Amanda Spielman
Spring Place
Herald Avenue
Coventry
CV5 6UB

13 April 2016

Dear Ms Spielman,

We are writing to express our concerns about the continuing problem of variable grading severity of subjects at A-level, the consequent adverse effects on student choice, and the need to take action to address it. We understand that Ofqual is currently considering its positon on action and we request that our concerns are put to the Ofqual board when it meets in May.

We are pleased that Ofqual is revisiting the problem and agree with much of the summary contained within the working papers[1]. We also welcome the initial engagement with the community through the recent on-line survey, though note that a more appropriate alternative to option of 'no action' would have been 'some action' -- both for balance and to allow respondents to consider actions other than the three provided. We believe that the problem must be addressed and that there should be a longer, more in-depth consultation to investigate ways of correcting relative grading difficulty and alleviating its effects. We would be glad to contribute, in detail, to such a process.

We disagree with the suggestion in the working papers that the differences in outcomes are the result of a range of factors other than grading severity. The consistency of the grading data suggests that it is far more likely that they result from the same, uniform, influence: severity of grading. Please see the Annex for more detail on our reasoning.

Much work has been undertaken by the community to increase participation in STEM subjects at A-level, and while this has had some positive effect, the underlying problems of grading and perceived difficulty remain. We are concerned that the current inequity in grading is narrowing students' options at A-level, reinforcing gender bias and limiting opportunities for students from lower socio-economic backgrounds. This effect can be summarised through two main mechanisms:

- **Student choice**: A large consideration in student subject choice is what their likely grade is going to be. Currently, there are markedly different likelihoods of getting a given grade in different subjects for the same prior performance, interest, aptitude, teaching quality and application. The perception of difficultly created by this has been seen to have a significant effect on girls' participation in the 'more difficult' subjects particularly.

- **School influence**: There is strong evidence that students are either being debarred from taking those subjects or are self-selecting themselves out of them based on their reputation for difficulty – an effect particularly prevalent in schools in more deprived areas of the country. As a result, there has been a reduction in the range of ability within the entrants to the more severely-graded subjects and, separately, the creation of further barriers to the participation of students from lower socio-economic backgrounds.

[1] https://www.gov.uk/government/collections/inter-subject-comparability-research-documents

It should be noted that the symptoms and consequences are becoming more extreme with time. A decision for no action now will result in the effects becoming more engrained. If action is postponed, not only will more year-groups miss important opportunities, but the problem will be harder to address in the future.

We strongly recommend that the board allocates more time to fully investigate the effects of the problem and find a workable solution.

We would be happy to provide further information or to discuss these issues further with you.

Yours sincerely,

Corinne Stevenson
Chair
Association for Science Education

Philip Britton FInstP
Vice President (Education)
Institute of Physics

Professor Tom McLeish FRS
Chair, Education Committee
Royal Society

Dr Jeremy Pritchard
Chair, Education Training and Policy Committee
Royal Society of Biology

Professor Gareth Price FRSC
President, Education Division
Royal Society of Chemistry

Annex

An overview of the data of grading difficulty

The available data suggest that there are clear differences in the ways that certain subjects are graded. In particular, science subjects and maths appear to be more severely graded than most other subjects.

The CEM Centre in Durham produced a report in 2008 which looked at relative difficulty in exams in different subjects. [2] Figure 1 below, taken from this report, shows the differences in grade expectation for different subjects allowing for prior attainment.

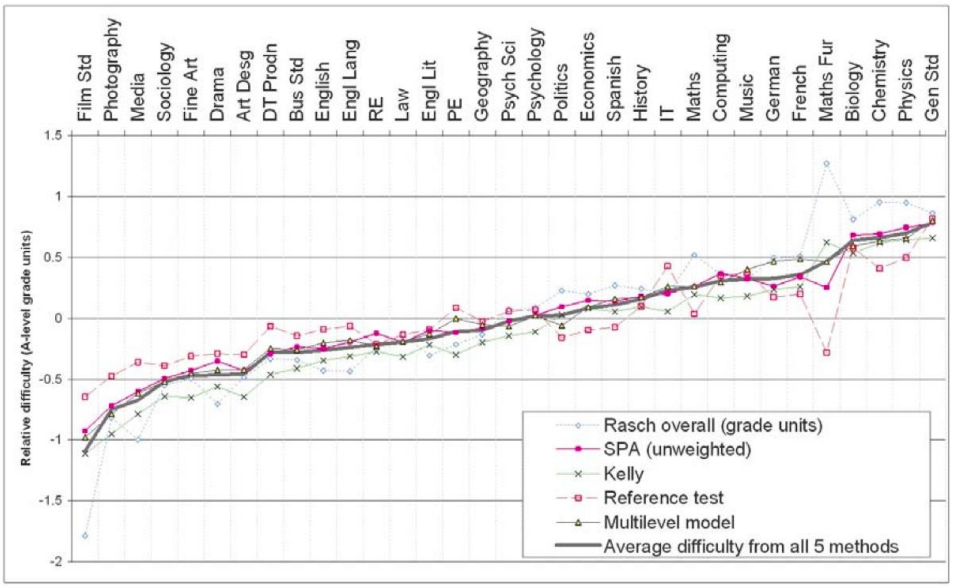

Figure 1

Figure 1 suggests that the sciences and maths are graded more severely than most other subjects. The difference in expected outcome is up to a grade compared with other facilitating subjects and by up to a grade and a half overall. It is possible that other effects could be responsible for this distribution – for example the quality of teaching or the amount of engagements/application of students – however, this is less likely if one considers the distribution in output grades for typical B grade students embarking on A-levels.

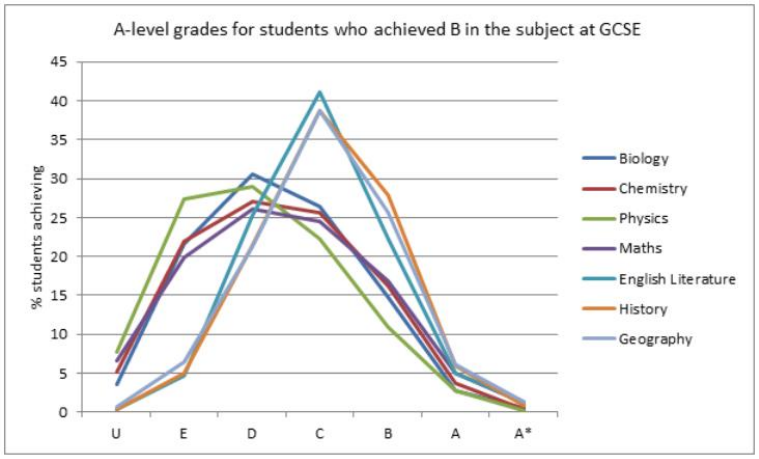

Figure 2

[2] http://www.score-education.org/media/3194/relativedifficulty.pdf

Figure 2 shows that there are two distinct distributions in students who received a grade B at GCSE: the sciences and maths follow one general pattern and the other subjects follow another. This suggests that the subjects are systematically graded differently. Considering other explanations, it seems unlikely that there would be such a uniform drop in motivation, quality of teaching (and all other factors suggested) for the sciences and, at the same time, such a uniform retention of all those factors for other subjects.

Evidence exists to suggest that schools apply some kind of filtering and that this filtering is different for the more severely graded subjects.

Figure 3 below shows that there are 720 schools in England with no entries at physics A-level among students with a B grade or less at GCSE. In contrast, there are only 125 schools with the same pattern in history. It seems unlikely that this disparity could have arisen by chance.

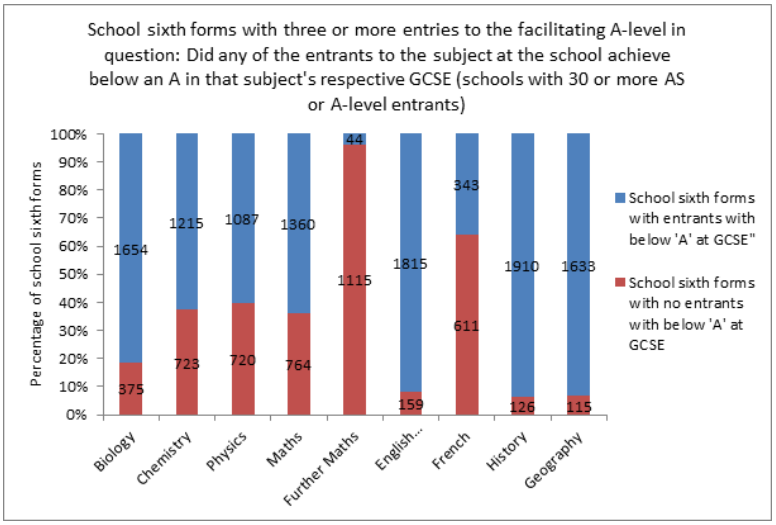

Figure 3

The above data could be explained in a number of ways: that schools have different entry policies for the sciences and maths; that schools are directing students with lower grades away from the sciences and maths (possibly through the use of prediction tools); or that students are selecting themselves out of what are more severely graded subjects. This may, in part, be due to the school's desire to increase their proportion of the highest grades (which, as shown in Figure 2, are more likely in the less severely graded subjects).

In view of the above data, it appears that, in effect, differences in grading severity are resulting in students being denied access to more severely graded subjects because of pressures on schools through performance measures.