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Research and the music curriculum

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In this paper I wish to demonstrate how research can illuminate practice and inform curriculum and teaching decisions. I shall draw attention to three areas where I believe research contributes to the development of music education. These are: assessment of the musical work of students, the evaluation of curriculum activities, the relationship between music in schools and music beyond the school gate.

Assessment

One element of research is sometimes overlooked, the process of conceptual clarification. Assessment is a good example. Assessing the work of students is not a simple and single type of activity but ranges from making instantaneous informal choices - such as selecting or rejecting music by tuning to a radio channel - to the relative formality of producing analytical written reports.

Along this assessment continuum, ranging from informal and instantaneous response to the formalised rigours of reports, tests and examinations, teachers find themselves playing several different roles, assessing in different ways and for various purposes. Teachers do far more than simply reject and select. Nor do they merely examine and report. Fundamental to educational transactions is a process of interaction and comparison.

The teacher points out and discusses the relationship between aspects of the music, querying anomalies, drawing attention to special strengths, and suggesting extra possibilities. He or she discusses what skills are needed for the task in hand, to what extent they have been successfully deployed, how they might be perfected, what further skills might more fully realise the music, and how these might best be acquired.

The teacher tries to get the pupils to bring fully into play their own listening and self criticism, so that the process becomes an interaction between self-assessment and teacher-assessment (Loane, 1982: 242).

Comparisons may be intra-personal - between what a particular student happens to be doing just now and what was happening with the same student last week or perhaps last year. To make such comparisons we have to focus either on what is the same and what has changed. In what particular way is this composition, this performance or this talk about music different from or the same as before? Comparisons may also be inter-personal - between different students. The level of informality diminishes when comparisons begin to

be made with the work of other students. We may then have to search for a meaningful shared vocabulary or to find and declare criteria that make sense to everyone. Even if these assessments are not reported to other people, making comparisons between students will unavoidably pervade any form of group teaching. For example, during instrumental lessons teachers inevitably make comparisons between the student of the moment and other students. It is at this point, the point of comparison, that we become aware of the need for touchstones, for explicit standards, for a shared language of musical criticism.

The first requirement of a music critic must be to acknowledge the complexity of musical experience. The task is challenging and it is easy to get it wrong. For instance, those responsible for the National Curriculum for music in both England and Wales seem to have been assembled a model of assessment along the lines of c o m m o n s e n s e , w i t h o u t a t t e m p t t o v a l i d a t e o r c h e c k r e l i a b i l i t y (A C A C , 1 9 9 6 ; S C A A , 1 9 9 6 a ; S C A A , 1 9 9 6 b ; A C A C , 1 9 9 7) . T h e s e m a t e r i a l s r a i s e m i s g i v i n g s a b o u t w h e t h e r t h e p r o c e d u r e s r e a l l y a s s e s s m u s i c a l w o r k m u s i c a l l y a n d w h e t h e r t h e a s s e s s m e n t r e s u l t s a r e c o n s i s t e n t b e t w e e n a s s e s s o r s a n d o v e r t i m e . I h a v e d e a l t w i t h t h i s e l s e w h e r e (S w a n w i c k , 1 9 9 7) . H e r e I o n l y n o t e t h a t i n t h e W e l s h N a t i o n a l C u r r i c u l u m t h e f o l l o w i n g e x p r e s s i o n s , w h i l e a p p a r e n t l y s u g g e s t i n g a s s e s s m e n t p o s s i b i l i t i e s , r e a l l y d e f y d e f i n i t i o n : i n c r e a s i n g l y c o m p l e x , i n c r e a s i n g a t t e n t i o n t o d e t a i l , s u b t l e c h a n g e s , i n c r e a s i n g l y d e m a n d i n g , i n c r e a s i n g a w a r e n e s s , s o p h i s t i c a t e d t e c h n i q u e s , r e f i n e =&Mac240;, a p p r o p r i a t e , c h a l l e n g i n g d e m a n d s . T h e E n g l i s h v e r s i o n a l s o h a s a f e w d o u b t f u l c a n d i d a t e s s u c h a s s u b t l e c h a n g e s a n d a p p r o p r i a t e l y . T h e r e i s a l s o a n u n f o r t u n a t e a t t e m p t t o i l l u m i n a t e t h e c o n c e p t o f p r o g r e s s i o n w i t h s u c h p h r a s e s a s m o r e c o m p l e x s t r u c t u r e s , m o r e c o m p l e x a s p e c t s o f m u s i c a l k n o w l e d g e a n d g r e a t e r m u s i c a l i t y (S C A A , 1 9 9 6 a) . Such language is too imprecise and spuriously quantitative to form the basis of a viable assessment model. Furthermore, suggested criteria would give a curious result if applied, for instance, to many of Bach's single subject fugues. Though conceived for performance on a keyboard they stay within a vocal range and therefore do not 'make full use of the technical possibilities of instruments' (SCAA, 1996a: 13). Nor is there a 'wide range of ideas', since these fugues tend to have but one subject and a counter theme. On this evidence we would have to say either that Bach is only 'working towards' or is just 'achieving' the level expected of a thirteen year old.

Such confusion might have been avoided had the dimension of musical understanding received explicit attention from the start. It would then have been possible to develop a basis for teachers to assess the quality of pupils w o r k , h o w e v e r s i m p l e o r c o m p l e x t h e m u s i c h a p p e n s t o b e . T h e r e h a s b e e n s u s t a i n e d r e s e a r c h i n s e v e r a l c o u n t r i e s w h i c h s u g g e s t s t h a t i t i s i n d e e d h e l p f u l t o t h i n k o f m u s i c a l u n d e r s t a n d i n g i n e i g h t l a y e r s (S w a n w i c k , 1 9 7 9 ; S w a n w i c k , 1 9 8 3 ; S w a n w i c k a n d T i l l m a n , 1986; Swanwick, 1988). It seems then not unreasonable to have them infiltrate our thinking on assessment. They define the qualities woven through the fabric of musical experience and they happen to be very robust in day-to-day use. Condensed to the briefest possible format and formulated as observable criteria they can be formulated as follows and they can be applied to composing, performing (see the text in brackets) and also to audience-listening. It is important to remember that they are cumulative. The later statements take in and include all preceding layers.

General criteria for assessing the musical work of students
The student:
Layer 1 recognises (explores) sonorities, for example loudness levels, wide pitch differences, well-defined changes of tone colour and texture

Layer 2 identifies (controls) specific instrumental and vocal sounds - such as types of instrument, ensemble or tone colour

Layer 3 (communicates) expressive character in music - atmosphere and gesture - or can interpret in words, visual images or movement

Layer 4 analyses (produces) expressive effects by attention to timbre, pitch, duration, pace, loudness, texture and silence

Layer 5 perceives (demonstrates) structural relationships - what is unusual or unexpected, whether changes are gradual or sudden

Layer 6 (makes) or can place music within a particular stylistic context and shows awareness of idiomatic devices and stylistic processes

Layer 7 reveals evidence of personal commitment through sustained engagement with particular pieces, performers or composers

Layer 8 systematically develops (new music processes) critical and analytical ideas about music

Variations of these criteria have been rigorously tested in a variety of performing and composing setting and they have also been helpful when assessing the responses of students as audience-listeners (Hentschke, 1993; Swanwick, 1994). During 1997 one or my research students, Cecilia Fran Á a Silva, translated versions of these into Portuguese for the most difficult area, that of audience-listening, an assessment mode where information from students is second-hand, usually in words rather than in music. She gave random ised sets of the eight statements to 12 judges-teacher musicians-who were asked independently of each other to sort them into a hierarchy. It is perhaps surprising that music educators make so little of inter-subjective reliability and often seem reluctant to employ the simplest statistical analysis of levels of assessor agreement. In the hierarchical sort of these statements there was considerable judge acc ordance. The agreed order matches perfectly the predicted hierarchical order. We can then feel reasonably confident about these criteria as an assessment instrument. They have musical validity and they are reliable.

Formal assessment is but a very small part of any classroom or studio transaction but it is important to get the process as right as we can, otherwise it can badly skew the educational enterprise and divert our focus from the centre to the periphery; from musical to unmusical criteria or towards summative concerns about range and complexity rather than the formative here-and-now of musical quality and integrity. There are many benefits from having a valid assessment model that is true to the rich layers of musical experience and, at the same time, is reasonably reliable. One of these possibilities is a richer way of evaluating teaching and learning, coming to understand more fully what is at issue in the classroom or studio. I can give just a recent example of this, a study that illuminates the relationship of the major music curriculum activities of composing, performing and audience-listening.

Curriculum evaluation

Any valid and reliable assessment model takes account of two dimensions: what pupils are doing and what they are learning, activities on the one hand and understanding on the other. Understanding is the residue of activity. It is what remains with us when an activity is over, what we take away. Musical understanding is revealed and developed in musical activities - composing or improvising, performing the music of others, responding in audience to music. This distinction is clear if we think for a moment of linguistic abilities. Converse for a time with a child of four or five and we are likely to hear a wide vocabulary with excursions into most grammatical forms, with appropriate prepositions, conjunctions, auxiliary verbs and so on. But examine the written language of the same child and at such a young age we are likely to find a much less advanced linguistic ability. The mode of articulation can reveal or conceal the level of understanding. Take a reverse example. I once supervised a Korean PhD student who had systematically

studied English at school almost entirely from books. Her conversation was halting and difficult to follow and she often had to ask for something to be repeated before she understood what was said. And we also had to ask her for clarification of what she said. But her written essays - including her answers to previously unseen examination questions - without the benefit of any reference material - and her eventual PhD thesis all evinced evidence of a sophisticated use of English.

These are clear examples of the difference between activities and understanding and of how one activity can reveal more or less understanding than another. This is why it is usually unwise to rely only upon one type of evidence or just a single product when trying to assess the work of students. If it is true that one activity may reveal a person =&Mac240;s understanding more than another, then it also follows that understanding may be developed more in one setting than another. For example, a gifted improviser who is asked to perform difficult music composed and notated by someone else may feel constrained and under pressure, unable to develop musical ideas freely. In this situation opportunities to function in a comprehensively musical way seem contracted rather than expanded, at least initially. Similarly, a fluent and sensitive performer may feel lost if asked to compose or improvise and may function at a level where musical understanding is neither revealed nor being extended.

The selection of a curriculum activity is thus important. For example, the little military marches by Beethoven for wind band written in Vienna between two major symphonies (six and seven) are really very ordinary, quite predictable, commonplace pieces. It would be very unwise to assess Beethoven as a composer on this evidence alone. Just then he had a specific job to do: knock up some functional marches for the open air and do it fairly quickly. Over a period of time and after several encounters with the work of any individual we may become more confident about trying to place a person, but even this depends on the range of products. And what if Beethoven had only been employed to write marches, and wrote nothing else? Teachers prescriptions for products matter and we have to be careful not to confine students to relatively closed tasks.

Of course, the activities of performing and composing may compliment each other and insights gained in one domain might then inform the other. The performer who also composes is likely to be more aware of compositional processes and this understanding may illuminate subsequent performances. Many music educators certainly believe that composing performing and audience-listening are activities that reinforce one another. (Leonard and House, 1959; Swanwick, 1979; Plummeridge, 1991). And there is an assumption that these activities are interdependent, a view we find, for example, in Janet Mills.

In an integrated and coherent music education in which children compose, perform and listen, the boundaries between musical processes disappear. When children compose, for instance, they cannot help but learn as performers and listeners - - (Mills, 1991).

Evidence supporting this kind of observation has been put forward by Dr Michael Stavrides who, working with teachers in Cyprus schools, found that students who listened to music produced more developed music in their own compositions (Swanwick, 1994; Stavrides, 1995). However, we ought not to assume that there will be a kind of symmetry of musical understanding, equal levels across the three domains of composing, performing and audience-listening. The examples given earlier of different levels of linguistic achievement depending upon the specific context should make us cautious. During 1997, Cecilia FranÁa Silva, worked with 20 Brazilian children at her school in the city of Belo Horizonte. These students were between 11 and 13 years of age and were enrolled in music classes in one large private music school. (In the absence of music Brazilian state schools it is in the private sector where most music is taught.) For the purpose of her study, each child made recordings of three memorised piano performances (the piano being their main instrument), recorded three of their own compositions (produced aurally, without not

ation)anddiscussedthreerecordedpiecesofmusicwhichwereheardthree times.

Theseninepoductsfromeachchild-threeperformances,threecompositionsandthreeaudience-responses-wereassessedbyfourjudgeswhowereallexperiencedteacher-musicians.Theyusedthebestfitstatementsbasedontheeightlayersgivenabove.Theresultsshowthatwhilemostchildrendisplayedconsistentlevelsofmusicalunderstandingbetweencomposingandaudience-listening,thesamestudents=&Mac240; performancesappearedlessdeveloped.Musicaldecision-makingseemedtogoundergroundwhentheyplayedtheirpreparedpianopieces(frommemory),whilecomposingandaudience-listeninggaveopportunitiestofunctionatahigherlevel-alevel involving more layers of musical understanding.

Figure 2

We notice a relationship between the assessment of audience-listening and composing. But performing attracts significantly lower levels of criterion descriptions. It appears that the same children reveal less musicalitywhentheyplaythemusicofotherpeoplethantheydowhentheyplaytheirownpiecesordiscussrecordedmusic.Whatarewetomakeofthis?Oneinterpretationisthatalthoughtheseperformanceswereallfrommemorytheyallbeganfromreading notation. The consequence of this is that they are less aurally fluent. Listening is not so acute. The pieces have also been practised over a longish period of time and boredom may play a part. Furthermore and importantly, the level of technical complexity is decided by the choice of piece, whereas when composing these children often stepped back to a technical level within which they were able to make musical decisions, judgements about speed, about expressive shaping, about structural relationships. In audience-listening there are no technical problems.

Such comparisons only become possible with a half-way decent theory of musical understanding. There are several important implications and here are just two. First, students should have access to a range of musical possibilities and relate to music in different ways, performing, audience-listening and composing. What are we to make of the commonsenseviewinNorthAmericathatamusiccurriculumcanbebasedalmostentirelyonperformance?(SeeElliott,1995)Second,teachersneedtobesurethatstudentshavethechancetoplayandrespondtomusiconalllevelsofunderstanding,whateverthepariticularactivity.Studentsshouldbeabletomaketrulymusicaldecisions.

Musicinschoolandbeyond
Myfinalillustrationofthepowerofresearchtogetusthinkingistoexaminethecommonsenseassumptionthatschoolisthebestplace for learning. Between 1994 and 1997 we carried out an evaluation for the South Bank Centre in London involving their education department and six inner city secondary schools. Over three years, teachers and classes of between 25 and 30 students - one from each school - had access to the resources of the Centre, including the Festival and Queen Elizabeth Halls, the Gamelan room, ensembles in rehearsal and performance and, most importantly, to musicians - performers and composers. The musicians associated with this scheme represented of many different musical traditions from around the world and it was central to the rationale of the programme that students should work with musicians of the highest calibre and that their experiences should be musically genuine, authentic.

Thefirstprojectbeganintheautumnterm,1994andwaslocatedaroundtheCentre'sJavaneseGamelanintheRoyalFestivalHall.Thesixclasseswerewithdrawnfromtheirrespectiveschoolstoattendthe SouthBankCentretoworkwiththeGamelan.Thiswasfollowedbyactivitiesduringnormals

chool music lessons where the Gamelan sessions were taken as a source of ideas for composing. The second project had as its focus Steve Reich's composition, City Life. The classes from the six schools were given the opportunity to meet and talk to Steve Reich. They heard City Life in final rehearsal and composed and performed their own music using rhythm loops, city noises and word sounds, to some extent as does Reich himself, helped by members of the London Sinfonietta and two composers. The third project (during the first part of the second year) focussed on percussion and rhythm. Five musicians between them visited each school three times, including an orchestral percussionist who played in the premiere of Birtwistle's controversial Panic at the Last Night of the Proms, a Chilean expert in samba, an orchestral percussionist with a particular interest in contemporary music and a West African drummer. In the fourth project, Film, students watched a film clip and aided by film composers, thought about the style, the period and the feeling that the film evoked and made music to underscore the film. The fifth and final project culminated in mid-July, 1997 in a lively Royal Festival Hall concert advertised and run along the lines of a pop concert under the heading Freed Up. The groups had been previously prepared and were accompanied in performance by four professional musicians.

Interviews with teachers, students and visiting musicians took place in all six schools over three years and when opportune during events at the Centre. Observations and recordings were made of the compositions and performances of the students, allowing us to informally assess any influence the projects may have had on their work. We thus had a large amount of qualitative data. Quantitative data was also gathered. Student attitude inventories were completed in school within two to four weeks following the completion of each of the five projects by both groups. Students from the project classes answered all five questions while the parallel control =&Mac240; classes from each school had a version with only the first four.

1 How do you feel about school in general?
2 How do you feel about people in your class?
3 How do you feel when you listen to music at home with your friends?
4 How do you feel about music lessons in school?
5 How do you feel about visits to the South Bank Centre?

Answers were on a five-point scale.
5 = happy/ very positive
4 = quite happy/ quite positive
3 = neutral/ no strong feelings either way
2 = quite unhappy/ quite negative
1 = very unhappy/ very negative

The main positive findings were that over the three year period:
Project and control classes all show a decline in attitude to music in school compared with altitudes to music generally, the project classes significantly less so at two of the four points of measurement. (Figure 3)
The project classes retained higher levels of group homogeneity in attitudes to music in school, to school, to peers and to music in general. (Figure 4)
Qualitative data supports quantitative findings and indicates positive gains in social maturity, students valuing of music, regard for musicians from a range of styles and in practical musical outcomes.

Among the many comments from students here are just three:
(In the Gamelan) You use numbers instead of letters. That was different and we had to concentrate. Once you knew that then it flowed. Some instruments were very loud

and some were soft. That music was more like a religious soft music. It was like stepping into a temple. It was very relaxing. If I had a headache then it would make me calm.

Nobody thought they were above us. It was just like talking to a normal person. They were really down to earth.

We feel like composers. When you see and work with different musicians you get to behave like them a bit.

One implication is that we might consider how to invest resources differently, for example, involving musicians, individuals and communities as part of a music education network, rather than seeing them as exceptional novelties. Schools might become facilitating agencies rather than sole p r o v i d e r s. M u s i c t e a c h i n g - e s p e c i a l l y i n i n n e r c i t y s e c o n d a r y s c h o o l s i s c h a l l e n g i n g , c o m p l e x a n d t a x i n g , y e t t h e r e i s a r i c h n e s s o f r e s o u r c e s b e y o n d t h e s c h o o l g a t e s i f w e k n o w h o w t o f i n d a n d u t i l i s e i t . T h e s t u d e n t s w e s t u d i e d h a d a c c e s s t o s p e c i a list professional music expertise and to a range of styles which it would not be possible to replicate authentically in every or indeed any school, certainly not on the costly scale of this programme. Our findings suggest that one important recommendation is to engage secondary students in g r o w n u p m u s i c , w o r k i n g w i t h c o n f i d e n t m u s i c i a n s o v e r a s u b s t a n t i a l p e r i o d o f t i m e . I t s o h a p p e n s t h a t t h e S o u t h B a n k C e n t r e p r o g r a m m e i n v o l v e d p r o f e s s i o n a l m u s i c i a n s . B u t a s R u t h F i n n e g a n h a s s h o w n , t h e r e a r e m a n y m u s i c i a n s c o m m u n i t i e s w h o c o u l d c o n t r ibute to the authenticity of music in schools (Finnegan, 1989). Schools may not always be the best places for music education.

In conclusion

I have tried to show how research can challenge convention and commonsense and inform professional practice. Reflecting on the three examples I have given it seems reasonable to say that research can help us to improve student assessment, to evaluate the relative contribution of curriculum activities and to think about the future relationship of music in schools t o m u s i c i n t h e w i d e r w o r l d .

R e f e r e n c e s

A C A C (1 9 9 6) E x e m p l i f i c a t i o n o f S t a n d a r d s i n M u s i c : K e y S t a g e 3 , C a r d i f f : W e l s h S c h o o l C u r r i c u l u m a n d A s s e s s m e n t A u t h o r i t y .

A C A C (1 9 9 7) O p t i o n a l T e s t s a n d T a s k s i n Music: Key Stage 3,, Cardiff: Welsh Curriculum and assessment Authority.

Elliott, D. J. (1995) Music Matters: A New Philosophy of Music Education, New York and Oxford: Oxford University Press.

Gardner, H. (1993) The Unschooled Mind, London: Fontana.

Leonard, C. and R. W. House (1959) Foundations and Principles of Music Education, New York: McGraw-Hill.

Loane, B. (1982) The Absurdity of Rank Order Assessment, Music in the Secondary School Curriculum, J. Paynter. Cambridge: Cambridge University Press.

Mills, J. (1991) Music in the Primary School, Cambridge: Cambridge University Press.

Piaget, J. (1951) Play, Dreams and Imitation in Childhood, New York: Norton.

Plummeridge, C. (1991) Music Education in Theory and Practice, London: The Falmer Press.

SCAA (1996a) Exemplification of Standards in Music: Key Stage 3, London: School Curriculum and Assessment Authority.

SCAA (1996b) Optional Tests and Tasks in Music: Key Stage 3, London: School Curriculum and Assessment Authority.

Stavrides, M. (1995) The Interaction of Audience-Listening and Composing: A Study in Cyprus Schools, Unpublished PhD thesis, University of London, Institute of Education.

Swanwick, K. (1979) A Basis for Music Education, London: Routledge.

Swanwick, K. (1983) The Arts in Education: Dreaming or Wide Awake?, London: University of London Institute of Education, a special professorial lecture delivered on 4 November, 1982.

Swanwick, K. (1988) Music, Mind and Education, London: Routledge.

Swanwick, K. (1994) Musical Knowledge: Intuition, Analysis and Music Education, London and New York: Routledge.

Swanwick, K. and J. Tillman (1986) 'The Sequence of Musical Development: A Study of Children's Composition', British Journal of Music Education 3(3, November): 305-339.

Swanwick, K. (1997) 'Assessing Musical Quality in the National Curriculum', British Journal of Music Education 14 (3).

Notes

- PAGE 7 -

. The idea of cumulative layers is essentially Piagetian. Unfortunately popular convention asserts quite wrongly that P i a g e t t h o u g h t e a c h s t a g e s o m e h o w s e p a r a t e f r o m t h e o t h e r s . F o r e x a m p l e , G a r d n e r a s s e t s t h a t f o r P i a g e t t h e c h i l d d o e s n o t e v e n h a v e a c c e s s t o h i s e a r l i e r f o r m s o f u n d e r s t a n d i n g . O n c e h e i s o u t o f a s t a g e , i t i s a s t h o u g h t h e p r i o r s t a g e h a d n e v e r h a p p e n e d [G a r d n e r , 1 9 9 3 : 2 6 - 2 7] . T h i s i s c e r t a i n l y n o t m y i m p r e s s i o n o f P i a g e t . F o r e x a m p l e , w h e n w r i t i n g o f t h e d e v e l o p m e n t o f c h i l d r e n t h o u g h w h a t h e c a l l s t h e s u c c e s s i v e s t r u c t u r e s - s e n s o r y - m o t o r , s y m b o l i c , p r e c o n c e p t u a l , i n t u i t i v e a n d r a t i o n a l - P i a g e t t e l l s u s p l a i n l y t h a t i t i s e s s e n t i a l t o u n d e r s t a n d h o w e a c h o f t h e s e b e h a v i o u r s i s c o n t i n u e d i n t h e o n e t h a t f o l l o w s , t h e d i r e c t i o n b e i n g f r o m a l o w e r t o a h i g h e r e q u i l i b r i u m . I t i s f o r t h i s r e a s o n t h a t i n o u r v i e w a s t a t i c a n a l y s i s o f d i s c o n t i n u o u s , s t r a t i f i e d l e v e l s i s u n a c c e p t a b l e [P i a g e t , 1 9 5 1 : 2 9 1] .
. A K e n d a l l C o e f f i c i e n t o f C o n c o r d a n c e g i v e s a W o f 0 . 9 1 a n d a s i g n i f i c a n c e l e v e l o f p < 0 . 0 0 0 1 . M o r e o v e r , a g o o d i n d i c a t i o n o f t h e n a t u r e o f t h e c o n s e n s u s i s t h e o r d e r o f t h e s u m o f t h e r a n k s w h i c h matches perfectly the predicted hierarchical order.
. We did not take as evidence the highest score on any single occasion. Nor did we reduce the 12 scores for each activity to either median or mode because the highest level of musical development in each

activity can be hidden in an average score. It was decided to take the highest score assigned at least three times out of the 12 observations This procedure gives a measure of the level of musical understanding of each child revealed in each activity.
. A Friedman two-way ANOVA gives the following levels of probability: Composing and Audience-listening - no significant difference, Performance with both Audience-listening and Composing - $p<0.001$.

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