Music in Lectures and Examinations to Promote Right Brain Activity

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Introduction
The text of this paper is adapted from entries in recent years in the course outlines of Laws 211, Contract, and Laws 365, Elements of Taxation.

Baroque music in class
Since 1998, most of John Prebble’s classes in Laws 211 Contract and Laws 365 Elements of Taxation have been accompanied by background music from the Baroque era, approximately 1600 to 1750. The same music was played in 2012 and 2013 as background to classes in Taxn 301, Advanced Domestic Taxation, a course in the Victoria University Business School.

Broadly speaking, most music from the Baroque period is suitable to listen to while studying or in class. People are not entirely certain why this should be, but one plausible explanation is that Baroque music generally has a very regular tempo and, apart from fast movements, about one beat per second. That is said to be approximately the rate of alpha waves in the human brain. There are thought to be two possible benefits.

First, some people hypothesize that stimulating alpha waves may promote creative thinking. Most legal study calls more directly on the analytical processes of the brain. It is thought that people can learn more effectively if creative processes are brought to bear at the same time. Secondly, people generally learn best if they are in a state described as “relaxed alertness”. Music that mimics the pattern of alpha waves is thought to promote this state.

Nobody has verified either of these hypotheses, though some language teaching experiments claim to have demonstrated the benefits of appropriate music. Language teaching lends itself to quantifiable experimentation more than most teaching because one can measure vocabulary acquisition against control groups.

Some people call music’s beneficial effect on learning the “Mozart Effect”. This term seems to be possibly misleading, in that Mozart wrote after the

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Baroque era, and in that much of his music is more complex than Baroque music. Nevertheless, it seems that at least some Mozart is as effective as Baroque music in promoting learning.

**Student preferences**

Victoria University of Wellington encourages teachers to administer teaching evaluation questionnaires towards the end of each course. In 2013, questions as to music preferences were added to the questionnaires in Laws 365 Elements of Taxation and Taxn 301, Advanced Domestic Taxation. The results were:

**Laws 365 Elements of Taxation**
- Total responses 53
- Music 40, 75%
- No music 4, 7%
- No preference 9, 17%

**Taxn 301 Advanced Domestic Taxation**
- Total responses 85
- Music 69, 81%
- No music 15, 17%
- No preference 1, 1%

Students made a number of comments orally and by notes on their questionnaires. Students who are very good musicians tend to have the greatest reservations about music during lectures, particularly if they are familiar with the pieces being played. This reaction may not be surprising. Research tends to show that for most people analysis is a left-brain activity, while the right brain deals with creativity. For musicians, the position is typically different. Musicians process music in the left brain, where the rest of us process words and mathematics. The result is that for musicians music during classes is apt to interfere with their left-brain processing of the information that they receive orally.

This is a matter of some concern. Even in the face of preference for music by an overwhelming majority of students, and of indifference on the part of others, should lecturers impose music on students who find it distracting? There is some evidence that this concern, while serious, is self-regulating. Over the years, there have been a number of good musicians in classes where music was played. They initially find classes difficult. But after two or three weeks it seems that they adjust. In most cases, the music no longer interrupts the processing of the lecture. In one case, the student’s comment was that she had to concentrate harder with music in the background, but she found the additional concentration so beneficial that she opted for music in her examination.
It is impossible to draw valid conclusions from discussions with a few students. Nevertheless, the absence of complaints is reassuring.

**Music in examinations**

Experience in Wellington suggests that the longer and more intensively people have been exposed to Baroque music during teaching the more likely they are to opt to have Baroque music during examinations if they are given that choice. Until about 2009, in VUW law courses with three hours’ teaching a week, after about six weeks approximately one-third of the class opted for music with examinations. On the other hand, after an intensive one-week course of six to eight hours’ instruction per day with music about 90 per cent of people opt for music during examinations. At least, this is the experience in classes for tax officials.

There was a change at Victoria University that probably occurred in about 2009, though the change was not measured until 2013. It was discovered in 2013 that after 6 weeks or so of music in lectures over 70 per cent of the class opted for music in their mid-term examination. Students who chose music scored higher than those who chose silence. It may be possible to compare candidates’ marks in examinations where music was available with their grade point averages, but this analysis has not yet been undertaken.

Opting for music in examinations has a theoretical justification. The theory is that candidates who have learned with music are likely be more able to recall their work if similar music plays during an examination. Performance figures from examinations are:

**Laws 211, Contract, examination 16 April 2013**

Contract is compulsory for the LLB. Most students enroll in their second or third year of study.

The examination was an open book multi-choice test of 90 minutes carrying a possible 25 marks. There were three examination halls. McLaurin Lecture Theatre 1 played Adagio Albinoni, Naxos 8.552244. McLaurin Lecture Theatre 2 played Adagio J.S. Bach, Naxos 8.552242. McLaurin Lecture Theatre 3 was silent. Assignment of candidates between the Albinoni and Bach examination halls was alphabetical. The examiner moved between Theatres 1 and 2, checking by ear that the volume was similar and at background level only. The following analysis is of raw, unscaled scores.

Total candidates: 291.

Candidates choosing music: 222, 76%  
(Albinoni 97, Bach 123)

Candidates choosing silence: 68, 24%
Average scores before scaling
Albinoni 15.7, 62.8%
Bach 15.3, 61.4%
Combined Albinoni and Bach: 15.5, 61.9%
Silent examination hall: 15.0, 59.9%
Average difference, music compared to silence: 0.5, 2%

Laws 365, examination in Elements of Taxation, 11 May 2013
The examination was an open book multi-choice test of 90 minutes carrying a possible 20 marks. Results counted for assessment on a double chance basis. That is, (i) the results in this examination would contribute to candidates’ final results only if they improved the results obtained in the end-of-trimester examination, and (ii) candidates could choose not to sit this examination. There were two examination halls. Rutherford House LT 1 played Adagio Albinoni, Naxos 8.552244. Rutherford House LT 3 was silent. The examiner remained most of the time in Rutherford House LT 1 to check that the music was at background level only. The following analysis is of raw, unscaled scores. (This examination proved too testing. Raw scores were scaled up by adding 6 per cent to each mark. This change yielded a curve very close to the Law Faculty norm.)
Total candidates: 60.
(Did not sit, 11)
Candidates choosing music: 43, 72%
Candidates choosing silence: 17, 28%
Average scores before scaling
With music: 10.9, 54.5%
Silence: 10.1, 50.6%
Average difference, music compared to silence: 0.8/20 = 4%

Validity of results
The figures reported above do not come from experiments. Rather, they analyze publicly available results in examinations and questionnaires. This factor by itself appears to be neutral. The figures are in the nature of census results. However, is the fact that students who had music in their examination room scored higher than students in the silent room scientifically significant? The answer is probably no. Counting was accurate, but there was no control group. And finding a control group would be a problem. Could one reasonably ask students to consent to being randomly assigned to different forms of teaching and assessment? How should we treat the fact that students who answered their examinations with music playing were self-selected?
These are only two possible questions that mean that, to put the matter at its lowest, the figures should not be used as a basis for policy formation. Nevertheless, a control group may be possible, to wit the students themselves and their results in other examinations. If their results in the examinations that this paper reports vary from their grade point average, does it seem to have helped those who prefer music to have had music playing while they answered their examinations?

In the absence of, or in addition to, control groups, it would be helpful if colleagues were able to repeat the experiment: play baroque music in the background of lectures and offer the option of examination halls with music. Analysis of a sufficiently large number of records might provide statistics that are significant.

Finally, from a practical and an ethical perspective, if the great majority of students prefer music in the background of lectures, and if facilities are available, should one offer music? If the overwhelming majority of a class prefers music during lectures, should the teacher permit the preferences of a small minority to deny the preferences of the majority?

**Playlist**

The music comes mainly from several compact disks of collections of largos and adagios, especially from Albinoni. Students who plan to use similar music to accompany their own study often inquire what the recordings are. The collection is:

A. Largo, Naxos 8.550950
B. Adagio, Naxos 8.553841
C. Adagio 2, Naxos 8.550994
D. Adagio Albinoni, Naxos 8.552244
E. Adagio Mozart, Naxos 8.550994
F. Adagio J.S. Bach, Naxos 8.552242
G. The most relaxing classical album in the world … ever. 2 CDs, EMI 7243 5 66650 2 6
H. The most relaxing classical album in the world … ever, II. 2 CDs, EMI 7243 5 66967 2 3
I. Tune your brain with Bach: *Heal*, selected E. Miles, Deutsche Grammophon 289 459 796-2

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