# Relationships between entrance tests and exams in music performance and aural-skills at the Norwegian Academy of Music

*Anne Katrine Bergby*

**Abstract**

*Focusing on aural skills and main instrument performance, the results from entrance tests and exams from 307 bachelor students at the Norwegian Academy of Music were examined to explore a possible connection between test results in the two areas. The results show a moderate correlation between corresponding tests ($p<.01$) but no significant connection between aural/theory tests and music performance. Several reservations about the content and role of the aural entrance test are discussed, including concerns about how musical aptitude can be conceptualized, how it might be measured, in addition to its relationship to performance.*

*Keywords: aural skills and performance, aural entrance test, musical abilities assessment, musical aptitude conception*

## 1. Introduction

Questioning the validity and reliability of admission procedures should form a natural part in the quality assessment system for music institutions and programmes. The purpose of the present study is to elucidate the academy's admissions policies. Such a study is required at the Norwegian Academy of Music (NAM) for several reasons:

1. the collectively agreed Norwegian entrance test has never undergone the kind of investigation common to other established test batteries
2. the aural entrance test has remained unchanged since 2002, while the content and assessment of the teaching of aural-skills has been subject to continuous development

3. a general questioning of the predictive value of the aural entrance test, given that this study is a follow up to an earlier investigation which revealed diametric differences between students' achievement in performance and aural examination (Bergby 2003)
4. disagreement among the academy faculty concerning the role of the aural entrance test in the selection process
5. a need to ensure quality control in all measurement of musical behaviours

The problems for discussion focus on two questions:

> *Do entrance test results offer valid prediction for exam results in aural-skills and performance at NAM?*
>
> *Is there a significant correlation between exam results for aural-skills and performance at NAM?*

The article distinguishes between the terms *aural-skills* and *aural skills.* The term aural-skills refers to the educational subject in which the refinement and development of *aural skills* take place.

## 1.1. Musical aptitude

Since researchers began to study musical aptitude around 1800, they have generally acknowledged its nature to be complex (Gembris 1997; Shuter-Dyson & Gabriel 1981). Gembris (1997) classifies the understanding of musicality in three historical phases:

1. The first phase (1800–1910/20) is represented by researchers such as Michaelis, Billroth and Kreis, and has a phenomenological approach linked to musical beauty and the aesthetics of the time.
2. The second phase (1920–1980/90), characterized by a psychometric approach, is represented by Seashore, Wing, and Gordon. In this period, the main interest was to search for an objective definition of musicality and to develop standardized tests to assess musical aptitude.
3. The third phase (1980–present) is distinguished by an emphasis on musical meaning, advocated by Stefani, Blacking, Sloboda and others. The production of musical meaning necessarily involves subjectivity and creativity, but is also dependent upon musical culture/context.

The most recent approach (number three, above) is distinct from the two earlier approaches, especially in terms of psychometric measurement. Thus, several authors agree that the conception of musical aptitude has changed over time, from a largely behaviouristic view to one that is multifaceted and can be developed in the individual (Gardner 2006; Hallam 2006, 2010; Hallam & Shaw 2002; A. McNeil 1997; McPherson, Bailey, & Sinclair 1997; McPherson & Hallam 2009). Today many consider musical ability to be a social construction that is influenced by the individual's environment (Hallam 2010; Hallam & Shaw 2002).

## 1.2. Measuring musical aptitude

Aptitude measures attempt to predict potential whereas achievement tests are designed to measure actual achievement at a particular time. When it comes to the question of how to measure and assess musical abilities within today's broad conception, researchers have made various proposals. Karma (2007) argues that the purpose of testing must be well defined. If the purpose is complex, for example to predict success in musical performance, the test needs to be correspondingly complex. But if the purpose is to study a phenomenon in order to understand it, which is the basic aim of research, the consideration for validation requires studying each factor separately. Karma argues that *auditory structuring ability* is the single factor that can be isolated to represent musical aptitude without being related to musical genre, style, musical skills or training. Sloboda (2005/1985) suggests that testing structural skills would be the most relevant music ability test associated with musical expertise. Another study that points out *one* factor to represent composite abilities is a study from the University of Southern Queensland, where the authors suggest that pitch- and intonation-discrimination tests can be a diagnostic factor for both aural-skills results and general music studies results (Buttsworth, Fogarty, & Rorke 1993).

Shuter-Dyson and Gabriel (1981) offer an extensive and thorough review of test batteries for assessing musical aptitude and musical performance, including description of the development of the tests and how the tests have been analysed to examine their reliability and validity. Most of these test batteries assess one particular aspect of music performance at the time (for example rhythm or memory). McNeil (2000) points out a weakness of these tests: they do not specify the relationship between the various aspects and the effective performance. Shuter-Dyson and Gabriel also discuss the connection and distinction between aptitude and attainment, and, in addition, they stress that other factors influence musical achievement:

> [...] all aptitude tests are to some extent achievement tests, just as all achievement tests necessarily reflect the initial aptitude of the individual. Attainment depends not only on aptitude but also on the teaching received and the child's interest in music and willingness to learn. (Shuter-Dyson & Gabriel 1981: 7)

Because admission procedures, curricula, teachers, methods, and assessment vary between institutions, research or quality assurance related to these topics must be carried out at each school specifically. Thus, there exists a number of studies concerning the connections between entrance tests (or other predictive variables) and study results, and also regarding diagnostic factors for success in separate disciplines within music performance studies (Harrison 1990; Karma 2007; Shuter-Dyson & Gabriel 1981). Karma (1982, 2007) is critical of the methods, validity and musical aptitude tests used in many of these research studies. Like Shuter-Dyson and Gabriel, he is concerned that musical aptitude tests often become musical attainment tests, because they consist of composite tasks. According to him, abilities like musical memory or sense of rhythm are *consequences* of musical aptitude. They are of secondary nature and influenced by culture and training. In data processing, this may lead to a correlation between musical aptitude and performance that actually duplicates itself. Karma also emphasizes that the subject selection process may influence the correlation.

Sloboda has reservations about using music ability tests for educational selection reasons, and he offers some guidelines or considerations that will make the selection process more fair and accurate:

> First, a test should only be used when there are no more direct signs of achievement to examine. Instrumental or vocal performance which shows technical and expressive mastery provides better evidence of musical ability than any test can do (2005/1985: 234).

Sloboda also writes that test results should be interpreted in combination with other formal and informal evidence; test results should be linked to time and purpose, and not provide a once-for-all statement; the test should be both *content-* and *associative-valid* as a measure of musical ability; and the test should be reasonably reliable (2005/1985: 234-235).

According to Hallam and Shaw (2002) it is generally recognized that aural skills alone are not sufficient to predict success in music because of the acquisition of a range of skills required in musical practice. Hallam (2010) concludes her article by stressing that selection processes for musical instrument studies should consider a

wider range of factors than the traditional aural skills tests. Gembris (1997) stresses the necessity of deriving criteria from the music in practice, so that various musical styles and genres, with their different manifestations of musicality, can be accounted for. He criticizes the general predominance of strings, keyboard and music of the classical tradition in aural skills tests.

A diagnostic or selective use of musical aptitude tests has been widely discussed; but the aural examination in itself has also been questioned. In her doctoral thesis, McNeil (2000) identifies three "schools of thought": those who find separate aural skills tests necessary; those who claim that aural skills assessment can be performed through music performance; and those who find traditional aural skills testing outdated (2000: 115). The thesis contributes to the general discussion – both in identifying problems and in suggesting solutions or further investigation. Among the themes McNeil discusses are aural abilities required in music performance; the relation between aural skills and the musician's specific domain (involving more senses than the ear); and the need, in the communities of both performers and aural educators, for an understanding of the connection between performance and aural skills.

## 1.3. Norwegian perspectives

In Norway, there is no tradition for grade systems or using published batteries of tests to measure neither musical abilities nor achievement. Applicants for Norwegian music studies must perform an audition. In addition, they have to take entrance tests in music theory and aural skills. Most of the Norwegian institutions of higher music education have agreed upon common entrance tests in the two areas. Applicants who fail in either of the tests will usually be rejected from the studies. For many of the applicants, the admission procedure is their first experience with these kinds of tests. The entrance tests will be described in paragraph 2.2. The purpose of the music theory test is to assure that the applicants have the required minimum of knowledge. The purpose[1] of the aural entrance test is:

1. to find those applicants best suited to success in the programme
2. to reveal applicants who have significant shortcomings in their musical abilities, knowledge or skills
3. to map applicants' aural abilities in order to build groups of similar aptitude in the assigned courses

1 As discussed and understood by the aural skills section of NAM.

4. to indicate to applicants and pre-college schools the level of skills and knowledge required by the academy

These aims suggest that there is not a clear distinction between the concepts of aptitude and attainment. The aural entrance test is used to determine whether the applicants can be admitted or not. It is also used for diagnostic reasons – to stream the classes into different abilities once the applicants come into the program. The first two subsections, in particular, are decisive aims for which it is essential that the school asks itself whether the test is reliable and valid, as well as whether the test situation offers the right circumstances for applicants to demonstrate their level of achievement. The present study was concerned with the associative validity in the relationships between the entrance tests and the aural-skills and performance exams.

The type of aural entrance test in use for higher music education in Norway is a legacy from the musical aptitude tests of the twentieth century (Bergby 2003; Bergby & Blix 2007; Gordon 1965; Seashore 1960/1919; Wing 1961). These tests take a psychometric approach (cf. second phase in Gembris 1997). They primarily measure aural *perception* and do not take into consideration the interaction and implementation of different skills (or musical intelligences) in musical *performance*. In spite of the traditional aural entrance test, when it comes to curricula and programmes of instruction in aural-skills courses, the training at NAM has made progress. It has gradually moved towards an ecological approach, supporting the relationship between perception and meaning (Clarke 2005). The training is based on a complex conception of musical aptitude (the third phase according to Gembris) and it stresses instrumental- and study-program relevance. In addition, the assessment is based on consideration for differentiated needs according to instrument or study program. It seems clear that the entrance tests on one hand, and teaching and assessment on the other are based on two different concepts of what constitutes musical ability (Hallam 2010; Hallam & Shaw 2002).

Frequently, highly able performing musicians achieve low marks on aural tests (A. F. McNeil 2000). At NAM the discrepancy between students' aptitude and attainment was first described in a qualitative study in which students who had achieved a severely low score in the aural entrance test, were tested and followed up throughout their studies (Bergby 2003). The results suggested that the aural entrance test was *not* a reliable predictor for success in aural-skills. Furthermore, the results showed that most of these students did very well in their main instrument performance exam despite a poor aural-skills assessment. This gives occasion to the present study.

# 2. Method

## 2.1. Subjects

All the students who enrolled in their bachelor studies at NAM during 2002–2007 were required in the data. This set of students formed the complete group which at the time of data collection (summer 2011) had completed two measurements: the Norwegian standardized entrance tests in aural skills and music theory, and the scale of marks A–F (initiated by the Bologna process). Initially, the electronic student list had 564 entries, but the list was insufficient when it came to assessments. Both the electronic student files and the paper archive were examined and compared to collect and confirm the data. After correcting for double listings, changes of study program, dropouts, postponed exams and incomplete files, the sample consisted of 307 individuals.

## 2.2. Variables and criteria

### 2.2.1. Entrance tests

All three of the entrance tests that were common to all applicants were included in the study (performance, aural skills and music theory[2]). Additional entrance tests for particular programmes (e.g. group tasks for music pedagogy applicants) were excluded.

The performance entrance test was a musical audition for a jury of 3–5 teachers who short-listed the applicants. About 20 juries took place each year. The jury members were usually experts on the respective instrument. They could assess the applicants using a scale from 0 to 20, or they could simply note their comments on the performances. The academy offered no guidelines or criteria for the assessments. Both the number of juries in a given year and the range of possible assessment criteria influence the reliability of the data. At NAM this is accepted as part of the tradition and assessment practice, and it is not considered a problem. The problem of performance assessment is widely discussed in the research literature. Elliott (1987) states that even if assessment of musical performance is common (in exams, auditions and competitions), examiners often seem reluctant – or perhaps find it hard – to explain what they are looking for in anything but the most general terms. In Elliott's study, three professional examiners showed an agreement in the ranking of six performances, but the criteria they emphasized and their comments about intonation and balance were very diverse.

2 The music theory entrance test results were included primarily for context and to highlight the area of focus (entrance audition and aural test).

The entrance tests for aural skills and music theory consisted of recorded examples, with instructions and paper answer sheets. In the aural skills entrance test the applicants listened to several recordings of different musical styles and instruments and were asked to define tonal modes, intervals, chords, keys, time signatures and one- and two- part melodic inconsistencies, as well as to carry out rhythmic and melodic corrections and dictation. The minimum passing score was 65 out of 100 points.

The music theory test consisted of identification of intervals, chords, scales and harmonic analysis, as well as exercises in four-part choral harmony, two-part counterpoint and transposition. The minimum passing score was 35 out of 70 points.

These two test batteries, common to most Norwegian music education institutions, were implemented at NAM in 2002. They had been developed by a group of academic staff representing several schools. Assessment guides and point scales were included, and a minimum score for passing the tests was suggested. NAM had been satisfied with the criteria for admission in their previous entrance test battery, so they carried out investigation to compare the old tests with the new tests. This resulted in a higher minimum score for passing the aural test at NAM, than in other schools. For music theory, the limits corresponded.

The tests were assessed by faculty members. Answers that were assessed near the failure limit were re-assessed by another teacher. Four sets of tests with similar tasks rotated every four years. The tests were carried out for all the applicants simultaneously in auditoriums and other venues. Applicants could either take all of these tests during the regular week of entrance tests (medio March) or they could participate in decentralized tests beforehand (ultimo January). If they failed in January, they got a second chance in March. If they failed in March, they were disqualified unless the performance jury specifically argued in favour of them. In that case, they were allowed another attempt 2–3 months later. In a few special cases, if the test results still were not satisfactory and the performance jury maintained their opinion, the applicant's capacity to respond to expert guidance in a practical situation was tested by two aural skills teachers and one instrumental teacher. In the present study, the most recent of the general written attempts are included in the data.

### 2.2.2. Exams

The study includes results from the second year exam in aural-skills and the final exam (fourth year) in performance in the bachelor's program. The aural exam results from the second year (the courses Gehør 11 and Gehør 12) were included in the data because this was the last year in which all of the students had aural training in their curriculum. A few of the programmes had aural training for one or two more years,

but then more integrated with their instrumental training and sometimes without a separate exam. There was no separate music theory course in the program to be compared with the music theory entrance test[3].

In the first year, students in all of the programmes followed a uniform aural-skills syllabus that focused on music conceptualization and the development of skills, as well as knowledge and strategies for music reading and notation. In the second year, the academy offered two different courses in order to provide aural classes that were as relevant as possible to the students' instruments or study programs. The Norwegian word *gehør* means *the musical ear*. The course *Gehør 11* was designed for classical music performance studies (except church music) and folk music. It lasted for one semester and focused on the practical use of the ear in connection with playing and singing. The course *Gehør 12* was designed for the other students: jazz, composition, music pedagogy and church music. Gehør 12 was a two-semester course and had somewhat more focus on written tasks.

The aural-skills exams were assessed by an internal examiner in addition to the student's teacher. For both courses, the final exam reflected the content of the lessons and thus included some tasks that varied according to the student's instrument. Gehør 11 had a practical exam that included the use of instruments, while Gehør 12 had a two-part exam including both written and practical tasks. All the students had to prove their knowledge and skills related to harmony, melody, rhythm and listening, but the concrete tasks and the degree of difficulty varied. One might say that the exams mirrored the intentional distinctions in course content and methods, based on the needs of each instrument group or study program. The exam measured whether the students had acquired the essential professional expertise for utilizing their aural skills in connection with their instrument. This was the main premise behind the differential curriculum and a major purpose that made it appropriate to compare the results from second year aural exams[4].

Naturally, the lessons in performance were even more differentiated and tailored for each unique student than the aural-skills lessons. The value of comparing performance exam results is similar to that of comparing aural-skills results: although the students represented different instruments, repertoire and teachers, the exam results could be compared because they related to a shared standard of musicianship within the community of performance practice. In addition, comparing performances

3 While the music theory entrance test may be associated with teaching subjects such as harmony and counterpoint, a comparison of those results would be outside the scope of this study.

4 One could argue that it would be preferable to use data from the first year aural-skills results, since all first year students took the same aural-skills course. However, because I chose to focus on aural-training as a supportive subject to instrumental performance – a focus that was not emphasized in the first year course to the same extent as the second year course – I used the data from the second year aural-skills results.

of different instruments or different repertoire has a long tradition in general musical practice, for instance in music competitions. In the data for this study, external examiners assessed the performance exams and the criteria were the same as for the admission audition: the examiners' personal criteria.

### 2.3. Data analysis

The data were analyzed by the use of *IBM SPSS 19*. First, the material was contextualized through descriptive statistics, such as frequency and mean values, in order to understand the sample of students. In the performance audition, the mean score is 14,76 (out of 20 points, N = 209). The mean result for the theory entrance test is 51,75 (out of 70 points), and correspondingly for aural entrance test 77,81 (out of 100 points). When relating to domain-specificity (vocal, string, wind, percussion and chordal instruments), the mean scores for the aural test are between 77,1 (wind) and 78,9 (percussion). For music theory the difference is somewhat bigger and vary between 49,1 (vocal) and 53,3 (chordal instruments).

Second, Pearson correlation coefficients were calculated.

## 3. Results

### 3.1. Correlations between entrance tests and exams

*Table 1: Correlations between entrance tests and exams*

| | | Aural | Theory | Audition | Exam Gehør 11 | Exam Gehør 12 | Exam Performance |
|---|---|---|---|---|---|---|---|
| **Aural** | r | 1 | ,284** | ,045 | ,565** | ,625** | ,002 |
| | p | | ,000 | ,514 | ,000 | ,000 | ,977 |
| | N | 307 | 307 | 209 | 178 | 129 | 238 |
| **Theory** | r | ,284** | 1 | -,097 | ,300** | ,317** | -,045 |
| | p | ,000 | | ,164 | ,000 | ,000 | ,486 |
| | N | 307 | 307 | 209 | 178 | 129 | 238 |
| **Audition** | r | ,045 | -,097 | 1 | ,181* | ,043 | ,483** |
| | p | ,514 | ,164 | | ,023 | ,768 | ,000 |
| | N | 209 | 209 | 209 | 159 | 50 | 164 |

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

The correlations between the aural and theory measures are all significant at the .01 level. The correlation between the performance audition and performance exam is also significant at the .01 level. Between the audition and exam Gehør 11 the p-value is <.05. The other results involving performance in either audition or exam are not significant. In light of the purpose of validating the entrance tests, a correlation below .20 may be considered weak; between .20 and .40 week to moderate; between .40 and .60 moderate; between .60 and .80 moderate to strong; and above .80 strong. In this light there is a moderate to strong correlation between the aural entrance test and Gehør 12 exam (r =.625), and a moderate correlation between the aural entrance test and Gehør 11 exam (r =.565) and between the performance audition and performance exam (r = .483). The music theory entrance test correlates weakly to moderately with the aural entrance test (r =.284) and aural exam (r = .300 and .317).

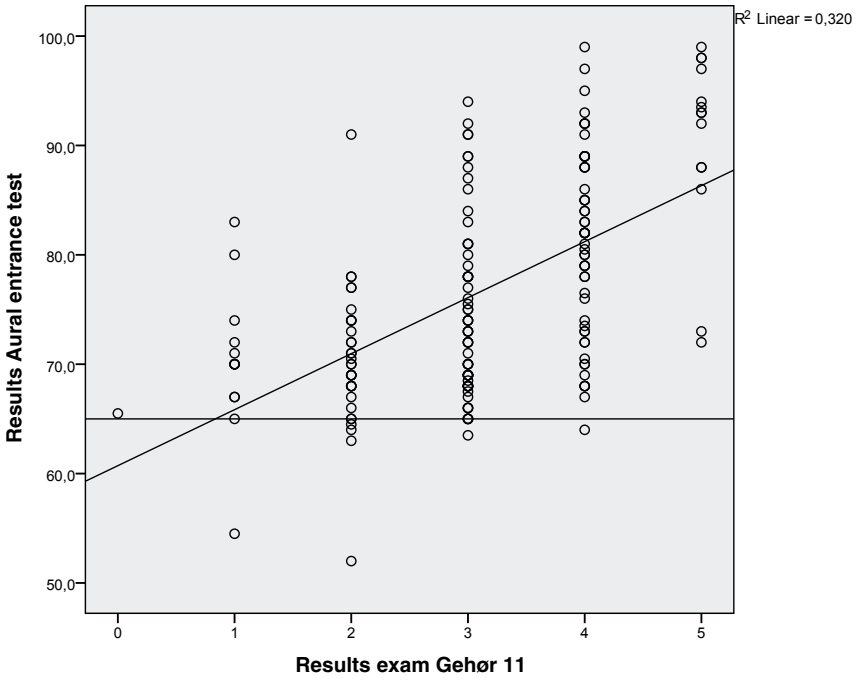


*Fig. 1: Scatter plot for aural entrance test and results for Gehør 11*

Scatter plots (Fig. 1 and Fig. 2) illustrate how some results weaken the correlation between aural entrance test and aural exam. The x-axis represents the marks given at the aural-skills exams. In figure 1, the numeric scale 0–5 equals the marks F–A. In

figure 2, the scale 1–5 equals the marks E–A. In both the figures, the y-axis represents the point scale in the aural entrance test, and a horizontal line at 65 points marks the threshold for passing the test. Below the line, we find those individuals who did not pass the aural entrance test. Their marks for the aural-skills exam vary from E up to B. We also find that some individuals scored well in the aural entrance test but not so well in the aural exam, and that those students who achieved good marks in the exam had a big variety in the entrance test achievement, even failure. This variation influences the correlation considerably.

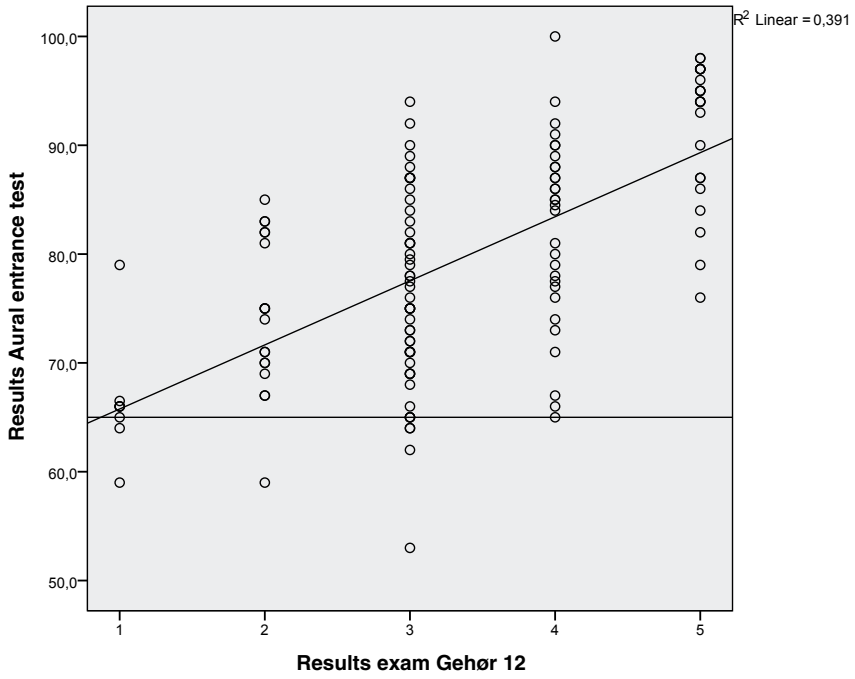


*Fig. 2: Scatter plot for aural entrance test and results for Gehør 12*

## 3.2. Correlations between aural-skills exam and performance exam

*Table 2: Correlations between exams in aural-skills and performance*

| | | Gehør 11 | Gehør 12 | Performance |
|---|---|---|---|---|
| **Gehør 11** | r | 1 | | ,058 |
| | p | | | ,481 |
| | N | 178 | 0 | 151 |

| | | | | |
|---|---|---|---|---|
| **Gehør 12** | r | | 1 | ,051 |
| | p | | | ,639 |
| | N | 0 | 129 | 87 |
| **Performance** | r | ,058 | ,051 | 1 |
| | p | ,481 | ,639 | |
| | N | 151 | 87 | 238 |

The data show close to zero correlation between aural exam and performance exam (r = .058 and .051). In addition, the significance probability suggests accidentals in the correlation (p = .481 and .639). There is no particular difference between the two aural-skills courses in this respect.

## 4. Discussion

The estimates in studies concerning relationships between entrance tests and exams are often not ideal. The statistical results are subject to the following important limitation: Those applicants who are not accepted as students do not take an exam. Therefore, we are not able to measure the results they *might* have accomplished, and this may well influence the statistic results. In the present study, the reduction of subjects in the data (from 564 to 307) may also be a weakness; but this was necessary to ensure that the data were reliable.

The entrance procedures at NAM are based on the assumption that entrance tests are good predictors of which applicants are most likely to succeed in their studies and which are not. But the literature reviewed for this study shows that musical aptitude tests correspondent with the aural entrance tests have been criticized for low validity and for being poor at predicting real-world musical skills. Success is, of course, a relative concept. The Norwegian authorities use the completion of studies on time as a criterion. In this study, the exam results in aural-training and performance are chosen as criteria. From the application forms, we know that many of our students are aspiring to become professional musicians. Success as measured by exams may have little to do with success in the professional life. Still, we can expect that study results in music performance offer some prediction about future success as a musician and, as a consequence, that good results in the performance exam may be regarded as general success in the studies. Given this condition, one could expect a relationship between the entrance tests and the performance exams.

Karma (1982) questions the principle of "the higher the correlation, the better the test", when the aim is to predict musical performance from a musical aptitude test. He finds a correlation of around .70 to be most valid. A correlation is very seldom exactly zero. In the present study, we found close to zero correlation when we related the aural entrance test to the performance exam. Equally disturbing (or even more so) is that the p-value suggests no linear connection at all. A close examination of the data shows that the students who achieved the best results in the aural entrance test were to be found amongst both those who did best and those who did worst in the performance exam. This paradox suggests that the national standardized aural tests cannot be relied upon in predicting success in the studies at NAM. On the other hand, the performance audition and the performance exam seem to correlate significantly ($p = .000$). The moderate correlation of .483 probably has several explanations – low motivation, that performance is not the main subject for every study program, and that the subjects already are selected according to musical criteria at the time of application (they all are good performers) (Karma 1982, 2007).

But, if there is no correlation between aural entrance test and performance exam, one could still argue in favour of using the present admission procedures *if* there was a clear relationship between aural entrance test and aural exam *and* there was a relationship between aural exam and performance exam. Unfortunately, this study shows that the second of these premises also fails. At NAM there has been a focus on relating aural-skills to performance for many years. But the exam results themselves do not seem to reflect this relationship. There may be several reasons for this. The introduction to this study outlined some dependent factors for attainment. Explanations to the findings may be that the aural exam did not measure and assess those activities linked to performance, or that the students did not prioritize both their instrument and aural-skills homework. Another reason might be the influence on the exam results of performance anxiety or aural examination fright.

This study does not investigate the reasons behind the findings. It simply sheds light on a practice where talented musicians sometimes are rejected because of poor aural entrance test results. Within this practice, the aural entrance test and the aural-skills training are grounded on different conceptions of musical aptitude (cf. Gembris 1997). While the aural entrance test is based on a practice, which has been criticized in the literature, of predicting success in studies by the means of musical aptitude tests, the teaching of aural-skills is based on a more modern conception. Here aural skills are closely linked to the processes in which they will come to use, such as playing, singing, conducting, teaching, listening and evaluating performance. In this more ecological approach, aural abilities are both developed and expressed through musical practice and reflection.

## 5. Conclusion

At NAM applicants who fail in the written entrance tests are usually not admitted. If the institution is to maintain this custom, there should be an indisputable connection between the entrance tests and the study results. In this research paper, exam results have been criteria for study results, and the study has revealed that the national standardized entrance tests in aural skills and music theory did not predict results for the performance exam at NAM. The only results they predicted were the results for aural-skills exam – and this exam did not correlate with performance. A broad discussion is needed about the purpose of the admission procedures, about the conception of musical aptitude and its relation with musical achievement, and about which abilities the entrance tests should measure and how those tests should be assessed. There is also a need for continuous evaluation of assessment criteria in aural-skills, as the aural-skills courses continue to develop in the direction of applied aural skills in musical performance and other musical practices.

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## References

Arenson, Michael A. (1983). The validity of certain entrance tests as predictors of grades in music theory and ear training. *Bulletin of the Council for Research in Music Education, 75*, 33-39.

Bergby, Anne Katrine. (2003). Forsøksprosjekt med tilrettelagt undervisning i gehørtrening for studenter som har fått underkjent opptaksprøven i gehør. [Adaptive teaching in aural training for students who have failed in the aural entrance test]. *Flerstemmige innspill. NMH-publikasjoner, 2003*(2), 97-133.

Bergby, Anne Katrine, & Blix, Hilde Synnøve. (2007). Undervisningsfaget hørelære. In Hilde Blix & Anne Katrine Bergby (Eds.), *Øre for musikk*. Om å undervise i hørelære (pp. 15-38). Oslo: Unipub.

Buttsworth, Louise M., Fogarty, Gerard J., & Rorke, Peter C. (1993). Predicting aural performance in a tertiary music training programme. *Psychology of music, 21*, 114-126.

Clarke, Eric F. (2005). *Ways of Listening. An Ecological Approach to the Perception of Musical Meaning*. New York: Oxford University Press.

Elliott, David. (1987). Assessing musical performance. *British Journal of Music Education, 4*(2), 157-183.

Gardner, Howard. (2006). *Multiple Intelligences: New Horizons*. New York: Basic Books.

Gembris, Heiner. (1997). Historical phases in the definition of musicality. *Psychomusicology, 16*.

Gordon, Edwin. (1965). *Music Aptitude Profile*. Boston: Houghton.

Hallam, Susan. (2006). *Music Psychology in Education*. London: Institute of Education, University of London.

Hallam, Susan. (2010). 21st century conceptions of musical ability. *Psychology of music, 38*(3), 308-330.

Hallam, Susan, & Shaw, Jackie (2002). Constructions of musical ability. *Bulletin of the Council for Research in Music Education, 153*(4), 102-108.

Harrison, Carole S. (1990). Relationships between grades in the components of freshman music theory and selected background variables. *Journal of Research in Music Education, 38*(3), 175-186.

Karma, Kai. (1982). Validating tests of musical aptitude. *Psychology of Music, 10*(1).

Karma, Kai. (2007). Musical aptitude definition and measure validation: ecological validity can endanger the construct validity of musical aptitude tests. *Psychomusicology, 2007*(2), 79-90.

McNeil, Alison. (1997). *The significance of aural development in the performing musician.* Paper presented at the Third triennial ESCOM conference, Uppsala, Sweden.

McNeil, Alison Fiona. (2000). *Aural skills and the performing musician: function, training and assessment.* (Doctoral Thesis), University of Huddersfield. Retrieved from http://eprints.hud.ac.uk/4749

McPherson, Gary E., Bailey, Michael, & Sinclair, Kenneth E. (1997). Path analysis of a theoretical model to describe the relationship among five types of musical performance. *Journal of Research in Music Education, 45*(1), 103-129.

McPherson, Gary E., & Hallam, Susan. (2009). Musical potential. In Susan Hallam, Ian Cross & Michael H. Thaut (Eds.), *The Oxford handbook of music psychology* (pp. 255-264). Oxford: Oxford University Press.

Musumeci, Orlando. (1997). The Bentley "Measures of musical abilities" as predictors of conservatory students' musical achievement. *Bulletin of the Council for Research in Music Education, 133*, 95-99.

Seashore, Carl E. (1960/1919). *Seashore Measures of Musical Talents*. New York: The Psychological Corporation.

Shuter-Dyson, Rosamund, & Gabriel, Clive. (1981). *The Psychology of Musical Ability* (2 ed.). London: Methuen.

Sloboda, John A. (2005/1985). *The Musical Mind. The Cognitive Psychology of Music*. Oxford: Oxford University Press.

Wing, Herbert. (1961). *Wing Standardized Tests of Musical Intelligence*. Windsor: N.F.E.R. Publishing Company.