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Problems in Music Pedagogy is an international refereed journal concerned with all aspects of music pedagogy. Topic areas include music teaching/learning process in a new education paradigm context, music learning outcomes, assessment in music pedagogy process, music teaching and learning activities, music teacher competence in the context of sustainable development, music education institutional responses to current trends. The journal is committed to promoting excellence in these fields by providing an international forum for the debate and evaluation of a wide range of music pedagogy issues and professional concerns.

The journal aims to publish articles which will contribute to improving theory and practice in the field of music pedagogy.

These articles may variously:

- raise and debate contemporary issues;
- report on new research;
- relate new research to theory;
- relate theory to practice;
- offer informed comment on contextual and professional matters;
- describe cases and their implications for a wider field;
- discuss a historical movement in terms of its relevance to present and future situations.

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CONTENTS

EDITORIAL

Dear readers,

This issue of "Problems in Music Pedagogy" contains studies reflecting practical experience and theoretical propositions originated not only in the Baltic region (Finland, Latvia), but also in Australia and India.

Teachers, parents, peers, and friends have a big impact on motivation. The research done by Antti JUVONEN (Finland) focuses on 5th and 6th graders' motivation to study music and the factors connected to this. The author explores connections between self-efficacy, appreciation, and intrinsic motivation as well as the significance of parental beliefs and appreciation in connection to pupil's motivation to study music.

Developing notation, chart reading and large ensemble performance skills has significant applications for higher music education, pedagogy, and music industry practice. Annie K. MITCHELL (Australia) discusses successful pedagogical strategies, music arranging and ensemble techniques used to teach music notation, chart reading and ensemble performance in Southern Cross University's (SCU) Contemporary Music degree. Several themes underpin author's teaching philosophy, pedagogy and the ethos that she strives to nurture in students and colleagues: a) musical literacy, b) adaptability composing, arranging and adapting music for particular cohorts and available instruments, c) originality to create and arrange music, d) professional development and e) resilience to maintain one's own practice, teaching and creative self-belief.

Singing requires the integration of multiple motor, perceptual, and cognitive functions. The study of Melkote Krishnarao SHANKAR proposes vocal tract geometry based on heuristic schema for singing musical pitches, employing the idea of imagery. The author concludes that a) production of pitch in singing is dependent on the appropriate sensory-motor translation of the utterance plan and a clear imagination of the expected conventions or rules, as well as b) a close study of steady state vowel spectrogram might help provide leads to the attainment of particular timbral quality.

Analysing opinions of piano teachers, learners and their parents Larisa MAĻKOVA focuses on the topicalities in the content of mastering piano playing. Within the context of axiological approach, mastering piano playing occurs during a close interaction between three basic values: a) values of learner's personality; b) values of a pedagogical process in

the interaction between the subjects – a learner and a teacher; c) values of music as the object.

We are grateful to the authors of the articles in this issue for their contribution to the development of theory and practice of music pedagogy. We hope that you, our readers, will respond to the ideas put forth here and contribute more ideas, descriptions of practice, and research that deepen our collective understanding of how to teach and nurture the younger generation in the 21st century.

Editor-in-chief
Jelena DAVIDOVA

MOTIVATION TO STUDY MUSIC AMONG 5TH AND 6TH GRADE PUPILS IN FINLAND

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Abstract
This research focuses on 5th and 6th grade pupils' motivation to study music in Finnish elementary school. The research explored connections between self-efficacy, appreciation, and intrinsic motivation. The research also explored the significance of parental beliefs and appreciation in connection to pupil's motivation to study music. The data was collected from 403 respondents from 10 different schools around Finland.
The data was analysed using quantitative methods. The connections between the factors were explored using Spearman's Rank-Order Correlation test. Having music as a hobby in connection with motivation to study music was tested using cross tabulation and the x^2 test.
According to the results, pupils' motivation to study music is strongly connected to their self-efficacy beliefs and appreciation, which were classified as attainment value, utility value, and costs. There were differences between pupils depending on them having music as a hobby or not. In addition, there was a connection between parental beliefs and appreciation and a pupil's motivation to study music.
Key words: *music studying and learning motivation, self-efficacy beliefs, Expectation-Value Motivation Theory*

Background

Especially in art and skill subjects, motivation has an important role, because positive learning experiences can lead to self-directed music actions and learning situations and, in the best case, to taking music as a hobby. At school, we can only teach these subjects a limited amount because the number of lessons is low. The idea in arts and skills is to make the pupils motivated and interested in the subject so that they can deepen their knowledge and skills after starting a hobby. This article focuses on 5th and 6th graders' motivation to study music and the factors connected to this.

Teachers, parents, peers, and friends have a big impact on motivation. This has been widely explored, and intrinsic and extrinsic motivations have been separated (Peltonen & Ruohotie, 1992; Kantelinen, 1995). There is information about the impact of parents

(Tulamo, 1993; Jacobs & Eccles, 2000; Lehtinen & Kuusinen, 2001; Wigfield, Tonks & Eccles, 2004) and hobbies (Puurula, 1992; Eccles, O'Neil & Wigfield, 2003). In this research, I focus on 5th and 6th grade pupils because those under 10 years of age are not quite capable of distinguishing the concepts connected to this research (see Nicholls & Miller, 1984). This is important when a questionnaire is used to collect data.

Music in the Finnish Elementary School

In Finland, there is compulsory education (Perusopetuslaki, 1998). Elementary school consists of classes 1–9. The first six grades are taught by a class teacher who usually teaches all subjects. Sometimes art and skill subjects can be taught by one teacher for several classes; there is a little variation in practices between schools. The National Board of Education determines the aims and core contents of school subjects and thematic entities in basic education and the curriculum. The basis of the elementary school curriculum is determined by the Finnish National Board of Education, and this forms the starting point for school-specific curricula.

Music education aims at helping pupils find their own interest in music, encourages pupils to musical activities, offers media for musical expression, and supports pupils' comprehensive growth and development (POPS 2004, 232). The pupils should understand that music is bound in time and context, differs from time to time and in different cultures and societies, and has a different significance for different people. The basis for understanding and conceptualising music is built on significant experiences that are gained through listening and making music together. Music education offers tools for developing a musical identity, in a process that targets building an appreciative and curious approach to different types of music. Musical skills are developed through longlasting and repetitive practice. Making music together develops social skills, responsibility, constructive depth, and acceptance and appreciation of differences in skills and cultures. Music education applies the possibilities that technology and media offer (POPS 2004, 232).

Motivation

Motivation means a system that guides the regulation and directional factors of behaviour. Motivation is often used to refer to needs, desires, instincts and intrinsic impulses, rewards, and penalties. Motives tune and support the direction of the individual's behaviour. They can be goal-oriented, conscious, or subconscious (Peltonen & Ruohotie, 1992, 16).

Motivation is a quantity with direction and vitality. The starting point for a definition is the individual's overall situation and processes that produce action (Peltonen & Ruohotie 1992, 16). According to Peltonen and Ruohotie (1992, 16-17), motivation carries three characteristics: 1) vitality, 2) direction (goal-orientation), and 3) system-orientation (the forces that come from outside, increasing the intensity and direction of an individual's needs or making them give up an action plan and focus their endeavour in another direction).

Luopajärvi (1993, 142-143) has recapitulated the characteristics describing motivation:

1. ***Motivation is hypothetical***. The motivation of an individual cannot be observed directly, and it cannot be measured. Motivation is a conceptual scheme that targets the understanding of behaviour. Motives may occur in a hidden form, several motives may occur for similar or identical activities, similar motives may be represented by different behaviours, and cultural or personal differences may considerably change the manifestation of the motives.
2. ***Motivation includes several processes.*** Motivation is not directed only by an individual's intrinsic imbalance and extrinsic stimulation environment, but also by the perception of different situations, and selection and interpretation of the information available.
3. ***Motives are dynamic by nature.*** In all individuals, different needs and expectations occur continuously, which not only change, but are often also contradictory to each other.

Anttila and Juvonen (2002, 100) define motivation as a concept that refers to the reasons for an individual's goal-oriented behaviour: the psychological processes that affect the birth of goal-oriented behaviour. The motivation processes develop and metamorphose continuously (see also Peltonen & Ruohotie, 1992, 17; Luopajärvi, 1993). At any one moment, an individual does one thing and, after a while, their actions take another direction.

Anttila and Juvonen (2002, 100) add that, in general language, the type of student who is actively committed to studying and learning processes is called a motivated student. Peltonen and Ruohotie (1992, 17) separate attitude and motivation, defining attitude as a relatively permanent intrinsic and slowly changing reaction preparedness. Motivation is temporary and usually connected to one situation at a time. Attitude affects more the quality of an action, and motivation affects the vitality of the action. Changes in motivation do not require changes in attitude in the context (Peltonen & Ruohotie, 1992, 17). Peltonen and Ruohotie (1992, 17-18) separate general motivation, which can be seen as a synonym to attitude, and situational motivation, which means a dynamic motivation that changes from one situation to another and that is affected by an individual's intrinsic and extrinsic factors, and especially how the individual sees the personal significance of the task (Peltonen & Ruohotie, 1992, 17-18; Kantelinen, 1995, 43-44).

Research has shown that parents' support for a child's self-determination, the democracy of the relationships in the family, and parents' commitment and interest in relation to the child's school attendance are connected to the child's intrinsic motivation. On the other hand, parental control is connected to extrinsic motivation. Too tight control signals to the child that they are not trusted in their own abilities and in taking care of school tasks (Aunola, 2002, 117).

A teacher-centred classroom environment in which learning basic skills is underlined and differences in abilities are emphasised through, for example, rewards and public evaluation seems to be harmful to intrinsic motivation. Instead, in classes in which the teacher aims at supporting and developing the pupils' independence, the children are more motivated and trust their own abilities more than in a controlling teacher's class (Aunola, 2002, 118).

General Motivation for School and Favourite Subjects

From the characteristics point of view, motivation is seen as a general orientation to school attendance, and it is not analysed in subject areas (Murphy & Alexander, 2000; Malmberg & Little, 2002). Among the youngest schoolchildren, the motivation to attend school may be a more general interest in school as a whole (Harter, 1983; Jacobs et al., 2002). Another approach is a more subject-centred exploration of motivation (Murphy & Alexander, 2000). Eccles and colleagues (1993) and Wigfield and colleagues (1997) found that motivation for school may sharpen to subject-oriented motivation already in the early stages of school attendance. For example, maths-oriented pupils can be distinguished from reading-oriented pupils (Eccles et al., 1993; Wigfield et al., 1997).

Expectations, Values, and Motivation

Ford (1992) collected 32 different motivational theories together in a single table. Many of the theories have essential differences, but, basically, they all examine the same questions concerning a human being's turning towards an activity and guiding it (Lehtinen & Kuusinen, 2001, 213).

Actual expectancy-value theories have been definied since the 1960s e.g. Vroom, 1964; Atkinson, 1964; Ajzen & Fishbein, 1980; Rotter, 1982 (see Bandura, 1997, 125). They all share an attempt to explain the factors affecting motivation through some impulses. Expectancy-value theories simply explain that the more an indvidual believes that an action will lead to a certain objective, and the more they appreciate the achievement, the greater motivation the individual will have to perform the action (Bandura, 1997, 125).

Today, Wigfield and Eccles's (2000) Expectation-Value Motivation Theory has gained a central place in the field of motivation research. In addition, this research is based on their theory, and the questionnaire was built on its principles. According to the theory behind the pupil's task choices, there are expectations (their own beliefs and anticipation about managing the task) and values (the appreciation that the pupil connects to the activity or task).

Self-efficacy and Motivation

Bandura formed the concept of 'self-efficacy' (Bandura, 1993), but in Finnish there have been several other terms to describe the same concept, such as 'effectiveness beliefs' (Ruohotie, 1998) and 'spontaneous effectivity'. Bandura defines self-efficacy as an individual's own conception of their own abilities to organise and carry out different activities or performances.

Individuals gain positive self-efficacy in subjects in which they have success and in which their areas of strength are handled (e.g. Denissen, Zarret & Eccles, 2007). People who have strong self-efficacy in some area are motivated to work harder when they believe they can manage well and when they appreciate the task most (Bandura, 1993; Wigfield & Eccles, 2002). If an individual believes they are able to influence their own learning and believe they can survive well in it, they will also work persistently and with determination to reach the target (Pintrich & McKeachie, 2000, 36-37). Self-efficacy

strengthens not only motivation, but also the effectiveness of memory and cognitive processing (Bandura, 1993; Berry, 1999).

A belief in one's own ability affects the choices, endeavours, and amount of struggle to reach a target and tolerate adversity. The beliefs of self-efficacy also guide the self-regulation system and influence the way in which an individual observes and processes their performance and their products (Ruohotie et al., 1993, 27). Kääriäinen (1988, 16-19) has noticed that if an individual has an average self-image, they are often modest in estimating their own skills and abilities. Similarly, an individual with a negative self-image is socially passive and brands themselves incompetent (Kääriäinen, 1988). Repetitive experiences of failure in certain tasks gradually generate in the individual a belief that they cannot succeed in similar tasks. Respectively, success and positive learning experiences strengthen the beliefs of self-efficacy in the area (Lehtinen & Kuusinen, 2001, 226).

Hobbies are connected to self-efficacy. Eccles and colleagues found that elementary school pupils who played an instument had greater belief in their success in music lessons than those children who did not play any instrument or who had stopped music as a hobby (Eccles, O'Neil & Wigfield, 2003). Upbringing and beliefs that come across through social interaction also have an impact on self-efficacy. The first experiences of self-efficacy are gained at home. As the child grows older and their social network widens, peer groups become more important in the development of self-efficacy, and siblings also have an important role (Bandura, 1997, 169-174). Tulamo (1993, 125) found that home also reflects the parents' attitude to music studies, as evaluated by the child. At school, it is also important how the child experiences the music teacher's attitude to them (Tulamo, 1993, 125). Parental beliefs in and anticipation of their child's school performance predict the child's beliefs in their ability and their self-efficacy even more than the child's real skill and ability level (Aunola, 2002, 115). Parents who believe in their children's skills and abilities have children whose attitudes to school are positive, and the children also see themselves in a positive light. Parental uncertainty about their children's skills and abilities shows in the children's more negative attitudes towards their own abilities and performance (Aunola, 2002, 115-116). According to Grolnick, Ryan, and Deci (1991), the parents' participation in their child's schoolwork and support for their autonomy improve the child's school performance and increase the child's belief in their own skills and abilities.

School has an important effect on children's beliefs in their competence. It is a place where children's cognitive skills develop and are being developed. In addition, school offers a large number of different tests that evaluate, measure, and compare abilities and skills. At the same time as children develop their cognitive skills, they also form a conception about their own academic abilities and competence (Bandura, 1997, 174).

A teacher's positive expectations of a certain pupil's possibilities are also mirrored in the teacher's way of instructing them in the classroom. This can be seen in more positive feedback, giving thanks, and encouragement. The teacher's belief in certain pupils also seems, according to research, to predict changes in the pupils' performance and motivation. On the other hand, it has been found that a pupil's own motivation, skills, and belief in their abilities also have an effect on the teacher's beliefs (Aunola, 2002, 117).

According to Wigfield and Eccles's (2000) expectancy-value theory, motivation at school is dependent on the value given to different tasks and school subjects. Eccles and colleagues classified the value of a task in four parts: attainment value (importance for identity or self), intrinsic value (enjoyment or interest), utility value (usefulness or relevance), and cost (loss of time, overly high demand for effort, loss of valued alternatives, or negative psychological experiences such as stress).

Attainment value is based on how important the individual feels it is to succeed in the task. Intrinsic value is the amount of enjoyment gained from the task and how eagerly it is carried out. Utility value is dependent on how much carrying out the task offers to future plans, or how much it indirectly leads to reaching other targets (see also Locke & Latham, 1990). The costs consist of how much carrying out the task restricts participation in other activities, how hard the individual must struggle to complete the task, and what emotional costs the task requires.

Intrinsic value can be seen as part of intrinsic motivation. An intrinsically motivated pupil experiences the task itself as satisfactory and rewarding (Kantelinen, 1995, 42-43; Peltonen & Ruohotie, 1992, 18-21). Intrinsic value shows, for example, in playing a musical instrument as a hobby. A hobby has a strong impact on appreciation of the school subject (Puurula, 1992; Eccles, O'Neil & Wigfield, 2003). In art and skill subjects, having a hobby is clearly connected to appreciation of the subject at school (Puurula, 1992). Most hobbyists think that the subject to which their hobby belongs should be taught in more lessons at school (Puurula, 1992, 94).

An extrinsically motivated pupil carries out tasks for reasons that are outside the task (Kantelinen, 1995, 42-43; Peltonen & Ruohotie, 1992, 18-21). Utility value is one important factor encouraging motivation. According to Olkinuora and Lehtinen (1984; see also Peltonen & Ruohotie, 1992, 82), the psychological and logical meaningfulness of school work is based on how a pupil sees the school as serving their distant educational and professional targets. The research questions in this research are based on Eccles and Wigfield's Expectancy-value Theory, and the questionnaire was originally built by McPherson and O'Neill (2010).

Research Questions

1. *How motivated are 5th and 6th grade pupils in studying music? Are there differences between the genders?*

These questions mainly describe the pupils' intrinsic motivation and their appreciation, interest, and enjoyment in music studies. In addition, I also explore the differences between boys and girls.

2. *Does self-efficacy have a connection to 5th and 6th grade pupils' motivation in music?*

People with high self-efficacy in certain areas are motivated to work hardest when they believe that they will succeed well in the task (Bandura, 1993; Wigfield & Eccles, 2002).

If the individual believes that they are able to influence their own learning, and believe they will succeed in carrying out the task, they will also work persistently and with determination to reach the target (Pintrich & McKeachie, 2000, 36-37).

3. *Does appreciation have a connection to 5th and 6th grade pupils' motivation in music?*

   Subquestion 1) Does the motivation have a connection to the importance of succeeding well in the subject?

   Subquestion 2) Does the motivation have a connection to the usefulness of the subject for the pupil?

   Subquestion 3) Does the motivation have a connection to how much the pupils must work and struggle to succeed in the subject?

4. *Does having music as a hobby have a connection to the pupils' motivation to study music?*

5. *Do parental beliefs and appreciation have an impact on the children's motivation in music?*

   Subquestion 1) Does a pupil's motivation have a connection to their beliefs about the parental belief that they will succeed in music?

   Subquestion 2) Does a pupil's motivation have a connection to their beliefs about parental appreciation for music as a school subject?

Collecting the Data

The data is taken from international research led by McPherson, in which there were participants from the USA, Brazil, Hong Kong, South Korea, Israel, and Finland (McPherson & O'Neill, 2010).

The Finnish data was collected by the author in 2008-2010. There were altogether 1654 respondents to the questionnaire in Finland. Of all the respondents, there were 403 (24.4%) 5th and 6th graders. This research targets the group mentioned. There were 182 (45.2%) 5th graders and 221 (54.8%) 6th graders, so the whole sample consisted of 403 respondents. The respondents were from 10 different areas in Finland. The respondents consisted of 211 (52.4%) girls and 192 (47.6%) boys.

The Data Analysis

The questionnaire consisted mostly of 5-step Likert-scale questions. The data was analysed using non-parametric measures because it was not normally distributed. Normal distribution was tested using all sum factors. Because the data was bigger than 50 respondents (N=403), the normal distribution was measured using the Komogorov-Smirnov test. The result was that the statistical significance was <0.001 concerning every sum factor. The risk of turning down the basic assumption of the data being normally distributed was 0.1%.

This research explores intrinsic motivation and especially its connection to the factors explored. An intrinsically motivated pupil is interested mainly in the task under study, and they experience the task as satisfactory and rewarding (Peltonen & Ruohotie, 1992, 18–21; Kantelinen, 1995, 42–43). The indicator of motivation was, in this research, the

sum factor of intrinsic value, which consisted of three complementary questions. These questions measured how much the pupils liked learning music and studying it, how interested they were in music at school, and how interested they were in music outside the school.

Results

1. *How motivated are 5th and 6th grade pupils in studying music? Are there differences between the genders?*

The pupils were moderately intrinsically motivated in learning music (they liked studying music and saw it as interesting). The average of the intrinsic motivation sum factor was 3.75 on a Likert scale, where 1 = not at all interested and 5 = really interested. Girls liked music and saw music as more interesting than boys did. The girls' average intrinsic value sum factor was 4.1, and the boys' average was 3.4.

The connection between intrinsic value and gender was tested using Mann-Whitney's U-test. The mean rank value for the girls is 238.31, which is bigger than the value for the boys (156.58), which means that the girls have estimated, on average, that they like music and are interested in it more than the boys are. Mann-Whitney's U (11638.5) is statistically remarkably significant ($p < .001$).

2. *Does self-efficacy have a connection to 5th and 6th graders' motivation to study music?*

The linear connection between intrinsic value and self-efficacy was explored using Spearman's Rank-Order correlation test. There was found to be a statistically largely significant connection ($r=.71$, $p<.001$).

The connection between the factors can also be explored separately for the genders. According to Spearman's Rank-Order correlation test, the connection was relatively strong and statistically largely significant among both boys and girls. The boys had a stronger connection ($r=.75$, $p<.001$) than the girls ($r=.65$, $p<.001$).

Table 1. The connection between self-efficacy and intrinsic value according to gender. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

GENDER	N	R_2	P
Boy	180	0.75	< 0.001
Girl	203	0.65	< 0.001

3. *Does appreciation have a connection to 5th and 6th graders' motivation to study music?*

This research question includes three subquestions, which can offer an answer to the main question through comparison. Every subquestion was tested using Spearman's Rank-Order Correlation test.

Subquestion 1) Does the motivation have a connection to the importance of succeeding well in the subject?

According to the correlation test, we can say that intrinsic value and the level on which the pupil feels it is important to succeed in the subject have a remarkably high linear statistical significance level (r=.75, p<.001). In attainment value, there is no statistically significant difference between boys and girls (see Table 2). The strength of the connection is almost equal for boys (r=.75) and girls (r=.76).

Table 2. The connection between attainment value and intrinsic value according to gender. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

Gender	N	r_2	p
Boy	187	0.75	< 0.001
Girl	206	0.76	< 0.001

Subquestion 2) Does the motivation have a connection to the usefulness of the subject for the pupil?

Utility value also has a strong correlation with motivation. The linear connection is statistically remarkably significant (r=.73, p<.001). There was only a small difference between boys and girls (see Table 3). Spearman's Rho value for the connection for the boys was .72, while the Rho value for the girls was .70. Both results were statisically significant (p<.001).

Table 3. The connection between utility value and attainment value according to gender. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

Gender	N	r_2	p
Boy	180	0.72	< 0.001
Girl	203	0.70	< 0.001

Subquestion 3) Does the motivation have a connection to how much the pupils must work and struggle to succeed in the subject?

Intrinsic value and costs have a statistically remarkably negative connection (r=-.62, p<.001). Among the girls, the connection was stronger than among the boys (girls r=.59, boys r=.54).

Table 4. The connection between intrinsic value and costs according to gender. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

Gender	N	r_2	p
Boy	185	-0.54	< 0.001
Girl	200	-0.59	< 0.001

4. *Does having music as a hobby have a connection to the pupils' motivation to study music?*

Music is considered to be a hobby if the pupil, at least once a week, sings in a choir, studies music privately or at a music school or elsewhere, plays a musical instrument, or plays together with friends or by themselves.

Motivation was measured using a sum factor of intrinsic value. Its average values were rounded, for this research question, into five classification groups. The first group (1= Not interested at all) contained pupils whose intrinsic value was between 1.00–1.49, the second group contained pupils whose intrinsic value was between 1.5–2.49, and so on.

The results were then cross-tabulated and the connection was measured using the x^2 goodness of fit test. The results show that there are statistically significant differences between the motivation of those pupils who have music as a hobby and the motivation of those who do not have music as a hobby [x^2=16.3, df=4, p(.003)<.01]. The strength of the connection (c=.205) is rather small, but still statistically significant (p<.01).

According to standardized residuals, the biggest differences in the group who had music as a hobby were found between answers with intrinsic values of 3 (Cannot estimate) and 5 (Very much interested). The intrinsic value of 3 (Cannot estimate) was over-represented, and the value of the standardized residual was 2.2 in the column. The column for very much interested had an under-represented number of answers, and the value of the standardized residual was -2.3.

Table 5. The interest in studying music among those who had music as a hobby and those who did not (N=371). Cross-tabulation with SPSS program. Column percentages: % with music as a hobby, yes or no

		How interested the pupil was in music studying?					
		1 Not interested at all	2	3	4	5 Very much interested	Total
Do you have music as a hobby?	No	4.3 %	14.9 %	42.6 %	27.7 %	10.6 %	100 %
	Yes	1.9 %	7.1 %	24.1 %	35.8 %	31.2 %	100 %

5. *Do parental beliefs and appreciation have an impact on the children's motivation to study music?*

The research question includes two subquestions, which answer the main question through comparison.

Subquestion 1) Does the pupil's motivation have a connection to their beliefs about the parental belief that they will succeed in music?

In the questionnaire, the respondents were asked to rank their school subjects (9 school subjects) according to whether they believed their parents thought they would be successful. There were nine school subjects altogether, and the data was coded so that if the pupil thought that their parents considered they were best at music, the value was set to 5. If the pupil thought that their parents considered that they were worst at music, the value was set to 1. The connection was measured through the correlation of this value and intrinsic value.

Between intrinsic value and parental beliefs, there was an average linear statistical connection (r=.59, p<.001). When the data was explored for boys and girls separately, there was no statistically significant difference (boys r=.54, girls r=.55).

Table 6. The connection between parental beliefs and intrinsic value according to gender. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

Gender	N	r_2	p
Boy	172	0.54	< 0.001
Girl	202	0.55	< 0.001

Subquestion 2) Does the pupil's motivation have a connection to their beliefs about parental appreciation for music as a school subject?

In the questionnaire, pupils were asked to rank their school subjects according to what they believed their parents saw as their most important school subject (9 subjects). The answers were then coded so that if the pupil thought that their parents considered that music was the most important subject, the value was set to 5. If the pupil thought that their parents considered that music was the least important subject, the value was set to 1. The connection was then measured using correlation between this value and intrinsic value.

Parental appreciation and intrinsic value had a statistically weak significant connection (r=.32, p<.001). The connection for boys (r=.38) was a little stronger than for girls (r=.34).

Table 7. The connection between parental appreciation and intrinsic value according to gender. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

Gender	N	r_2	p
Boy	173	0.38	< 0.001
Girl	199	0.34	< 0.001

In Table 8, I have collected a summary of the factors that have a connection to motivation for studying and learning music.

Table 8. Summary of factors connected to motivation for studying music. Spearman's Rank-Order Correlation test. N=number of respondents, r_2=Spearman's Rank-Order Correlation coefficient, p=statistical significance

Factors	N	r_2	p
Self-efficacy	383	0.71	< 0.001
Attainment value	393	0.75	< 0.001
Utility value	388	0.73	< 0.001
Costs	385	-0.62	< 0.001
Parental belief of succeeding	374	0.59	< 0.001
Parental appreciation of school subject	372	0.32	< 0.001

Reliability of the Research

The motivation to study music was explored using a questionnaire that was built based on previous research on motivation. It used the expectation-value-motivation theory by Wigfield and Eccles (2000). The data was analysed using statistical methods.

The reliability is good because of the extensive use of reference literature and the strong theoretical framework on which the questionnaire was built. The research literature and results support each other well. The results from statistical measurements were all statistically significant. One factor affecting this was the big sample size (N=403). The small differences in the sample between the tests were due to the fact that not all respondents replied to each and every question, and therefore they were dropped from the sum factor sample.

The reliability of research is directly commensurate to the reliability of the measure instrument. In this research, the concepts used and the research questions were

constructed on previous research and Eccles and Wigfield's theory. This means that the concepts used support the theory and cover the phenomenon widely.

Self-efficacy and appreciation were measured using sum factors, which were built from several questions approaching the phenomenon from different angles. The connection between music as a hobby and motivation to study music was explored using simple methods, and music as a hobby was defined during the research process.

Reliability was also considered when collecting the data. In quantitative research, it is important that the respondents understand the questions correctly. For this reason, 5th graders were the youngest target group, because they have good enough understanding about the used concepts (see Nicholls & Miller, 1984; Nicholls, 1990).

Reliability means that the results would be the same even if the questionnaire was used several times (Metsämuuronen, 2003, 86). Reliability can also be calculated statistically in quantitative analysis using Cronbach's alpha, which is one of the most used measures of reliability. Alpha measures internal consistency (Metsämuuronen, 2003, 439). In this research, sum factors were built from different questions measuring a certain area. For example, the sum factor of intrinsic value was built from three questions: 1) *How much do you like studying and learning?* 2) *How interesting do you find music at school?* and 3) *How interested are you in music outside the school?* Sum factors were also created for self-efficacy, attainment value, utility value, and costs. All sum factors were tested using the Crombach's alpha test, making sure that it was >.80 for every sum factor. This means that the internal consistency of the dimensions can be seen as strong.

Summary and Discussion

Generally, pupils see music as a very interesting subject. The distribution in intrinsic value was clearly negatively curved, and the most frequent answers were in the column *"Very much interested"* when we explored the sum factor of intrinsic value. The average for intrinsic value was 3.75. Girls were clearly more often *"very much interested"* in studying music (average 4.1) than boys, who showed a lower interest (average 3.4).

The differences between genders have been explored previously. In Palviainen's research (2008), 6th and 7th grade girls appreciated music more than boys. Similar results were obtained by Wigfield and his research group (1997, 466-467). Similarly, the results show that appreciation has a connection to a pupil's areas of interest.

There was a strong statistically significant connection between self-efficacy and intrinsic value in motivation to study music among 5th and 6th graders. This supports Wigfield and Eccles' theory, which claims that motivation to study is connected to task-oriented self-efficacy. The stronger a pupil's belief is that they can succeed well in a task, the more interested the pupil is in studying it. Although this research does not demonstrate a causal relationship, there are strong signs for this in previous research (e.g. Bandura, 1993; Wigfield & Eccles, 2002).

Boys have a stronger connection between self-efficacy and motivation to study than girls. For girls, self-efficacy is not as important to motivation as it is for boys. Boys must believe more strongly that they will succeed well in a task to gain motivation. In practice, a teacher should offer pupils tasks that they believe they are able to cope with.

When choosing exercises for music lessons, these should be a little too easy rather than too challenging. If overly difficult exercises are practised for too long in music lessons, there is a danger of killing interest in music entirely as a school subject. This does not take much, particularly when it concerns exercises in playing a musical instrument. It is necessary to start with exercises that every pupil can manage. That raises the feeling that they are able to play the instrument, and interest in the future can be even higher because of the positive self-efficacy.

Appreciation also has a connection to motivation, exactly as Eccles and Wigfield's theory suggests. Interest and attainment value, meaning how important success is to an individual in a task, have a rather strong statistically significant linear connection. There were no differences between the genders. Of all the factors measured in connection to intrinsic value, attainment value had the highest correlation to motivation. This means that pupils' experience of the importance of succeeding well in a subject affects motivation the most. Attainment value was measured using the following questions: *How important is it for you to study music? How important is it for you to succeed well in music? How important is it for you to get good marks in music?*

According to Aunola (2002), the teacher can signal to the pupil, through actions and attitudes, their own targets and appreciation, as well as their attitude to success and learning. Research has shown that a teacher's general beliefs and anticipation with regard to an individual pupil guide their actions in the school classroom, and have an impact on the pupil's motivation and performance (Aunola, 2002, 117). It is important that the teacher shows appreciation for studying and transfers this feeling to the pupils. This research result mirrors the way in which, if a pupil starts to appreciate music and see it as valuable, their motivation also grows. The correlation measurement also showed a rather strong connection between utility value and motivation. This goes the way in which the theory predicted. Utility value highlights the usefulness of music in everyday life, and how useful it is seen to be compared to other activities, life, and hobbies, and how useful it is seen to be later, when moving to working life. Although music is one of the art and skill subjects, there is a rather strong connection between interest and usefulness. This means that to gain high motivation in arts and skills, it is important to see their usefulness as part of a pupil's life outside school. This usefulness may be different to that of core subjects such as maths and science, but it is an important result to find that it is important to see the usefulness of the subject in music, too.

According to Eccles and Wigfield (2000), intrinsic value and costs have a statistically significant negative connection. The sum factor of costs in this research included questions about the difficulty of learning music, how difficult it was compared to other subjects, and how much the pupils had to struggle to learn music at school, as well as how much they had to struggle to get good marks in music. A negative connection means that the more music caused costs, the less a pupil was interested in learning music, and vice versa. The connection among girls was a little stronger than among boys. This is an interesting discovery, because in an earlier result, namely the connection between self-efficacy and intrinsic value, the connection was stronger among boys. In practice, this means that boys should have higher self-efficacy than girls to maintain their motivation for a task. If the task is felt to be difficult or the struggle becomes too great and too tiring, girls lose their interest in music faster than boys. This means that boys work more tenaciously in music in spite of the costs, but they always need to maintain the belief that they can carry out their tasks successfully. Girls do not

need that strong belief that they will succeed in music when they start to study, but if the costs grow too high, girls lose interest in the subject faster than boys. In this research, costs had the weakest connection to motivation compared to the other elements.

Having music as a hobby was connected to an interest in studying music. Having music as a hobby was defined as the pupil, at least once a week, singing in a choir, studying music privately at a music school or adult education center, or playing a musical instrument alone or with friends. The pupils who had music as a hobby were more interested in learning music than those who did not have such a hobby. In the group without music as a hobby, there were fewer pupils very much interested in learning music, but also more pupils who could not say if they were interested in music or not. This result confirms the idea that having music as a hobby strengthens a pupil's identity and opinions about music in general.

Music activities at school strengthen a pupil's musical identity, which is also a target in the curriculum. According to previous research, having music as a hobby strengthens appreciation of the subject (Puurula, 1992; Eccles, O'Neil & Wigfield, 2003).

If a pupil thinks that their parents believe in their success in music, this strengthens their motivation in music studies. This supports the background theory, which suggests that parental appreciation also increases the motivation of the pupil (Tulamo, 1993; Bandura, 1997; Lehtinen & Kuusinen, 2001). In previous research, it is shown that parential beliefs in success predict a child's own self-efficacy more than their real level of skills (Aunola, 2002, 115). In this research, self-efficacy had a connection to motivation. Boys pay more attention than girls to their parents' appreciation when they select their own areas of interest.

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DEVELOPING NOTATION, CHART READING AND LARGE ENSEMBLE PERFORMANCE SKILLS IN CONTEMPORARY MUSIC STUDENTS THROUGH HIGHER EDUCATION

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Abstract

This paper discusses successful pedagogical strategies, music arranging and ensemble techniques used to teach music notation, chart reading and ensemble performance in Southern Cross University's (SCU) Contemporary Music degree. The profile of enrolled students is increasingly guitarists and singers from a popular music background, with limited traditional music education, poor music reading skills and little experience of playing from notated charts in ensembles. However, many of these students are training for careers as secondary school music teachers, a vocation requiring practical skills of playing in and directing various school music ensembles: choir, contemporary bands, big band, school orchestra and musical theatre show band. School music teachers also have to teach composition and arranging and apply these skills when preparing repertoire and resources. Other university students pursuing a portfolio career of musician and composer similarly require performance, reading, composition, and arranging and ensemble skills. Because of the predominant numbers of guitarists and vocal students, large ensembles at SCU have an imbalance of these instruments over keyboards, bass, drums and horns. This paper discusses teaching and learning approaches used to overcome this imbalance by extending the roles and musical function of each instrument, enabling all players to contribute meaningfully to the large ensemble learning environment. The pedagogical challenge was

- *to provide contemporary repertoire to develop notation and chart reading skills in popular musicians;*
- *to arrange repertoire to broaden the ensemble roles of guitarists and singers in large ensembles;*
- *to train students in directing and performing in large ensembles;*
- *to nurture these professional skills in pre-service teachers and musicians entering the contemporary music industry.*

Developing notation, chart reading and large ensemble performance skills has significant applications for higher music education, pedagogy, and music industry practice, namely

- *teaching pre-service teachers vocational arranging and ensemble direction skills required for school music teaching, choral and band direction;*
- *providing professional development for popular musicians needing to improve their performance, ensemble and musical direction skills and broaden the musical genres they play in;*
- *motivating teachers to compose original educational resources;*
- *applying arranging skills in professional music practice to create repertoire for professional ensembles;*
- *contributing to music scholarship and research by interrogating and sharing teaching practices, performance training, resource creation, and overcoming challenges in music higher education.*

The ethos of professional development, creativity, originality and adaptation that underpins this pedagogy are all relevant themes of the 11th International Scientific Conference "Problems in Music Pedagogy".

Key Words: *music notation, pedagogy, contemporary music, teaching strategies, large ensemble performance*

Introduction

Over my two decades' tenure lecturing in Australia's Southern Cross University's (SCU) Bachelor of Contemporary Music (BCM) degree, which is situated within the School of Arts and Social Sciences (SASS), the student cohort has changed significantly. From the balanced collection of keyboard, guitar, bass, drum and vocal students plus a few brass and woodwind players that prevailed for the first decade of my tenure, this workable student demographic has increasingly been replaced by a cohort of guitarists and singers from popular music backgrounds, with limited traditional music education, poor music reading skills and little experience of playing from written music and notated charts. However, many of these students are training for careers as secondary school music teachers, a vocation requiring practical skills of playing in and directing various school music ensembles: choir, contemporary bands, big band, school orchestra and musical theatre show band. School music teachers also have to teach composition and arranging in a variety of genres from classical to contemporary, and apply these skills when preparing repertoire and resources. Students pursuing a portfolio career of musician and composer similarly require performance, reading, composition, arranging and ensemble skills.

Aim of the Research

This paper *Developing notation, chart reading and large ensemble performance skills in contemporary music students through higher education* aims to expose and examine pedagogical strategies, musical arranging and ensemble techniques I have found successful in teaching music notation, chart reading and ensemble performance in SCU's BCM degree. A parallel stream of instrumental studies and ensemble group work classes run through the performance strand of the BCM, a scaffolded, developmental program extending the three years this degree is offered. Large ensemble group classes are mandatory for the first two years, students taking either guitar ensemble or Choir, with some participating in both ensembles. A broad pedagogical aim is to enable all players to contribute meaningfully to the large and small ensemble learning

environments. The paper also aims to illuminate the impact these pedagogical techniques and the associated teaching resources I have created may have on practical music education at tertiary and secondary levels in Australia experiencing similar demographical change.

Object of the Research

The pedagogical challenge was to

- provide contemporary repertoire to develop notation and chart reading skills in popular musicians;
- arrange and adapt repertoire to broaden the ensemble roles of all students, particularly guitarists and singers in large ensembles;
- train students in performing in, directing and conducting musical ensembles;
- nurture these vocational skills in pre-service teachers and musicians entering the contemporary music industry and teaching profession.

Teaching and learning approaches used to address the emerging student profile and the limited available instruments to work with include extending the roles and musical function of each existing instrument or section. An example of this strategy is transcribing horn section parts of a big band piece for three guitars, where the rhythm of melodic lines is generally complementary but the melody is harmonised, giving each part some independence but the section general rhythmic homogeneity. Further techniques are composing and arranging pieces specifically for the available ensembles, and adapting existing charts to suit each individual ensemble. All students are encouraged to extend their role in ensemble by playing a secondary instrument e.g. percussion, singing harmonies, and playing lines on keyboard to emulate horn or string parts. Integrated into this scaffolded learning program was the objective of training students in these adaptive creative musical techniques, building their independence, musical leadership and facilitation skills; enabling them to employ this pedagogy in their future teaching and musical direction roles.

Methodology: Description of research and practice

Over the past seven years, qualitative methods have been employed to undertake this research, based on a practice-led research approach *"concerned with the nature of practice and lead[ing] to new knowledge that has operational significance for that practice"* (Candy, 2006, 1). During this time, interrogation of my own pedagogy has constantly occurred, through my roles as teacher (participant) and researcher (observer). Each semester, creative outputs have resulted from this project, namely musical compositions, choral and ensemble arrangements which are then used as teaching resources and their effectiveness investigated. This approach aligns with practice-based research: *"…an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice"* (Candy, 2006, 1). Student focus groups were conducted in 2016 and 2017, specifically to discuss ensemble teaching and performance.

The qualitative data collected by the instruments mentioned above has been consistently verified by quantitative statistical evidence. Formal student feedback on

all SCU subjects and their teaching is collected anonymously by the university after the delivery of every subject. Each subject in this study is offered once a year. The data collection instrument gathers statistical and written feedback, which is then independently analysed. Ratings over this seven-year period average 4.39/5 unit (subject) satisfaction for the musicianship and ensemble subjects I teach, and 4.65/5 for my teaching. The success of my teaching strategies is verified by SASS Head of School Professor Barbara Rugendyke:

> *"Formal evaluations of Annie's teaching are extensive, statistically valid and consistently excellent… In 35 years as an educator I have rarely encountered such compelling evidence of high quality teaching as the result of conscious professional refinement" (2016).*

The previous SASS Head of School also attests to the success of my curriculum development and pedagogy:

> *"The quality of her teaching is demonstrable in both quantitative and qualitative terms. Music students are often enthusiastic about the practice of music, but markedly less so about theory; the consistently high ratings Annie has received in her theory classes need to be read in this light" (Professor Mike Evans, former SASS Head of School, 2012).*

Informal student feedback, communicated regularly each semester, further supports this data:

> *"The teaching of this unit was beyond excellent. Formerly I was dull in the knowledge of theory but now I have a deep understanding of what has been taught in this unit which will now lead me to further advancement in subsequent units. This unit was the most dense of all the units I have completed so far. The content was complex and vast. Annie is an amazing teacher: I have learned a great deal and greatly enjoyed it" (Contemporary Music Theory II student, 2014).*

Regarding the BCM subjects where I teach music notation, *chart reading and ensemble performance, university* statistics over the past three years reveal that 91.56% of all students enrolled have passed these subjects, with an average of 19.3% of students receiving High Distinction or Distinction (the two highest grades).

As BCM graduates obtain employment as professional musicians and music teachers, data collected about their pedagogy (modelled on my methods) also informs this research.

"I have been very fortunate to have enjoyed a great career in music education since leaving SCU. I would like to offer my thanks and respect to you for the impact and influence you had on my music teaching philosophy and practice, particularly in relation to the rigour you brought to the teaching of aural skills in musicianship. I have employed these techniques in my own teaching practice to great effect since" (Andy Mison, Principal, Northern Territory School of Music, 2016).

Schools where BCM pre-service teachers undertake practicum and where beginning teachers recently graduated from the BCM are employed have reported significant improvements in the standard of musical literacy of these young teachers.

Pedagogical Model

Fundamental pedagogical concepts are embedded in my Model (see Figure 1), which addresses key learning areas in music: theory, aural musicianship, composition, performance and ensemble; and graduate attributes including lifelong and self-directed learning, and professional practice. Strengths of this curriculum include foundational skills learning music notation, basic scales, chords and rhythms (Year 1); advanced and applied harmonic and rhythmic vocabulary (Year 2); composition and performance in specialised genres (Year 3); creative/exegetical Honours projects or final education year (Year 4).

My pedagogy and curriculum design have been triangulated against the spiral curriculum models of Bruner (1960, 1996), Harden and Stamper (1999); Efland's (1995) lattice curriculum, and Kolb and Kolb's (2005) experiential learning theory. The learning journey is built on foundations of music theory, musicianship and creative/instrumental practice, curriculum design is hierarchical and developmental (Bruner, 1960, 1996), with recurrent engagement in content (Bruner, 1960, 1996), presented through a comprehensible structure and sequence of content (Curzon & Tummons, 2013). Advanced knowledge of these subjects, gained through the application of musical concepts via diverse learning approaches, resulting in expertise in the knowledge domain (Efland, 1995) creates a lattice that upholds these steps in musical education. The higher levels of the model below depict active engagement in creative professional and/or academic environments which can facilitate graduates' holistic adaptation to the world and where knowledge is created by transformation (Kolb & Kolb, 2005), often through self-directed and lifelong learning, work and community engagement.

Figure 1. A 21st century curriculum model for music higher education (Photo: Tree Stairs, 2014)

Results of the Research

A. Musical examples: Developing music notation and chart reading skills through ensemble performance

My third-year large instrumental ensemble class this year had a proliferation of guitarists, plus bass and keyboard players, drummers and male and female vocalists. As one of the common ensemble groups found in high school and in the music industry is big band, I included big band repertoire in this class. I adapted the score of Birdland (Zawinal, 1977*)* from an arrangement for full big band of brass (3 trumpets, 3 trombones), saxophone section (2 altos, 2 tenors and 1 baritone), piano, rhythm guitar, bass and drums. The arranging techniques I used were to divide the original sax and horn section parts among the guitarists. Selecting parts that were most varied, avoiding duplication of parts that were very similar. Thus, Guitar 1 played Soprano Sax line, Guitar 2 played Alto Sax, Guitar 3 played Trumpet 1, Guitar 4 played Trumpet 2 and Guitar 5 played Trumpet 3 part. I also created a rhythm guitar chart for very poor

readers. The guitarists were encouraged to take turns playing solos, motivating them to demonstrate their improvising skills.

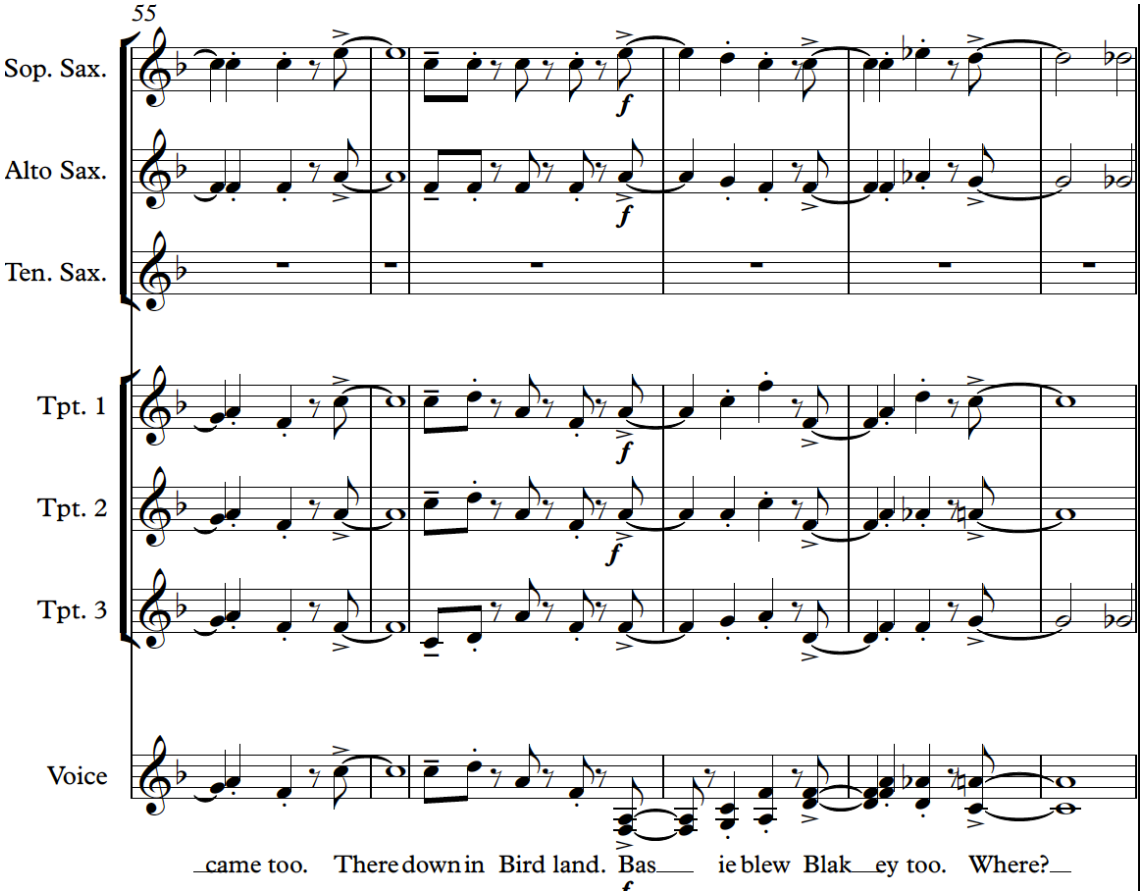

Figure 2. "Birdland" excerpt

The pedagogical success of this approach for ensemble teaching was apparent. Students initially rehearsed in sections, learning to play unison lines or harmony lines in rhythmic unison. Some melodic independence of the parts allowed individuality for each student. Teamwork was enhanced by learning the importance of blending (timbrally and rhythmically) within a section. Singers were required to read from a written chart and follow a score rather than relying on lyric sheets. The angular and syncopated nuances of the jazz vocal lines in this arrangement improved their sight singing.

Advanced musical concepts were taught and applied in this learning activity. All students were trained in the importance of navigating the form as per the written arrangement. All students (including singers) learned the application of scales and modes for creating improvised solos. Rhythmic concepts included syncopation, rhythmic stabs, and doubling on percussion instruments. Harmonic concepts included advanced harmonic vocabulary, jazz chords, extended and dissonant chords, piano and guitar chord voicings, the effective use of dissonance, and parallel chromatic runs. Interpretative considerations included playing with dynamics, expressive nuances and

specific instrumental articulations, timbral blends and sectional sounds, and one's individual contribution to the whole ensemble.

The other large ensemble group I teach is the Southern Cross University Choir. The choir comprises first and second year students who study this ensemble as part of core subjects, plus any other students enrolled in the BCM who voluntarily attend. The choir is for Soprano, Alto, Tenor and Bass parts (SATB) which are fairly evenly represented in the ensemble. This semester I composed a medley of three Latin songs for SATB: *Shaker Song* (Beckensstein, Lasley & Willis, 1977), *Sausalito* (Duke, 2005) and *Rio de Janeiro Blue* (Haeny & Torrance, 1977). I composed these arrangements from a *New Real Book* (1988) vocal and chord chart of *Shaker Song* and my own transcribed charts of *Sausalito* and *Rio de Janeiro Blue*. This type of repertoire is not readily available for choirs, so I compose my own arrangements; endeavouring to broaden the repertoire knowledge of students and educate them in various musical styles and genres.

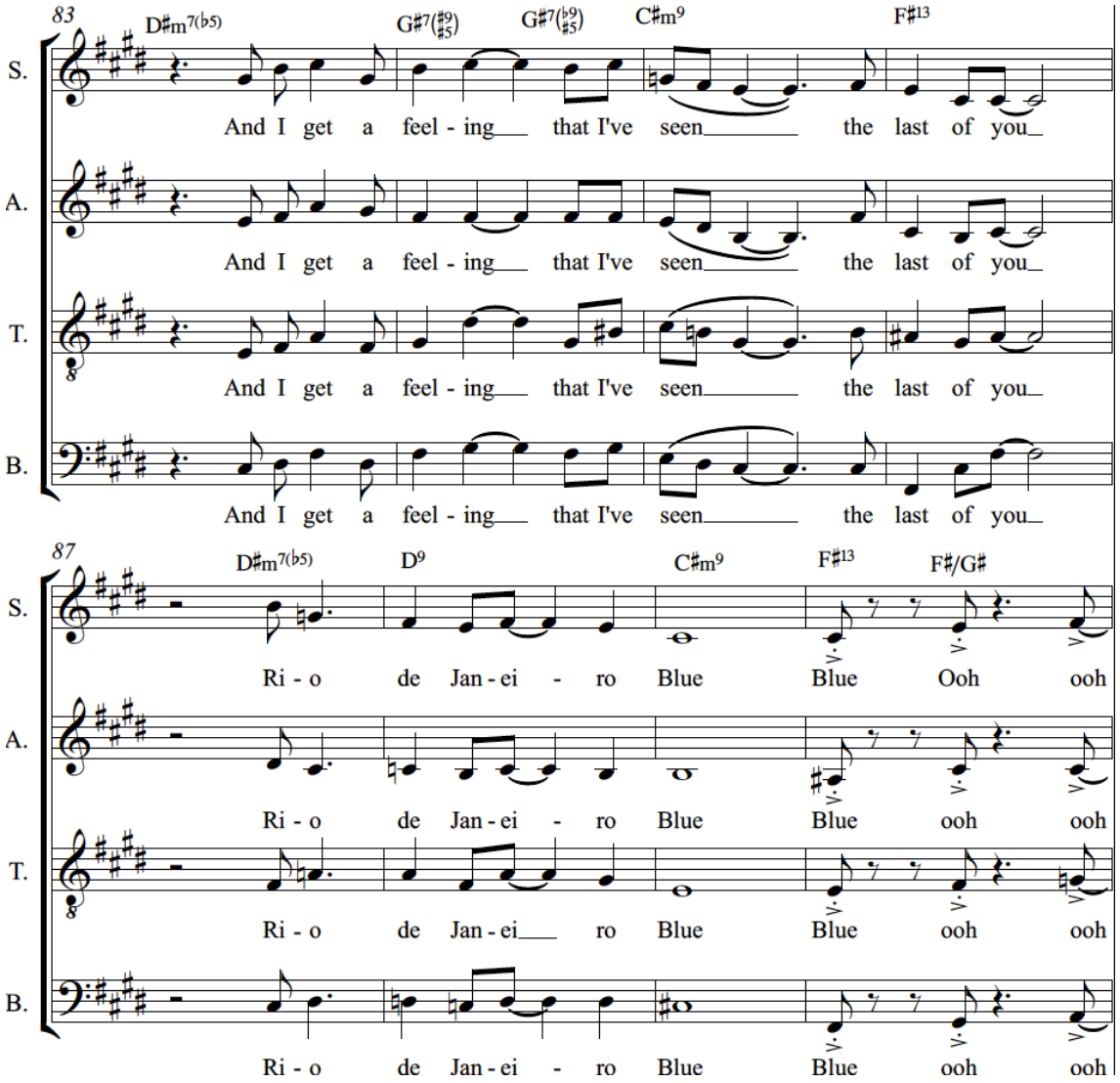

Figure 3. Rio de Janeiro Blue SATB choral excerpt

The rhythmic concepts taught and applied in this arrangement include Latin rhythms, particularly the performance of samba and bossa nova dance rhythms, accents and syncopation. Students also learn accompanying techniques, such as piano chord voicings, piano rhythmic patterns, Latin bass lines and drum and percussion grooves. This medley also contains advanced harmonic vocabulary, extended chords, tritone substitutions and dissonance, which singers must learn to pitch in harmony with accurate intonation and punctuate in punch chord riffs. Again, students learn to navigate arrangements with extended forms, read notation correctly, interpret dynamics, and scat sing angular melodic lines. The different roles of individuals and vocal sections within the choir, and their contribution to the whole ensemble, are emphasised by antiphony (call and response) and the texture and harmony created by moving line progressions.

B. Problems in music pedagogy and examples of good practice

Several problems are common when trying to develop notation, chart reading and ensemble skills in musicians, often regardless of their age. These are summarized here with some suggested solutions:

1. Students who are not good readers (many contemporary/popular musicians) avoid being heard, when placed in a position where their note-reading ability is exposed. Avoidance tactics include not playing or singing, or playing/singing so softly that it is inaudible. Sectional rehearsals are a good preparation to build reading confidence, where students can practise their parts in a smaller and hopefully supportive group, before participating in the full ensemble. The teacher or ensemble director must monitor the volume output of each instrument to ensure no students' playing is being deliberately hidden.

2. Conversely, classical musicians often read music adeptly but have little rhythmic feel, particularly when interpreting contemporary and jazz genres. Because they are good readers, some will plough through the arrangement but without listening to the ensemble. Technology is a very useful teaching and practice resource in this situation. Playing in grooves can be improved by facilitating rehearsals with sequenced tracks, drum machines, and at least a metronome. Encouraging students to practise with drum machines and playing along with recordings will not only improve their time keeping, but experimenting by playing different grooves should build more authentic 'rhythmic feel' in their playing which can be applied to ensemble performance.

3. Soloing needs to be taught as well as discovered through one's individual practice. Application of scales, modes and arpeggios over chord progressions is a craft to be learned, as is the architectural skill of constructing solos effectively over chord progressions and song structures. Teachers may set up small groups, allocating different roles for each student. For example, three keyboard players may individually play the chords/rhythm part, the bass line and another improvise over the chord changes; then swap parts. This technique is effective in small guitar groups. Single-note instruments can practise improvisation to pre-recorded rhythm section grooves or rehearse with a live rhythm section.

4. The ability to accompany vocalists and melody-line players empathetically, stylistically and supportively is a technique that often needs nurturing in ensemble players. This concept can be especially challenging when instruments change role from lead and/or improvisation to backing another instrument. As above, practising in small groups, alternating the roles and ensemble function each instrument performs can develop students' facility to move effectively between musical parts. Teachers can reinforce students' appreciation of the different textural roles by training students in aural perception; making them listen to, and identify or notate, the various techniques specific instruments use in melodic, harmonic and rhythmic roles.

5. The tonal balance of the ensemble timbre and volume needs to be checked and maintained, so that the sound levels don't keep increasing as the rehearsal/performance progresses. Timbral balance and ensemble volume should also be receptive to the repertoire. Again, the teacher or ensemble director should exercise leadership in this situation, but they should also delegate by instilling a strong sense of responsibility in each band member for their individual contribution to the collection rehearsal sound.

C. Relevance and applications: Notation, chart reading and ensemble skills for the musical world

Community engagement

Developing notation, chart reading and large ensemble skills has significant applications for higher music education, pedagogy, music industry, professional practice and community-engaged musical activities. Mentoring students (when they are ready) to play in available ensembles, such as orchestras, big bands, music theatre shows and their own bands, is a very positive and effective way to build their performance skills, music reading and interpretation, and ensemble etiquette. The Lismore Symphony Orchestra (LSO) in which I play double bass, is a local community orchestra in partnership with SCU; with the university providing the rehearsal and concert venues. Its present conductor is a former SCU Contemporary Music student. He also plays brass in the Northern Rivers Big Band, an ensemble that I played piano in for several years. One of our graduates plays piano and percussion with the LSO. Other interested students are invited to attend concerts as ushers, and encouraged to aim to join the orchestra when their performance and reading skills are of sufficient standard. Sound production students gain valuable work experience by volunteering as stage crew, lighting personnel or audio engineers.

Teachers creating original resources

One of my PhD students who graduated from SCU's Bachelor of Contemporary Music/Bachelor of Education (Secondary) degree about 10 years ago is employed as music teacher and choral director in the Northern Territory Music School. She conducts and directs choirs in Darwin and supervises the choral program throughout Northern Territory schools. This teacher is half-way through her Doctorate, a creative work/exegesis project composing 12 original choral pieces for 4-part female choir, specifically written for adolescent girls experiencing different stages of voice change.

The choral works are unique in addressing the physical challenges faced by female adolescent singers, a neglected area of choral pedagogy and resourcing. The pieces feature local languages and dialects to reflect the vast linguistic diversity of the choral cohort, many for whom English is a 3rd or more remote language. Her lyrics narrate the history, geography and culture of the Northern Territory and its peoples. The songs align with the Australian music school curriculum, and are accompanied by a kit of teaching lesson plans and resources to assist music teachers in the remote areas of the Northern Territory, most of whom are not musically trained or able to read music.

In a similar project, next year I have been granted 6 months' Special Studies Leave to undertake a project entitled *"Equitable representation of female musicians, composers and academics in Australian contemporary music and higher education".* This creative work/research project aims to elevate the contribution of female musicians and composers to Australia's contemporary music industry and higher music education. Creative outcomes will comprise seven original compositions for publication, to be made available for performance by professional and community choirs, ensembles and orchestras; and as performance and teaching resources for music higher education providers. The original works will include compositions for large contemporary ensembles, orchestra, duet of double bass and piano, big band, and SATB choir. Scholarly outcomes will be researched by analysing this repertoire; interrogating my creative process and evaluating the pedagogical value of these resources after trialling them on various ensembles.

From 2020, SCU's Contemporary Music Program will be in partnership with a Technical and Further Education (TAFE) college on the Gold Coast. This facility will offer our BCM music course from an interstate campus. An upcoming task involves training their staff to successfully deliver our subjects with appropriate pedagogical strategies, resources, lesson plans and repertoire. The teaching resources I create and the music I compose and arrange are specifically designed to suit and improve our student levels of skill and musicianship, include original Australian repertoire (including my own) and be adaptable to the different instruments the students play.

Conclusion

Several themes underpin my teaching philosophy, pedagogy and the ethos that I strive to nurture in students and colleagues:

- *musical literacy,* the ability to play, compose, interpret and understand music in various genres;
- *adaptability,* composing, arranging and adapting music for particular cohorts and available instruments;
- *originality* to create and arrange music to embrace the complexities and diversities of various learning environments;
- *professional development* to upskill musicians through many stages of lifelong learning and creative practice; and
- *resilience* to maintain one's own practice, teaching and creative self-belief.

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TOWARDS A VOCAL TRACT GEOMETRY-BASED PEDAGOGY OF SINGING

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Abstract
Recent music pedagogical research has begun to look at ways to apply emerging knowledge on the vocal tract for singing. In focus are aspects of articulation, measures of precision and accuracy, and the role of imagery in pitch production. This study proposes vocal tract geometry based heuristic schema for singing musical pitches, employing the idea of imagery.
The study is the result of the author's practice-based independent research. It has been found to work in the classroom as a practical pedagogic device and is amenable to public scrutiny and testing. This also constitutes an attempt at finding a theoretical context for the schema, a place within the overall discourse of music pedagogy.
Key words: *articulatory mechanism, vocal tract geometry, imagery in pitch production, music pedagogy, theoretical context*

Introduction

Traditional pedagogy of singing is based on imitation. Cox says: "*Humans understand other entities…and events in their environment in part via overt and covert imitation. We imitate gestures, facial expressions, postures, gaits, vocalizations, and other behaviors of those around us. This is part of how we learn to be human*…" (Cox, 2011, 4).

Imitation is associated with a neurobiologically based capacity for empathy and sociality (Iacoboni, 2009). This capacity is at the basis of all learning. Unlike as in visible actions - such as in acting, for instance - in singing, the series of stimuli is invisible and the imitator depends on hearing. The individual hearer does not 'see' how the sounds are shaped inside the vocal tract. Classical phonetics offers a static map of positions of articulation of consonants and vowels. In recent times there have been attempts to understand the aerodynamics of phonation (Khosla, Murgugappan, Paniello & Ying, 2009) and suggestions that the use of imagery may facilitate production of the right pitch. The current study proposes visual imagery that can be a useful pedagogical tool

in teaching and learning singing. It is imagery that has evolved in the specific context of Indian Hindustani classical music.

One definition of singing describes it as consisting of complex multimodal multidimensional behavior that requires the integration of multiple motor, perceptual, and cognitive functions (Pfordresher, Halpern & Greenspon, 2015). This report will first propose the core findings of the study and then seek to locate a context for them. According to classical phonetics, an utterance begins with an abstract plan (Tatham & Morton, 2011). The plan is intentional and governed by a cultural context as well as laws regulating neuromuscular coordination. The utterance is executed with the help of mobile articulators - tongue, lips, uvula, larynx and the lower jaw. In practice, the resulting acoustic signal never quite matches the plan because of mechanical, acoustic and other artefacts introduced in the production process. This applies to the singing sounds as well. In translation of the utterance plan, the ideal mapping may elude the practitioner. This is where problems of teaching and learning may occur (Tatham & Morton, 2011). This mismatch between theory and reality constitutes a pedagogical gap.

Setting

A vocal utterance is the culmination of a series of physiological steps. Emerging from the lungs, air presses against the vocal folds of the larynx and the glottis. The sound wave - acoustic signal - issuing at the laryngeal cusp is further processed by the articulatory apparatus of the vocal tract to produce speech or song. Singing requires sustained vowels at the subglottal, glottal and supraglottal levels. It is the sustained vowel that the present study is interested in with the focus on the elongated standard English vowel /ɑ/.

Singing is a generative system that makes infinite use of finite media, creating something new, something that is not present per se in any of the constituents. In singing - as in speech - discrete parts are combined in a variety of ways to make new, expressive wholes. Merker (2002) proposed that humans do not exploit the continua of frequency (pitch) of their voice or of instruments – and of time, but create limited sets of discrete categories and combine them into complex patterns.

Curiously enough, the Indian musical aesthetics is inspired by the kind of continua that Merker is referring to. In the current study since we are going to focus on the steady vowel /a/, we shall not be speaking of voice onsets, pauses, terminations and other discretized aspects of pitch and duration. In the background of our concern is the recognition that mechanical properties of oral and pharyngeal mucosa and muscle tissues, among others, influence the transfer of the acoustical energy (Mainka et al, 2015); that specific control of these structures serves to tune the timbre characteristics of vowel sounds and; that the features change rapidly during speech and singing (Sundberg, 2019).

Of relevance to our study is the suggestion that production of pitch in singing is dependent on the appropriate sensory-motor translation of the utterance plan and a clear imagination of the expected conventions or rules. Singing, however, involves more than pitch: voice quality, intensity, and timbre. But pitch accuracy may be considered a first priority and its attainment is usually willed and planned. Intensity, too, can be

willed and planned. Timbral quality is more complex business and depends on the default characteristics of the vocal tract and harmonics in the higher frequencies. A close study of steady state vowel spectrograms might help provide leads to the attainment of particular timbral quality.

Again, pitch accuracy is not always a requirement for reception of a song. Cultures tend to be willing to ignore minor departures from expected pitch executions and may be swayed by the emotional quality, timbre, and verbal import of the lyric. Even so, first of all, how well the singer translates the image of the plan is a function of how well she deploys the muscular conformations necessary for articulation of the desired pitch. The link between pitch image and articulatory action has been indicated as a contributing factor in inaccurate singing (Pfordresher, 2010).

The Multi Modal Imagery Association (MMIA) Model proposed by Pfordresher, Halpern & Greenspon (2015) on the sensorimotor translation of the utterance plan in general and imagery in particular is based on three sets of data: data suggesting a link between auditory imagery and singing accuracy; evidence for a link between imagery and the functioning of internal models for sensorimotor associations; and the use of imagery in singing pedagogy.

Articulation depends largely on the deployments of the tongue, the lips and the larynx. The tongue, through appropriate positioning, serves to increase or decrease resonating spaces and related timbres and is potentially capable of producing an infinite number of vowel sounds. It is recognized that shifting relative positions of tongue tip within the vocal tract, up, down, dorsal and back, can produce a continuum of vowel sounds to build a system of phonemes. These, with additional combinatorial rules, will allow construction of language specific syllables (combinations of vowels and consonants). The mandible, too, widened or collapsed to a default position, has the effect of changing the shape and volume of the vocal tract regions that affect the amplitude, pitch and timbre of the voice. In this manner, the mobile components of the vocal tract make it a variable resonator, with changes in their positioning causing changes in formant frequencies.

Further, in view of the fact that the frequency of the vibration of glottis, the source function - and the harmonics produced in the vocal tract - the filter - are largely independent of each other, by fixing the shape of the vocal tract it is possible to produce the same vowel repeatedly with widely different fundamental frequencies and harmonics. Or, keeping the source frequency - F_0- constant, it is possible to alter the shape of the vocal tract independently to change the vowel that is produced (Raphael, Borden & Harris, 2011).

This observation allows holding the shape of the vocal tract fixed in a particular conformation to produce a sustained vowel /ɑ/. Since the shape of the conformation plays a critical role in the production of the vowel, it may be fruitful to consider geometry of the vocal tract for articulating the same vowel as relevant to singing. Geometry is proposed in which the vocal tract is divided into upper and lower 'palate'. 'Upper palate' is the physical space extending from the upper pharyngeal region, the velum or soft palate, the hard palate, alveolar ridge, upper teeth and the region bound by the lips. The 'lower palate' is the region symmetric with the 'upper palate', and comprising the lower and inner part of the mouth, space under the tongue, and bound

by the mandible. For all their apparent physicality, the two 'palates' are putative, virtual geometric spaces, conjuring up imagery of the vocal tract as a cavity resonator made up of two mutually interlocking hemispheres.

Another caveat at this point is in order. Practitioners of art have to contend with the subjective in judging the quality of art - the truth of art - as mediated by culture and tradition. In particular reference to music, its aesthetic is mediated by the idea, and perception, among others, of sensory consonance. The idea of consonance is mediated by culture so that what is 'consonant' to one tradition might not be consonant to another. Consonance is used here as tied up with the enjoyment that comes with listening (Zatorre, 2015). Cultural preferences are seen as modulating the perception and reception of music (Huron, 1994). It is in this backdrop that the pedagogic practices discussed and the schema proposed here must be viewed (see McDermott et al, 2016). The human species shares a universal neural disposition towards sensory consonance and comes with a default 'fine tuning' mechanism to allow for cultural preference. The fine tuning occurs through sympathetic oscillations in the sensory-motor regions; these are the neural modules that are also recognized as responsible for entrainment to rhythm (Large et al, 2015).

As will be seen, the Indian system allows for fair degree of deviations in the pitches. The idea of the sruti is an example of how this cultural tolerance is realised in musical practice.

A Note on Indian Musical Aesthetics

For the ancient Greeks proper sounds of music manifest the class of simple ratios by which the world itself is believed to be organized. This property - of simple ratios - allows the sounds to come into harmony with one another and with our organs of perception, which, too, are believed to share a natural affinity for the same ratios.

For the ancient Indians, reality was continuous and persistent as the background for all human actions and cognitions (recall Merker's observation above). It is through moments of singularity, of discontinuity, of ordinary experience, that the imperceptible, persistent continuum is to be inferred. In this scheme of things, musical reality is a continuum of sounds, and srutis are the resonant discontinuities that come to life by their sheer capacity to give pleasure. They become the svaras, or musical sounds. The loci of the svaras around which the srutis fructify are 12 in number - the same as in the western system of music. It is the positioning of these 12 notes, as actualizations of the srutis, however, that controversy has persisted. The srutis represent potential divisions of the pitch continuum scaling the octave into unspecified twenty two micro units and these are regions, intervals, frequency bands, rather than points or boundaries.

Previous exposure - literacy, if you wish to call it - plays a critical role in the acts of musical perception in the Indian context. An individual in this tradition is said to experience spontaneous perception (of musical sound) at the end of exposure to a series of individual sounds and syllables. The memory of qualities or attributes of experience acquired in a progressive and cumulative manner is the backdrop for and facilitator of recognition. The memory of these sonic qualities occurs within a gestalt called the raga. Operative within this raga gestalt is the functional concept of sonance of musical sounds or pitches. It may be defined as the degree of affinity or 'valence'

between one note and another; it is the extent to which one pitch agrees or disagrees with another. In the idea of the raga, which is foundational to the classical musical system of India, a pitch or sound can enter into four kinds of musical possibilities with another pitch or sound. It can act as the sonant (vadi), consonant (samvadi), dissonant (vivadi), or assonant (anuvadi, that is, neutral or subordinate).

Analogous to the dominant note or pitch of the western musical system, the vadi is the voice; it 'speaks' for and on behalf of the other notes within the raga, entering into certain selected relationships with them. Once chosen, it determines the dynamic musical quality of a particular raga. The other musical notes, respectively, 'speak in concert with', 'speak in opposition to' and 'speak in a subordinate manner' with respect to the sonant or vadisvara. Several note pairs might be in consonant agreement, but only one note acts as the official samvadi, and consequently it cannot be dropped from the scale under any circumstances. It is the vadi and the samvadi in alignment - two strong and closely related svaras - that provide an axis of tonal stability and structural consonance (Rowell, 1990).

There are other rules governing the 'behaviour' of ragas. A raga may not have more than seven svaras, either in the ascendant or the descendant; it has a minimum of five svaras in the ascendant and descendant; it must always feature the tonic - represented as Sa; it must have at least one of the two notes - perfect fourth Ma or perfect fifth Pa as part of the gamut; it always has a sonant or vadisvara; the pitch distance between the vadi and the samvadi must be either 9 srutis or 13 srutis.

The sonant note is the single fixed point of reference from which all other tonal affinities are reckoned. When actualized in a particular scale formation or melodic construction, it becomes the 'denominator' (as in a fraction), and by extension, it is this pitch that determines the individual roles and limitations of the remaining pitches (there is a hint of mathematical relationship of tonalities here).

In performance, a raga is introduced by way of a handle/lever or 'pakad' constituted of the leading svaras, especially vadi, samvadi and anuvadi. The 'pakad' may be thought of as the core musico-acoustic signature of the raga. The nearest analogy of the 'pakad' to any entity within the western system of music is the dominant chord played out in arpeggio.

There are three possible ways in which one can visualize the relationship between the octave and the srutis:

a. Divide octave equally into 22 identical or roughly equal srutis;
b. Allow the srutis to remain unequal and unspecified in size, allowing the intervals to gravitate towards 'natural' intervals - those expressible in simple integral ratios: 3/2, 4/3, 9/8, 10/9 and so on, approximating the system of just intonation;
c. Come to terms with the prospect that the sruti intervals never achieve an exact size; that the srutis will be determined on the basis of oral instruction within a particular teacher-student line and will always remain rough approximations of the intervals mentioned.

The Indian system is closer, at least in concept, to just intonation than to the celebrated Pythagorean tuning, in which all the whole tones are of equal size: 9:8 = 204 cents.

Bharata's experiment around 2000 years ago with two vinas in which he demonstrated the existence of the twenty-two srutis is interpreted as argument for the system as conforming to just intonation. This is because the measure Bharata mentions - the so-called pramana-sruti, the standard measure of tuning - turns out to be the well-known syntonic comma (81:80 = 22 cents), the difference between the two whole tones of just intonation.

Musical experience in the Indian tradition has been summed up in the following passage: "*To put the entire question of tuning into perspective, it is useful to recall that musical experience in ancient India - music as heard, as taught in face to-face instruction, as learned, and as remembered - had accustomed practitioners to live in a world of subtle microtonal shadings which to them were more familiar, more tangible, and more real than anything they could hope to set down in the form of written knowledge. Modern Indian practice has evolved into a close approximation of twelve-tone equal temperament, from which seven svaras (or in certain cases, more or fewer) are ordained for each raga, but in which individual notes may be shaded up or down from this standard. Once learned and 'locked into place' at the beginning of a performance, each set of svaras becomes a collection of unique possibilities, and the difference between one scale step and another is understood, not as a calculated interval with an identity of its own, but as a matter of jumping or sliding from one fixed location to another*" (Rowell, 1990, 149).

Recent history of Indian classical music has witnessed a curious experience with attempt to introduce the idea of equal temperament through the harmonium. The harmonium features a hybrid between pure and tempered tuning. Working with Indian musicians in performance, Mark Levy has shown empirically that the intonation of the human voice is handled along similar lines: for each step in the scale there is a certain bandwidth within which the intonation of the voice still sounds correct. According to Levy's data the upper and lower limits of this bandwidth can be as much as 50 cent apart within one performance (see Abels, 2010, 124).

The combination of several notes woven into a composition in a way which is pleasing to the ear is called a raga. Each raga creates an atmosphere, which is associated with feelings and sentiments. A performer with sufficient training and knowledge alone can create the desired emotions. A raga is a subtle and aesthetic melodic form with its own peculiar ascending and descending movement consisting of either a full seven note octave, or a series of six or five notes (or a combination of any of these) in a rising or falling structure. It is the subtle difference in the order of notes, an omission of a dissonant note, an emphasis on a particular note, the slide from one note to another, and the use of microtones together with other subtleties that demarcate one raga from the other.

It may be useful at this stage to take a brief look at the thinking on music in other traditions. A certain degree of previous exposure has been seen as important to aesthetic reception and pleasure even in the western philosophical traditions. Hanslick (1957) saw the influence of aesthetic judgment as preceding feelings invoked by artistic expression. Meyer (1903) believed that repeated listening to a novel musical work tends to increase reported satisfaction. Lundin (1947) saw consonance and dissonance preferences as cultural in origin. In the cognitivist view, music evokes emotion only after passing through a cognitive/interpretative filter (Huron, 2016).

According to Huron, "*sometimes art is successful because it educates us, inspires us, challenges us, disturbs us, or even insults us. But if art never offered any element of pleasure, it would cease to play much role in human affairs*" (Huron, 2006, 367). Pleasure circuits in the brain were discovered accidentally half a century ago and more recently, peak musical experiences have been shown to produce dopamine release in brain regions implicated in many pleasure-related experiences (Salimpoor et al, 2011).

However, in order to achieve the microtonal aesthetics that the Indian musical system encourages, the practitioner would still need to be able to produce the twelve pitches in a manner that allows for the flexibility needed to negotiate the srutis, or inter-interval pitch (frequency) spaces. For a beginning, the schema to be presented here seeks to play the role of facilitator.

Vocal Tract Modeling

The sound emerging from the lips is the result of aerodynamic processes in the vocal tract. It is the result of vibrating column/s- and eddies - of air, and amenable to experience as such. The shaping of the sound in the vocal tract can be viewed from a geometric perspective. In modeling the acoustic modulation of speech, the vocal tract has been viewed as a concatenation of cylinders, of varying radii (Fant, 1970). The pharyngeal part has been viewed as cylinders piled one on top of another vertically. The remaining part of the vocal tract, through which air flows towards the lips, has been viewed as a series of horizontally telescoping cylinders. Air, thus, flows first along a vertical axis and then through a horizontal axis, along the space of the vocal tract with its modulating parts.

Another caveat is called for here. This geometry has to be viewed as virtual and as heuristic imagery to support a particular series of conformations of the vocal tract. In the same way as linguists seek to map the vocal tract through approximations to describe resultant speech sounds, an approximation is being sought to be made here, and to only model one vowel for a beginning. In fact, x ray views of the flows of air show up the complexity of modeling physical reality. So, the model is inspired more by linguistics than it is by physics.

In this assumed geometry that is conceptualized, the 'upper palate' and 'lower palate' introduced earlier share a common plane along their rims. The plane runs horizontally from the midline of the pharyngeal arch, just below the velum, to the midline just below the upper lip, both lines being central in an 'axiomatic' sense. During sustained vowel phonation, air travels from the glottis along this horizontal plane to and beyond the lips. It may be seen as approximating a columnar flow along a virtual straight line drawn between the midpoints of these two midlines. The straight line is at the intersection of the horizontal plane mentioned earlier and a vertical plane perpendicular to it, intersecting the upper and lower palates along a sagittal ridge, touching both virtual poles, upper and lower. Viewed from above, the planes divide the cavity into left and right halves and, viewed laterally, into upper and lower halves. The virtual straight line is chosen as x axis with its positive side oriented towards and beyond the lips.

Let us consider the production of the sustained vowel /ɑ/. In classical phonetics, it is produced by a tongue position that is lowered and pushed to the back. Of course, the same vowel has different actualizations in different languages, and as different speech

events in the same speaker at different times. This manner of movement of the tongue causes the pharyngeal space to shorten and the oral cavity to enlarge. The shortened pharyngeal cavity resonates to higher frequency harmonics in the source, generating a relatively high-frequency first formant, whereas the large oral cavity resonates to low-frequency harmonics in the source and thus generates a relatively low frequency second formant. The relationship between the two formants - and how an entire range of vowels may be produced by shifts in their relative positions (using movements of the mandible, lips and larynx) has been worked out in detail by Sundberg (2019). In his work on the acoustics of the vocal tract, Fant (1970) approximates the passage to a series of cylindrical tubes of differing radii. Assuming a particular conformation of muscles for the production of the vowel /a/ sustained over a period, arguably, one can ignore the larger system complexity. Author and associate are currently studying spectrograms of the sustained and sung vowel /a/ to identify, if any, invariant acoustic features of the vowel. The geometry being considered here is intuitive and meant to serve a heuristic, mnemonic device to aid pedagogy of the sung pitches in the Indian musical context.

The next step in building the geometry is the creation of a shared aural framework between singer/speaker and listener. The framework must help singer and listener judge levels of consonance of the produced pitches. A steadily maintained pitch held outside of the vocal tract - as in a drone or played on the harmonium or piano - would be a good reference source. There are three functions for the drone in melodic music such as the Indian system. The drone provides a rich tonal background against which the musician places the notes of the raga being played or sung. It also provides the base for accurate intonation of tones. With the drone as the background of tonality, the musician is able to perceive, psycho-acoustically, the relationship among isolated tones and the relationships of their relationships. Both acoustic and neuromuscular mechanisms are involved in this process. The drone, externally representing the tonic, functions as a rest note. It is the note from which any melody must start and finish. While any departure from it causes neuromuscular unrest, return to the tonic resolves the unrest (Deva, 2011, 49).

The role of the drone may be played by any instrument as such but typically it is the four-stringed tanpura. The tanpura is a fretless musical instrument that is played traditionally for accompaniment in Hindustani music. At one end it has a large gourd resonator and a long voluminous neck with four or five metal strings supported at the lower end by a meticulously curved bridge made of bone or ivory. The strings are plucked one after the other in slow cycles of several seconds generating a buzzing drone sound. In modern day construction, the first string of the tanpura is tuned to the perfect fifth or fourth, depending on which is the dominant pitch in the raga being sung. The second and third are tuned to the mid tonic Sa and the fourth, to Sa an octave lower. The fourth string has thicker gauge to produce a lower pitch. Male vocalists pitch their tonic note to about C#; female singers usually a fifth higher. The male instrument has an open string length of approximately one metre, the female is three-fourths of the male. The standard tuning is 5-8-8-1 (sol do' do' do) or, in Indian sargam, P-S-S-S$_*$ (S$_*$ is the tonic one octave lower). For ragas that omit the fifth, the first string is tuned down to the natural fourth: 4-8-8-1 or M-S-S- S$_*$. Both in its musical function and how it works, the tanpura is unique in many ways. It does not partake in the melodic part of the music but it supports and sustains the melody by providing a colourful and dynamic harmonic

resonance field based on one precise tone, the basic note or key-note, often referred to as mean-tone (Datta et al, 2017, 169).

Vocal Tract as Cavity Resonator

The idea of the schema was inspired by the possibility of imagining the vocal tract as topologically equivalent to a cavity resonator. In a cavity resonator, as in a laser, the light signal is amplified through multiple collisions - stimulated emissions - with the container wall. This insight will do for us. We need not go into details of light signal amplification.

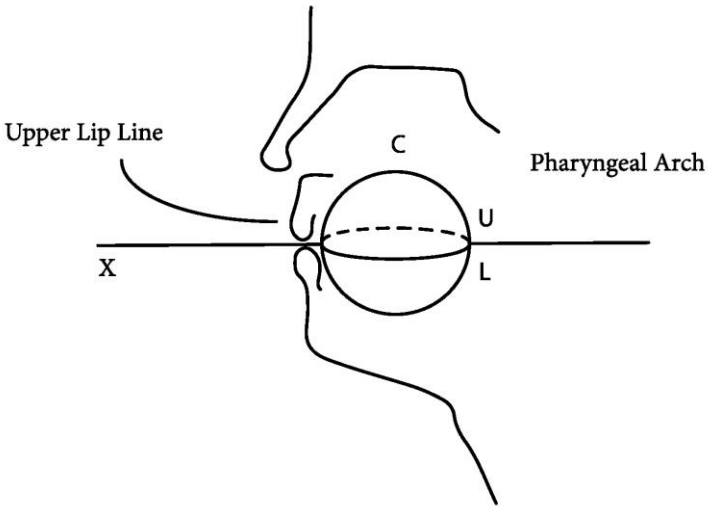

Figure 1. Vocal tract as cavity resonator

The vocal tract may be viewed as a cavity C. C is comprised of two hemispheres, upper hemisphere U and lower hemisphere L, interlocking at their rims and sharing the same plane. A horizontal straight line (x axis) marks two important midpoints on this plane, one at the back of the vocal tract, the other on the lip line of the upper lip.

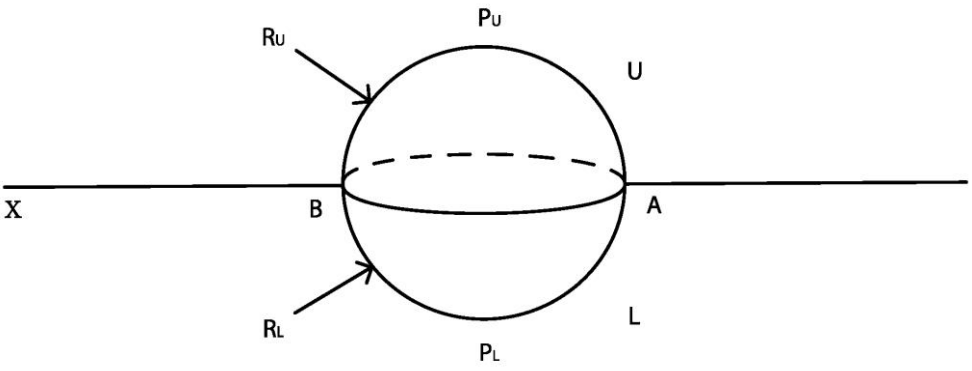

Figure 2. Proposed geometry

The x axis intersects the pharyngeal arch at its midpoint A and the lip line of the upper lip at its midpoint B. Two ridge lines, RU and RL run from A to B along the upper and the lower ridges - longitudes - of the respective hemispheres, as well as through the apices PU and PL.

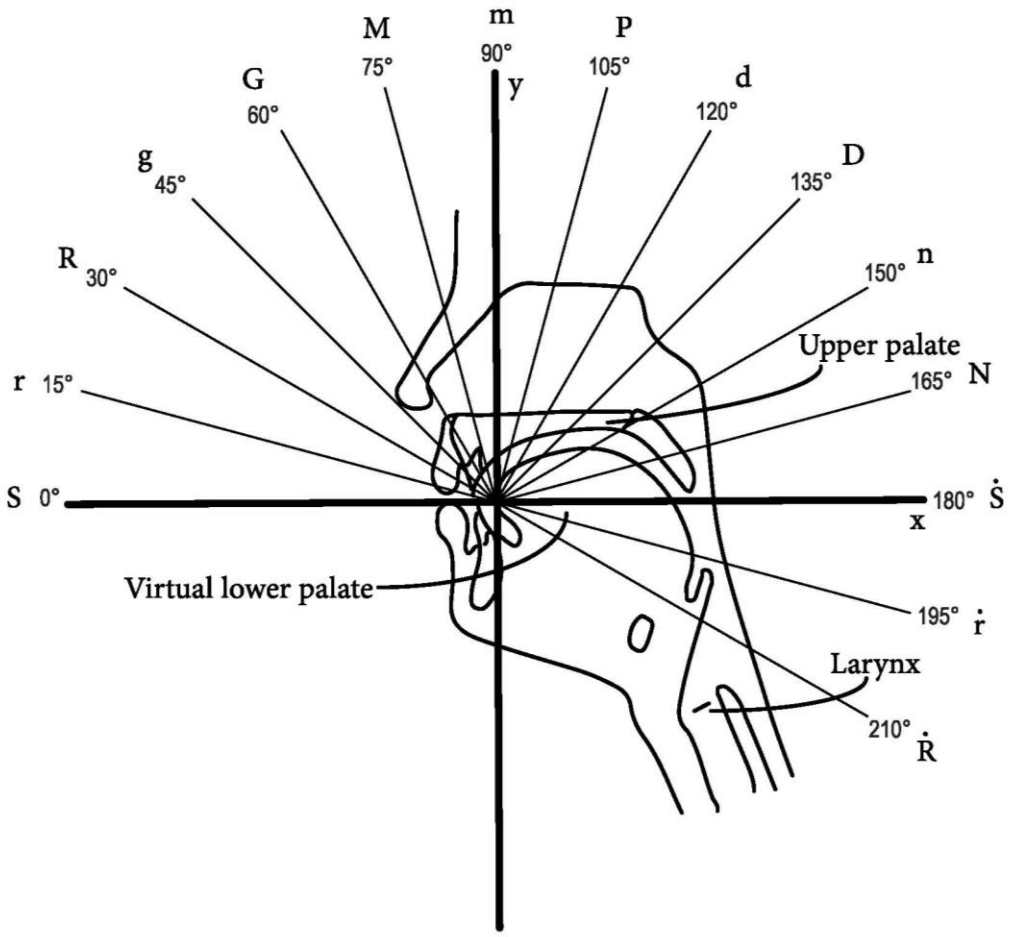

Figure 3: Notes by division

It is possible to produce the 12 musical pitches comprising an octave by aiming the post-pharyngeal, epiglottal air column - e.g. leading to the production of the sustained vowel /a/ - along points on a palatal geodesic that divides the vocal tract into arcs of 15 degrees each, starting with the horizontal axis as the reference note or tonic - S, and moving along the sagittal ridge, from zero degrees to 180 degrees, to attain the tonic in one octave higher - S*. The 12 musical pitches are, in the ascending order: S r R g G M m P d D n N S*.

In the author's practice, the outside reference pitch was produced by an electronic version of the Indian tanpura. The vowel /a/ is repeated several times to ensure that the tone produced is in unison with the drone. The air flow that is responsible for the production of the tone is experienced as moving 'smoothly' from the glottis to, through and beyond the vocal tract, and out into the open medium where the acoustic signal is carried as pressure waves. An optimal level of air flow is a rate that is held steady for at least ten seconds, the steadiness being more important than the duration. The reference

pitch is assumed to match the uttered vowel if the humming that is produced by stopping the air flow by a closure of the lips matches the drone pitch; if they are aligned, there is both an aural experience of the sonance/resonance and a subtle vibration palpated at the skin level. In the attainment of the open vowel /a/, the lips are parted and closed alternately to produce a humming tone and an /a/.

An electronic tanpura has a light emitting diode window displaying pitches according to the nomenclature used in the western system: A A# B C C# and so on. It has now become an ineluctable appendage to Indian classical musicians of both the Hindustani and the Karnataka styles of singing. The author chose C sharp as the reference pitch, the tonic. Teachers often use the alternating hum and the /a/ as part of warming up exercises. In the Indian musical context, singers do not use a score (except in the context of modern day film music where the orchestration is elaborate and one can clearly see the influence of western harmonic instrumentation).

In order to experience the production of the /Sa/, the canonical tonic with its fricative onset, author sought to keep the utterance of the fricative part /s/ as brief as was possible and quickly moved on to co-articulate the /ɑ/ vowel, the energy carrier. Previous to the use of the geometry of the schema, the singing of /Sa/ was gone through unreflectively. Awareness of the geometry allowed bringing the experience into conscious proprioception. This awareness is a critical transitional moment for pedagogy, from unreflective singing to reflective conscious singing. Of course, there are many questions that would need to be answered before one could definitely make a claim on behalf of the new vocal geometry-based singing. But the experience so far has been encouraging.

Once the /Sa/ is experienced, pitches that rise with respect to it - higher frequency pitches - are tested gradually, one step at a time, by bringing the vocal tract muscles to produce air flow at different angles. /Sa/ has been determined by us - experientially - as the result of air column striking the walls of the virtual cavity along the x axis, from the pharyngeal arch to the lips. Now by aiming the air column towards the pharyngeal end of the x axis we experience the production of pitch /Sa/ one octave higher (represented in Fig. 3 as S*). This is the tonic one octave higher; the air column now subtends an angle of 180 degrees with the x axis (see Fig. 3). This process seems abstract at the level of verbal description but empirical effort proves this to be accessible and much easier to comprehend. The term calibration may be used to ascribe and map tone values to angles at which air columns strike the oral cavity walls along the sagittal ridge, between angle zero - /Sa/-1 to angle 180 degrees - /Sa/-2 - of our geometry (S* of Fig. 3). This provides the framework for the production of pitches that lie in between. Although experienced subjectively, the production of pitches follows a set of images that is objectively given. A set of primitives or postulates will help us systematize the geometry to be meaningful. It is easily seen that the postulates are self-evident and collectively shared.

A Set of Postulates

1. The vocal tract - or mouth - may be viewed as enclosed space, a cavity (designated **C** in Figure 1). It is a cavity that resonates acoustically to vibrating air columns.

2. The space of the cavity can be viewed as being limited by boundaries. It is made up of an upper hemisphere (**U**) and a lower hemisphere (**L**), inverted over each other, interlocking at the rims and sharing a common plane (see Figure 1).
3. A horizontal straight line - x axis - may be drawn between a midpoint at the back of the vocal tract and a midpoint of the lip line of the upper lip. The midpoints comprise, one, the point at which the rim of the 'upper palate' meets the wall of the pharyngeal arch at its intersection with the x axis (**A**) and, two, the point constituting the midpoint of the lip line of the upper lip at the intersection with the x axis (**B**) (see Figure 2).
4. A ridge line, $\mathbf{R_U}$, runs from **A** to **B** forming one half of a sagittal longitude and passing through the pole, $\mathbf{P_U}$. A similar ridge line $\mathbf{R_L}$, runs from **A** to **B** in the lower half, complementing the longitude in the upper half, and passing through the pole, $\mathbf{P_L}$ (see Figure 2).
5. With the help of the appropriate muscular conformation and shaping of the vocal tract, the air column may be made to vibrate between diametrically opposite points in the two hemispheres along the sagittal ridges $\mathbf{R_U}$ and $\mathbf{R_L}$ striking the walls of the cavity **C** at diametrically opposite points. In the process, it is possible to produce S and S*, r and r*, R and R* (where the * refers to a note pitched one octave higher) in the corresponding hemisphere. This relationship is also seen to hold with respect to attainment of notes an octave lower; this involves minimally three subjective processes: perception of the pitch produced in comparison with the reference pitch, cognition of pitch identity between the two, and sensorimotor muscle articulation (see Figure 3).

These postulates will be the framework of ideas and images to build a schema for articulation of the musical notes in singing. It is a schema that has worked in practice and its pedagogical value has been established through trials with students.

The tongue plays a central role in navigating the air column. For purposes of the geometry building it is assumed to form the centre point of the air column. It is a virtual centre which the air column engages as fulcrum, as it shifts angle and negotiates points along the sagittal ridge of the 'palates' to produce different pitches.

Pitches are produced when air column is made to strike points on the walls of the oral cavity. In the geometry here conceptualized they strike points along the ridge - sagittal ridge - formed when a plane passing through the centre of the upper palate and the lower palate also intersects the straight line aligned with the x axis (see Figures 1 and 2). From previous discussion, we have the two /Sa/ pitches one octave apart, subtending zero and 180 degrees with the x axis. These have been designated as S and S*. In this geometry, the 12 pitches between these two ends of the octave will span the 180 degrees. Since we are dealing with a system that is tolerant of microtonal deviations, we are looking for a general region in which pitches occur so we are justified in dividing 180 by 12, to get a 15 degree difference in angle from pitch to pitch: as the air column rises, therefore, a change in pitch occurs every 15 degrees. In this manner are produced the 12 pitches, namely: /S/, /r/, /R/, /g/, /G/, /M/, /m/, /P/, /dh/, /Dh/, /n/, and /N/.

A note on pronunciation: the symbols represent pitches, each carrying a consonant head and vowel coda. So, /S/, /G/, /g/, /m/, /M/ and /P/ are to be pronounced with the vowel /a/ suffixed to them; /dh/ and/Dh/ are to be pronounced by stretching the vowel

/a/ just a little; /r/ and/R/ are pronounced with the vowel /e/ in suffix and /n/ and /N/ with the vowel /i/.The /S/ is led by the fricative /s/; the /R/ and /r/ are defined by the liquid /r/; /g/and /G/ are velar; /m/ and /M/ are nasal-bilabials; /P/ is a bilabial; /dh/ and /Dh/ are soft, voiced alveolar; and /n/and /N/ are nasal velar.

A note on symbolism: Where a letter carries a * or dot above its body, it is to be read as a pitch one octave higher; if it occurs below the body of the letter, it is to be read as a pitch in the lower octave. S, Sa and Sa-1 both refer to the same note; S* and Sa-2 refer to the tonic in the upper octave.

Although the octave of the Indian system is not laid out in the same way as the equal tempered octave of the western classical system, a rough and ready approximation, a one-to-one correspondence, might be set up between: C C# D D# E F F# G G# A A# and B, on the one hand, and /S/ /r/ /R/ /g/ /G/ /M/ /m/ /P /dh//Dh/ /n/ and /N/, on the other. There are significant differences between the two systems because of considerations historical and aesthetic-philosophical (see Huron, 1994).

It is possible to produce the 12 musical pitches comprising an octave by aiming the post-pharyngeal, epiglottal air column along points on a palatal map that divides the vocal tract into arcs of 15 degrees each, starting with the horizontal axis as the reference note or tonic and moving along the sagittal ridge, from zero degrees to 180 degrees (see Fig. 3).

Discussion and Conclusions

Is there a way to reconcile the phonetic chart and the geometry of the schema with respect to the 12 pitches?

Some phonologists see the production of consonant sounds as being initiated in one of three distinct zones of the roof of the vocal tract. The principal zones or places of origin are labial (lateral), coronal (or ventral) and dorsal (back of velar). A consonant is co-articulated with a vowel so that it derives from and moves toward another region. In the case of [g, k], for instance, the consonant is initiated in the dorsal (phonetically velar) zone, spreading thereafter to coronal or labial places (Wyn & Reimers, 2010).

Using this logic, and focusing on the second part of the sound - the vector of the vowel - we now seek to map the sounds of the 12 pitches. The sound value of /P/, a bilabial initiated by the parting of the lips, spreads on the vowel /ɑ/in a vertical direction. The same bilabial, nasalized and articulated more softly, yields /M/and /m/. These sounds are articulated upwards into the roof or coronal zone. /P/ starts at the inner line of the lips and /M/ from a point just a little inwards and closer to the upper dental ridge. Both pitches are sustained in the mid region of the vocal tract, spanning - as experienced in practice - an angle of 45 degrees in the upper dental-alveolar-palatal swath. /M/ is sounded at 75 degrees and /m/ is sounded at 90 degrees; /P/ is sounded at 105 degrees.

The positioning of /g/ and /G/ is not very straightforward. Phonetically born in the back of the velar, in a swath between 225 and 240 degrees, they are co-articulated with /ɑ/ to sound in the labial-dental region closer to the upper lip. The two pitches span, respectively, an arc between 45 and 60 degrees, making allowance for the lowering of the mandible which causes the angles to rise along the arc.

The nasalized consonants /N/ and /n/ are sounded in the velum and nasal resonating region. But as they are co-articulated with vowel /i/, which is produced along an arc roughly between 15 and 30 degrees, below the lower lip, respectively, they produce two pitches that are experienced as being lower than the tonic /Sa/.If these two columns are projected backwards into the velar region, we account for the production of upper pitches /n/ and /N/ at 150 and 165 degrees, respectively.

Radiographs of the vocal tract of a speaker saying [i] have shown that the tongue mass, fills most of the oral cavity, leaving a small volume of air to vibrate in the space anterior to the constriction formed by the tongue. The pharynx, in contrast, enlarges because the posterior part of the tongue has been raised, that is, lifted out of the pharyngeal space. The oral cavity is larger and the pharyngeal cavity smaller for the vowel /ɑ/ than for /i/ (Raphael et al, 2011).

The size of the oral cavity for /ɑ/ may be increased in two ways: lowering the tongue passively by lowering the jaw or actively by depressing the tongue. It is also possible to combine these two strategies. Active or passive lowering of the tongue for /ɑ/ provides the large oral cavity and small pharyngeal cavity volumes that characterize this vowel (Raphael et al, 2011).

The pitches /dh/ and/Dh/ need a somewhat convoluted justification. In the classical chart, they are born in the alveolar region. In practice, they resonate to coronal harmony. They are produced when air column strikes the upper palate at angles 120 and 135 degrees, respectively.

By extending the arc of the angle to beyond 180 degrees, it is possible to produce members of the pitch sets /r/, /R/ and so on in the higher octave. In the other direction, in the arc of angle moving down from the lips into the lower palate, pitch sets /N/, /n/ and so on are obtained in the register one octave lower.

In the vocal tract it is air that moves to produce the sound output. Air would need to move steadily to justify use of the cavity resonator analogy. We assume that it would remain steady if the muscles that shape the articulatory part of the vocal tract are held steady. Imagining the movement of air column with a fixed point in the middle, invoked the image of a see-saw plank that was free to move in a circle, carving out an upper half and a lower half. The idea of the upper palate and the lower palate being navigated by such a see-saw like air column was tempting. It is also fitted in with the image of an old-fashioned wall clock with its second and minute arrows fused along a diameter.

As a pedagogical tool to learn the pitches, the schema provided an imagery that was easy to relate to. Students recognized its usefulness in attaining the desired pitches, both canonically and in the context of particular ragas. The canonical form represents something close to the twelve notes of the equal tempered scale. And with respect to the srutis, the schema facilitates imagination of a continuum of pitches which can be executed through mappable conformations of muscles, repeatedly and consistently.

The schema is testable. It extends the classical phonetic chart. It also extends the observation with regard to the placement within the articulatory space of the vowels /i/ and /e/ (Zavadska & Davidova, 2017), as well as the observation that the lower part of the pharynx is important for classical singing (Mainka et al., 2015). It illustrates the idea of a relationship between imagery and actualization in utterance. It is likely to help

create long term muscle memory of the conformations needed for singing (see Pfordresher et al, 2015). It is available to the singer's proprioception within the vocal tract. It becomes part of the sensorimotor system such that imagery and translation are separated by the least temporal distance. It has implications for the shape and timbre of musical pitches. Familiarity with it offers a degree of control over the production of notes and the confidence that one will not go wrong. Its geometry envisages 12 seesaw-like diagonals crisscrossing the vocal tract. It is pitch invariant.

The aim of the training is to acquire internalized representations of the pitches to elaborate a raga or a set of ragas. A raga is like a language. And like language, one learns the basic vocabulary and the idioms before venturing narratives in it. This usually takes years of practice, partly because of the problems of enunciation, partly problems of cognition and partly imagination. The ability to perform raga elaboration is considered an attainment in melodic singing. The author sees value for the schema presented here as an aid to raga melodic practice and performance.

In summary, two quotations would serve as a suitable valediction:

- *"The marksman ends by thinking only of the exact position of the goal, the singer only of the perfect sound..."* (James, 1880, 774);
- The play of imagery and its actualization in performance is like *"... a duet between the music in your head and the music you are performing"* (Green & Gallwey, 1986, 75).

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THE TOPICALITIES IN THE CONTENT OF MASTERING PIANO PLAYING WITHIN THE CONTEXT OF AXIOLOGICAL APPROACH

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Abstract
Mastering piano playing is the development of learners' activity of plying the piano and involves performing music on it. An indispensable component of the process of learning music is the necessity to subjectify a composition – 'to revive' music, develop its imagery properties in the reality of learner's emotional experience during the performance. In the learning process, a teacher helps to do it.
Within the context of the axiological approach, mastering piano involves close interaction between three basic values: values of learner's personality; values of a pedagogical process in the interrelation between its subjects (a learner and a teacher); values of music as the object.
Research aim: by bringing into focus and analyzing the interrelations between and the needs of society and the process of mastering the piano, to improve the content of mastering the piano and educational content of music with the context of axiological approach.
In order to find out opinions of piano teachers, learners and their parents about the priorities at learning the piano, questionnaire surveys "Components of the Content of Learning the Piano" were carried out.
Comparing data of questionnaire surveys in 2010 and 2018 the results of the analysis of questionnaires allowed concluding that the respondents' needs have changed.
The content of learning is the experience of humanity specified for the learners' age-group, society and epoch, which is distributed between the subjects. The content of learning includes specific knowledge, skills and attitudes which learners acquire during the learning process. The content is incorporated into the curricula, which have to be acquired during the learning process.
Key words: *learner, mastering the piano playing, content of mastering the piano playing, public needs, axiological approach*

Introduction

The principal tasks of music pedagogy relate to sharing musical experience with the younger generation. The totality of musical experience is revealed in specific knowledge and competences promoting listening to, performing and creating music. In schools of

general education offering in-depth music studies, this knowledge and competences develop during the process of learning, which includes also piano playing. Within the context of the axiological approach, the content of mastering piano playing is to be implemented in the interaction between three basic values: values of learner's personality; values of a pedagogical process in the interaction between subjects – a learner and a teacher; values of music as the object. As all three basic values are changeable, changeable is also the content of mastering the piano, and its updating is constantly needed.

Research aim: by bringing into focus and analyzing the interrelations between and the needs of society and the process of mastering the piano, to improve the content of mastering the piano and educational content of music with the context of axiological approach.

Research subject: topicalities in the content of mastering the piano playing.

The research is based on the axiological approach by carrying out the assessment of theoretical findings for identifying research categories, as well as by interpreting the process and results of mastering the piano in connection with the opportunities to improve the content of learning.

Methods and Sample

The research presented in the article is a part of a larger scientific work about piano learning process in the context of axiological approach. This article is focused on the topicalities in the content of mastering piano playing. The author used the following research methods: a) analysis of philosophical, pedagogical, psychological and methodological literature; b) questionnaire survey of piano teachers, learners and their parents.

The aim of questionnaire survey was to find out opinions of piano teachers, learners and their parents about the priorities at learning the piano.

11 piano teachers of Riga Secondary School No 88 (offering an in-depth music learning curriculum), 238 learners and 238 their parents as well as 57 participants of the festival for the pianists of Latvia's schools of general education providing in-depth music learning participated in the questionnaire surveys *"Components of the Content of Learning the Piano"* in 2010 and 2018.

Principles of the Main Content of Mastering the Piano

Mastering the piano implies the development of learner's activity of piano playing and involves playing music on it. An indispensable component of the process of learning music is the necessity to subjectify a composition, i.e. to 'revive' music, develop its imagery properties in the reality of learner's emotional experience during the performance. During the learning process a teacher helps to do it.

In the learning process, music is the object which the learners as subjects of the process acquire by learning to perform it on the piano, assisted by a teacher. Within the context of axiological approach, mastering piano playing occurs during a close interaction between three basic values: a) values of learner's personality; b) values of a pedagogical

process in the interaction between the subjects – a learner and a teacher; c) values of music as the object.

As the values of a pedagogical process exist in the field of concrete public values, the interaction between the values during the process of mastering the piano can be schematically shown as follows (see Figure 1):

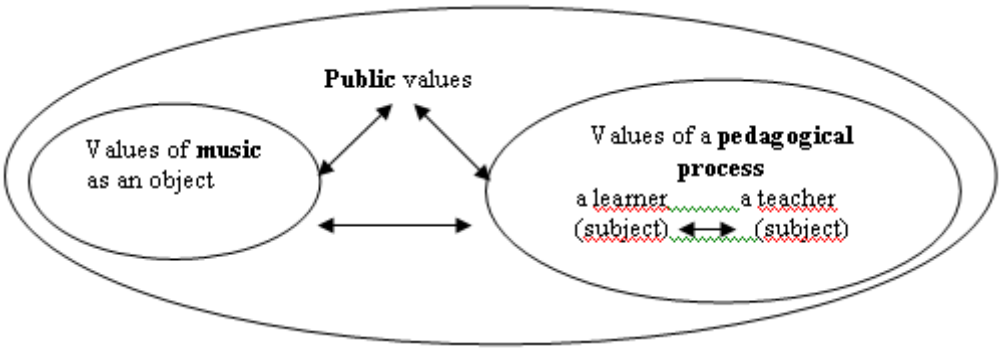

Figure 1. Interaction between values in the process of learning the piano

This figure schematically shows the vision the author has concerning the interaction between the values during the process of mastering the piano where the values of music as the object interact with values of a pedagogical process and public values (Maļkova, 2004). Values of a pedagogical process, which consist of the values of the relationship between subject – subject, interact with music and public values. During the process of this interaction, the musical repertoire to be learnt during the learning process is being created, and it becomes the content of mastering the piano within the context of axiological approach.

Within the context of axiological approach, the main content of mastering the piano is to be developed on the basis of such basic principles as:

- Value-oriented mastering of music during the process of learning the piano as a discovery of music values and their functioning in the process of art development;
- Realizing a value interaction between the studied object (music) and a collective subject under study (teacher, learner, society) during the process of learning the piano;
- Orientation towards the mutual dialogue between all the participants of this process;
- Studying the world of music and music pedagogy as a single organism linked by common problems;
- Studying and enrichment of the motivation sphere through studying values;
- Generating of new ideas, promoting opportunities for the development of music pedagogy.

The content of learning is the experience of humanity specified for learners' age group, society and epoch, which is distributed between the subjects. The content of learning includes specific knowledge and competences which the learners acquire during the learning process. The content is incorporated into curricula which are acquired during a learning process.

In music, one of the most complicated and significant arts, clarification of subject-object relationships or object's importance for the subject is especially encumbered if normative consciousness - external regulator - dominates and is oriented towards regulations, acquiring the status of law in a specific stage of time.

At analyzing the concepts *norm* and *canon,* the Russian scientist of music pedagogy and philosophy, Scherbakova (Щербакова, 2008) maintains that though during the centuries, music pedagogy, whose integral part is learning the piano, has accumulated extensive experience and much knowledge about music, it still remains normative and canon oriented. This circumstance is not regarded as a defect, since canon is the best thing that has been selected during the evolution; there are the values which in the process of the development of music have inherited the status of *norm.* Norm (as well as a tradition) has a protective function which regulates the interrelations by selecting laws. This is characteristic of both the development of society and that of the world of art (music including). Though norm has a prohibiting function, which creates limits for the allowed, however, unlimited freedom might also be sometimes dangerous, since it has the tendency to transform into arbitrariness and contribute to the tendencies of disintegration. But the normative approach still leads to a deadlock, since at some definite moment it comes in conflict with the development of values. Norm is an external regulator, equally obligatory for everybody; it is the end of the process, the result, while value is a process, development, changes. Norm is objective: the subject who accepts it cannot influence it. Value is the process developing subject – object or subject – subject relationships and interaction (Щербакова, 2008).

The whole history of music is illuminated by the dynamics of spiritual activity. Norms of music sometimes exist centuries long, but they never are everlasting. The strict polyphony transformed into esthetics of the epoch of baroque, the lucidity of classical art was replaced by the romantic flow of emotions. The end of the 20th century and the beginning of the 21st century are a new reality of music, where all the perceptions about the nature of music were broken: about a sound, sense of musical language, about the special role of musical hearing, musical intonation, timbres, about the synthesis of genres and styles, about the space and time of musical creativity.

The Russian musicologist Asafyev (Асафьев, 1923) states that the perception about music and also piano playing as a kind of art or type of artistic activity is traditional. However, music is not only a kind of art. It is studied in a broader scope: as a component of spiritual culture, as the world of a human. The focus is on communicative, social and other music functions. The research on psychological-pedagogical problems studies the power that transforms music, its spiritual-educational role. The Russian musicologist Holopova (Холопова, 1990) considers that the values of music are expressed in the functions of music: in communicative, esthetic, ethic, catharsis, heuristic, compensatory, hedonistic and pragmatic functions. The author divides these functions into two groups: functions that relate to acquiring music during the learning process, and functions that pertain to the perception of music. The first group incorporates: communicative, esthetic, ethic, heuristic and pragmatic functions. The second – catharsis, compensatory and hedonistic functions (Холопова, 1990). In the context of this study, e.g. the piano learning process, music functions included in the first group are considered important, since they are oriented towards the development and improvement of learner's personality.

The researcher of Latvian music pedagogy, Zariņš (2005) has distinguished three directions in which music as a kind of art and music acquisition as a learning process influences the development of a personality. They are:

- Direction of studying the world (with the help of musical images);
- Organizational-educational direction;
- Direction of developing ethical attitudes.

In their conclusions, music pedagogues and scientists (Reimer, 1989; Цыпин, 2003; Абдуллин, 2006; Zariņš, 2005) accentuate the priority of music pedagogy for the development and perfection of a value-oriented personality, for the re-evaluation of the problem of values.

At creating the philosophy of music education as an autonomous discipline whose subject is music education as a sociocultural phenomenon, American music philosopher Reimer (1989) admitted that the nature and values of music education, including mastering piano playing, are determined by the nature and values of music as art. The author established five criteria of music education theory, providing the theoretical basis for learning the piano:

- To be relevant to the society where one or another system of education functions;
- To be directly related to the needs of music pedagogy, its history and contemporary time;
- To take into consideration all leading aspects of music education, being at the same time concentrated;
- To have many impulses for music education, for mastering piano playing;
- To respect the nature of other arts also (Reimer, 1989).

The criteria established by Reimer have been used for evaluating the content of learning the piano and promoting its improvement.

Meaning of Playing the Piano

This paper looks at the problem of promoting pupils' learning as related to the condition that a learner is aware of the sense of his/her learning the piano. Therefore, to make the process of learning axiological, the analysis of the research problem requires studying the concept of *meaning*, which has been researched by many authors and defined as the content characterization of a personality. In science, the category *meaning* is to be studied either as a phenomenon of objective reality within the context of problems of meaning of life (Maslow, 1954; Франкл, 2000) or as a category of consciousness, e.g. subjective personal characterizations which reflect human's interaction with reality (Выготский, 1934; Рубинштейн, 1946; Weisskopf-Joelson, 1968; Леонтьев, 1975; Леонтьев, 2003).

In his work *"Meaning as an Integrative Factor"* Weisskopf-Joelson (1968) states that the characterizations of meaning have to be grouped into three sections:

- Meaning as the interaction between personal and social realities;
- Meaning as the interpretation or explanation of life;
- Meaning as the aim or task of a life period.

The first characterization is the broadest one and incorporates the second, which, in turn, includes the third, the narrowest characterization. The perception of meaning as a life task is elaborated in detail in the personality and psychotherapy theory developed by the Austrian psychologist Frankl (Франкл, 2000), who has divided it into three parts: teaching on the attitude to meaning, teaching on the meaning of life, and teaching on the freedom of will.

The Russian psychologist Leontyev (Леонтьев, 1975) considers that instability is one of the basic characterizations of meaning. The author maintains that the dynamics of meaning relates to the dynamics of the activity of subject. Meaning itself cannot link consciousness with the world around us; it is the activity that does it. The psychologist explores meaning in three aspects: structural, genetic and functional. The structural aspect involves the perception about the place of personal meaning within the structure of activity, consciousness and personality. The genetic aspect reveals the regularities of factors and determinants at creating meaning, which underlie the formation, development and transformations of meaning. According to Leontyev (Леонтьев, 1975), the functional aspect of studying meaning interprets perceptions about the place and role of meaning in the processes of activity and consciousness.

In his monograph *"Sense Psychology: Nature, Structure and Dynamics of Meaning"*, the Russian psychologist Leontyev assumes that personal values, needs and motives are sources for creating meaning (Леонтьев, 2003). The analysis of the concept *personal meaning* in literature within the context of studying values allows drawing such conclusions:

- Meaning can emerge in real relationships which link the subject with reality;
- The sources forming the meaning are personality's needs and motives;
- Meanings form and change during activity.

Meaning as a complex quality, which the learner obtains during the learning process, determines learner's personality. Leontyev (Леонтьев, 2003) thinks that the formation of the complex of personal meanings is the developmental process of learner's personality. The author considers that as much as a person would be able to self-realize, so much he would realize meaning.

On summarizing scientists' findings about the nature of meaning, we can draw a conclusion: since the complex of personal meanings constantly interacts in the basic spheres of personality's functioning (intellectual, emotional, and behavioral), we need to organize such a process of learning piano that would activate the development of learner's personal and social meanings and would promote self-realization by using the axiological potential of music education. During such a learning process, also develops learners' axiological, value-oriented activity oriented towards rational studying of values of music, piano playing, and oneself as a personality.

According to Leontyev (Леонтьев, 2003), the formation of a complex of personal meanings is the process of personality's development. Promoting of self-realization is important in this process.

One of the sources creating the meaning is a motive – personality's inner inclination to some kind of activity relating to satisfying specific needs. Actually, no activity is without a motive: an unmotivated activity is not the activity that lacks a motive, but rather the activity with a subjectively or objectively hidden motive (Леонтьев, 1975). Motives can be conscious (world outlook, interest, aspirations) and unconscious (inclination and attitude). One of the strongest motives – interest – manifests itself in personality's conscious tendency to direct attention, activity towards an emotionally attractive object, phenomenon or activity. Stable interests are always based on a positive emotional state which is provided by the process of satisfying the needs important for a human, as well as the achievements in human's activity. If human's, also a child's, activity does not lead to success, then negative emotions will hinder the development of stable interest in it. Leontyev (Леонтьев, 1975) notes that the emotional state that has developed as the

result of a definite emotional reaction, may later affect human's reaction on different phenomena of activity. Emotional reactions influence the intensity of human's behavior. Besides, human's behavior depends not only on the intensity of emotional experience, but also on the quality of personality's energy. Emotional reactions of a medium strength, whose influence on human's behavior is well controlled by his consciousness, usually are called emotions or emotional life. One form of this emotional life is feelings. The main feature of feelings is the direction of subject's activity in relation to the object of feelings.

In the process of personality's development, feelings enhance the formation of motives (music you or another person have taken liking to creates a wish to learn it; a well-done job creates a wish to continue it). Feelings are not absolute. Since stability is quite relative, because a personality is in a constant stage of development, then the instability of personality's development pertains first of all to feelings. There are two more properties of feelings: intensity and depth. Intensity or the strength of feelings manifests itself in the degree of stimulus or in the ability of feelings to activate the respective motives and direct the whole behavior. Exertion of feelings involves personality's ability to influence other feelings, needs, interests. The depth of feelings implies stability, strong links with all elements of personality's structure. Deep feelings as if overwhelm the whole motivation sphere, showing the personality's development.

At learning the piano playing, motivation for learning and music making is important. Motivation as a human's psychic inner condition, which entails activity directed towards the object, has its own causes which manifest themselves as needs. To some extent, motivation is a developmental form of needs.

Theories about psychology (Maslow, 1954; Ericson, 1963; Юнг, 1992; Rogers, 2004) that touch upon personality's activity admit that the primary source of activity is always a need. The term *need* denotes two interrelated phenomena:

- Need for definite conditions that provide for the life of a human as an individual and personality;
- Discomfort, instable state of human's psyche in different conditions (Maslow, 1954).

The next source of creating meaning is a need – the discrepancy between the present and a better state. As regards to the development of an educational program, we can say that a need is a discrepancy between awareness about the learner's present level of mastery in piano playing and that which could be desired after some definite time. Therefore, at developing the content of learning the piano, it is essential to find out what the parents would desire their children to learn and be able to do, on the one hand; on the other, it is very important that the parents would like things their children have learnt, and this would arouse their true interest, deep feelings concerning children's activities and achievements. Undeniably, all this should be subjected to and coordinated with the aims and methodology of learning the piano playing.

Ideal needs relate to being aware about the world around us and our place in it. Being of the same opinion as Reimer (2003) that the values of the content of music education are determined by the values of music as art, the author of this paper considers that a special attention is to be paid to such a value of the content of learning the piano as a learner's emotional activity and promotion of its development.

Musicologist Cipin (Цыпин, 2001) thinks that the practice for enhancing children's music esthetic development that exists in the sphere of music education is based on the

assumption that any musical activity is rooted in the emotional-content aspect. It is impossible to perceive, understand and perform music without emotions, which are its basic content.

Emotions (Latin *emovere* – to excite, to perturb) are states that involve assessing the importance of different factors that affect the individual. These states manifest themselves in situations when the individual just experiences satisfaction or dissatisfaction (Леонтьев, 2003). To perceive the world of human emotions and feelings, depicted in compositions of different epochs, not only a well-developed hearing and practical skills of playing the piano are needed, but also an emotionally developed subject who can perceive it is necessary.

Reimer (2003) states that perception is a psychic cognitive process which displays itself as a direct reflection of objects, phenomena and events of reality in our consciousness with the help of sight, hearing, tactile and other organs of senses in relation to a definite recognition and understanding of what is being reflected. At evaluating the emotional perception of music artistic image by learners, Reimer has underlined such parameters as:

- ***Impression*** – internal musical experience which is perceptible in learners' attention, and concentration during the act of listening to a musical composition;
- ***Expression*** – external manifestation of musical emotional experience perceptible in movements, in facial expression;
- ***Emotional dictionary*** – verbalization of emotional experience, a skill of creating emotional-imagery characterizations of music (Reimer, 2003).

To perceive the importance of the expressiveness of music language, to understand the emotional meaning of a music piece is possible only if the development of learners' *emotional responsiveness* to musical content is enhanced (Reimer, 2003), therefore the development of skills of being able to share musical-imagery emotional meaning is one of the basic values during the process of learning to play the piano.

The nature of emotional responsiveness was revealed in the content of basic theories on emotions. The problems of emotions were studied from different aspects. Ideas about the specific nature of emotional development, about the character of its personal value are expressed by authors of general and music psychology (Рубинштейн, 1946; Назайкинский, 1972; Vygotsky, 1978; Теплов, 1985; Леонтьев, 1991; Цыпин, 2001), by piano teachers, music pedagogy scientists (Алексеев, 1952; Bogdanova, 2003; Reimer, 2003; Sīle, 2003; Zariņš, 2005; Абдуллин, 2006), authors of theory and practice in art of music performing (Мартинсен, 1966; Нейгауз, 1982; Спигин, 2008). Theoretical conceptions about the emotional and communicative nature of music are given in works by musicologists (Медушевский, 1980; Холопова, 1991).

The psychological theory of emotions by Teplov (Теплов, 1985) is widely known. The author studies the emotional component as a leading structural element of musical abilities (musicality), which is topical in pedagogical practice as well. Teplov regards musicality as a synthetic expression of musical giftedness whose basic elements are:

- Emotional-esthetic attitude to reality;
- Imagery thinking;
- A complex of musical-auditory perceptions which includes different qualitative properties of musical hearing, mode and sense of rhythm (Теплов, 1985).

Learners' emotional responsiveness during the learning process is to be promoted by studying the content of music (as a value) and by strengthening the emotional-personal attitude in it. Reimer (1989), who has extensively written about the emotional perception of music, has developed basic principles of the development of emotional responsiveness when learning the piano:

- Artistic value;
- Creative activity;
- Constant interest support;
- Link with the life around us and with different kinds of art.

The structure of emotional responsiveness, being a learner's personal quality, incorporates such components as: artistic imagery, expressiveness of movements, verbal analytical aspect (Reimer, 1989).

Vygotsky (1978) admits that every emotion is attended by imagination which creates a number of fancy images. Outstanding pianists-pedagogues (Алексеев, 1952; Коган, 1968; Нейгауз, 1982) stress that the emotional expressiveness of the performance develops from several elements, which the authors study in unity:

- ***Emotionality*** – emergence of emotions, emotional experience and skill of performing it on the piano;
- ***Intellectuality*** – awareness about musical emotional experience, which is based on learners' personal experience, general development, knowledge of history and theory of music, on knowledge of composition, polyphony, harmony;
- ***Technical level of learners' piano skills*** which allows freely express emotions in playing the piano.

After summarizing scientists' findings, we can conclude that emotional activity as a value of the educational content of mastering piano playing incorporates emotional perception, emotional responsiveness, and emotional expressiveness, which must be taken also as the criteria of emotional activity (see Table 1). At first, a learner perceives music, then responds (or does not) to its content, and this promotes emotional expressiveness (Maļkova, 2012).

Table 1. Criteria and indicators of emotional activity

CRITERION	INDICATOR
1.Emotional perception (Reimer, 2003)	1.1. *impression* – internal emotional experience of music which is perceptible in attention, in learners' concentration during the act of listening to a musical composition; 1.2. *expression* – external expression of emotional experience of music, perceptible in movements, facial expression; 1.3. *emotional dictionary* – verbalization of emotional experience, skill of creating emotional imagery characterizations of music.
2.Emotional responsiveness (Reimer, 1989)	2.1. *artistic imagery;* 2.2. *expressiveness of movements;* 2.3. *verbal analytical aspect.*

CRITERION	INDICATOR
3.Emotional reproductive expressiveness (Коган, 1968)	3.1. *emotionality* – emotions, emotional experience and skill to perform it on the piano; 3.2. *intellectuality* – awareness about musical experience which is based on learners' personal experience, general development, knowledge of history and theory of music, on level of knowledge of composition, polyphony, harmony. 3.3. *level of learners' technical piano skills* which allows freely express emotions in piano playing.

During learning the piano, the emotional activity has to be promoted gradually, enriching learner's musical experience with values of music. In her work *"Music as a Kind of Art"* Holopova (Холопова, 1991) defines values of music expressed in its functions. Among others, communicative value of music, as well as esthetic, ethic heuristic and pragmatic values are mentioned as axiological accents of the content of learning the piano. Music, selected for children to learn, must be such that at playing it a child could learn to communicate with the listener. It is vital also that a composition should be demanded among the listeners. During the process of learning, a child learns the Beautiful and the Good as the esthetic and ethic functions of music. The heuristic value of music should be emphasized by all means, since it develops learner's creativity. In the contemporary time of innovations, the pragmatic function of music has become important, because during the process of promoting self-realization a learner acquires a skill of setting a specific aim (for what audience he/she will perform, where he/she will perform) as well as a skill of controlling the time for fulfilling the aim. This will greatly contribute to the development of future adult person's skill of acting purposefully, which is a much-needed quality under the contemporary conditions of world market. It is essential that music to be learnt would have been selected by the learner himself/herself and its content would evoke responsiveness.

Results

The results of questionnaire surveys of piano teachers (N=11), learners (N=238) and their parents (N=238) as well as participants of the festival for the pianists of Latvia's schools of general education providing in-depth music learning (N=57) about the priorities at learning the piano held in 2010 and 2018 see in Table 2.

The respondents are asked to arrange knowledge, skills and attitudes included in the content of a questionnaire in the succession according to their rating, where the most valuable statement is to be given a digit "1" and a relatively valuable statement – "10". In the context of the research, knowledge, skills and attitudes included in the qestionnaire are to be regarded as a piano learning value complex.

Table 2. Results of the questionnaire surveys "Components of the Content of Learning the Piano"

No	Components of the content of learning the piano	Learners', parents' value scale		Teachers' value scale	
		2010	*2018*	*2010*	*2018*
1	To be able to perform compositions of different style, but give priority to learning popular music and jazz compositions.	**1**	**5**	**4**	**1**
2	To play a melody by ear and find the accompaniment for it	**2**	**3**	**2**	**9**
3	To develop technical skills of piano playing for a further serious activity as a performing artist.	**9**	**9**	**7**	**10**
4	To freely sight-read compositions of different music style (classical, jazz, popular music), to develop an appropriate repertoire for "home music making" and be able to perform it qualitatively and adequate to composer's conception, to be able to independently enrich it.	**4**	**7**	**1**	**2**
5	To be able to perform compositions of different style, but give the priority to learning to play compositions of academic and traditionsl music.	**8**	**8**	**8**	**7**
6	To be able to improvise.	**3**	**4**	**3**	**3**
7	To be able to accompany solo performances.	**6**	**10**	**9**	**8**
8	To understand music of different style by analyzing expression means; to develop a good musical taste, to be able to speak about music and musicians.	**7**	**2**	**5**	**4**
9	To develop skills of piano playing (also a synthesizer) and experience positive emotions from it.	**5**	**1**	**10**	**5**
10	To develop emotional perception and imagery thinking.	**10**	**6**	**6**	**6**

The results of the analysis of questionnaires allowed concluding that the respondents' needs have changed: in 2010, learners would better learn to play the piano by performing popular or jazz compositions and would create a corresponding repertoire for home music making, while in 2018, the tendency is to develop skills to play by ear and to learn improvising. The analysis of teachers' answers, in turn, leads to the conclusion that the teachers' priorities somewhat 'lag behind' learners' needs: in 2010, the first place is taken by mastering the repertoire adequate for home music making, but in 2018, their priority coincides with the priority mentioned by learners in the previous survey, e.g. to play popular music and jazz compositions. From this we can infer that the content of mastering piano has to be improved by methodologies that promote playing by ear and skill of improvising.

Emphasizing the significance of any artistic creative activity for the development of personality, in his research *"On the Relations of Analytical Psychology with Poetic Creative Activity"* Jung (Юнг, 1992) termed the process of personality's development an 'individuation', i.e. personality's integration, the process of self-awareness through a creative activity. Jung interprets the individuation process as a gradual self-revealing during three stages:

- The first stage of individuation is revealing a person: on the one hand, we behave as others expect it from us, as they see us, but, on the other, we have our own 'ego';
- The second – getting acquainted with our 'shadow' (becoming aware of evil);
- The third – encounter with one's own female or male soul (Юнг, 1992).

However, only a person who is engaged in art (also in art of piano playing, to add to the said by Jung) is able to realize that in us there is something more than our own 'ego' as the center of consciousness, not only 'a person', 'a shadow', a female or male soul, but also that divine spark which is the nature of our personality (Юнг, 1992).

To give learners this marvelous opportunity of feeling the 'divine spark' in themselves through their learning the piano is a unique opportunity offered by teacher's work, as well as encouraging learners to continue or start mastering piano playing.

Conclusion

The problem of enrichment the content of learning the piano with specific music values is to be addressed not only from the position of historical significance, but also from the position of the needs of our learners and society for some definite values of music. The word *value* itself incorporates the idea about its present moment usefulness for a human. For a learner, valuable is everything that will be an important and viable capital in both his/her present and his/her future life.

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Manuscripts, ideally between 5000 and 8000 words (including abstract, diagrams, references and tables), should be sent as an attachment in original format or Word document format (DOC). Manuscript should be submitted in English and only for *Problems in Music Pedagogy* in accordance with the publication manual of the American Psychological Association (APA).

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For chapters in edited books

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