



Professor Sarah-Jayne Blakemore
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8 August 2019

Dear Professors Blakemore, Lancaster and Dr Davenport,

Thank you for your letter of 6 June regarding our investigation into inter-subject comparability of grading standards in A level physics, chemistry and biology. My apologies for the delay in responding to you. We value your ongoing engagement with us on this issue, and the submissions your respective organisations made in response to our request for evidence.

We appreciate the decision we reached was not the one which you had hoped for, and we note that you consider the evidence presents a strong argument for adjusting grading standards. We acknowledge that some indicators such as Rasch analysis suggest a potential misalignment of standards which warranted further examination in light of our 2016 policy decision not to align grading in all A level subjects on a statistical basis – and this is what we did.

However, when we considered all of the evidence we had assembled we did not find that all our criteria for a ‘compelling case’ for an adjustment had been fulfilled. Please allow me to clarify where our respective interpretations of the evidence differ, and the conclusions which informed our decision.

Firstly, your statement that the Board decided not to adjust grading standards in A level sciences “even though they [the Ofqual Board] acknowledge that there is incomparability in grades” is not a correct representation of our decision. Grades in A level sciences are awarded on the same basis as other A level subjects, with the standard of performance required to gain a particular grade maintained year on year. This is achieved through the use of a combination of predictions based upon matched prior attainment of the cohorts taking them and senior examiner judgement.

We do not expect or intend that our approach to maintaining standards should ensure that students of a given prior GCSE attainment should have an equal probability of gaining a specific A level grade across all subjects, whatever their subject choices. To assume that would require that we accept the linking construct of an underlying ‘generic academic aptitude’,

which presumes that a student should perform just as well in an assessment in music as they would in English, or in history as they would in physics (and factoring out any potential subject-specific effects such as effectiveness of teaching, allocated curriculum time, personal motivation, and subject interest and aptitude). Reliance upon this potentially problematic attainment-linking construct is a feature of statistical measures of subject difficulty such as Rasch and Comparative Progression Analysis which, as we explain in our technical report on grading standards in A level science,¹ is one of the reasons why we treat this form of evidence with caution.

There are methodological limitations as well as conceptual issues with the statistical evidence, as we discuss in greater detail on page 15 of the technical report. For instance, the optional nature of A levels, which are taken in a very limited number of subjects and generally within a relatively narrow range of complementary subjects, means that there is a substantial amount of missing data. Bramley (2016) has demonstrated that this large amount of non-random missing data involved in these statistical analyses could produce biased estimates of subject difficulty.

While the Board considered carefully statistical measures of difficulty as a source of evidence, they do not accept the position which you state in your letter. Nor did we find that the statistics provide a secure enough basis to conclude that the Board's decision leaves A level grades "openly unaligned" as you claim.

Moreover, the decision not to adjust grading standards in A level sciences was not made solely on the basis of statistical evidence. In your letter you refer to evidence of damaging consequences arising from what you see as severe grading in these subjects – and your view that this is having both a negative impact upon uptake in general, but also specifically upon entry for A level science by currently under-represented groups. Our investigation did not find this to be the case.

Physics, chemistry and biology are amongst the most popular subjects at A level, and entries in all three have been on an upward trend overall since 2008. The recently published provisional entry statistics for 2019² show that this growth is set to continue this year, with entries for A level biology and chemistry up by approximately 10%, and entries for A level physics by approximately 5%, continuing long term trends. This would not seem to indicate that these subjects are suffering from declining uptake because of perceptions of severe grading. That A level science entries are increasing, despite their statistical 'difficulty', calls into question a strong causal link between perceived difficulty of qualifications and uptake.

Similarly, we did not find compelling evidence to support the assertion made in your letter that students from under-represented groups are being particularly discouraged from taking science A levels by concerns about their difficulty. For example, while we *did* find that female students are significantly less likely to study A level physics, constituting just over 20%

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757839/Inter-subject_comparability_-_technical_report_science_.pdf

² <https://www.gov.uk/government/statistics/provisional-entries-for-gcse-as-and-a-level-summer-2019-exam-series>

over the entry, this was not the case in chemistry or biology. In A level chemistry the gender balance is only slightly worse than in the A level cohort as a whole, and in biology female students make up more than 60% of the entry. Yet the apparent difference in 'difficulty' between these subjects, according to statistical measures, is extremely narrow. We do not find it feasible that the very minor difference in apparent statistical difficulty could account for this gender disparity.

Our research did not find any other evidence to show that disadvantaged groups are being deterred from taking science A levels because of perceived difficulty. Rather, the results of the Department for Education's *2017 Omnibus Survey of Pupils and their Parents/Carers* shows that students receiving free school meals are less likely to make subject choices based on the expectation that they are likely to do well or achieve high grades than students who do not.

Our report includes research by Ofqual (Cuff, 2017), AQA (Taylor, 2015) and the Department for Education (Panayitou, Boulden, Newton and Andersson, 2017) which suggests that perceived subject difficulty is not the primary factor in the decisions students make when selecting subjects, and that it is frequently trumped by personal interest/enjoyment and future career prospects/utility. Furthermore, individual perceptions of subject 'difficulty' were found to be highly subjective.

Our decision not to adjust grading standards in A level sciences was a holistic one, taken after we considered all of the evidence against the criteria outlined in our decision document. We note your view that we gave undue weighting to the views of representatives from Higher Education. We do not agree that these views were given disproportionate weight. While we were mindful that any decision should include a criterion which reflected the views of 'users' of A level science qualifications – and A levels have a defined purpose³ in permitting universities to accurately identify the level of attainment of students – our consideration of the evidence under criteria c⁴ and d⁵ was not solely based on the findings of the HE perceptions study.

We also took into account the views of exam board awarders. They are responsible for setting the standard of these qualifications, and for ensuring that candidate work at key grades is comparable to previous years and represents an acceptable level of performance. We judged that both of these stakeholder groups were well placed to inform our decisions about an adjustment to grading standards, and to consider the impact of any adjustment on the knowledge, skills and understanding and understanding of candidates on a certain grade by looking at scripts from their subject area. As we explain in the section of the technical report concerned with judgemental evidence, we are doubtful that there are individuals who are sufficiently expert across multiple subject areas to

³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/798366/GCE_conditions_April_2019.pdf

⁴ Evidence which shows that those who use the qualification and those responsible for maintaining the grading standard judge an adjustment to be acceptable.

⁵ The likely benefit to users of the qualification and society as a whole from a change in grading standards must outweigh and potential negative effects.

make informed judgements about performance standards evidenced in scripts from other subjects to facilitate the kind of comparisons you suggest should have been conducted.

A full explanation of the rationale behind our policy decision can be found in the relevant decision document⁶. To summarise for the purposes of this letter, it was the lack of convincing evidence against all of our criteria, rather than one single piece of evidence, that lead us to conclude that there was an insufficiently compelling case to adjust grading standards in these subjects. We do however recognise that, despite the inherent limitations, the statistical evidence of subject difficulty may inform some perceptions about the difficulty of these subjects and that it would be undesirable if the statistical evidence shifted so as to reinforce such views. This is why we decided exam boards should use only positive awarding tolerances in these subjects this year, and to review the impact that this has had on their apparent statistical difficulty following the summer awards.

The purpose of this review is to check that this has not had unintended negative consequences for the maintenance of standards, not to revisit our decision. Given the limitations of statistical measures of subject difficulty outlined in our technical report, and the lack of evidence of a negative impact that can be conclusively attributed to severe grading, a change in the relative difficulty of A level physics, chemistry and biology under such measures would not constitute a reason to adjust grading standards.

I hope you find this clarification of our position helpful.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Roger Taylor', with a stylized, cursive script.

Roger Taylor
Chair, Ofqual

Cc: Rt Hon Nick Gibb, Minister of State for School Standards

⁶https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757841/ISC_Decision_Document_20.11.18.pdf