

The Relationship Between Taking a Formal Music Qualification and Overall Attainment at Key Stage 4

Introduction and background

A considerable amount of previous research has explored the relationship between learning a musical instrument and a child's social, emotional or cognitive development. However, far less has been written about the relationship between learning music and academic achievement in the context of secondary school students in England.

Cambridge Assessment's researcher Tim Gill has conducted new research in this area, using data from the National Pupil Database to investigate whether having formal music tuition is associated with better GCSE results. Four different music qualifications were used to identify students who took part in formal music tuition prior to taking their KS4 exams. These were GCSE music, the VQR certificate, graded music practical and graded music theory.

The research is timely, as there is current concern about music and other arts subjects being 'squeezed out' of the curriculum.

Key findings

Previous research

- There is a large body of literature which suggests a positive relationship between participation in music and cognitive development, and there is evidence that the effect is greater for those with more music training. However, other studies find no links between music and cognitive ability.
- Researchers have put forward several possible reasons as to why music participation might improve cognition and academic achievement. The first of these involves the concept of executive functions (EFs), the ability to control and regulate thoughts and behaviours.
- The three main EFs relate to inhibition (controlling behaviour), updating (monitoring information and adding it to or removing it from working memory) and switching (moving between tasks). All three EFs may be important in successfully performing music, particularly in a group.
- Secondly, there may be a motivation or self-efficacy factor, whereby students who practice a musical instrument on a regular basis take satisfaction in their mastery of skills and achievement of goals. This may in turn lead to additional motivation (and subsequently attainment) in other areas of education.
- However, it is difficult to show direct causation. It is possible that students who are more motivated to do well academically are also more likely to learn an instrument. This was borne out by Corrigan et al (2013), who found that some personality traits associated with academic achievement (e.g., openness to experience and conscientiousness) were also significant predictors of duration of music training. It is possible that students with more developed EFs may find music practice easier and therefore more rewarding, and thus be more likely to continue to learn an instrument.
- There is not much research on the relationship between playing a musical instrument and attainment that uses data from England, and even less that focuses on secondary school students. However, a study by Hallam & Rogers (2016) compared the performance at the end of KS4 of students who had played a musical instrument for at least the past three years with those who had not done so, in 3 secondary schools in England. They found that after accounting for prior attainment, musicians outperformed non-musicians, and the size of this difference was greater for musicians with more musical experience (4-5 years) than for those with only 2-3 years of playing an instrument.
- Similarly, Chowdry et al. (2011) found a significant and positive association between playing an instrument and GCSE results, after accounting for prior attainment, demographic and family background factors and attitudes towards school. However, as this study was based on survey data only, it did not indicate students who had taken formal music lessons or undertaken a lot of music practice.



Characteristics of music and non-music students

- After excluding students with missing data there were 478,085 students in the dataset taken from the National Pupil Database. Of these, 6.7 per cent took at least one music qualification – most (6.2%) took music GCSE.
- The results showed some substantial differences between non-music and music students. Those taking the graded music or music theory exams (particularly grades 4+) were, by far, the students with the highest levels of attainment (both current and prior), and the lowest levels of free school meal eligibility (FSM), IDACI (income deprivation affecting children index) and special educational needs (SEN). Next highest attainment (and next lowest FSM, IDACI and SEN) was amongst the graded music/music theory students who only achieved grades 1-3, followed by the GCSE students, the non-music students and the VRQ students.
- Music students were also much more likely to be female than non-music students, particularly those taking the graded music/music theory exams. In terms of the types of school attended, graded music/music theory students were much more likely to attend selective schools (and single-sex schools) than non-music students, whilst VRQ students were more likely to attend comprehensive schools and mixed sex schools. Finally, music students tended to take more qualifications on average than non-music students, with the highest mean amongst graded music /music theory students (grades 4+).

Effects of taking music qualifications.

- A statistical model known as regression modelling was used to study the change in Key Stage 4 attainment associated with taking a music qualification.
- Analysis using this model showed that there was a significant and positive effect of taking GCSE music. The effect size of 0.177 means that it was associated with an increase in average points score of approximately 1/6th of a grade (i.e. an improvement of one grade in every sixth qualification).
- There was also a significant and positive effect of taking a graded music exam (0.280 for grades 1-3 and 0.356 for grades 4+). For the grade music theory exam there was only evidence of a significant positive effect for those taking grades 4+. This was the largest effect (0.481) according to the model, equivalent to an increase of almost half a grade per qualification. There was a significant but very small negative effect associated with taking the VRQ (-0.084).
- To put the figures in context, the average predicted KS4 points score for a pupil with no music is 4.71. This rises to 4.89 for pupils with GCSE music, and 5.07 for pupils taking graded music above grade 4.
- The analysis used other statistical models which used Maths and English grade as the outcome variables. These show similar results to average Key Stage 4 points, with a slightly larger effect of taking GCSE Music on English grade (0.173) than on Maths grade (0.129) and a slightly larger effect of taking graded music exams on Maths grade (0.295 and 0.274) than on English grade (0.155 and 0.229).

Interactions between GCSE music and other variables

- The analysis looked at the interaction between GCSE music and several variables.
- A comparison of the predicted KS4 APS (average points score) for students taking GCSE music with those not taking it shows that the positive effect of taking music was only present for those with higher levels of prior attainment and was largest for those with the highest prior attainment. For example, the benefit was 0.33 of a grade for those with KS2 mean fine grade of 5.5, compared with just 0.06 of a grade for a KS2 mean fine grade of 4.5.
- There was a significant interaction effect between GCSE music and ethnicity. However, the positive effect of GCSE music was mainly present for White and Asian students only. The effect for Black students was very small and was slightly negative for Chinese students.
- Finally, there was a significant interaction effect between GCSE music and school type, with the effect of GCSE music only being positive for students in comprehensive schools.
- For the graded music exams, the positive effect associated with taking these was only present for students with higher prior attainment. This was true for both grades 1-3 students at grades 1-3 and students at grades 4+, although the effect was larger for the latter. The positive effect was greater for boys taking grade 4 exams or above. The positive effect was only present for pupils in comprehensive schools.
- As with other music qualifications, there was a significant interaction effect between taking music theory (at grades 4+ only) and prior attainment, with the positive association between grades 4+ and KS4 APS greater for higher achieving students.
- There was a significant interaction between music theory exams and gender. Amongst girls, there was only a significant positive effect of taking grades 4+, whereas for boys there appeared to be a positive effect of taking grades 1-3 as well. Furthermore, the positive impact of taking grades 4+ was larger for boys than for girls.
- Across GCSE Music and Graded Music Exams, students without special needs were more likely to benefit from either music qualification than those with SEN (particularly statement and EHCP students). The effect was largest for Graded Music students with a statement. However, caution must be exercised because of the very small number of students in this group (fewer than 10 at both grades 1-3 and grades 4+). It is not clear why this effect was present; one possibility was that learning an instrument meant that SEN students had less opportunity to undertake additional academic work.

The full document can be downloaded from:

<https://www.cambridgeassessment.org.uk/images/603850-the-relationship-between-taking-a-formal-music-qualification-and-overall-attainment-at-key-stage-4.pdf>