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## Analysis on college music majors emotional expression in the perspective of lens model

Weixian Chen

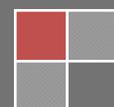
Hanshan Normal University, Guangdong, Chaozhou, 521041, (CHINA)

### ABSTRACT

This essay analyzes the lens model and lens model equation in musical communication, and makes a comprehensive analysis on its meaning for college music teaching. In the course of playing, we can find out how the player make use of various or excess of clues to express his/her feelings by the analysis of lens model. In the meantime, we also can discover how audiences interpret player's feeling based on these clues. In this equation, the linear regression can be used to connect the player and his/her audiences. Based on the lens model, mathematical model will also be used to improve the expression in the musical play. CFB is a kind of play feedback for the player when the play ends, and this clue will be compared with the clues used by viewers to maintain consistency between these two clues.

### KEYWORDS

Lens model; Lens model equation; Cognitive feedback.



## INTRODUCTION

In terms of music, experts home and abroad have done many deep researches, which shows that in the actual playing, player's performance is different from the music score. In some degree, this kind of deviation is called as "player's expression". In the actual condition of playing, musical performance is related with tone, sound velocity and timbre, which will change in some degree. It will help us to distinguish this play and that play<sup>[1]</sup>. As for the same piece of music, different players will have different performances, which are at random. For example, a player can repeat the microstructure of speed<sup>[2]</sup> therefore, how to explain the function of these changes in performance is the prior factor in the course of playing. As for the function of these changes in performance, there will be many factors. First, audiences may have a good knowledge of the music score. However, according to experts, changes in performance may help the emotional changes in the course of playing. Famous music psychologists C.Seashore points out that changes in the course of playing offers a sense of beauty and they are the medium for emotion communication. But he does not find a reasonable explanation for this situation. Therefore, he rarely mentioned relevant theories in his works. Early researches on music emotion expression still have a lot of problems, and some experts just simply analyzes the music itself, but ignores the effects of performance on expression in the course of playing. At the same time, researches on performance focus on the play structures, not emotional effects. It allows experts to give reasonable explanation on how different aspects of music impact musical emotions, but cannot explain different performance effects' on audiences. The same piece of music can be palyed in different ways, and leave deep impressions on audiences. Therefore, how to express the true emotion in the course of playing is the second problem to deal with.

## THE LENS MODEL

### Brunswik's lens model

In 1939, E. Brunswik proposed the "organism-environment" model to analyze the function of perception. This model has been improved in 1952, and was renamed as Lens Model<sup>[10,11]</sup>. Brunswik analyzes the uncertainty of preceptors' inner world, and regards the perception as a variable distal proximal cue to allow them to retain the indirect process. However, as for clues in this environment type, its reliability is low. Because there is a probabilistic relationship between them and remote variables. In order to make perception adjust the environment better, preceptors should balance these clues and transform useless clues into useful ones. Therefore, perception can be considered as a non-deterministic transmission mechanism. Its main purpose is to ensure correctness by reducing the accuracy rate. Based on Brunswik's theory, psychologists conducted a comprehensive analysis of remote variable degree to an organism, and made out a strategy for organism to complete the task. Bruswik followed the principle of Isomorphism in his research. The Brunswik's organism-environment lens model is shown as Figure 1.

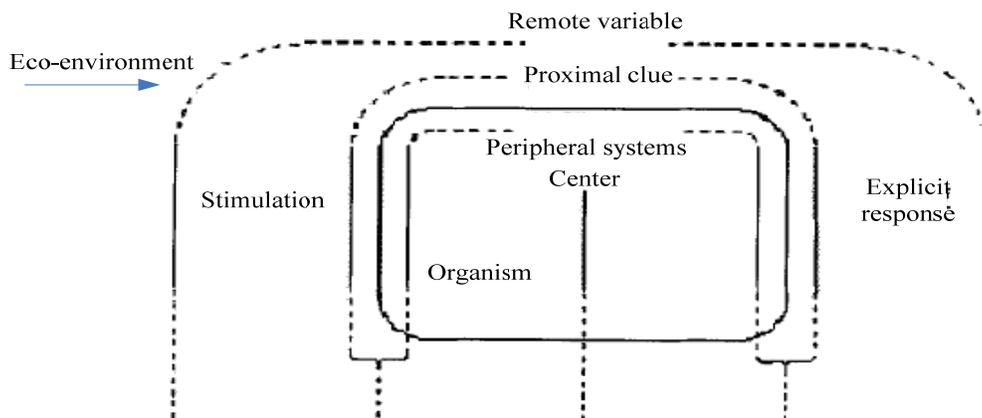


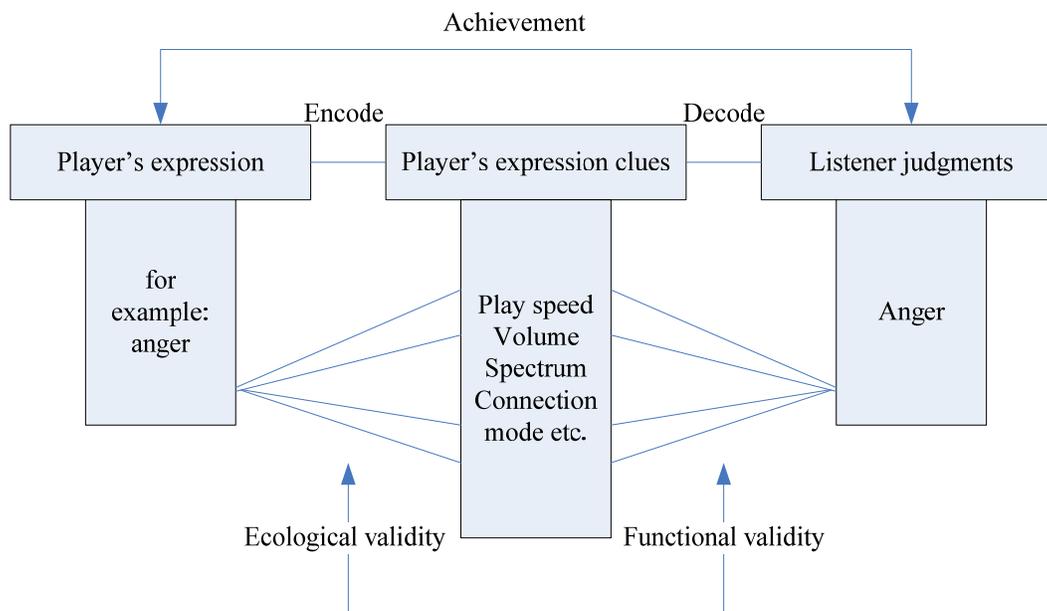
Figure 1 : Brunswik's organism-environment lens model.

Figure 1 shows Brunswik's Lens Model to integrate every unit of psychological analysis as a system. There are two components in the inner system, namely secondary environment system and the organisms. Meanwhile, these two secondary systems are connected with the proximal clues, distributing in the environment. Only when these alternating clues are restructured, can potential development rule in the objective world be found out. Therefore, the main function of this model is to guide preceptors to make use of environment to form the right perceptions. At the same time, there is a probability relation between long-term targets and clues. So mathematical methods should be adopted in the process. Remote variables and proximal clues have some impacts on the value of certain clues in the environment, which is called as ecological validity. In the research below, the functional validity of clues will be discussed to offer an effective analysis tool for researchers. The Lens Model has been widely adopted in the academic community. Today, psychologists in various countries have applied it into various aspects of psychology.

### Revised lens model

Juslin has developed and revised Brunswik's Lens Model, and applied this model into the course of musical playing. (Figure 2). This model can encode the clues in the course of playing, which may realize the musical emotion expression. The fact that audiences use the clues to decode the musical emotion is called as Recognition. The musical emotion expression may not remain consistent with the specific environment. From this aspect, the probability exists. Therefore, audiences have to integrate all these clues together to make the correct judgement.

There are two differences between the original Lens Model and the revised one. First, the original Lens Model simply analyzes the interactional relation between the environment and organisms, while the revised one can analyze the interaction between player and audiences. Second, in the prototype, the both relationship between the lens can be explained by the concept of ecological validity and the clues, while the revised one can use the ecological and functional validity to determine the clues' validity in the Lens. The emotional communication Lens Model in the course of playing is shown as Figure 2.



**Figure 2 : Emotional communication lens model in the course of playing**

The revised Lens Model has a great significance in practice, which is shown in two aspects as followed. First, in the course of playing, player's emotional expression is closely linked with the clues,

which is called probability. Second, in order to find out why there will be communication or failures in such conditions, some experts analyze the player's performance and audience actual appreciation level by the same method. Then, they find out there are inconsistency among these clues. So players are not constrained by playing styles to communicate with audiences. Brunswik proposed a new function, that is the Alternative Function, which can lead audience to apply clues in a flexible way to transform useless clues into useful ones. The alternative clues in this model is that specific emotion expressions or identification are replaceable. Audiences can use various clues for emotion communication.

### LENS MODEL EQUATION

Some experts point out that it is possible to use the LME to establish the regression model between performer and audience. In 1964, Hirsch Hammond and Hirsch pointed out the aim of the model research is to link cognitive systems and judgement in a descriptive manner. However, the LME only analyzes the emotion communication in the course of performance. In this model, the meaning of "Achievement" is the accuracy and sense of purpose in the course of performance, which becomes the bridge for communication between player's expression and audience judgements. There are two aspects of emotion expression for players in the course of performance. We can use 1 to represent the specific emotion play, and 0 to other performance types. Audiences can make judgements based on the expressed emotions.

According to the LME model, the achievement is originated from two changes. First one is partial linear change, in which the achievement can be attributed to a linear regression model.<sup>[13]</sup> As for linear aspect, if the achievement needs to be presented, the function among  $R_e$ ,  $R_s$  and  $G$  can be used to keep the consistency of performance.  $R_e$  stands for the consistency of the performer while  $R_s$  stands for the consistency of audiences, that is multiple correlation among audiences. The linear regression of both indicators may correspond with the clues. In general, they are regarded as consistency index. If  $R=1.0$ , the clues are consistent. Players can identify the matching indicator by the predicted values in the regression model. If this indicators can justify the completion of regression models between palyers and audiences, then  $R_e=R_s=1.0$ .  $G$  and  $R_e$  are independent from  $G$  and  $R_s$ , without any connection. Because  $G$  can be used for non-conformance amendments.

$$r_a = G R_e R_s + C \sqrt{(1 - R_e^2)} \sqrt{(1 - R_s^2)}$$

During the actual communication, if the emotion communication fails to complete, there may be several reasons: first, audiences and players use different codes, which causes the difference on  $G$  value. Second, consumers use different codes, so the  $R_e$  value is low. Third, audiences use different codes, so the  $R_s$  value is low. All these three factors may contribute to the emotional expression failure. Therefore, this kind of problems can be tackled by the analysis of their causes. The second part of LME is called as non-typical part. The linear part in this model is hard to interprete the non-system and system of variance<sup>[13]</sup>. The main reason is the inconsistency in the use of these clues, the ignorance of focus effects and other clues, and the adoption of formed clues.  $(1 - R_e^2)$  and  $(1 - R_s^2)$  represent the residual variance between the player and audience in regression model respectively.  $C$  stands for player's residual variance in regression model and audiences' residual variance in regression model respectively.

### APPLICATION OF THE LENS MODEL IN THE MUSICAL TEACHING

Recently, the Lens Model has been widely applied in various fields, especially in the electronic algorithm of emotional decoding and encoding. The Lens Model is a kind of emotion computing models and has close link with the real emotions. It is originated from emotions. In the course of performance, how the player use various or excessive clues to express his/her emotion can be analyzed by the Lens Model. At the same time, this model has been also applied in music teaching, which can be seen from player's performance skills. A marjority of researches have confirmed that the application of emotion

expression skills in the performance can help students learn more knowledge. However, in recent college musical teaching, most teachers attach less importance to emotion expression in the course of playing. Compared with clues between players' and audiences', this problems can be fixed effectively, which can turn the implicit knowledge into explicit one and enhance teacher-student interaction. This education approach is called as Cognitive Feedback (CFB). This approach can be used in the research of cognitive judgment. After the performance, the regression model can be established by the auditory analysis, and offers clues of feedbacks.

Juslina and Laukka used the CFB method to make structural prediction. After a feedback field, the accuracy during the communication has been enhanced. Therefore, the researches in the future aim to offer player's a kind of feedback to enhance the actual performance. However, computer feedback program for players is not new. For example, this kind of program has been existing in piano skills and conduct since a long time ago. But the emotion expression was not mentioned when this program was first invented. During the development of application in the future, the automatic analysis method should be applied for acoustic feature analysis. Meanwhile, the imitator judging algorithm will be copied. The Lens Model provides a great convenience for the copy and provides strong protection for more data information.

The Lens Model can not only ungrade the player's overall performance, but can enhance audience's appreciation, making some people that do not know music into a loyal music listener. The reason why they cannot appreciate music is that they cannot put real emotions into the performance. If these professional players's clues can link with their emotion that they want to express, and transfer to the audience, then these beginners can transform into a professional music listeners. However, the following researches need to be testified too. It is also a main way for an overall teaching of music appreciation in colleges. Therefore, the Lens Model plays an important role in musical emotion expression and has its unique application value as well.

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