# A Theoretical Framework for Evaluating Musical Imagery

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音楽的イメージの評価システム（試案）――その理論的枠組み[1]

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**Abstract**

The aim of this paper is to construct a theoretical framework for an evaluating system of musical imagery. Starting from 'resonance' of our body with music, it is clarified how musical imagery functions and interacts with musical perception in expert musician's performances. Furthermore, the criteria for evaluating it in musical activities are indicated.

## Introduction

The aim of this study is to construct a theoretical framework for the functioning of musical imagery and to submit a tentative proposal for evaluating it.

Musical imagery has been one of the most examined issues in Music Pedagogy and Music Psychology in recent years. There are some reasons why the issue, which was not even an index entry in Music Psychology in the 1980s, has attracted attention. First, there was a boom in imagey studies, as well as the development of related research methods, in the field of psychology. Imagery had been seen as a black box for a long time, but its mechanism was identified, and this finding was applied to auditory and musical imagery (Reisberg, D., 1992, p. vii). Currently, new approaches combining quantitative and qualitative research are playing an especially important role in clarifying the relationship between musical imagery and performing strategies (Persson, R. S., 2001; Bailes, F., 2002 ; Arakawa, K. *et al.*, 2003).

Second, there has been a boom in interdisciplinary research dealing with musical imagery. As findings in various research areas have been shared and discussed at symposiums, they have been generalised, and problems in research methodology have been identified (Godøy, R. I. and Jøgensen, H., 2001).

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We cannot help but observe that the term *imagery* is now used frequently in practical research in music education. Of course, it is natural that educators have realised the importance of nurturing imagery, as their realization reflects the recent trend to respect the inner side of the individual child. However the meaning of the term *imagery* has yet to be defined clearly, and as discussions continue, the term retains a certain vagueness and ambiguity.

Building on earlier studies, I have worked to throw light upon the formative process of musical imagery in order to develop a system to evaluate it fairly for educational purposes (Sakata, 1993; Sakata, 1995; Yamashita, 2002a). In this paper, I summarise these findings, clarify their relationships, and construct a theoretical framework for musical imagery.

Section one describes the formative process of musical imagery, focusing on the resonance of our body with music. Section two makes clear how musical perception and musical imagery interact in musical activities, especially in musical performance. Section three presents viewpoints and concrete examples that must be considered in order to construct a system to evaluate musical imagery.

The system proposed in this paper is designed for use not only in music education classrooms but also private settings, especially private piano lessons. It is appropriate to include piano lessons, for they are usually designed not only to teach playing technique on a single musical instrument, but also to encourage basic musical development (Uszler, M., 1992, p.584; Tarchalski, H. S., 2003, p.273). Another consideration is that the number of Japanese children who start music lessons with the piano is far greater than the number of those who start with other instruments. Though both music lessons in classrooms and in private settings share the same aim of encouraging musical development, people working in the two areas have had, until now, hardly any interaction at all. I hope that the discussion here will facilitate their working more closely together.

## I. Resonance of our body with music: the formative process of musical Imagery

In western music, which is based on functional harmony, music is clearly distinguished from sound. What separates them is the existence of *movement*. According to E. Jaques-Dalcroze (1865-1950)'s definition, music consists of *sound* and *rhythm*. He says what dominates music is rhythm, changes in movement and energy, which we perceive through sound (Jaques-Dalcroze, E., 1965, p.37).

Movement shapes a *unit* which cannot be segmentalised. When the unit has vibration and periodicity, we refer to it as *rhythm*. We call what is organised by modification of pitch a *melody*, and what is formed by overlapping, a *harmony*. These elements are combined with each other, and they leave some *form* in our minds.

At the same time, sound and movement evoke some sort of 'feelings' inside us. The factors that evoke them have some configurationality (Sakata, 1999). At first, our ears recognize *timbre*. Timbre consists of textures and their duration. For example, from the phrase 'velvet-voice,' we imagine a deep and smooth voice. When someone says 'His voice is sweet,' we are able to imagine a soft, tantalizing voice. These adjectives describing timbre belong not to auditory sense but

to tactile and gustatory senses. Therefore, it is definite that feelings evoked by timbre are based on a sort of common sense that acts beyond the modality of five senses.

A sense of distance is also one of the feelings that music evokes inside us (Clarke, E., 2000). For example, such musical pieces as 〈The Turkish March〉 by L. v. Beethoven (1770-1827) and 〈American Patrol〉 by F. Meacham (1856-1909?) start with a very soft tone, increase their tonal volume gradually, remain *forte* for a while, and, then, become softer gradually. This alteration gives us an image of a military band coming from a long distance and passing by. Though actual distance does not change, we feel as if the distance between ourselves and the music is changing (Yamashita, 2003).

Furthermore, these feelings evoke something extramusical inside us. For instance, in 〈The Swan〉 in «Carnival of the Animals» by C. C. Saint-Saens (1835-1921), the flowing melody of cello and undulating accompaniment of piano conjure up images of swans and waves, respectively. Examples of the relationship between music and the extramusical are too numerous to enumerate; music evokes images of not only real objects but also words and paintings.

Considering all this, we can understand that musical cognition has two aspects: 'appreciating forms' and 'appreciating feelings'. Although they are essentially two sides of the same coin, we actually prioritise one or the other when listening to music. Wolpert, R. (1990) reports interesting experiment results. She divided subjects into two groups, musicians and non-musicians. She had them listen to three musical fragments, A, B, and C. Fragments A and B had the same melody line and fragments A and C were played with the same instrument. There were no other commonalities. When she asked the two groups which they thought resembled A, B or C. There was a significant tendency for the musicians to choose B and the non-musicians to choose C. The result indicates that people who have learnt music professionally tend to pay more attention to musical form, and non-musicians, musical feeling.

Additionally, there are some reports that professional musical performers are apt to deny anything extra-musical evoked by music. According to R. S. Persson (2001), for example, one of the performers whom she had interviewed said, "Music describes nothing but itself" (Persson, R. S., 2001, p.281).

How can we explain the relationship between the 'form' and the 'feelings' of music? A clue can be found in the resonance of our body with music. When we try to understand a thing, a vibration occurs in inside us and a search begins. When resonance with an affordance (information in the thing) occurs, perception comes into existence (Sasaki, 1994).

It is widely known that resonance and exploratory behaviour are observed frequently among young children. In daily life, it is not at all uncommon to see children who are listening to music begin to move spontaneously, dance, and hum. Another feature of resonance in early childhood is the relationship between utterances and gestures (Yamashita, 2002b). In both the above cases, observable resonances in children gradually lessen as they grow older and develop.

When the resonance of our body with music has been fully experienced and built up, musical imagery is formed. This is why musical imagery is of a metaphorical nature (Sakata, 1995).

When we listen to stimulating music for a long period of time, fragments of its rhythm or

melody sometimes ring in our ears. Such aftereffects, however, are not considered a part of musical imagery. According to M. J. Intons-Peterson (1992)'s definition of auditory imagery, musical imagery is the 'duration of musical experience without musical stimuli or their aftereffect,' and it differs vastly from memory in the sense that imagery can be reconstructed and created afresh consciously and actively. In the following section, I will examine the functioning of musical imagery in association with perception.

## Ⅱ. The functioning of musical imagery and musical perception

Inside dedicated musical performance experts, perception and imagery interact with each other in a complicated manner. In this section, I will focus on 'performance,' which plays a central part both in music classes and piano lessons, and examine in detail the relationship between perception and imagery. I will take Etude op.10-12 by F. Chopin (1810-1849) as a concrete example. It appears in music textbooks for junior high school students.

Figure 1 shows the beginning of the etude usually referred to as 〈Revolution〉. Two different movements are derived from the first half-note chord (G7=the dominant seventh chord in C

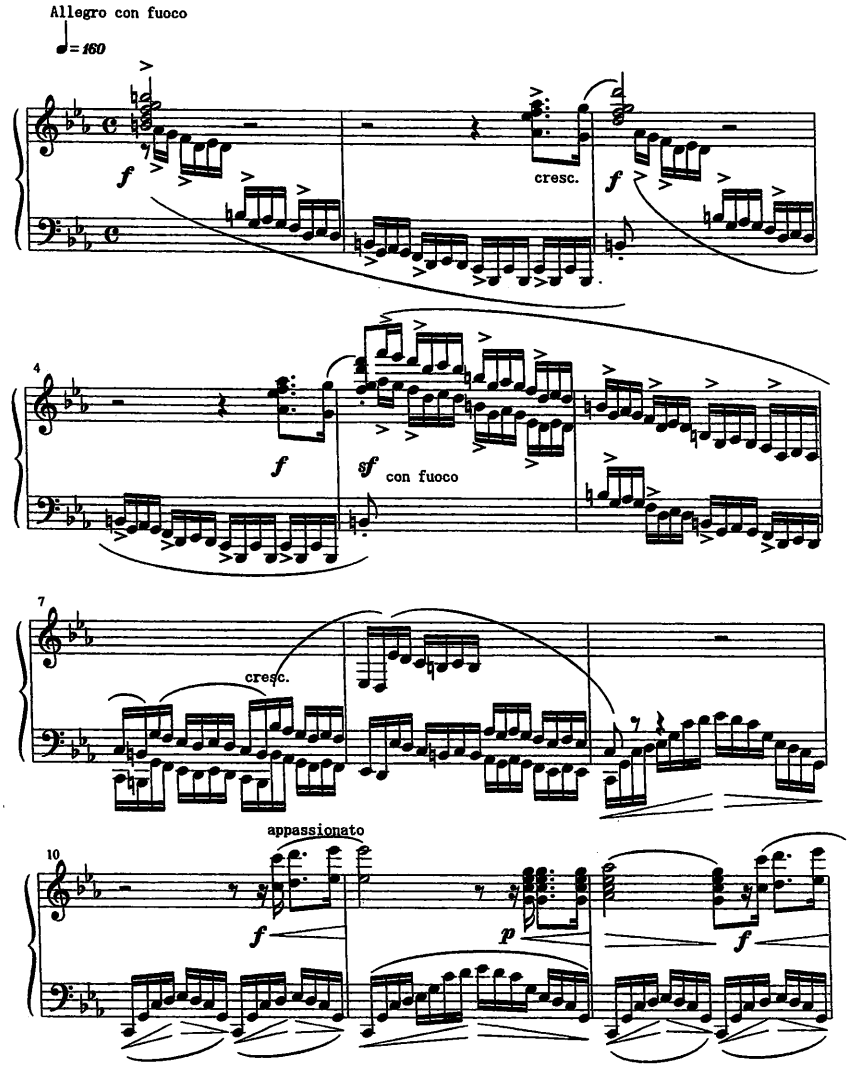


**Figure 1 F. Chopin: Etude op.10-12, bars 1-12.**

minor): one is a right-hand movement ascending in increments of tierce by two bars, and the other is a left-hand movement of sixteenth notes that tumble down as if they were weaving together the constituent notes. Though these waves continue to move separately until the fourth bar, they join together at the fifth bar and shape a big unified wave. The dominant chord continues for eight bars and is finally resolved into a tonic chord at the ninth bar. The sharp turns within the same chord arouse storm-like intensity and anger-like excitement.

Before performing this part, pianists imagine the time, space, and energy needed for the preliminary movements required for playing the beginning chord. In the light of the mark *forte* and *crescendo* for the following eight bars, they set their body in such a manner that they will be able to endure the release of considerable energy.

At the moment that the G7 chord is played, they keep in mind the chords to come in the third and fifth bars and imagine a big-boned line formed by the three chords. On top of that, they have to imagine the sounds made by the left-hand every two bars. While they accent the left-hand sixteenth notes that run between the middle and lower ranges, they also need to think of overall balance, for large scale waves and the sense of unity will disappear if they over-emphasise the accentuated notes.

When playing the chord of the fifth bar, they think of the *unison's* wave that lasts until the eighth bar. The passage that has run down from the high range to the low range protuberates three times and is resolved into the tonic, C. Before they actually play the chord, they need to allocate energy appropriately to suit the whole movement.

When a new phrase starts in the ninth bar, they have to think forward to the right-hand chord from the tenth bar, its dotted notes to be played fragmentarily to develop the theme. They have to think through that it is all to be played with *crescendo*, that the phrasing dynamics change drastically, and that these phrases continue until the eighteenth bar. They also need to relate the right-hand theme to the opening chord.

As the music flows, the performer perceives the actual sound produced and can judge whether or not the movement they have imagined has been realised. The movement consists of manifold parameters, e.g. modifications of sound and its texture, changes in *agogics* and *dynamics,* and the like. If something unexpected occurs at any point, fine adjustments are repeatedly made to avoid damaging the inevitable outcome of the movement.

It is generally said that musical performers are influenced by traditional values and conventions and that once their imagery for some musical piece is determined, they almost never change it (Persson, R. S., 2001). And yet, in reality, a feeling of improvisation is created in each performance, as if the music were pouring out from inside them (Brelet, G., 1951, p.447).

Based on these analyses and considerations, two important features emerge concerning the generation of musical imagery in experts' performances: one is that imagery precedes perception, and the other is that an image constitutes a complete entity that cannot be separated into parts.

E. Willems (1976, p.85) *et al.* have pointed out the former, musical imagery preceding perception, in performances by excellent musicians. This functioning of imagery is referred to as 'inner ear,' 'mind's ear,' or 'audiation,' and it is emphasised in music education, especially

in *solfège.*

Imagery preceding perception also occurs in the appreciation of artistic works, as mentioned by L. B. Meyer (1956). According to Meyer, emotions in musical appreciation arise from the satisfaction or dissatisfaction derived from conformities or nonconformities between the listener's anticipation of sounds and the actual sounds produced. This listening attitude, in which imagery precedes perception, is completely different from the attitude in listening to BGM or easy listening music. Aesthetic significance cannot come about without this internal imagery-production function; there arises similar imagery in aesthetic experiences, whether in creating them or appreciating them. Given this, I conclude that performance can be the most pleasurable aspect of music appreciation.

Highly developed abilities are required to weave imagery into large unities. When frequent recurrence of resonance in early childhood is internalised with age, conceptual knowledge and analytic understanding develop notably, replacing real body motion. Also, when people work on difficult tasks that require complicated motions of arms and fingers, their motorial imagery disturbs the evocation of musical imagery (Sakata, 1993). This developmental change into a grown-up leads to a weakening of uplifting feelings during performance.

Because each musical work has its own generative process, performers need to fully understand it in advance (Clarke, E., 1988, p.3). Once it is internalised through musical analysis and interpretation, then they should remove it from consciousness. After that, musical imagery can function.

Thus, the following three conditions are necessary for musical imagery to function well in musical activities:

1. It should be based on internalised resonance.
2. It should function independently from perceptions or motorial images of operating instruments.
3. Its unity should be in accordance with the generative structures.

Musical learning cannot be deepened without the development of such musical imagery. I will examine some concrete methods to evaluate musical imagery in the following section.

## Ⅲ. Developing a system to evaluate musical imagery

(1) Performance with the use of silence

It is well-known that 'silent singing' is one of the most important tasks for developing inner ear in Jaques-Dalcroze Eurhythmics and the Kodály method. In applying this method, it may be effective to make learners play inwardly for a few bars in the middle of playing some piece and then continue playing the piano. By so doing, we will be able to see how much resonance with the music has been internalised by assessing whether the duration of the silence is accurate or not.

Another method is to have learners sing a part instead of playing it. This enables them to stop the automatic emergence of motorial imagery necessary for playing the instrument. These two methods will be useful in evaluating how independently musical imagery functions, because

both activities require a relationship between perception and imagery.

(2) Body percussion and voice percussion

Body percussion, which C. Orff incorporates into his method, is an excellent learning method, as it allows us to experience both tapping the body and the body being tapped simultaneously. It is also an effective tool for understanding how learners structuralise the pieces and what kind of movement they tend to imagine. It is also possible to obtain a contact point between body expression and voice expression, by adding voice percussion to this. The voice will play polyphonies with the movements and sounds of the body.

When learners transform some piece into body percussion and/or voice percussion, we can evaluate whether they understand its generative structure, whether they have chosen the sound based on musical knowledge, and whether the stored energy, preparative movement, and the sound and/or voice are harmonised.

(3) Improvisation

In order to accomplish improvisation without any delay, we must continue to anticipate in unified phrasal increments the music that we are going to play. Thus, improvisation is very suitable for evaluating the functioning of musical imagery. Tasks can be analysed from the viewpoints of 1) deepening comprehension of music theory and musical style, 2) acquiring the performing skills, and 3) facilitating metaphorical projection (Sakata, 2000). In every case, it is necessary to set a clear goal and give a simple task.

We should set appropriate criteria for evaluating the activities: whether it is played fluently and smoothly and whether specific nuances are drawn out, for example.

(4) Titling

R. S. Persson (2001) have had several pianists practice some unknown piece (R.Gliere: Prelude, op.31-1), and guess its title after they have mastered it. They gave it a title from the aspects of mood, semblance, idiom, and structure.

In my own investigation, I had university student learners listen to musical pieces and guess their titles. Although they mostly titled them from the same aspects as Persson's subjects, some of them titled them based on a general image accompanying classical music (ex. breakfast at a hotel). In such cases, what is behind the titles is just a kind of superficial association of ideas without the functioning of musical imagery.

The activities of titling musical pieces may be an effective way to understand how learners listen to (or hear) music when forming musical imagery.

## Ⅳ. Summary and issues for future consideration

This paper clarifies the concept of musical imagery and suggests some viewpoints and methods for evaluating its functioning. In developing my ideas, I have presented concrete examples as much as possible based on the latest theories.

The first section explains musical 'form' and 'feeling' and how musical imagery germinates

from 'the resonance of our body with music'. The second section analyses how musical imagery interacts with perception in expert musicians' performances and points out three necessary conditions for realising it: internalised resonance, independence from perception or motorial imagery, and its unity according with the generative structure of music. The third section presents activities for evaluating musical imagery: 1) the use of silence, 2) body percussion and voice percussion, 3) improvisation, and 4) naming musical pieces.

These tentatively proposed activities need to be field tested for validity, problems in using them need to be identified and corrected, and finally the activities need to be systematised. To this end, cooperation among those doing research in musical education classes and piano lessons is essential.

I believe that musical imagery plays an important role not only in performing music but also in appreciation and creative activities in general. As I continue to work with active young people, I will make an effort to collect a wide variety of practical examples of musical imagery and to organize a program for musical imagery development.

**References**

**Arakawa Keiko, Doi Tomoko and Ohta Kimiko** (2003). "Piano Ensou-Hyougen ni okeru Hyoujougo eno Strategy ni kansuru Ichikousatsu: Piano Ensou-Shidouhou no Kanousei wo Motomete (A Study of Pianists' Strategy for Expression Words in Piano Performance: in Search of the Possibility of Teaching Method of Piano Performance)." *Kyouiku-Gakka Kiyou (Bulletin of the Department of Education).* No.43, Kyoto Women's University, pp.101-115.

**Bailes, Freya Ann** (2002). *Musical Imagery: Hearing and Imaging Music.* Doctoral Dissertation at the University of Sheffield.

**Brelet, Gisèle** (1951). *L'interprétation créatrice.* Presses Universitaires de France.

**Clarke, Eric F.** (1988). "Generative Principles in Music Performance." *Generative Processes in Music.* Edited by John Sloboda, Clarendon Press, pp.1-26.

_____ (2000). "Meaning and the Specification of Motion in Music." *6th ICMPC Proceedings Paper.*

(Edited by) **Godøy, R. I. and Jøgensen, H.** (2001). *Musical Imagery.* Sewts and Zeitlinger.

**Intons-Peterson, M. J.** (1992). "Components of Auditory Imagery." *Auditory Imagery.* Edited by D. Reisberg, Lawrence Erlbaum Association, pp.45-71.

**Jaques-Dalcroze, E.** (1965). *Le rythme, la musique et l'éducation* (Nouvelle Edition). Fœtisch Frères S. A. Editeurs.

**Meyer, Leonard B.** (1956). *Emotion and Meaning in Music.* University of Chicago Press.

**Persson, Roland S.** (2001). "The Subjective World of the Performer." *Music and Emotion: Theory and Research* (Series in Affective Science). Edited by P. N. Juslin and John A. Sloboda, Oxford University Press, pp.275-290.

(Edited by) **Reisberg, D.** (1992). "Preface." *Auditory Imagery.* Lawrence Erlbaum Associates, pp.vii-ix.

**Sakata Kaoruko** (1993). "Naiteki-Choukan no Honshitsu to Sono Keisei-Katei: Ensou-Koui ni okeru Shinteki-Sayou no Kousatsu wo Toushite (The Nature and its Formative Processes of the

'Inner Ear:' Based on an Analysis of Mental Prosess in Musical Performances)." *Ongaku-Kyouiku Kenkyuu (Bulletin of JASME).* No.23-2, *Japanese Academic Society for Music Education.* pp.4-13.

_____ (1995). "Metaphor to-shiteno Miburi to-wa Nani ka: J-Dalcroze no Shintai-Ron wo Bunseki shite (What is the Gesture as a Metaphor?: Based on an Analysis of Jaques-Dalcroze's Essaies on Body)." *Dalcroze Ongaku-Kyouiku Kenkyuu (The Japanese Journal of Dalcroze-Eurhythmics and Music Education).* No.20, pp.1-10.

_____ (1999). "Classic Ongaku ni okeru Choushu no Ghijutsu: Ensou-Katsudou to Kanshou-Katsudou wo Sasaeru Kiso-nouryoku no Ikusei wo Megutte (The Skills for Listening to Classical Music: For Formation of Basic Skills as a Foundation for Musical Performance and Appriciation)". *Ongaku-Kyouiku no Kenkyuu: Riron to Jissen no Touitsu wo Mezashite (The Research on Music Education: For the Integration of Theories and Practices).* Ongaku no Tomo Sha, pp.177-185.

_____ (2000). "Piano-Shidou ni okeru Sokkyou-Ensou no Ighi: Naiteki-Choukan no Ikusei ni Mukete (The Significance of Improvisation in Piano Lessons: For Development of the Inner Ear)." *Shizuoka-Daigaku Kyouiku-Gakubu Kenkyuu-Houkoku [Kyouka Kyouikugaku Hen] (Bulletin of the Faculty of Education Shizuoka University [Educational Researcg Series] ).* No.31, pp.71-79.

**Sasaki Masato** (1994). *Affordance: Atarashii Ninchi no Riron (Affordance: A New Cognitive Theory)* [Iwanami Library of Science 12].

**Tarchalski, Helen Smith** (2003). "Pedagogy." *The Piano: an Encyclopedia* (Encyclopedia of Keyboard Instruments), Second Edition. Edited by Robert Palmieri, Routledge, pp.269-276.

**Uszler, Marienne** (1992). "Research on the Teaching of Keyboard Music." *Handbook of Research on Music Teaching and Learning.* MENC, pp.584-593.

**Willems, Edgar** (1976) *L'oreille musicale, Tome II: La culture anditive les intervalles et les accords.* Edition Pro Musica.

**Wolpert, Rita S.** (1990). "Recognition of Melody, Harmonic Accompaniment, and Instrumentation: Musicians VS Nonmusicians." *Music Perception,* 8, pp.95-105.

**Yamashita Kaoruko** (2002a). "Ongaku no Grade-ka wa Kanou ka: 'ABRSM' Ongaku-Kentei no Bunseki ni Motozuite (Is it Possible to Grade the Skills for Listening to Music?: Based on an Analysis of ABRSM's Music Examinations)." *Shizuoka-Daigaku Kyouiku-Gakubu Kenkyuu-Houkoku [Kyouka Kyouikugaku Hen] (Bulletin of the Faculty of Education Shizuoka University [Educational Research Series]).* No.33, pp.87-98.

_____ (2002b). "Youji no Hatsuwa to Miburi no Kyoushin-Kankei wa Hattatsuteki ni Henka Suru ka (How does the Resonance Relationship of Utterances and Gestures in Infancy Change Developmentally)?" (Roundtable 12. Young children and Music) Kurashiki Seminar Houkoku-Sho *(Reports of the Seminar in Kurashiki).* Japan Academic Society for Music Educaion, pp.72-73.

_____ (2003). "Ritomikku wa Ongaku no Chikaku wo Donoyou ni Kaerunoka: Ecological Approach ni yoru Saikou (How does Dalcroze-Eurhythmics Changes the Musical Perception?:

A Reconsideration Based on the Ecological Approach)." *Ritomikku Kenkyuu no Ima (Present Researches on Eurhythmics)*. Kaisei Shuppan, pp.107-117.