russell applicants becomes more even across the WP profile. This would follow as the sub-sets of candidates in each WP group now being considered by admissions tutors are not only stronger academically but also more homogeneous in quality across the WP groups. It follows, too, that the persistence of a downwards dip of M-M1, albeit a shallower one, most probably reflects a similar decline in applications to the Russells by the more able candidates as WP-scores increase, without any possible complication of different rejection rates as we hypothesised earlier for the M-M1 cases.

These results, while not surprising, have not been shown in this precise way before. They are certainly consistent with the premise of PQA, based on the ‘underbidding’ view of WP applicants, especially those with the highest academic scores. But we need to recognise they are equally consistent with the alternative thesis discussed earlier, rooted in ‘self-identity’.

**Stage 2: do WP candidates apply relatively more to elite universities after knowing their results than before?**

Here, at the crux of the analysis, we focus on applications receiving unconditional offers. We now have a much better opportunity to judge between the ‘underbidding’ and ‘self-identify’ interpretations of Stage 1: all applicants now apply knowing their ‘market value’ on achieved grades against a hierarchy of entry standards. While not every post-results applicant is a second applicant, and not every second applicant trades up following better-than-expected results, the PQA project presumes a substantial number of such upward traders, especially among the high-score WP groups, who will now re-orientate their applications towards Russell places. On the other hand, under the ‘self-identity’ interpretation we would expect much less difference between the behaviour of pre- and post-results candidates as they are not driven by grade-maximising considerations, but by feelings of where they will ‘fit in’.

In Figure 4 we show the results from repeating the Stage 1 analysis, but now for successful post-applications, again both for all such candidates and for those qualified for the median Russell place (the PA-PA1 and PM-PM1 lines respectively). Wider inter-subject variations now arise, as the number of cases being analysed in some categories shrinks considerably, down to single figures in some subjects.
Figure 4: Percentage of successful offers to post-results candidates which came from Russell Group universities.
A similar argument to that earlier (over the relative roles of differential application and rejection rates) can be advanced for the ‘top quality’ downwards slope (of PM-PM1) again being shallower than the ‘all candidates’ equivalent (PA-PA1). But the most striking feature of these new results is how little has changed from the pre-results outcome. Figure 4 could hardly be less encouraging for the PQA lobby. The ‘all subjects’ lines show no signs of flattening from their pre-results slopes. If anything, the slope steepens. Marginally over 60 per cent of the successful post-results applications from WP0 candidates are now to Russell universities, against barely 20 per cent from the WP4s. So with their results securely recorded on their applications, successful traditional applicants are, if anything, even more likely to target Russell universities and non-traditional ones the nationals. Admittedly, there is a modest tendency for successful high-quality post-applicants to be more Russell-oriented than before, but this applies consistently across the WP profile.

On the basis of these results, a ‘self-identity’ interpretation of applicant behaviour is much more probable than a ‘grade maximising’ one.

Stage 3: what estimates can be made of changes in the intake of elite and non-elite universities under PQA?

Finally, what predictions can be made of the impact of PQA on the intake profile of each university category from our nine-subject experience of the existing UCAS system? The focus now shifts from successful applications to final acceptances at the university of entry. Our predictions then arise from redistributing the total acceptances for each subject by WP group across the three university categories in proportion to the by-subject current distributions of post-acceptances by WP group. This assumes that the current profile of successful post-applications is the best guide to that of all such applications in a PQA world. To the extent that the distributions of pre- and post-acceptances for any WP group/subject combination are different, substantial gains or losses in university intakes could result.

By way of example, suppose for the WPn group 20 per cent of Subject S’s post-acceptances are currently at Bristol, 30 per cent at the remaining Russells and 50 per cent at the remaining nationals, and the combined total of pre-and post-accepts is 1000. We then predict they will be distributed under PQA with 200 (20 per cent of 1000) to Bristol, 300 to Russell and 500 to national. A similar exercise across all WP groups and subjects will generate predictions which can be compared both with the existing volume and also the WP-profile of acceptances by subject and ‘university’.

Higher Education Review – Hoare/Aitchison Galley 21
While there is no obvious alternative, this approach has its limitations. First, it ignores the question of whether each campus is able and willing to accommodate the increases or accept the reductions in student numbers the results imply. Second, by assuming that all accepted candidates will behave under PQA in the same way as the current ‘post-results’ sub-set it oversimplifies the student decision-making (see Section 4) and probably over-estimates the impact that PQA would have, in either of its variants. Third, it ignores any effect PQA may have on the total number of applications forthcoming from any WP/subject combination across the country. This could either rise or fall, as well as being redistributed. So there are some heroic assumptions here, which we examine more closely in Section 4. But without making them we have no way of making any estimates at all.

For this part of the analysis it is instructive also to isolate Bristol from the remaining Russells to illustrate possible impacts at a campus level. Table 4 summarises the estimated net PQA changes of acceptances on this basis, by university and subject, as a proportion of the corresponding current (2002-04) acceptances.

<table>
<thead>
<tr>
<th>Subject</th>
<th>National</th>
<th>Russell</th>
<th>Bristol</th>
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<tbody>
<tr>
<td>Chemistry</td>
<td>0.2</td>
<td>-9.1</td>
<td>74.4</td>
</tr>
<tr>
<td>Economics</td>
<td>-5.7</td>
<td>5.5</td>
<td>27.6</td>
</tr>
<tr>
<td>Geography</td>
<td>3.2</td>
<td>-5.2</td>
<td>23.1</td>
</tr>
<tr>
<td>Geology</td>
<td>23.3</td>
<td>-27.2</td>
<td>42.4</td>
</tr>
<tr>
<td>Law</td>
<td>-9.6</td>
<td>18.4</td>
<td>-9.0</td>
</tr>
<tr>
<td>Physics</td>
<td>-7.3</td>
<td>-3.2</td>
<td>96.0</td>
</tr>
<tr>
<td>Politics</td>
<td>-0.6</td>
<td>-1.5</td>
<td>46.2</td>
</tr>
<tr>
<td>Social Policy</td>
<td>-3.4</td>
<td>16.9</td>
<td>-10.0</td>
</tr>
<tr>
<td>Sociology</td>
<td>-2.3</td>
<td>2.1</td>
<td>40.6</td>
</tr>
</tbody>
</table>

Clearly, the main overall gainer in relative terms is Bristol which is also, of course, by far the smallest university category we consider. On the basis of the current post-results acceptances we estimate that that university would gain entrants in seven of the nine cases, and in each such case by proportionately more than either the Russells or nationals. So while Bristol nearly doubles its potential Physics intake, elsewhere in the Russell group the subject hardly changes at all. The estimated
impacts also depend on the subject under discussion, as exemplified by the contrast in Bristol between Physics and Law. Of course, the results for the Russell and national groups are clearly net of many individual gains and losses among the universities within those groups, but for which we have no individual data. 7

The WP-composition of these PQA-generated acceptance changes is summarised in Table 5 at the elite destinations (Bristol and Russell) being targeted by PQA. So for Chemistry, Bristol’s WP0 acceptances would fall by nearly 9 per cent compared to the current intake and WP1s increase by almost 25 per cent, while in the rest of the Russells the respective changes are in different directions and relatively smaller. At the subject level Gini coefficients can be used to measure the degree of change in these predicted PQA-generated WP profiles compared to the equivalent current (‘pre’ plus ‘post’) profiles of acceptances8 – the larger the Gini, the greater the change – while the other data show the percentage gains or losses by WP group.

Overall, it is hard to argue that these projected intakes are anything but neutral in terms of widening participation. Certainly, no clear pattern emerges for gains in acceptances to concentrate among the high-score WP groups for elite destinations, even at the individual subject level. Were Bristol to prioritise PQA as a means to meeting its WP targets our results imply it might favour expanding its Law and Sociology departments, say, at the expense of Chemistry and Politics, but the evidence is scarcely overwhelming. It is also subject to the assumptions we have had to make to generate these estimates, to which we now return.

Discussion

These results so far are clearly at odds with the hopes of PQA’s promoters that it will recruit more ‘widening participation’ students to elite universities, when re-applications are allowed. On examining the most obvious present-day substitute for this ‘PQA world’ – current successful post-results applications and acceptances – we find no supporting evidence. If anything, there is an overall anti-WP trend among total applicants, with non-traditional (high WP-group) students applying successfully to elite universities less than before once their results are known, while the predicted pattern of maximum change in first-degree acceptances shows no significant influx of WP students on elite campuses. Given the serious implications of these conclusions we need to examine more closely the crucial assumption underpinning our analysis so far, that of the parallel between our current post-applicants on the one hand and student decision-making in this PQA world on the other. We distinguish below between the ‘trading up’ and ‘full blown’
<table>
<thead>
<tr>
<th>Subjc</th>
<th>Percentage changes under PQA</th>
<th>Percentage changes under PQA</th>
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<tr>
<td></td>
<td>Gini</td>
<td>WP0</td>
</tr>
<tr>
<td>Chemistry</td>
<td>24.7</td>
<td>-8.9</td>
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<tr>
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<td>25.8</td>
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</tr>
<tr>
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<tr>
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<td>9.5</td>
</tr>
<tr>
<td>Social Policy</td>
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<td>2.2</td>
</tr>
<tr>
<td>Sociology</td>
<td>23.5</td>
<td>-10</td>
</tr>
</tbody>
</table>
variants of PQA identified earlier, and now referred to respectively as Case 1 and Case 2.

Our basic assumption could be challenged either by arguing that the detailed composition of current post-applicants will bear little resemblance to those in a PQA world, and/or that the behaviour of these component parts will change under PQA. Consider Figure 5, which shows our categorisation of successful university applications (those generating offers) at one or more of three steps in the current and Case 2 PQA process:

i: the current ‘pre-results’ step
ii: the current ‘post-results’ step
iii: the future Case 2 PQA step

Those who are currently successful following pre-results applications consist of three groups: first, those ‘contented’ with their outcome and who would remain so after PQA (a)); second, those ‘upgraders’ who already aim to ‘improve’ themselves with a revised application the following year (b)); and a further ‘latent upgraders’ group (c)) who currently do not try to upgrade but would do so under PQA, with a shorter, more acceptable entry delay. At present, (a) and (c) constitute the pre-results cases of our database while those in (b) appear in the post-results stream (they may also be in the pre-results population for a previous year but we have no way of knowing).

As well as transfers from step i, step ii also includes in category (d) those whose pre-results applications failed and who re-apply at step ii, but with a more realistic, downgraded application, presumably directed to lower entry courses and/or universities. Completely new components at step ii) are the ‘post-gappers’ (e) – gap-year students always intending to apply post-results – and an influx of those we label ‘Newcomers 1’ (f), who apply for the first time once their results are known after reassessing their previous decision not to seek higher education.

Finally, at step iii we have many of the categories as before, including the latent upgraders from stage i (category (c)) and a further tranche of ‘Newcomers 2’ (h). These were dissuaded from a first-time application at step ii by a year’s delay (and loss of earnings) but are no longer when this ‘lost time’ is reduced by more than half. On the other hand, the extra PQA-imposed delay is too long for the ‘deterreds’ (g) who would have been successful pre-results applicants under the current regime but have no desire to wait to enter university at a later date.

We cannot isolate these separate components from our current dataset, nor estimate their relative sizes, but the key point to note is that
Figure 5: Classification of applicants under current and PQA admissions systems

comparatively little would change. All the step ii categories remain at step iii, with no logical reason why their behaviours will alter (as some had between steps i and ii with a mixture of upgrading and downgrading). Equally, the ‘contenteds’ from step i should mostly remain unchanged at step iii. Admittedly, under PQA they will not have put in an application ‘for real’ prior to receiving their results, but in practice they will still have considered their options should they achieve what transpire to be their exam results. Finally, for those currently entering at step ii ((e) and (f)) the Case 2 application process is also unchanged from the present post-results one, both formally and as a mental exercise.

The only real unknowns are (c), and the new categories (g) and (h). Logically, those in (c) will now try to upgrade but the (g)s, now lost to the successful applications pool, are disproportionately likely to be non-
traditional (high-WP) students for whom the time delay is particularly problematic. Finally, it seems unlikely that many of the (h) candidates, changing their self-assessments from ‘university’s not for me’ to a ‘well, maybe I am degree potential after all’, will be aiming at the most elite institutions.

Case 1 of PQA is simpler. As only those already holding a ‘pre-application’ place have the chance to upgrade, there will be no ‘Newcomers I’ or ‘post-gappers’ – new entrants having to wait a further year, as now. On the other hand, the ‘deterreds’ also disappear. Potential new upgraders will again be drawn from (c), but there is no way of telling whether numbers will rise or fall when compared to Case 2. For some, the immediate prospect of a ‘better’ place may be more attractive than one some months away, let alone over one a year distant, but others may be dissuaded from a decision on the ‘act in haste, repent at leisure’ principle. And for those who do seek to trade-up quickly, students from more traditional, HE-aware, school and family backgrounds may better recruit the advice, contacts and resources (eg campus visits) necessary to succeed under such time-pressure, in the absence, of course, of explicitly pro-WP decisions from elite universities with available places.

So while a diverse a set of applicants and ambitions currently congregate under the heading of post-applicants, with their disappointing (for PQA advocates) behaviours, most will remain ‘in play’ in a PQA world and those that don’t will mostly be high-WP cases in (g). Overall, any changes to this ‘post population’, under either Case 1 or Case 2, are likely to be fairly small, and by no means guaranteed to lead to a significant increase in WP students at elite universities. This would only happen if three conditions all hold:

i: component (c) (and (b) for Case 1) turns out to be a large part of the current ‘contenteds’ (ie the propensity to re-apply and upgrade is highly sensitive to changes in the timing of HE entry)

ii: and it/they contain a disproportionate number of non-traditional applicants

iii: and these differentially re-apply successfully to elite universities.

Conclusion
To recap briefly; we have analysed the structure of all domestic applications to UK universities for nine major academic subjects to test its conformity to the predictions and hopes of PQA over the differential behaviour of traditional and non-traditional applicants towards elite
(Russell Group) compared to ‘non-elite’ universities. True to expectations, we find that successful traditional applicants, applying before their results, differentially favour elite universities compared to non-traditional applicants, when controlling for academic subject and applicant quality. However, the same differentials arise, if not more so, when candidates know their results, in the closest present-day approximation to life in a PQA world. We conclude this most likely reflects structural stability in their patterns of applications independent of knowing their results. There is no sign of any ‘correction’ of the previous shortfall of non-traditional applications to the elites.

We offer some estimates of the quantity and structure of the likely gains and losses from PQA at our own university, the remainder of the Russell group and all other universities, with an accompanying methodological health warning over how these should be interpreted. We then argue that the nature and behaviour of most types of applicants in the (current) pre- and post-results categories will be unchanged by either version of PQA, and that where, exceptionally, this introduces new ‘types’ of applicants, without contemporary equivalents, this too offers no guarantees for increasing the representation of non-traditional candidates in elite universities.

Despite some acknowledged limitations with the dataset, about 320,000 successful applications have still been analysed, producing results which are emphatic and robust across academic subjects. They are also consistent with an established message from the research literature that university applicants from non-traditional background are far from universal ‘grade maximisers’, instead they focus their HE sights through social lenses of self-identity and their ‘fit’ with different campus cultures.

Inevitably, our analysis reflects the reality of a recent past: we are all aware that the outturn of PQA, when it comes, will be in the context of a speculative future, with a number of imponderables beyond this analysis. First, the UK’s HE environment is far from unchanging, even aside from PQA. Since our ‘data’ years, higher top-up fees have been introduced, and will be followed by A* grades, extensions to IB exams, possibly new vocational and highly academic school qualifications (eg the Cambridge pre-U exam, the 14-19 diploma), and doubtless further rafts of national WP programmes and incentives, plus maybe juicier funding carrots for universities to enrol WP applicants. The much-expected demographic dip of 18-year olds may also force universities to recruit relatively more WP candidates to fill lecture rooms and maintain income streams (anon, 2008). Second, the practical configuration of PQA will owe much to the Delivery Partnership’s determination of its
ground-rules. This means much is still unclear about how the two key parameters of government policy on widening participation in HE will play off each other – overall non-traditional participation rates and their entry to the elites. What if the political implications of the price for success on the second proves to be failure on the first?

So there is much still to play for over PQA, and we can only conclude from what we know at present. PQA may well mean a simpler, less frustrating, traumatising, resource-demanding and energy-sapping admissions process for both universities and their intending students. But in the absence of other significant future changes, those expecting it also to deliver a more equitable higher education system, with more social mixing across campuses and more able students from non-traditional backgrounds enrolled on the most demanding degree programmes, are in for a disappointment.

Address for correspondence
Dr Tony Hoare, School of Geographical Sciences, University of Bristol, University Road, Bristol, BS8 1SS. Phone: 0117 9289106. Email: A.G.Hoare@bristol.ac.uk

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Notes
1 We used the Lexis-Nexis database (http://web.lexis-nexis.com/professional/form?_index=pro_en.html&_lang=en&ut=3369381398) to identify all press articles citing ‘post qualification application’ or ‘PQA’ from the first, in February 1997, to December 2006 to chart the nature of the public debate, supplemented by equivalent references from parliamentary references in Hansard (http://www.parliament.uk/publications/committees.cfm).
2 All the more so with its recalibration in 2003 based on UCAS tariff rather than A Levels grades. Because the former includes several elements other than A Levels this boosts the score of many applicants, particularly from WP backgrounds (in contrast, schools traditionally providing HE entrants tend to focus more on the tariff’s core of A levels). Yet as Russell universities still set
entry standards in terms of A Levels the overall effect has been to increase significantly the benchmarks for their more 'elite' courses by embracing WP students reaching the 'required' tariff value, but without the necessary A grades embedded within it. Not surprisingly, most Russells fail to reach these benchmarks.

3 Confidentiality constraints preclude individual HEI data being available from UCAS other than for our own university.

4 For the Russell and national cases we have to use the entry grade band containing the median (rather than a single precise figure) as the A level scale is a stepped function rather than a continuous one. Where entry levels are specified in our sources both in UCAS tariff points and A levels the former seem a simple translation of the latter, discounting other ingredients of the tariff. Any residual uncertainties were usually resolved by reference to on-line prospectuses.

5 Figures 2a) and 2b) show ‘box plots’, a way graphically of summarising five features of a set of data – their lowest and highest values (the extreme ends of the diagram, shown by the whiskers), the lower (first) and upper (third) quartile (defining the ends of the ‘box’) and the central (median) point. Where extreme outliers arise these are sometimes shown separately (as in the asterisks in Figure 2a). Box plots provide visually simple, compact and transparent ways of summarising and comparing different sets of observations. So a small box, such as the Russell/Law case, indicates that most courses have similar entry standards, whereas a large one, such as National/Sociology, shows a large spread in entry standards.

6 The unweighted average ignores the different number of successful applicants by subject, and so avoids being unduly affected by large-intake subjects over smaller ones. Most subjects conform to these unweighted averages closely, though the variation in gap between the ‘all’ and ‘high quality’ cases is notable (compare Law and Chemistry, for example) while some jerkiness arises when numbers per category become small, despite our inter-cohort pooling (eg Social Policy). Here, and on the subsequent graphs, we plot separately for each of the five WP groups the percentage of their successful pre (Figure 3) and post (Figure 4) applications that were to Russell universities.

7 When Bristol and Russell are combined the outcomes are, predictably, not very different from the ‘Russell’ results in Table 4 (Bristol is just one of its then 19 members). All other universities are free to buy equivalent data from UCAS to ours and repeat this exercise for themselves, of course.

8 The Gini (G) coefficient is a simple means of comparing two sets of data (X and Y) over a common set of (i) categories, with each specified in percentages. Where the two distributions are identical the G value is zero and where maximised, by the formula below, it is 100, thus:

\[ G = 0.5 \times \sum_i | p_{Xi} - p_{Yi} | \]

When
\( p_{Xi} = \) percentage of variable X in category i [in our case, the predicted per cent of WP group acceptances under PQA]
and
\( p_{Yi} = \) percentage of variable Y in category i [in our case, the current per cent of WP group acceptances]
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