

HOW TO BECOME A MAESTRO: A STUDY ON THE QUANTITY AND QUALITY OF PRACTICE

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Abstract

In a study with 118 conservatoire students, we readdressed several conclusions from research on professional musical practice behavior. Quality of daily self-directed practice was reflected in two Principal Components comparable with the Formal Practice framework (Bonneville-Roussy & Bouffard, 2015): the use of learning-goals and the ability to maintain focus. Quantity of practice was indicated by daily practice time. Neither quality factors, nor quantity of practice was a significant predictor of end-of-term performance-exam. This study questions the validity of exam grades as core measure of musical skill: these were mainly related to study-year and years of performing experience, but not to practicing.

Keywords: *Assessment, motor skills, music education, learning strategies, deliberate practice, self-regulation.*

1. Introduction

Making music is one of the most complex procedural skills humans can acquire, and this calls for sophisticated pedagogy. The concept of formal practice (Bonneville-Roussy & Bouffard, 2015) combines two leading education psychological approaches; Deliberate practice and Self-Regulation. Deliberate practice has the central purpose of acquiring knowledge or skill (Ericsson, Lehmann, & Tesch-Römer, 1993; Hambrick, Oswald, Altmann, Mainz, Gobet, & Compitelli, 2014). Self-regulation is aimed at actively arranging one's own thoughts, feelings, and actions to reach goals (McPherson, Nielsen, & Renwick, 2013; Schunk & Zimmerman, 1998). Combining these into one framework led Bonneville-Roussy and Bouffard (2015) to a model that allowed to explain more variance in training results than with the two components separately. The two elementary aspects of this new formal practice framework were the ability to maintain focus on the activity, and the use of learning-goals to lead towards the chosen activities. In part 1 of this article, we discuss the formation of a concise scale for practice quality, in line with the formal practice framework. In part 2, we describe an attempt to relate this measure of practice quality, together with practice quantity, to musical achievement.

2. Method

A survey was spread among students from different study years and instruments, within one conservatoire. Respondents were only included in the analyses if they met the following criteria: following a fulltime course in the classical, jazz, or early music department, and sufficient mastery of English. The resulting sample included 118 students (68 M / 47 F / 3 unknown; age 18-33y, M = 23y), following bachelor (n= 94) or master (n = 38) courses in the jazz (n = 29), classical (n = 76) and early music (n = 13) departments. Nine students were in a preparatory year.

2.1. Part I: principle component analysis (PCA) on practice quality

The aim of this study was to create a more concise and applicable scale to obtain insight in practice behavior, based upon other questionnaires and formulations on self-regulation, deliberate practice, and formal practice (Araújo, 2016; Bonneville-Roussy & Bouffard, 2015; Ericsson et al., 1993; Miksza, 2007). Ten questions were initially considered in this new scale: (1) *When something is difficult, I try to find/make exercises to learn it;* (2) *My practice is mainly just playing through the music from beginning to end;* (3) *Before I start playing, I think about one specific thing that I want to focus on;*

(4) *I plan my practice in advance*; (5) *When I've set a goal to improve one thing, I stick to evaluating and improving that thing*; (6) *During practice, I structurally take moments to think about what I want to improve*; (7) *During practice, I often think about something else while I'm playing*; (8) *During practice I'm often distracted by things like my phone*; (9) *I can put myself to practice things that I don't like*; (10) *When I practice, my thoughts are fully engaged*. Questions were framed on a five-point scale, ranging from *Never* (1) to *Very Often* (5). Results on the negatively framed items 2, 7, and 8 were inverted when necessary.

Internal consistency checks and a PCA on the ten items were executed to derive the list's underlying constructs (Cronbach's $\alpha = .62$). Two components (items 1-6; items 7-10) accounted for 42.6 percent of the variance. Deleting item 9 and forcing the model into two dimensions raised the fit to 45.5 percent (KMO = .688 and Bartlett's test: $p < .001$; oblimin rotation). The first component (VAF = 26,9%) consisted of the items 1-6 ($\alpha = .66$), and the second component (VAF = 18.6%) was based on the variables 7, 8, and 10 ($\alpha = .64$). These components were named 'goal-driven practice' and 'focus' respectively, which is in accordance with the main components of formal practice, described by Bonneville-Roussy and Bouffard (2015).

For details on the development of the PCA-model, please see the original report: <https://openaccess.leidenuniv.nl/handle/1887/48950/>

2.2. Part II: relating practice time, formal practice, and musical achievement

We predicted that (a) Practice time is not positively associated with musical achievement (cf. Burwell & Shipton, 2011), (b) unless this time is associated with practice quality, and thus (c) formal practice and practice time should interact (cf. Bonneville-Roussy, & Bouffard, 2015). As a measure of **musical achievement** we used the student's end-of-term exam grade on a ten-point scale where 6-10 represent levels from sufficient to excellent. Grades are determined by consensus in a committee of at least three experts. This graded exam performance is perceived by students as a central goal of practice during the study year, especially during the period in which students filled in this survey. 95 students gave permission to use this grade and played an exam performance. Alongside the qualitative practice factors described in the above, self-report **practice time** was tested as a predictor of musical achievement. Previous studies have shown that students are able to report practice time fairly accurately (e.g. Jørgensen, 2002). Daily practice time was computed as the mean of reported practice in the past three days. To test the hypotheses, the fit statistics were compared between Multilogistic Regression Analysis (MLRA) models with study year as predictor for correction.

3. Results

3.1. Practice time

As predicted, practice time did not correlate significantly with exam grade ($\rho = -.053$). Adding practice time did not improve the MLRA model fit, $\chi^2(2) = 1.892, p = .388$.

3.2. Formal practice

Practice quality variables 'goal-driven practice' and 'focus' were entered as predictors of achievement in a MLRA model. The addition of neither 'goal-driven practice', $\chi^2(2) = 2.594, p = .273$, nor 'focus', $\chi^2(2) = .157, p = .924$, significantly improved the prediction of exam grades.

3.3. Time x formal practice

To evaluate a possible interaction between practice time and formal practice characteristics, MLRA models adding practice time; practice time in interaction with 'goal-driven practice'; and practice time in interaction with 'focus' were compared as predictors of achievement. Neither of the interactions improved the fit, Practice Time * 'Goal-driven practice': $\chi^2(2) = 1.792, p = .408$; Practice time * 'Focus': $\chi^2(2) = .681, p = .711$.

For a more thorough discussion on the MLRA testing, please see the original report: <https://openaccess.leidenuniv.nl/handle/1887/48950/>.

4. Conclusion

As expected, students' daily practice time was not related to achievement. Surprisingly, the newly formed formal practice variables 'goal-driven practice' and 'focus' were also not significant as predictors of exam grade in an MLRA model, nor were the interactions of these factors with practice time. The lack of significance concerning the variables 'goal-driven practice' and 'focus' in relation to

achievement, contrasts with the findings of Bonneville-Roussy and Bouffard (2015). Despite a sample size of 95 students, these null results may be partially due to power limitations, which in turn can be caused by the heterogeneity of the student population.

A second possibility is that the newly computed summarizing characteristics of formal practice are not an accurate measure of practice quality. These constructs were formed and interpreted on the basis of their face validity, construct validity and internal consistency, and consisted of fewer items than the original model. Nonetheless, the statistics of the PCA support the composition of the two factors and the composing items match the formal practice dimensions.

Finally, we should seriously consider the possibility that exam grades are not a valid and sensitive measure of musical improvement. Such exam grades have also been used in other studies, but with different grading systems (Bonneville-Roussy & Bouffard, 2015; Burwell & Shipton, 2011; Jørgensen, 2002). Concerns about the use of grades in this study are fed by our observations of small dispersion of grades, and the influence of musical department, study year and performing experience on the height of the grades. Normally, a small proportion of students would perform insufficiently. With a range of only 'sufficient' grades, the spreading of achievement was perhaps not large enough to demonstrate differences. Also, students' exam grades appeared to be most associated with study year and performance experience. Students in higher years were more likely to receive a higher grade. In a normal grading system, average exam grades should remain constant across different years. Especially the number of years of performing experience was significantly correlated with performance on the exam, rather than the number of years that a student practices the instrument. This may mean that such an exam grade could be more a measure of being able to perform well under the pressure of a concert setting - for example how to cope with nervousness (e.g. Oudejans, Spitse, Kralt, & Bakker, 2017) - instead of an indication of the improvement of musical skill. For a conservatory, this is not necessarily a problem, because the actual concert performance could be argued as the major goal of a course at a conservatoire. Scientists and conservatoires should however be more cautious with interpreting such exam grades as measures of advancement in musical and technical skill.

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