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THE INFLUENCE OF VISUAL ATTRIBUTES OF SOLO MARIMBISTS ON PERCEIVED QUALITATIVE RESPONSE OF LISTENERS

*The University of Oklahoma* PH.D. 1985

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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

# THE INFLUENCE OF VISUAL ATTRIBUTES OF SOLO MARIMBISTS ON PERCEIVED QUALITATIVE RESPONSE OF LISTENERS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

IN

MUSIC EDUCATION

BY

CORT ALAN McCLAREN

Norman, Oklahoma

1985

THE INFLUENCE OF VISUAL ATTRIBUTES OF SOLO MARIMBISTS ON PERCEIVED QUALITATIVE RESPONSE OF LISTENERS

A DISSERTATION

APPROVED FOR THE SCHOOL OF MUSIC

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THE INFLUENCE OF VISUAL ATTRIBUTES OF SOLO MARIMBISTS ON PERCEIVED QUALITATIVE RESPONSE OF LISTENERS

By: Cort Alan McClaren

Major Professor: Dr. Richard C. Gipson

A number of variables influence one's response to musical performance. Although it is traditionally judged on its "aural" content, judgments concerning the perceived quality of "live" musical performance may be strongly affected by the listener's evaluation of "visual" stimuli.

The purpose of this study was to determine whether solo marimbists' visual attributes influence listeners' perceived quality assessment. In addition, the study sought to determine the differential influence of marimbists exhibiting either "positive" or "negative" impact.

Seventeen marimbists were selected to video record a solo performance. After a panel of experienced listeners viewed the recorded performances, the marimbists were designated as either "positive" or "negative" based upon an overall evaluation of their performance. Three performers from each of the two categories were randomly selected and evalu-

ated by thirty-seven subjects.

The evaluation instrument consisted of four bipolar adjective scales; 1) sensitive-insensitive, 2) good-bad, 3) effective-ineffective, 4) positive-negative. The scales, each consisting of seven steps, were converted into numerical values allowing for the computation of means. Analyses of variance, follow-up procedures, and the sign test were then computed for each scale.

Means comparison for Scale 1 indicated that listeners rated visual/aural (V/A) presentations higher than aural (A) presentations and rated "positive" performers higher than "negative" performers. Although cell means varied for Scales 2, 3, and 4, the ANOVA and the Tukey Wholly Significant Difference value for each scale revealed similar results. Data indicated a significant difference between positive and negative performers in both the A and V/A modes, but a significant difference between the A and V/A evaluation only for the positive performers. Aural and V/A performances by negative performers were not significantly different. The sign test yielded similar results as those produced by analyzing cell means of Scales 2, 3, and 4.

This study provides evidence that listeners tend to rate V/A performances higher than aural-only presentations, especially when the performance is "positive". It also suggests that performers having "positive" affect are preferred over those identified as having "negative" affect.

# THE INFLUENCE OF VISUAL ATTRIBUTES OF SOLO MARIMBISTS ON PERCEIVED QUALITATIVE RESPONSE OF LISTENERS

## CHAPTER I

## THE PROBLEM AND NEED FOR THE STUDY

### Introduction

When attending a live musical performance, a number of variables influence one's qualitative response. The variables most often associated with the performance of music--pitch, timbre, rhythm, form, and dynamics--are those elements which musicians generally use to define the musical experience. They are considered "aural" stimuli and occur during the presentation of all music. In live performance, however, another variable, the visual, is often a powerful concomitant of the aural soundscape. In other words, "hearing is not the only sense involved in music."[1] Judgments concerning the perceived quality of musical performance may be strongly affected by the listener's evaluation of visual stimuli.

Opinion about what constitutes a "musical" performance

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[1] Edward Lippman, "Spatial Perception and Physical Location as Factors in Music," ACTA 35:1 (1963): 24.

varies among individuals and cultures. It is often difficult to determine whether a performance is "good" or "musical" with any degree of consensus. Although one may judge a performance as "good" or "bad", seldom can explicit criteria be identified for making the judgment. Determining the "positive" or "negative" influence of visual cues within a performance is equally difficult due to the lack of specific criteria. However, most listeners are able to state whether, in their opinion, a performance is "good" or "bad" and, to some extent, how "good" or "bad". Likewise, they may be able to state whether a performer's visual presentation complimented or detracted from the overall experience, although they may not be consciously aware of specific factors that affected their assessment.

> The difference between good and bad does not depend upon the completeness of the apprehension or the grasp of every constituent detail, but rather upon the elements singled out as controlling foci of attention.[2]

Communication does not cease when the listener is not consciously aware of the variables that may affect his response. An audience constantly receives messages through visual and aural channels and responds to meaningful and structural elements. Listening, then, is essentially "a selective response in which certain elements in the total complex of the musical

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[2] James Mursell, The Psychology of Music (Westpoint, Conn.: Greenwood Press, 1971), p. 204.

experience become controlling while others are subordinated."[3] Since listening to music may involve aural stimuli alone or the simultaneous presentation of aural and visual stimuli what then, is the influence of each possible combination on the listener's qualitative response?

It is a generally accepted tenet that all the attributes of a musical performance, including the visual, combine to some degree to affect one in some way. That is, there is a subjective response--conscious or unconscious--to everything perceived. Sporre believes that it is unlikely that one will "confront a work of art without developing some attitude toward it and placing some personal value on it."[4] While the value one places on a work of art may be affected by visual as well as aural inputs, in musical performance the extent to which the visual mode affects one's positive or negative reaction is unknown.

When an artist steps before an audience, there is an instantaneous sense of life he or she projects which is rapidly perceived at some nonverbal level by every person present. Gordon calls this special characteristic, the "electric charge"

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[3] Ibid., p. 203.

[4] Dennis Sporre, Perceiving the Arts: An Introduction to the Humanities (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1981), p. 6.

or "charisma".[5] He suggests that without it in some measure a person cannot succeed in sustaining a performing career. In his words, "some personalities are given the special gift of commanding a large public following and others are not."[6] Unfortunately, Gordon fails to outline the characteristics of performers with this special gift. Since a portion of the listener's reaction to "live" performance may occur before the presentation of sound stimuli, for example, as the performer enters the performance area, one must conclude that the visual mode is important.

Several sources within the field of music support the notion that visual inputs are powerful adjuncts to the musical experience. Lippman states in his article about spatial perception and physical location as factors in musical performance that "vision is so much our dominant sense that it never can be completely set aside."[7] He believes that if one dislocates the visual field optically, sound will appear to come from a new location. Given this premise, one can readily understand that visual experience plays an important, although unanalyzed, part in listening to music.

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[5] Stewart Gordon, "The New Davidites: XII," American Music Teacher 25 (September/October 1976 ): 25.

[6] Ibid.

[7] Lippman, "Spatial Perception and Physical Location as Factors in Music," p. 33.

> The dominance of vision over hearing is of course sufficiently obvious in ventriloquism, or in sound film, or in television. In all these cases, the visual object becomes . . . the apparent sound source . . . even though the position of the actual source may be quite different. It is vision then, that is the final arbiter of perceived events . . . .[8]

Most will agree that syntactic analysis may contribute to one's basic understanding of music but, according to Keil, it is not sufficient in itself. He thinks that the gestures one makes while performing are important in the communication process. He believes that careful attention to the physical movement associated with music making will eventually lead to more intellectually and emotionally satisfying results.[9]

Stravinsky placed a great deal of importance on visual cues in performance and their implications toward influencing the listener.

> The sight of the gestures and movement of the various parts of the body producing the music is fundamentally necessary if it [the music] is to be grasped in all its fullness.[10]

Meyer supports the idea that "visual cues provided by performers in the form of gestures and postures" tend to affect one's attitude toward the performance.[11] Furthermore, Meyer be-

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[8] Ibid., p. 34.

[9] Charles Keil, "Motion and Feeling Through Music," Journal of Aesthetics and Art Criticism 24 (Spring 1966):339.

[10] Leonard B. Meyer, Emotion and Meaning in Music (Chicago: University of Chicago Press, 1956), p. 80.

[11] Ibid., p. 80.

lieves that there is no "distinction between a response to the gesture of a motor behavior of a performer and a response to one's aural experience."[12]

> Visual experience of various kinds constitutes an . . . extrinsic factor which plays a significant part in listening . . . The whole experience becomes much more definite . . . if the eyes cooperate with the ears in giving objective reference to what we hear. . . . In a great deal of listening the chance to watch the performer or to observe the source of the sound plays a very considerable part, and at times it may even become a dominating factor in the experience. This is the reason why a well-designed concert hall or opera house will provide for seeing as well as hearing, and why striking appearance, a good "platform manner", and a graceful and dramatic style of performance can be contributing factors in an artist's success. It is no use saying that all such things are irrelevant . . . Visual experience is closely interwoven with aural perception, and cannot but play a significant part in listening to music.[13]

This study will seek to determine whether visual attributes in "live" musical performance affect listeners' perceived qualitative assessment, as well as assess the influence of positive or negative affect. In other words, the study will determine whether and to what extent visual and aural elements of musical performance relate. It is an investigation of the perceived relationship that many believe to exist, but has not been throughly investigated.

## Visual Aspects In Other Performing Arts

Other performing arts, notably dance and theatre, rely

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[12] Ibid., p. 80.

[13] James Mursell, The Psychology of Music (Westpoint, Conn.: Greenwood Press, 1971), pp. 209-210.

heavily on visual components for their aesthetic appeal. "In dance, movement is used for the purpose of creating a flow of visual design . . . ."[14] In addition to visual aspects, dance often depends on the quality of music that accompanies it, the aural and visual aspects acting as compatible partners. In pantomime, communication occurs to the extent that the mime is able to influence meaning and emotions by the manipulation of body gestures. Pantomime and dance are similar in that both rely on visual elements, usually in the form of body movement, as a primary means of artistic expression.

Acting combines visual inputs and speech. Actions and gestures must be consistent with the character being portrayed if the character is to appear as an individual with unique mannerisms. In opera one cannot dispute the influence that the combined variables of music, speech, and visual elements have in the total experience. However, the advent of the phonograph and radio created an interesting phenomenon in that opera is often experienced without the visual element. While few will make the mistake of considering recorded dance music as an acceptable version of what is expected at a live dance performance, recorded versions of opera are often viewed as equivalent to the original. In order to grasp the total

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[14] Neale King Bartee, "The Development of a Theoretical Position on Conducting Using Principles of Body Movement as Explicated by Rudolph Laban" (Ph.D. dissertation, University of Illinois at Urbana-Champaign, 1977). p. 8.

essence of opera or dance the visual elements must be present, since their complete aesthetic experience involves one's vision as well as hearing.[15]

The integration of the visual and aural modes is understood and accounted for in the preparation of dance productions, plays, and similar live performances. It is in the area of concert and recital performance that the impact of visual components on the total aesthetic experience is often taken for granted or completely ignored.

## Visual Aspects In Music Performance

Most published literature in the area of instrumental music views the influence of visual cues in musical performance in an indirect way. Visual elements are considered secondary to the development of performance technique. A performer's physical movement is important in the development of dexterous skills that enable him to meet technical/musical demands. Pierce believes that there is a direct correlation between a performer's physical movements and the resultant production of sound.[16] That is, subtle shadings in a performer's body movement will result in appropriate nuances of tone. Chapman stated in his article on freedom at the keyboard that physical freedom, i.e., the absence of constriction, "requires

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[15] Lippman, p. 34.

[16] Alexandra Pierce, "Body and Performance," Piano Quarterly 22 (Spring 1974):26.

a controlled freedom of movement so that the pianist may respond to his imagination."[17] He believes that the physical movements of a performer will have an affect on the performer's ability to create musical nuance.

> Coloring is kept locked up if the motions of playing are not flowing, and the player tends to deal with the elements of coloring in a disconnected, contrived way which corresponds to his way of moving.[18]

In this sense, a performer's motions are related to his ability to create desired musical effects. The study and recognition of these movements is difficult, but they are indispensable for the teaching/learning of instrumental practice and performance. Pierce and Chapman do not deny that one's physical movements may affect a listener. Like others, they simply avoid the issue.

Some instrumentalists see a relationship between a performer's gestures and their influence on an audience. Szende believes that actions "impart the experience of subjective emotions to other people."[19]

> The more perfect and adequate the response and function of the motor apparatus and hence, the totality of expressive motions, the more successfully refined its realization in performance, i.e., in the communication of its message.[20]

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[17] Norman Chapman, "Freedom at the Keyboard," Music Journal 18 (February/March 1969):29.

[18] Ibid.

[19] Otto Szende and Mihaly Nemessuri, The Physiology of Violin Playing (London: Collet's Limited, 1971), p. 13.

[20] Ibid.

Strings

Szende and Nemessuri in The Physiology of Violin Playing present an elaborate account of the body's role in violin performance.[21] Polnauer, a violinist, in collaboration with Mark, a medical doctor, wrote a similar document based on the need to establish scientific principles applicable to senso-motor skill, particularly as they relate to musical performance.[22] Each book presents scientific data in support of physiological tendencies in string performance.

Clapp says that "on people like Perlman, playing looks easy . . . ."[23] Furthermore, he believes that there are objective reasons for this. The performer's effort to achieve musical intensity and the resultant physical reaction--tension--often cause ineffective body movements. Ineffective body movement caused by tension, an observable phenomenon, will surely be perceived at some level by a listener.

In an investigation of kinesthetics of violin playing Jacobs says that

> it is impossible to produce tone with any musical instrument without moving those parts of the human body which are involved in playing an instrument. These

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[21] Otto Szende and Mihaly Nemessuri, The Physiology of Violin Playing (London: Collet's Limited, 1971).

[22] Frederick Polnauer and Morton Marks, Senso-Motor Study and Its Application to Violin Playing (London: Boosey and Hawkes, 1969).

[23] Stephen Clapp,"Tension in Violin Playing," American String Teacher 33 (Summer 1982):10

> movements are dependent on the possibilities of movement of the parts concerned and the structural and physical properties of the instrument.[24]

Some of the most complicated human movements are those involved in the performance of instrumental music. Every sound produced is brought to realization by means of movement. Movements, then, are the means of musical expression on any musical instrument. A performer's physical movements are an irrevocable part of the total musical experience.

Piano

Pianists have also been concerned with the physical process of musical performance. In a series of articles, Pierce described a system whereby musicians may develop a kinesthetic awareness of body movement. The system is based on the research and teaching of F.M. Alexander, an Australian actor/director who developed a method for improving neuro-muscular coordination. Pierce believes that there is a direct correlation between the physical presentation of musicians and the resultant production of sound.[25]

> If the body of the performing pianist never can reach a position of balance and rest, then neither does the sound of the music. Connectedness of fluid movement between

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[24] Camille Jacobs, "Investigation of Kinesthetics in Violin Playing," Journal of Research in Music Education 17 (Spring 1969):112.

[25] Alexandra Pierce, "Body and Performance," Piano Quarterly 22 (Spring 1974):26.

> the body parts is essential for the creation of musical sound.[26]

Holland, a student of the Alexander Technique, further emphasizes the importance of body motion in that

> movement is more directly observable than thought and emotion, and since the relationship between the three is incredibly intertwined, observation and work on movement can be work on ourselves on more levels than we are consciously aware of.[27]

While there is a preponderance of evidence provided by string players and pianists that supports the notion that visual elements are strong concomitants in musical performance, there is a conspicuous void of information in wind and percussion writings. Although the essence of instrumental music depends on a performer's physical movement, instrumental musicians unfortunately have not shown much interest in investigating not only the necessary technical facility but the resultant affect one's visual presentation has on listeners.

## Conducting

Few will disagree that the gestures of an accomplished conductor seem to be a direct means of evoking musical expression. An admirable trait of any conductor is the ability to control gestures that may affect listener or performer reaction. Rudolph states that a conductor must be able to

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[26] Ibid.

[27] Mary Holland, "The Alexander Technique," Strad 89 (November 1978):621.

"convey his intention to his players by means of gestures."[28] To obtain an artistic result, a conductor must be able to communicate nuances in dynamics and tempo, as well as details in phrasing and articulation. The appropriate gesture for each musical expression must be mastered.

Any body gesture that aids in the communication of musical ideas is basic to conducting and while there is no easy way to insure communication, one must have adequate technique to translate musical thoughts and silences. "For me", writes Fennell, "there is no doubt that the body--and I mean the whole body--can and must be a vital part of this translation process."[29]

Garber, in an analysis of ideas on communication in modern orchestral conducting, uncovered several discerning issues. His sources were nineteenth- and twentieth-century treatises that dealt with the nature of the art of conducting. After thorough investigation he concluded that "showmanship, the visual display by the conductor, results in the means becoming communication content."[30] The literature, according

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[28] Max Rudolph, The Grammer of Conducting (New York: G. Schirmer, 1950), p.1.

[29] Frederick Fennell, "The Calesthenics of Conducting," Instrumentalist 31 (November 1978):16.

[30] Herbert Garber, "A Study and Analysis of Ideas on communication in Modern Orchestral Conducting Drawn From Selected Readings" (Ed.D. dissertation, Teachers College, Columia University, 1971), p. 5.

to Garber, supports the tenet that the audience is a recipient of a conductor's activity on a visual as well as an audient level. While there is disagreement among authors about the communicative intent of various conducting gestures, there is consensus that the physical message does affect listeners.

> In performance the conductor communicates 100 percent nonverbally through 'body language' that includes eye contact, body orientation and posture, facial expression, movement of the feet, torso, and head, in addition to the expected hand gestures.[31]

## Congruity versus Incongruity

The previous statements point to several related but crucial questions concerning the influence of a performer's visual components on the perception of the quality of musical performance. To what extent does the level of congruity or incongruity between aural and visual cues influence one's reaction? To what extent is a listener's "positive" or "negative" response affected by visual or aural cues or their interaction? Do soft, long tones resemble slow body movements? If so, and if they occur simultaneously, will the resultant listener reaction be "positive"? Likewise, should quick moving tones be accompanied by rapidly occurring visual cues? Should disjunct tonal patterns (pointillism) be complimented by jerky, dislocated visual impressions? Will the congruency or incongruency between visual and aural elements

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[31] Faye Julian, "Nonverbal Communication and the Conductor," Instrumentalist 35 (November 1980):64

inherent in musical performance interact to affect listeners in any way? Although these questions may ultimately be answered by investigations such as the current study, some performers and educators have definite opinions.

Fischer, in an article about tension and relaxation in violin performance, emphasizes the need for body movements and aural stimuli to be complimentary, since a musical performance is a gestalt in which one attends to all visual and aural variables.

> "Gestalt" is a term that psychologists use to express human conduct based on the principle that the physical, mental, and biological phases of activity do not work separately, but are integrated. When a violinist plays well, he performs in a unified manner, and through this complete involvement, he brings the message to the audience.[32]

This statement implies that if congruity exists between a performer's actions and the music being performed, a particular message, the intended one, may be transmitted to an audience. One may infer from Fischer's statement that if the intent of physical action (body movement) is to enhance the aural component, at the very least, this action will not distract from aural elements.

Most listeners have heard amazing musical technicians who do not perform aurally satisfying music. Similarily, most listeners have heard other musicians whose every movement

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[32] Bernard Fischer, "Playing the Violin with Confidence--Tension and Relaxation," American String Teacher 19 (April/May 1970):24

was a study in excessive tension; nevertheless, their superb musicianship qualified them as artists.[33] This suggests that even though incongruity between aural and visual stimuli may exist, the musical or aural elements may be "positively" perceived. However, a listener's perception of excessive tensions and stiffness in a performer's visual presentation may distract from the total aesthetic impact.

Directors of large performance groups, such as choirs, bands, and orchestras, often require performers to dress alike and enter the performance area in a uniform manner. Listeners may be effected when one organization enters the performance area in an orderly fashion while another group appears disorganized and enters in a haphazard manner. The negative impact is often exaggerated when the unorganized group happens to be wearing individually different clothing and the other group appears in identical apparel. Adjudicators of contests in which large groups participate are acutely aware of the potential affect of such visual cues on the listener, regardless of the aural content.

The marching band is exemplary of the combined presentation of visual and aural stimuli. Traditionally, pictures and formations formed on the field (except in cases where pictures refer to song themes or titles) had little to do with

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[33] Francis Tursi, "The Problem of Excessive Phycho-Physical Tension in String Performance," American String Teacher 9 (Spring 1959):8

aural presentations. Recent innovations place musical aspects before visual elements in the total show design, creating congruity among all perceived events. Visual and aural elements should be reciprocal.

The aural content in opera is obvious. However, since an opera singer must act, there is an increased likelihood of creating incongruity between the aural and visual elements. "In operatic acting, movements should be correlated with the music and inspired by it."[34] An example of incongruity in opera would be a singer who sings beautifully, but does not act well. The same singer may appear stiff and may have poor eye contact and rigid posture. In addition, in difficult passages, the singer might further limit his/her acting in order to concentrate on vocal technique or interpretation. Reynolds believes that in such cases "it is necessary to control stringently the disruptive influence of sight, since visual cues tend to override auditory cues for position when the two are not congruent."[35]

The level of congruence among the various parameters in a "live" musical experience may affect a listener's qualitative response. Since hearing and sight are the dominant senses with which humans perceive a musical experience, it

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[34] Alice Duschak, "Differences in Approach Between the Art of Actors and Singers," American Music Teacher 31 (June 1982):30.

[35] Roger Reynolds, "Thoughts on Sound Movement and Meaning," Perspectives in New Music 16 (Spring 1978):190

seems appropriate to initiate investigation that will attempt to discuss their interaction in live musical performance, an area that lacks thorough investigation. The degree to which one attribute, visual or aural, is more powerful than another is unknown. The only evidence to date is speculative. For example, Pierce believes that an audience uses the sense of hearing and sight equally in that "subtleties of movement and tone can be quickly grasped if they are seen and heard."[36]

> That the players gestures must be made only in response to the music is also stressed by Stravinsky who observes that only if the player's movements are evoked solely by the exigencies of the music will they facilitate one's auditory perception.[37]

## Pedagogy

Although professional performers and educators generally agree that visual components in performance directly affect listeners, there is a paucity of related pedagogical methodology. While some educators have applied specific techniques such as the Alexander Technique to musical performance, there remains a void in the literature as well as in actual practice of instructional techniques designed to impart knowledge related to the impact of visual cues in musical performance. Instruction in large performance groups is commonly

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[36] Alexandra Pierce, "Elbow Movement and Access to the Heart," Piano Quarterly 24 (Winter 1975-76):30.

[37] Meyer, Emotion and Meaning in Music, p.81.

limited to directions concerning acceptable clothing, entrance procedures, manner of sitting or standing, and exit procedures.

While the private lesson is used to teach applied music at virtually all levels, few teachers provide instruction in the visual affect of musical performance. This may be due to the fact that teachers and prospective teachers are seldom required to participate in coursework that deals with this issue. Since teachers are often evaluated by the quality of their students' performance, it seems appropriate to investigate the possibility of providing adequate instruction in how a performer may control the affect of his visual presentation. Most listeners have experienced performances by young musicians who are unable to recognize applause comfortably. They appear uneasy on stage and consequently directly affect the listeners response, regardless of the previous aural presentation. Perhaps proper guidance will improve that technique and the resultant listener response.

Jacobs believes that "the teaching of the movements that produce musical expression . . . belongs among the most important subjects of the curriculum."[38] Further, movements involved in all performance are subject to certain norms which can be found in the study of kinesthetics. Unfortunately, the average teacher is unaquainted with research in kinesiology.

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[38] Camille Jacobs, "Investigation of Kinesthetics in Violin Playing," Journal of Research in Music Education 17 (Spring 1969):112.

Keene suggests that "one of the most common problems in the teaching of instruments on all levels is the student's inability to experience and remember the correct physical movement."[39] It is important for a performer to know when a deviation from the "ideal" will cause a "negative" listener response.

Dalcroze believed that immediate physical response--realizing the music as it is heard--is essential to the comprehension of a musical idea. Musical instruction in the Dalcroze method involves three areas of study: solfege, improvisation, and eurhythmics. Eurhythmics is the area of study that gives "students a feeling for musical rhythm by means of bodily movement."[40] While the Dalcroze method stops short of suggesting that movement training will ultimately affect a listener's response to musical performance, the implication of such training is an area of profound investigative interest.

There are no statistics that indicate the amount of time that should be devoted to instruction of visual cues via body gestures. Naturally a comprehensive outline of gestures and appropriate techniques must be established first. Only

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[39] James Keene, "Physiological Aspects of Playing Instruments," Instrumentalist 24 (October 1969):84.

[40] Beth Landis and Polly Carder, The Eclectic Curriculum in American Music Education: Contributions of Dalcroze, Kodaly, and Orff (Washington, D.C.: Music Educators National Conference, 1972), p. 102.

then can one determine the appropriate amount of instructional time.

## Visual Attributes

Visual attributes in "live" musical performance include all visual stimuli perceived, consciously or unconsciously, by a listener. While there are many such variables, this investigation will be limited to the affect of visual attributes related to a performer's physical appearance, that is, all visual attributes manifest in a performer's body gestures. For purposes of this study, the terms body movement, body gesture, body motion, gesture, movement, physical movement, and their derivatives will be used interchangeably. Body gestures include movements associated with any part of the human body, such as eyes, face, hands, arms, and legs. In addition, visual cues will be considered synonymous with body gestures. When visual cues, inputs, variables, attributes, or elements are referred to, one may assume the reference is being made to one or more of a performer's body gestures.

The visual attributes of a musical performance are rarely studied in traditional classroom settings. Nevertheless, they are easily identified. They include all environmental stimuli. Boots says that "communication with the listener begins at least as early as the moment he enters the

concert hall."[41] The facilities for handling tickets, checking coats, the quality of the printed program, and the demeanor of all personnel connected with these operations have a definite impact upon the receptivity of the listener. Although the preceding influences may be indirectly related to positive or negative responses, others, more directly related to the visual presentation, may have increased impact; they include lighting, proximity to the performance area, and the general appearance of the concert hall. Other visual factors pertain directly to the performer(s), such as clothing (style, fit, color), facial expression (mouth, lips, eyes), arm movement, head movement, breathing, and movement from the torso and legs.

Many performers, when preparing for a performance, rely totally on the aural aspects without regard to the visual. Although some performers have a natural tendency to present visually satisfying results, others need practice in identifying visual cues that may likely be positively perceived by an audience. Many performers seem to create a barrier between themselves and the audience. What is the probable cause--facial expression, clothing, the music? Brooks and Emment cite Mehrabian's research in nonverbal communication indicating that the total impact of a message is

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[41] Frederic Boots, "A Judicious Amount of Showmanship," Instrumentalist 24 (January 1971): 60.

seven percent verbal, thirty-eight percent vocal, and fifty-five percent facial.[42] Perhaps, among all the visual attributes in "live" musical performance, facial expression has the greatest impact on a listener's perceived assessment.

## Marimba

All musical instruments require some degree of movement in order to perform; some more than others. For example, violin players seem to require more external movement than flute players. Trombone and violin players move one arm more than the other, while pianists move only the upper portions of the body. Percussionists move different parts of the body according to the instrument being played. Any of these visual attributes may affect a listener. Some visual cues may have more impact than others, depending on the performance genre and accepted practice. This study will focus on the perceived affect of the visual attributes of solo marimbists on the response of selected listeners.

The marimba is a relative newcomer to art music. Although its origin dates to ancient civilizations, its role as an instrument suitable for the concert stage is recent. This has prompted rapid change in repertoire and performance techniques. Leigh Howard Stevens, Gordon Stout, Karen Ervin, Linda Pimental and many others have significantly contributed

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[42] William Brooks and Philip Emment, Interpersonal Communication (Dubuque, Iowa: W.C. Brown, 1976), p. 118.

to a renewed interest in marimba performance.

Given the nature of the instrument, marimbists are sometimes required to make exaggerated movements while playing. That is, since the instrument is long (approximately seventy inches for a four-octave marimba), one must make lateral, vertical, and horizontal movements in order to reach a variety of pitches. Techniques related to two and four-mallet playing require a myriad of subtle body gestures. For example, certain stroke types might create overt muscular movements that influence one's perception, while others may create different impressions. A marimba player creates intensity not through diaphramatic control as in the case of wind players, but by varying the type, weight, and size of beater, placement of the beater, style and manner of dampening, and use of agogic accent. These and other musical facets may be controlled, in part, by various changes in body movement.

Stevens may have been the most explicit in his efforts to identify and categorize contemporary playing techniques. His book, Method Of Movement for Marimba, is an elaborate discussion that includes sticking permutations, four-mallet grip, interval changes, stroke efficiency, stroke types, and other pertinent issues confronting contemporary marimbists.[43] Steven's interest in body movement is evident when he states

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[43] Leigh Howard Stevens, Method of Movement for Marimba (New York: Marimba Productions, 1979).

that today's performance problem is "not so much striking individual notes or groups of notes as it is getting to those notes."[44] He believes "that this is the area in which traditional methodology is inadequate to the demands made of the marimbist of contemporary music: efficiency of movement."[45] However, Stevens does not discuss the probable influence of a marimbist's visual cues on listeners.

Pimental has gone to great length to identify and classify movements that accompany multiple-mallet marimba technique.[46] Her studies indicate that three positions, combined with interval size and configuration, represent manipulative factors necessary in satisfactory performance. Additionally, a relationship may exist between physical movement and melodic movement since the performer usually initiates movement in the direction of melodic flow.[47]

Although there is consensus about the need to develop appropriate body gestures in marimba performance, there remains an insufficient amount of pedagogical material devoted to its development. Raush's study, however, in which he explores specific performance problems inherent in selected

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[44] Ibid., p. 2.

[45] Ibid.

[46] Linda Pimentel, "Multiple Mallet Marimba Technique," Percussionist 14 (Fall 1976):2.

[47] Ibid., p. 6

four-mallet marimba literature, is evidence that a new area of research may be emerging.

While the present study will focus on the affect of solo marimbist's body movement, features inherent in playing the marimba may be likened to those required on most percussion instruments since sound on the marimba and most percussion instruments is produced by a striking motion that is easily observed. Ervin suggests that in "multiple percussion performance there is a necessity for graceful, relaxed motion in order to create facility and good sound."[48] She suggests that sequences of motion be planned and recommends practical gestures that will aid in achieving the most efficient performance. "Correct use of the body will improve all types of playing."[49]

Peck suggests that the visual appearance in percussion performance may be compared to an experience in theatre since percussionists make designs and patterns in their movements that are easily perceived by an audience.[50] He believes that an audience is more likely to respond to a performance with a strong visual component. If one is aware of potential visual

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[48] Karen Ervin, "Choreography in Multiple Percussion Playing," Instrumentalist 32 (March 1978):96.

[49] Ibid., p.97.

[50] Russell Peck, "Percussion Concerts: Impact and How to Achieve It," Instumentalist 33 (September 1978):62.

cues and utilizes movement oriented behaviors designed to enhance performance, the resultant effect will be positively perceived by an audience.

Hong noted that "man hears not only with his ears, but with his eyes."[51] Solo marimbists have two principal means of communication--aural and visual. Ultimately, both aspects of communication occur simultaneously, each playing an important role in the synthesis process. Unfortunately, the visual aspects of marimba performance seldom receive the attention that concomitant performance behaviors receive.

## Statement of the Problem And Purpose

Traditionally, emphasis in research concerning the affective response to music has been restricted to "aural" phenomena. Professional performers and educators, however, agree that visual inputs must affect listeners' qualitative response to "live" musical performance. There exists little substantive information regarding the effect of visual cues on listeners' qualitative response. No systematic language has been developed for teaching the use of effective body movements in large performance organizations or in private lessons. Valid and reliable information regarding the "positive" or "negative" affect of visual cues needs to be collected in an effort to clarify this important aspect of musical performance.

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[51] Sherman Hong, "Enhancing Performance Through Imagery," Instrumentalist 22 (May 1968): 104.

The purpose of this study was to determine whether solo marimbists' visual/aural attributes influence listeners' perceived quality assessment, as well as to assess the influence of "positive" or "negative" affect. For purposes of this investigation the hypothesis is stated in its null form. There will be no significant difference among the means ratings of aural and visual/aural musical performances of marimbists identified as "positive" or "negative".

## Limitations

Video taped solo marimbists from those universities in North Carolina with full-time percussion teachers constituted the stimuli in this study. No vocal, wind, string, or keyboard performers were evaluated. Undergraduate students enrolled in a music class designed for prospective elementary classroom teachers during the Spring semester, 1985, at The University of North Carolina at Greensboro served as subjects.

The results of the study are limited in generalizability in that conclusions which were drawn relate exclusively to solo marimba performance. While one may assume intuitively that the visual affect of marimbists may be similar to other performers, no attempt will be made to do so. This study sought to determine the influence of visual aspects in live musical performance on listeners' response. No attempt was made to identify the number, kind, or quality of visual attributes that may exist in the performances. The research

design accounted for perceived differences between an aural performance and a visual/aural performance.

# CHAPTER II

## RELATED LITERATURE

A review of the literature pertaining to the influence of visual cues on a listener's qualitative response to "live" musical performance yielded a number of periodical articles which approached the subject in an indirect way. However, when viewed in relationship to literature pertaining to other types of musical phenomena, such as performance practice in specific style periods, literature even remotely related to the effect of visual cues lacks depth and understanding. There are no bonafide research studies that deal directly with the effect of a performer's visual cues on listeners' qualitative response to musical performance. There is, however, a wealth of information in the area of nonverbal communication supporting the notion that body movement has a definite effect on one's perception.

Most literature in the field of music views body movement as an important part of the physical means of performing. That is, the development of a performer's kinesthetic sense is important in acquiring technique on certain musical instruments. Unfortunately, discussions regarding the effect

of one's body movement on an audience are conspicuously missing from the literature.

## Affective Response

Any inquiry relating to one's response to music ultimately deals with affective response. The very uniqueness of music is that response to it embodies the affective component of human behavior.

In recent years, there has been increased interest in the various manifestations of affective behavior. With this increased interest, several questions have surfaced. What is meant by affect and emotion? Is affective behavior the same as aesthetic behavior? Are changes in physiological rates indicators of affective behavior? Can affective behavior be studied from a scientific perspective? These questions and others concerning the affective components of human behavior have continuously perplexed philosophers, musicians, and psychologists.

Terms associated with the study of affective behavior such as mood, aesthetic, affect, feeling, preference, and emotion, seem to connote something nonmaterial and therefore less susceptible to scientific study. Further, early inquiry regarding the affective component often referred "to some implicit process or state which must be inferred from vari-

ables,"[1] but could not be directly observed. The assumption was that affective states did not submit readily to measurement and consequently should therefore be the subject of investigation for disciplines other than empirical science.

The problem of bringing quantitative measurement into the domain of affective behavior is partially clarified if one draws

> a sharp distinction between the study of the process of aesthetics as a kind of communication and the creation of aesthetic products. Whereas the latter should, and . . . will, remain in the domain of art, the former is a perfectly legitimate area of scientific study . . .2

A musical experience, and all its manifest behaviors, then, is a unique form of human communication that can be studied with its communicative significance in mind. Any definition of communication in aesthetic terms is destined to be somewhat vague, but one may assume that communication in aesthetic terms occurs

> whenever a system, a source, influences the state or actions of another system, the destination or receiver, by selecting among the alternative signals that can be carried in the channel connecting them.3

This definition implies that a stimulus displays several signals (channels) that may influence a respondent.

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[1] Charles E. Osgood, George J. Suci, and Percy H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957), p. 2.

[2] Ibid., p. 291.

[3] Ibid., p. 292.

There are several communication channels in musical performance that interact in a variety of ways. In addition to the aural channel of communication, there is also the visual-gestural channel of facial and postural expression, commonly called nonverbal communication. Although the identification of these nonverbal channels and the subsequent measurement of affective behavior made in response to them may be difficult, Lundin asserts that "we must remember that we are considering behavioral events," therefore, "we can regard this realm of investigation as objective."[4]

Radocy and Boyle identify affective behaviors as "those which have a significant feeling component."[5] Lundin defines an affective response as "one in which the stimulus has made some definite change in the organism."[6] Listener response has no effect on the stimulus object--music. Instead, the aural or visual elements act on the listener. Lundin believes that in this way one can distinguish between affective responses and other kinds of psychological activity in which the perceiver does something to change a stimulus.

It is important to note that several types of affec-

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[4] Robert W. Lundin, An Objective Psychology of Music, 2nd. ed. (New York: Ronald Press, 1967), p. 151.

[5] Rudolf Radocy and David Boyle, Psychological Foundations of Musical Behavior (Springfield, Illinois: Charles C. Thomas, 1979), p. 182.

[6] Ibid., p. 151.

tive responses to music have been studied. Physiological reactions have received the greatest attention from investigators. Whether physiological changes, which include galvanic skin responses, pulse and respiration rates, variations in muscle tension, changes in blood pressure, gastric motility, movement of the hair on the skin, and brain wave response are themselves affective behaviors is open to question. Behaviorists insist that they are, while others suggest that they are merely physiological correlates of affective behavior, since feelings are psychological rather than physiological. Other common types of affective behavior include the mood or character response, association responses, musical preferences, musical interests, and musical values.

Radocy and Boyle identify four approaches to the study of affective behaviors in music--physiological measures, mood responses, philosophical inquiry, and experimental aesthetics.[7] Generally, physiological studies involve the presentation of musical stimuli (usually aural) as the independent variable and use polygraph data measuring the various physiological rates as the dependent variable.

Mood responses to music have been studied primarily by means of verbal description. The three basic methods of gathering verbal information are adjective check lists, the semantic differential, and various types of rating scales.

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[7] Ibid., p. 190.

Although Farnsworth[8] and Lundin[9] both summarized research on mood, Eagle's extensive review of the literature on mood responses to music is the most recent.[10]

While philosophical inquiry concerning the value of music may be important to an understanding of the affective response to music, an examination of philosophical aesthetics reveals that "no clear-cut answers emerge regarding the affective response to music."[11] This may be due to the nature of philosophical inquiry in that information remains purely speculative and is not likely to be substantiated by empirical methods.

The field of the new experimental aesthetics purports to have made significant progress in objectively measuring affective phenomenon. Experimental aesthetics is a branch of psychobiological aesthetics which "applies the methods of empirical science to the investigation of human and animal behavior and its relations to the observable conditions that

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[8] Paul R. Farnsworth, The Social Psychology of Music, 2nd ed. (Ames, Iowa: Iowa State University Press, 1969).

[9] Lundin, An Objective Psychology of Music, 2nd ed.

[10] Charles Eagle, "Effect of Existing Mood and Order of Presentation of Vocal and Instrumental Music on Rated Mood Responses to That Music" (Ph.D. dissertation, University of Kansas, 1971).

[11] Radocy and Boyle, Psychological Foundations of Musical Behavior, p. 206.

can influence behavior."[12] It examines affective response by means of experimental methods, that is, through systematically varying some factors to determine their effect on some aspect of behavior. This area of investigative interest stresses the study of nonverbal behavior as well as verbally expressed judgments and attempts to establish links between aesthetic phenomena and other psychological phenomena.

Dependent variables for the new experimental aesthetics include verbal ratings, psychophysiological measures, and behavior measures. The semantic differential, developed by Osgood and his associates, is the primary framework for verbal ratings. Psychophysiological measures serve as indicators of arousal rather than affect, whereas behavioral measures include exploration time and exploratory choice. Exploration time measures intensity of attention or perceptual curiosity and exploratory choice is an index of incentive value.[13]

While Berlyne, Croizer, and others have established the foundation for using the theory and methodology of the new experimental aesthetics to study affective components of human behavior, further investigation is certainly warranted.

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[12] D.E. Berlyne, ed., Studies in the New Experimental Aesthetics (Washington, D.C.: Hemisphere Publishing Co., 1974), p. 4.

[13] Ibid., pp. 13-14.

## Nonverbal Communication

Although the systematic investigation of the effect of visual cues on listener's qualitative response to music has received limited attention from musicians, a precedent supported by rigorous scientific methods has been established in the area of nonverbal communication. Unfortunately, even this area of scholarly investigation has neglected to measure the effect of performers' nonverbal (body movement) cues on listeners' qualitative response in musical performance. What follows is a brief review of the tenets underlying nonverbal communication research that have potential for direct application to music research.

Whether one is talking or remaining silent, or being active or passive, one is behaving and is therefore communicating in some way. Whatever one is doing, another person perceives the behavior and attaches meaning to it. Those behaviors to which perceivers assign meaning become messages--intentional or unintentional. Since any behavior may become a message, it is impossible to avoid communicating. This axiom is a rather important one in terms of its direct application to musical performance. If there is a performer and a listener, communication must take place, although, the extent to which certain variables affect the listener may be unknown. When the nonverbal message is understood it makes the interpretation of the sender's meaning much more complete.

The task of nonverbal research has been to discuss the unwritten rules established by centuries of communicating without words. Although no general theory exists into which various concepts can be placed, several important implications for those persons interested in human behavior follow: (1) nonverbal behavior is consistent; (2) measurement techniques have been developed that quantify nonverbal behavior; and (3) people may easily be trained to detect nonverbal cues and signals.

Koehler identified six areas of nonverbal communication--proximics, kinesics, eye contact, paralanguage, facial expression, and chronemics.[14] Proximics is the study of the role of distance in communication. Kinesics refers to body motion and includes gestures, movements of the body, and posture. Body movements are indicators of how one deals with one's feelings, whereas facial expressions may show the feelings themselves. Most research in the field of nonverbal communication indicates that the face is the most reliable indicator of emotion, intention, attitude, and orientation. Eye contact, that is, visual interaction, influence how one perceives and reacts to another. During a normal transaction, there is more visual interaction when one is listening than when one is speaking. Paralanguage (vocal tone, stress,

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[14] Jerry Koehler, Karl Anatol, and Ronald Applbaum, Organizational Communication, 2nd ed. (Holt, Rinehart, and Winston, 1981), p. 54.

length of hesitations, and pauses) refers to cues transmitted by the voice but not through language. Chronemics refers to one's use of time.

Duncan's list of nonverbal communication modalities is similar to Koehler's but with minor variations. He includes facial expression and eye contact with kinesics.[15] The categories include kinesic behavior, paralanguage, proximics, smell, skin sensitivity, and use of objects.

Birdwhistell says that body motion is a system directly comparable to spoken language.[16] In Duncan's review of the literature pertaining to nonverbal communication, several studies on body movement were mentioned.[17] Dittmann, Parloff, and Boomer studied the utilization of visual cues in inferring mood.[18] A group of psychotherapists and a group of professional dancers rated the pleasantness of affect shown by a patient on silent film segments. Segments were shown with the whole body or the body with the face masked. Both groups of judges could make differentiated judgments on the basis of body movements.

One aspect of interpersonal communication is the

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[15] Starkey Duncan, "Nonverbal Communication," Psychological Bulletin 72 (August 1969):118.

[16] Ibid., p. 122.

[17] Ibid., p. 125.

[18] Ibid.

ability to interpret various signals simultaneously in order to maintain a continuous reading of another person's affective state. That is, the presence or absence of various kinds of visual information will allow a reasonable estimate of another's emotional state. This concept, which is basic to an understanding of nonverbal communication, is possible even in the absence of verbal information.

The idea that communication occurs even in the absence of language formed the basis of Bauer's study.[19] His project consisted of two independent studies of nonverbal expressive behavior. The purpose of the first study was to determine the importance of facial expression and gestural behavior in the nonverbal communication of four emotions: happiness, sadness, anger, and fear. Three experimental groups, each consisting of forty-two subjects, viewed sixteen video taped scenes of two actors and two actresses each portraying one example each of the four emotions. Group I viewed the originally taped scenes. Group II viewed the same scenes with faces of the performers masked out. Group III watched the same scenes with only the light patterns left by the performers moving through space being visible. Subjects were asked to label the emotion being portrayed along with a rating of confidence in each of their decisions. Results indicate that Group I was

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[19] Christopher Bauer, "The Perception of Affective Information From Aspects of Body Motion" (Ph.D. dissertation, Arizona State University, 1978).

better at decoding affective information than Group III.

The second experiment in Bauer's study was designed to examine intrachannel dimensions of expressive movement and their capacity to communicate affective behavior. Subjects' rating of happiness, sadness, anger, and fear were related to the movement factors of duration, tempo, radius, and direction. One experimental group saw thirty-two combinations of movement performed by a silent actress with both face and hands masked out. Another experimental group saw the same actress, but recorded so that only the light patterns were visible. Each of the movement dimensions were shown to relate to the perception of affective information. Bauer concluded that movement dimensions can be used to express emotional meaning. This is a significant study in that the results indicate a relationship between a performer's body movement and an audience's reaction to it. Although there was no musical sound in this experiment, the results suggest that body gestures may influence observers response in musical performance.

Mitchell also believes that body movement contains specific information about the emotional state of an individual.[20] He had two testable hypotheses: (1) effort-shape analysis of body movement will show regular shifts in quality

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[20] Hawkins Mitchell, "A Study of Body Movement as Expression of Emotion" (Ph.D. dissertation, Columbia University, 1979).

of movement after the stimulus-experience of specific color; and (2) varying the subjects by age, sex, ethnicity, and class, lead to differences related to one or more of these variables. Fifty-eight subjects were divided into four groups. Condition I consisted of eight subjects that were exposed to real and verbal color cues of red, blue, and yellow. Condition II subjects were exposed to real color cues (red, blue, yellow, and green). The subjects in Condition I and II were heterogeneously grouped. In Condition III, five black females and ten Iranian males selected the truest example of red, blue, and yellow from a selection of Munsell Color Standard chips. Subjects in Condition IV did the same as III, but also listed their association to the same three colors. All subjects were instructed to imagine a feeling to the color and express the feeling, nonverbally. These responses were videotaped and submitted to analysis by trained effort-shape notation analysts. The research hypotheses were supported. Data showed that muscle force and spacial quality relationships changed according to color stimulation. In this research the independent variable, color, became a replicable state or emotion. Specific colors reminded the performers of certain emotions which they acted out via body movement.

## Movement Notation

There is a lack of systematic language to describe visual cues in musical performance. However, one source for

systematic, logical, and comprehensive movement terminology is dance movement notation. The specificity with which dance notation systems can record movement is illustrated by Laban.

> Movement events in our inner and outer life have spiritual significance, and can be rendered in movement notation with more exactitude than when they are described in words.21

Although some scientists interested in movement research have studied dance movement notation systems, for the most part they have received limited use in behavioral research. The systems were developed from dance analysis and were later discovered to be applicable to any type of movement. Although there are a number of systems that may be used in behavioral research, Labanotation, Eshkol-Wachman, and Laban's Effort-Shape analysis appear to be the most popular. Effort-shape has been adapted to behavioral studies of child development, cultural difference movement, individual movement styles, and psychopathological aspects of body movement.[22]

Davis maintains that movement analysis systems can provide a valid basis for the study of movement in behavior research. She attempted to show how movement notation systems that were originally developed for recording dance were useful in providing a language for analyzing movement. She sought to

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[21] Rudolph Laban, Principles of Dance and Movement Notation, 2nd ed. (Boston: Plays, Inc., 1975), p. 17.

[22] Martha Davis, "Toward Understanding the Intrinsic in Body Movement" (Ph.D. dissertation, Yeshiva University, 1973). p. 40.

identify concepts within movement notation systems that have value for interpretation as well as for systematic description. The thesis followed a logical scenario. Principal trends in behavioral research were presented, followed by a summary of major movement notation systems. Davis developed a list of movement terms that should be relevant to behavioral research and discussed how particular movement parameters are typically used in the study of psychological and cultural phenomena. The movement glossary which illustrates the parameters of movement research is presented here in condensed form (Figure 1).[23] Davis cautions that the glossary provides a perspective on the wide range of variables one might consider, but is itself incomplete. No specific conclusions were drawn except that in some settings the application of certain parameters of movement systems may aid in behavioral research. The basic aims were to provide a demonstration of the value of using movement terminology and of deriving theories about movement that are consistent with the nature of movement. Davis' bibliography is an excellent source for identifying literature on movement dimensions.

In 1927, after several years of experimenting with expressive movement in dance, Rudolph Laban developed a nota-

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[23] Ibid., pp. 45-51.

FIGURE 1. Movement Glossary

I. Held or Maintained Aspect

- A. Body attitude or posture
- B. Position
- C. Hold

II. Mobile Aspects

- A. Body parts
- B. Spatial Aspects
- C. Kinesiological Terms
- D. Tension-Related Terms
- E. Weight-Related Terms
- F. Time-Related Terms
- G. Locomotion
- H. Group Relationship Terms
- I. Touch Patterns
- J. Pattern Features

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tion system that isolated and recorded the basics of movement in terms of direction, time, and parts of the body. The system, called Labanotation, remains an important method of notation in recording dance.

Laban's theory was refined after considerable study and investigation in many facets of life. Eventually the concepts of "effort" and "shape" became an integral part of his theory of movement.

> Effort-shape and Labanotation form the crux of the Laban theory of movement--a two-fold process. Effort-shape is a method of analyzing and recording the dynamics of movement. It does not indicate movement positions, but does describe the dynamic process of movement. Labanotation records the structure of movement and is concerned primarily with dance. It indicates direction of movement, level, weight, shift, and metrical units of time. Effort-shape is used to reveal the expressive

> qualities of movement energy in artistic and functional behaviors. Effort-shape has its own system of notation.[24]

Basically, effort-shape is concerned with how one moves rather than what one moves. It provides a way of analyzing the qualitative and intensity aspects of movement. A few research projects have adapted the concepts of effort-shape to the field of conducting.

## Studies in Music

Musicians overwhelmingly agree that body movement is vitally important in the development of one's musical sensitivity, as it relates to the development of performance technique. Keil,[25] Lippman,[26] and Boots[27] suggest that visual cues are primary communicators in musical performance. Mill says that "real pros weave and bend with the music . . . they put their whole bodies into the music."[28] Vinorich found that the major communicative value of music is affective, and that

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[24] Neale K. Bartee, "The Development of a Theoretical Position on Condocting Using Principles of Body Movement as Explicated by Rudolph Laban" (Ph.D. dissertation, University of Illinois at Urbana-Champaign, 1977), pp. 97-98.

[25] Charles Keil, "Motion and Feeling Through Music," Journal of Aesthetics and Art Criticism 24 (Spring 1966):337.

[26] Lippman, "Spatial Perception and Physical Location as Factors in Music," p. 24.

[27] Frederic Boots, "A Judicious Amount of Showmanship," Instrumentalist 25 (January 1971):60.

[28] Donn Mills, "Eurhythmics for Orchestra," Instrumentalist 37 (October 1982):64.

audiences often make the visual message cognitively fit the musical affect.[29] Pianists, percussionists, string players, singers, and music educators are vitally interested in this phenomenon.

Performers and teachers are often eager to share their methods of musical performance and pedagogical methods. This tendency is especially obvious in articles about piano performance. Pierce,[30] Chapman,[31] Kessler,[32] and others have emphasized the importance of knowing one's body, its capabilities and restrictions, so that one can integrate the whole body in playing the piano. In general they believe that one's style of playing can be translated into its counterpart in movement. Piazza,[33] Schultz,[34] and Bryant[35] agree that well-conceived

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[29] G.S. Vinovich, "The Communicative Significance of Musical Affect in Eliciting Differential Perceptions, Cognitive, and Emotion in Sound-Motion Media Messages," Dissertation Abstracts 36 (May 1976): 7031-A.

[30] Alexandra Pierce, "Body and Performance," Piano Quarterly 22 (Spring 1974):25-26

[31] Norman Chapman, "Freedom at the Keyboard," American Music Teacher 18 (February/March 1969):29.

[32] Minuetta Kessler, "Body Power and Technique," Clavier 20 (January 1981):31-33.

[33] Gabriel di Piazza, "Psychology in Technique: A Demonstration," Piano Quarterly 83 (Fall 1973):25.

[34] Arnold Schultz, "The Psychological Mechanics of Piano Playing," American Music Teacher (May 1951):6.

[35] Celia Mae Bryant, "Keyboard Problems and Physcial Solutions," Clavier 3 (September 1964):15-17.

movements may determine musical nuance, but they make little effort to draw conclusions regarding the influence of these movements on listeners.

String pedagogues and performers echo the sentiment of pianists.[36] While Pallie,[37] Rolland,[38] Fischer and others recognize the need for a performer to study and practice efficient body movement, they draw no conclusions regarding the effect of body movement on listeners.

With the exception of the specialized area of conducting, most literature in the field of music ignores the potential impact of a performer's visual cues on a listener's qualitative response to musical performance. A brief review of studies related to conducting will be followed by an overview of literature related to percussion and marimba performance.

Conducting

One may wonder how some conductors seem to communicate certain nuance with very little body motion while others appear to gyrate themselves into a frenzy. What did Richard

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36 W. Pallie, "Kinesthetic Skill of the Violinist," Strad 91 (September 1980):336-337.

37 Paul Rolland, "Movement in String Playing as it Relates to the Violin," American String Teacher 29 (Winter 1979):8-11.

38 Bernard Fischer, "Playing the Violin with Confidence: Tension and Relaxation," American Music Teacher 19 (April/ May 1970):24-25.

Strauss, Reiner, and other great orchestral conductors have in common? Culshaw believes that it was a special kind of communication in the eyes.[39] Interestingly, a conductors eyes serve as a communicator to performers, not listeners. Most audiences never see the conductor's eyes and are probably unaware that they may be his secret and most powerful device.

Several studies regarding conductor effectiveness address the issue of body movement. The purpose of Yarbrough's study was to investigate the effect of magnitude of conductor behavior on performance, attentiveness, and attitude of students in mixed choruses.[40] Four mixed choruses were rehearsed under three conditions: (1) with the regular conductor; (2) with a high magnitude conductor; and (3) with a low magnitude conductor. The experimental conditions, high and low magnitude, were operationally defined a priori by Yarbrough and included categories such as eye contact, gestures, facial expression, closeness, volume and modulation of the voice, and rehearsal pace.[41] A Choral Rehearsal Observation Form and a Music Conductor Observation Form were used to record student activity, number of students off-task,

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[39] John Culshaw, "Eyes," High Fidelity/Musical America 28 (August 1978), p. 19.

[40] M. Cornelia Yarbrough, "the Effect of Magnitude of Conductor Behavior on Performance, Attentiveness, and Attitude of Students in Selected Mixed Choruses" (Ph.D. dissertation, Florida State University, 1973).

[41] Ibid., pp. 23-24.

conductor approval/disapproval verbal responses, and conductor activity. Although results indicated no significant differences in musical performance, attentiveness, or attitude ratings among baseline and the two experimental conditions, high and low magnitude, three of the groups received their lowest ratings under the low magnitude condition, off-task percentage was lower during the high magnitude condition, and data demonstrated student preference for the high magnitude conductor.

In a 1975 study Ervin developed a systematic method for the observation of conductor effectiveness.[42] "Effectiveness" was defined as conductor behaviors which result in short term improvement of performance. Thirty-seven video recordings of ten minute length were made of junior high, senior high, and college level instrumental and vocal conductors. Tapes were rated by a panel of five judges using a seven point scale. Using a list of thirty-five variables to discriminate between good and bad conductors, the conductors were ranked and the fourteen highest and the fourteen lowest ranking were observed and coded to determine the frequency of each of the thirty-five variables. Data obtained from the two groups were analyzed by a stepwise discriminant analysis program to determine the eleven variables that were the best indicators. Two

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[42] Charles Ervin, "Systematic Observation and Evaluation of Conductor Effectiveness" (Ph.D. dissertation, West Virginia University, 1975).

nonverbal communicators, body movement and eye contact, were among the variables selected as the best indicators of conductor effectiveness. The eleven variables selected as the best indicators of conductor effectiveness were then incorporated into a systematic method of observation.

Lewis stated that "one of the most important skills which must be acquired by a director of vocal music is the ability to communicate nonverbally . . . ."[43] Conductors use hand, body, and facial gestures to convey rhythmic, dynamic, and emotional content to performers. The purpose of Lewis's study was to develop and validate a system for the observation and analysis of choral conducting gestures. She developed the Choral Conductor Observation System (CCOS) in an effort to provide a system for training inexperienced conductors. The basic system consisted of seventeen categories which describe specific gestures used by conductors of musical organizations. All of the seventeen categories were nonverbal communicators that require only movement of the various body parts. Data indicated that the CCOS was useful in objectively evaluating student progress. In her review of the literature, Lewis recognized the importance of nonverbal communication and its implications for research in musical performance. She identified several areas of nonverbal research that might be applied

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[43] Karon G. Lewis, "The Development and Validation of a System for the Observation and Analysis of Choral Conductor Gestures" (Ph.D. dissertation, Texas A & M University, 1977).

to music--facial expression, body movement and position, proxemics, gestural behavior, and visual contact.

Roshong also investigated nonverbal cues in conducting.[44] The purpose of his study was to develop an observational instrument that would inventory the nonverbal communication of conductors to see if relationships existed between the observed nonverbal behavior and the nature of the task being performed at the time the behavior occurred. This study is important for attempting to determine whether the intensities of observed nonverbal behaviors are related to the context in which the behavior occurs. Roshong's Conductor Nonverbal Behavior Observation Form consisted of eight categories, the first five of which were divided into two or three subcategories. A brief examination of this form clearly illustrates the extent to which nonverbal cues were measured. Roshong's investigation and subsequent interpretation of data emphasized the impact on the conducting process of nonverbal cues such as facial expression, conducting gesture, eye contact, and body movement.

Each of the preceding studies applied observational techniques to determine types and frequency of behaviors in conducting situations. In addition, each study devoted at least a portion of the investigation to the task of identi-

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[44] Jan C. Roshong, "An Exploratory Study of Nonverbal Communication Behaviors of Instrumental Music Conductors" (Ph.D. dissertation, Ohio State University, 1978).

fying and labeling nonverbal elements in conducting, primarily body movements. Since they support the notion that visual inputs in conducting are strong influences on performers, perhaps the results may be transferred to the area of instrumental performance.

The purpose of Garber's investigation was to analyze and discuss the ideas on conducting gathered from selected treatises of the nineteenth and twentieth centuries in the English language.[45] He was primarily interested in ideas having to do with the means and content of conducting communication. Garber discussed ideas concerned with the audience as the recipient of the conductor's activity on a visual as well as audient level. His review of selected references reflects two philosophical perspectives: (1) What should be the nature of audience-experience of a conducted orchestral performance? (2) What constitutes quality in the conducting act as it relates to the audience? Two opposing positions can be identified from the first perspective. The first is that audience reception and experiencing of the means and contents of the conductor's communication should be on an audient level only. The second is that the experience of the audience should be on the audient level and on a visual plane as well.

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[45] Herbert Garber, "A Study and Analysis of Ideas on Communication in Modern Orchestral Conducting Drawn from Selected Readings" (Ph.D. dissertation, Teachers College, Columbia University, 1971).

As Lewis states:

> . . . 'by no means can . . . the code of signals and gestures which the conductor uses . . . be considered as part of the performance.' The opposite side of the issue is voiced by Braithwaite like this: 'I think that every member of an audience has the normal amount of flesh and blood in his make-up and likes to see the conductor enjoying the more robust moments of music as well as the quiet ones.46

These apparently opposing views accentuate the very premise of the current investigation. Do the two components of musical experience, aural and visual stimuli, interact to influence one's response?

The purpose of Bartee's study was to examine the writings of Laban as a basis for improving body movement in orchestral conducting.[47] He defined conducting as a process of translating an aural image into the body movements that direct players to produce sound. The conductor's instrument is his whole body. The need for the study was justified by recognizing three deficiencies in conducting theory and practice: (1) there is a lack of principles of body movement in textbooks; (2) there is a failure to teach principles of movement in conducting; and (3) many conductors have limited ideas of the possibilities of expressive movement. The

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46 Ibid., p. 271.

47 Neale King Bartee, "The Development of a Theoretical Position on Conducting Using Principles of Body Movement as Explicated by Rudolph Laban" (Ph.D. dissertation, University of Illinois at Urbana-Champaign, 1977).

rationale was based on four assumptions: (1) conductors conceptualize the patterns of motions in the expressive line of a composition; (2) conductors communicate these concepts with gestures; (3) a theory of body movement exists that deals with communication in all the movement arts; and (4) conductors might benefit from knowing additional ways of communicating to his players through expressive body movement.

Specific implications of Laban's theory in Bartee's study dealt with the communication of feeling, translation of expressive line to gesture, phrasing, podium presence, efficiency in rehearsal, visibility, clarity, awareness of bodily feel for movement, range of movement expression, economy of motion, learning, and practice. General implications included the adaptation of Laban's theory to the teaching of conducting. Bartee believes that the application of aspects of Laban's theory is one basis for improving conductors' knowledge and awareness of the body's expressive potential.

Poch adapted certain features of effort-shape to teaching conducting to undergraduate students.[48] She agrees with Bartee that standard conducting textbooks deal with spacial reproduction of patterns and fail to provide tangible methods for developing subtleties of gesture. Poch believes that "if the conductor does not understand movement potential

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[48] Gail Poch, "Conducting: Movement Analogues Through Effort-Shape," Choral Journal 23 (November 1982):221.

and its relationship to music, his palette is limited to monochromatic expression."[49] After incorporating effort-shape principles in undergraduate conducting classes, Poch believes that the traditional "imitation" method of learning conducting patterns is obsolete. "Movement analysis provides guidance for the students in predetermining the physical quality of a gesture so that is will actually serve the musical idea."[50]

Julian agrees with the ideas set forth by nonverbal communication research in that a conductor may send several messages simultaneously. "Facial expressions show the type of emotion while body cues indicate the intensity of the emotion displayed."[51] These messages might be sent by way of one's face, eyes, or arms. While most aspects of nonverbal communication are learned subconsciously through trial and error, Julian suggests that the results of nonverbal communication research be applied to teaching and learning conducting techniques.

Collectively, authors of articles and research studies pertaining to conducting view the process of conducting from a single point of view. The viewpoint is illustrated by Clark:

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[49] Ibid., p. 221.

[50] Ibid., p. 221.

[51] F.D. Julian, "Nonverbal Communication and the Conductor," Instrumentalist 35 (November 1980):64.

". . . conducting is one of the few disciplines in which an aesthetic, artistic, even metaphorical idea is transferred into a physical gesture which is supposed to approximate that idea."[52] Unfortunately, most of the research deals with the influence of a conductor's gestures on performers, not listeners. While there is consensus among authors that conducting involves communication and that all parts of the body are indicators of expression, there is little evidence to support the notion that a conductor's visual attributes may influence a listener's response to musical performance.

Percussion

The psychological and musical variables that a percussionist can manipulate have never been thoroughly identified. Moreover, a review of the literature pertaining to percussion pedagogy and performance reveals (1) discussions regarding the superiority of one teaching method over another without clearly outlining or describing the parameters of either method, (2) discussions concerning the maintenance of instruments, or (3) reviews of percussion solos and ensembles.

Hong is the only author who has focused on the potential influence of a performer's visual cues on an audience. "Every movement that a musician makes during a performance should be

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[52] Stewart Clark, "Music's Body Language on the Psychophysiology of Conducting," American String Teacher 33 (Summer 1982):34.

expressive of the music."[53] This statement implies that every gesture, every expression used in performance elicits some association of musical meaning. Hong believes that just as a dancer conveys meaning through body movement, so does the percussionist. One specific movement that may increase the association between the two is "drawing" the sound out of the instrument. This refers to a slight lift of the mallet immediately after impact. Hong maintains that "the rate of speed of the stick movement away from the struck surface depends on musical tempo and stylistic markings."[54] For example, staccato style requires a quick movement, while legato playing indicates a slow, deliberate motion. He recommends teaching this concept through a vocal approach. Certain syllables are assigned to rhythmic patterns with the percussionist concentrating on making the instrument's sound match that which is vocally produced. He believes that singing rhythms in this manner will make the percussionist more conscious of agogic accent.

That movement and sound may be closely related in percussion performance is also given support by Hong:

> the tambourine is able to utilize the shake roll and give the illusion of changing the dynamics of the roll. The tambourinist cannot roll softer by using less and

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[53] Sherman Hong, "Enhancing Performance Through Imagery," Instrumentalist 22 (May 1968):103.

[54] Ibid.

> slower wrist action . . . . Using these facts; that people associate dyamics with position, that people hear with their eyes, and that absorbent . . . materials in front of the sound wave will absorb much of the sound, we can say that the percussionist really does produce dynamic changes in the shake roll . . . the percussionist produces descrescendi by lowering his arm to his side or behind the body. The resultant sound is softer.55

Hong agrees with the results of research in nonverbal communication stating that body movements and facial expressions of the performer may have a definite effect on the listener. He suggests percussionists utilize all the psychological, aural, and motor imagery possible to interpret percussion parts more musically.

In response to a perceived need to impress listeners at percussion ensemble concerts, Peck developed several ways to visually attract the listeners attention.[56] He suggests two types of visual impact--the sensational type and that which emphasizes the musical qualities of the music. The goal of a concert is to project musical(aural) thought, but if the visual communication of appropriate thought is poor, impact may be lessened. The performers primary means of communicating is to immerse the audience in a concert experience which includes aural as well as visual components. Peck identified several strategies to increase impact: (1) rehearse every aspect of the stage arrangement; (2) use lighting ideas to

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55 Ibid., p. 104.

56 Russell Peck, "Percussion Concerts: Impact and How to Achieve It," Instrumentalist 33 (September 1978):60-62.

establish atmosphere; and (3) consider the visual impact of performers' placement and movement.

With regard to lighting and physical arrangement of the percussion ensemble, "it is possible to think of the percussion concert with its beautiful and exotic instruments and its visually active performance as an experience in theatre as well as music."[57] It is in this sense that percussionists make designs and patterns in their movement. Percussionists can make designs independent of other players or they can create visual designs that interact with designs made by other players. He even suggests that certain actions may be more interesting if the player is seen in profile.

There is no absolute model to follow when designing visual elements in percussion performance. Each player relies on his sense of proportion and judgment. While there are several entities in a musical concert that might receive attention regarding visual cues, Peck thinks that the most crucial time is just prior a performance. If the audience's attention is not focused on the music, they will respond to the mechanics of producing the work and not hear the music. One should ask whether a particular piece is being presented in the visual context that will be most effective to the audience.

Ervin agrees with Peck that one needs to plan specific

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[57] Ibid., p. 62.

sequences of motion involving the hands, feet, torso, and legs. "Choreography is the art of planning body movement; it is a necessary concept for the multiple percussionist."[58] The difference between the approach taken by Peck and Ervin lies in the relationship to the audience. Peck sees visual cues in performance, whether they are performers' body movements or something in the physical setting, as having a direct impact on the audience. Ervin's view is more traditional in that body movement is considered an integral part of developing performance technique and musicianship. That the correct use of the body will improve all types of percussion playing is illustrated by Ervin:

> The percussionist/choreographer, standing with the weight evenly distributed, in a relaxed but athletic posture, allows the motion of the hands and arms to be followed by the body, with some bending of the knees or hips or turning of the torso. Not only is the body follow-through necessary for smooth playing, . . . there are many instances in which body anticipation can help smooth out a difficult passage . . . . [59]

In regard to teaching percussion, Beck believes that it is important to see as well as hear oneself play.[60] A major part of percussion instruction is visual, since the teacher can "see" what is happening. Beck thinks that audio-

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[58] Karen Ervin, "Choreography in Multiple Percussion Playing," Instrumentalist 32 (March 1978):96.

[59] Ibid., p. 97.

[60] John Beck, "Audio-Visual Aid in Percussion Instruction," Music Journal 26 (March 1968):66.

visual aids may be useful in detecting stiff and awk ward movments. Beyond that observation, he stops short of identifying the importance of movement in percussion performance.

Schultz used movement strategies normally incorporated in elementary music education to teach dynamics to young percussionists.[61] His method consisted of two parts: improvising on percussion instruments to a specific story-line, and introducing movement to percussion playing. By using movement to learn dynamics, a student physically imitates a character thus making all the changes in posture that a particular character might portray. Schultz's premise was that "movement is an emotion-releasing, and emotion-clarifying act in itself."[62] By using this story-telling approach complete with action and body movement, students were better able to form concepts related to the performance of dynamics.

Stauffer's motion and muscle study of percussion performance outlines some of the common movements used in percussion playing and how the laws of motion influence them.[63] He makes no attempt to relate the physiological problems of playing to their effect on an audience. Movement is approached

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61 Terry Schultz, "The Use of Theatrical Techniques in Teaching Dynamics," Percussive Notes 18 (Spring 1980):74-76.

62 Ibid., p. 75.

63 Donald Stauffer, "A Motion and Muscle Study of Percussion Technique," Percussionist 5 (March 1968):290-298.

from the traditional point of view; it controls the type and quality of sound. He is most interested in explanations of motion and muscle efficiency as they apply to single strokes of varying heights, their speed, and the resultant effect on dynamics. The study provides logical reasons for various physiological processes involved in playing percussion instruments that will ultimately help one to improve movement efficiency, but there is no attempt to investigate the influence of those efficient movements on audience response.

Marimba

Marimba technique has received increased attention in recent years. Composers have written music that places new technical demands on performers. Consequently, marimbists have responded by developing new techniques and procedures that enable them to adequately perform this newer music. Additionally, there has been an enormous surge in the quantity of periodical articles regarding the new techniques and their application to the literature. Most of these articles are limited to discussions related to how one holds the mallets, how one strikes the instruments, how one positions the body and its various parts in order to "reach" certain notes, and the effect of various mallets.

Gaetano's article is typical. He briefly discusses an appropriate time to begin playing with four mallets,

available grips, and choice of method book.[64] He outlines several elementary exercises for a beginning four-mallet player. Gard discussed techniques required to play selected marimba literature.[65] Three techniques (sustained, nonsustained, and independent) relating to four-mallet technique were discussed and applied to one composition.

The technical aspects of playing the instrument with four mallets, two in each hand, has received considerable attention. The need to know more about this technique, although it has certainly been a part of marimba performance for many years, grew out of increased compositional activity calling for difficult four-mallet manipulations. Four-mallet technique includes many simultaneous skills "having as its ultimate goal a musical performance in which all four mallets are throughly integrated in the playing process."[66] The introduction of new literature and subsequent techniques for playing the literature has seen marimba performance stand out in its own right, and not exist merely as an extension of two-mallet playing.

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[64] Mario Gaetano, "Beginning Four-Mallet Playing," Instrumentalist 35 (January 1981):66.

[65] Ronald Gard, "A Description of Three Percussion Keyboard Techniques Relative to the Use of Four Mallets." Percussionist 15 (Fall 1977):7-16.

[66] John R. Raush, "Four-Mallet Technique and its Use in Selected Examples of Training and Performace Literature for Solo Marimba," (D.M.A., University of Texas at Austin, 1977), p. 119.

The technique of any instrument does not exist as an entity separate from all other aspects of performance. It is integrated with the intellectual and artistic attributes that any performer may possess. Every marimbist, for example, is affected by physiological restrictions of technical development, such as the principles regarding motor activity, in addition to intellectual endowment or development. "The study of the physical conditions of marimba performance is . . . a study of movement."[67] Nevertheless, this area receives little attention in standard texts and methods for marimba or keyboard percussion. Any mention is usually limited to a discussion of the action of the wrists. Raush indicates two reasons for the neglect of texts in describing and discussing specific movements involved in marimba performance: (1) the manifold positions and movements would defy verbalization, and (2) there is a lack of an accurate terminology pertinent to marimba performance and pedagogy.[68]

Raush's very brief discussion of some of the physically-oriented problems caused by the construction of the instrument is one of few like it.[69] However, it is a beginning to understanding the technical problems inherent in marimba performance that result form the interaction of in-

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67 Ibid., p. 120.

68 Ibid., p. 121.

69 Ibid., pp. 120-162.

strument construction and the performer's resultant physiological adjustment. Unfortunately, a void of information exists concerning the effect of a performer's "necessary" body movement on the listener's perception of a performance.

Modern marimba literature exploits the entire range of the instrument. For this reason there is a problem involving physical adjustment to a long instrument. Its inordinate length, the variance of width in bar size, and the absence of the marimbist's tactile awareness of his instrument tend to confound the problem of physical adjustment. All of these factors contribute to the amount of movement required in performance. Raush illustrates how the length of the marimba affects one while playing.

> The extreme length of the instrument has probably created more problems for the marimbist than any other single factor. Many students attempt to play the marimba with their feet planted firmly in one spot, body vertical and unbent, limiting their movement to their arms, which they extend to the right and left, up and down the keyboard as needed. Obviously, this confines the player's range to a few octaves at best, unless he constantly shuffles his feet along the floor, or walks back and forth in front of the instrument.70

In his dissertation Raush made simple suggestions regarding how one might make certain movements more efficient. The crux of his method was a system of pivots that tend to increase efficiency.

Spacial orientation is also a problem that marimbists

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70 Ibid., p. 122.

confront. This is caused by the degree of variation in bar width. The smallest bar is a full seven-eighths inches narrower than the largest bar. The distance between notes an octave apart in the highest register is five and five-eighths inches less than notes an octave apart in the lowest register. Another problem regarding spacial orientation is that the largest bars are approximately twice the length of the smallest, "resulting in a keyboard shaped in the form of a long trapezoid."[71] This creates yet another adjustment problem for the marimbist, a problem that will undoubtedly influence his movement while playing.

## Conclusion

A review of the literature reveals little insight into the effect of a performer's physical gestures on listeners' qualitative response to musical performance. The relationship between performer and listener is an important one. While some claim that music exists only for the listener's aural enjoyment, there is a special line of communication that takes place visually between performers and listeners which seems essential to examine.

Clues to the development of strategies to enhance visual elements in musical performance may be found in other arts that share a common aesthetic ground--theatre, dance,

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[71] Ibid., p. 127.

design, painting, and sculpture. While there is no guarantee of communication in any performance, by incorporating what is known "intuitively" about visual impact one may increase the likelihood that more listeners will perceive the full intent of a musical performance.

# CHAPTER III

## DESIGN OF THE STUDY

Professional musicians, music educators, and psychologists agree that judgments of the quality of "live" musical performance may be strongly influenced by visual as well as aural stimuli. The purpose of this study was to determine whether solo marimbists' visual attributes influence listeners' perception of quality. In addition to determining if there is a difference between a listener's perception of the quality of aural performance and that of visual/aural performance, the study sought to determine the influence of a performer's positive or negative affect. This aspect of the study necessitated the development of criteria for identifying positive or negative affect. It is unlikely that a consensus can be reached concerning the identification of those specific visual attributes that affect one's perception of the quality of a musical performance. However, for purposes of this study positive or negative visual attributes of a marimbist's performance refer to overt physical behaviors manifest in any of the various parts or expressions of the human body that tended to enhance or detract from a musical

performance. The independent variable, positive or negative affect, was therefore operationally defined *a priori* as the combined affect of aural and visual phenomena including a performer's bodily movements that may enhance or detract from the qualitative assessment of live musical performance.

The design of the study is presented in terms of the selection of subjects, selection of performers, selection of music, performance preparation, video recording procedure, performance evaluation by subjects, the evaluation instrument, and data analysis.

## The Setting

The study was conducted during the Spring semester of the 1984-85 academic year on the campus of the University of North Carolina at Greensboro (UNC/G). Located in Greensboro, North Carolina, a city of approximately 150,000, UNC/G is a state university with an enrollment of 10,000 students. Approximately 2,700 of those students are pursuing graduate degrees. The School of Music consists of a full-time faculty of fifty and a student enrollment of approximately 325 full-time music major students.

## Selection of Performers

Seventeen solo marimbists were selected from three universities in North Carolina having full-time percussion teachers. East Carolina University, Appalachian State University, and The University of North Carolina at Greensboro were

the participating schools.[1]

Each percussion teacher was contacted and asked to recommend several student marimbists that met specific criteria and would agree to participate in the study. The teachers received a copy of the musical composition selected for the study so that they could match students' performance achievement with specific technical requirements. Performers were not informed of the nature of the study.

Prospective participants were required to meet several qualifying criteria.

1. Each performer had to be male
2. Each performer was required to have skill at playing with four mallets
3. Each performer was required to have technique adequate to perform the designated musical composition
4. Each performer had to agree to learn the composition within a specified time frame
5. Each performer had to agree to memorize the selection and perform it from memory for video recording.

Seventeen marimbists were selected for the first portion of the study. They included one college freshman, three sophomores, five juniors, four seniors, and four graduate students. Their ages ranged from eighteen to twenty-nine. Tables 22, 23, and 24 illustrate specific information regarding performers' ages and academic classications (Appendix E).

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[1] The investigator is the percussion instructor at The University of North Carolina at Greensboro.

## Selection of Music

All marimbists performed the same musical selection. In order to control as many variables as possible, specific criteria for selecting the composition were developed:

1. The composition had to be a four-mallet unaccompanied marimba solo
2. The composition needed to be no less than one and one-half minutes and no more than two and one-half minutes in length
3. Given the influence of other criteria the composition should be of substantially good quality (as judged by the investigator and one additional authoritative source)
4. Due to its musical style and arrangement, the composition needed to provide opportunities for performers to make exaggerated movements while playing
5. The composition should illustrate changes in musical style, dynamics, and nuance
6. The composition should not be a familiar melody that may be immediately recognized by the subjects.

Selecting an unaccompanied marimba solo rather than an accompanied solo also helped to control potential sources of error. It eliminated the need to find an accompanist who would have been willing to commit the necessary time to the study. Since the performances were recorded in several locations, it would have been impossible to control the quality of the accompanying instrument. An accompanying instrument would have presented an additional sound source, making it difficult to ascertain the specific aural stimuli influencing the listener.

While selecting an appropriate musical composition for

the study an additional criterion emerged. The difficulty of the piece had to be within a level that would allow as many performers as possible to prepare it given the limited time frame of approximately three weeks; while still not interrupting their normal sequence of study. Several pieces were musically and technically appropriate, but few met the last criterion. The first movement of Suite Mexicana by Keith Larson, published by Southern Music Company, satisfied all the critical criteria and was selected for the study.

## Performance Preparation

After receiving recommendations from the participating percussion teachers, the investigator met with the seventeen marimbists in their respective schools to provide instructions regarding the procedure for performance preparation. Each performer was given a published copy of Suite Mexicana and the following instructions were provided:

1. Prepare and memorize the first movement of Suite Mexicana
2. Follow all musical markings carefully (tempo, dynamics, etc.)
3. Do not to discuss the composition with other performers. It is permissable to consult your teacher if specific technical problems occur
4. Use four yarn-wrapped mallets of medium hardness such as Malletech brand, model LS 15
5. The performance instrument will be a Musser model M-150, a four-octave marimba with graduated bar size
6. Practice on a four octave instrument and avoid instruments of greater or lesser range

7. Wear black trousers, long-sleeve white shirt, and black shoes and black socks for the video recording session

8. In order to achieve consistency during video recording, one should begin with mallets in hands, gently resting at the side of the body

9. At the conclusion of the performance, return to the original position. Video taping will terminate approximately five seconds after the final note is played. (The procedure explained in numbers 8 and 9 was throughly explained and demonstrated by the investigator.)

10. On the date scheduled for video recording, fifteen minutes will be allowed for warm-up and becoming familiar with the instrument and fifteen minutes to record the selection, for a total of thirty minutes

11. Arrive early to avoid any delay.

The investigator's name, address, and telephone number were given to each performer. A performance date and specific times for each marimbist were scheduled during the initial visit with approximately three weeks allowed between first contact and the video recording session.

## Video Recording Procedure

The stimuli consisted of multiple video taped solo marimba performances of the same selection. The investigator personally video recorded each performance with identical sound-video equipment. High quality equipment was utilized which allowed visual/aural and aural performances to be played back with superior results. A Panasonic Model WV-3170 industrial video camera and a Panasonic Model NV-8420 portable video cassette recorder with VHS format was used to record all

performances. Each performance was recorded with only the investigator and performer present. The camera and microphone were placed directly in front of the instrument and performer at a distance that allowed a full view of the width of the keyboard of the marimba, extending slightly below the waist to several inches above the head of the performer.

In order to achieve consistency in performance procedure, each performer began with mallets in hands, gently resting at the sides of the body. This allowed a brief visual orientation before presenting the aural stimuli. The performer was instructed to return to the original position following the last note of the composition. Other nonmusical stimuli such as clothing were identical for each performer with the exception of the color of mallets. A slight variation in the color of mallets selected by the various performers existed. A portable black back-drop was designed and used for all video recorded performances.

## Experienced Listeners

A panel of six experienced listeners, selected on the basis of their experience in evaluating musical performance, viewed and rated for overall visual/aural effect a video recorded performance by each of the seventeen marimbists. Visual attributes of any "live" musical performance were defined as a performer's movements manifest in any of the various parts or expressions of the human body that tended to

enhance or detract from the musical performance.

The panel of experienced listeners were teachers and performers with diverse musical and professional backgrounds. Their combined strengths may have increased the likelihood that the results were typical of a larger population of experienced listeners. Members of the panel were the full-time instructor of guitar at UNC/G, a music theory teacher at UNC/G, a UNC/G doctoral student in trumpet, a professional cellist with the North Carolina Symphony, a doctoral student in music education at UNC/G with twelve years of public school teaching experience, and a UNC/G master's degree student with several years experience as a public school band director.

Information regarding the experienced listeners' reactions to the visual and aural attributes of each performance was obtained via the Experienced Listener Evaluation Form (ELEF) (Figure 2). Two seven-point bipolar scales served as the instrument for measurement. A brief orientation to the recorded sound of the marimba and specific directions about the use of the ELEF were included in the evaluation session (Appendix C). In addition to obtaining responses to each performer's visual and aural performance, judges were asked to describe the criteria on which their evaluation of the visual attributes of the performance was based. Their written responses are presented in Appendix B.

FIGURE 2. EXPERIENCED LISTENER EVALUATION FORM

Performer_____
Evaluator_____

1. Place an X in the space that best indicates the aural effect of this performance.

Negative____|____|____|____|____|____|____Positive

2. Place an X in the space that best indicates the visual effect of this performance.

Negative____|____|____|____|____|____|____Positive

3. Briefly describe the criteria on which your answer to question number two was based.

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One of the primary purposes of involving experienced listeners in the study was to help identify through objective evaluation those performers that tended to be perceived as positive or negative for the main study independent variable, positive or negative performance. Toward this end, mean scores for each of the ELEF questions were computed and those performers receiving a score from 4 to 7 were identified *a priori* as "positive" marimbists, and performers with mean scores between 1 and 3.9 were considered "negative". The range of mean scores for all seventeen marimbists' aural presentations was 1.0 to 5.2 while visual scores ranged from 1.5 to 5.7. Each range resulted in an identical difference of 4.2. Mean scores for visual performances were numerically

higher indicating that the visual component of musical performance for experienced listeners was perceived more positively than the aural component.

Data indicate that seventy percent of the performers were rated more positively on the visual attributes of their performance while thirty percent received ratings in favor of their aural presentation. Eight marimbists were rated positively on both aural and visual varibles while seven were perceived as negative on both attributes. One performer received a positive aural and negative visual score and one performer received a negative aural and positive visual score. Table 1 gives the mean scores for all seventeen performers.

Although comparisons of mean scores and subsequent categorization of each performer as positive or negative for the independent variable created four stratified groups (see Table 2), the number of performers associated with each category shows evidence of greater strength in the first two groups. Three performers with negative evaluations on both aural and visual as well as three performers with positive mean scores on both visual and aural attributes were randomly selected to be evaluated by thirty-seven nonprofessional music consumers. Table 3 gives the mean scores for the six marimbists whose taped performances provided the stimuli for the main study.

TABLE 1

PERFORMER'S MEAN SCORES

| Performer I.D. No. | Aural Mean | Visual Mean | Aural + = Positive - = Negative | Visual |
|---|---|---|---|---|
| 1 | 3.0 | 3.5 | - | - |
| 2 | 5.2 | 5.0 | + | + |
| 3 | 4.0 | 4.2 | + | + |
| 4 | 5.2 | 3.7 | + | - |
| 5 | 5.0 | 4.5 | + | + |
| 6 | 5.0 | 5.7 | + | + |
| 7 | 4.9 | 4.4 | + | + |
| 8 | 2.4 | 4.5 | - | + |
| 9 | 5.2 | 5.7 | + | + |
| 10 | 3.4 | 3.5 | - | - |
| 11 | 4.6 | 3.2 | - | - |
| 12 | 5.2 | 5.5 | + | + |
| 13 | 2.0 | 2.7 | - | - |
| 14 | 1.0 | 1.5 | - | - |
| 15 | 4.2 | 4.7 | + | + |
| 16 | 2.4 | 3.7 | - | - |
| 17 | 3.7 | 3.9 | - | - |

TABLE 2

STRATIFIED GROUPS

| Group | Aural | Visual | Total |
|---|---|---|---|
| 1 | + | + | 8 |
| 2 | - | - | 7 |
| 3 | + | - | 1 |
| 4 | - | + | 1 |

TABLE 3

PERFORMER'S SELECTED FOR MAIN STUDY

| Performer I.D. No. | Aural Mean | Visual Mean |
|---|---|---|
| Positive Performers | | |
| 6 | 5.0 | 5.7 |
| 9 | 5.2 | 5.7 |
| 12 | 5.2 | 5.5 |
| Negative Performers | | |
| 10 | 3.4 | 3.5 |
| 13 | 2.0 | 2.7 |
| 14 | 1.0 | 1.5 |

## Selection of Subjects

Subjects were thirty-seven college undergraduate non-music majors recruited from a class entitled "Music For the Classroom Teacher" taught during the 1985 Spring semester at UNC/G. Information concerning age, sex, classification, academic major, previous musical experience and name was gathered at the first evaluation session via the Evaluator Information Form (EIF)(Appendix A). The subjects for this study were selected primarily due to their accessibility, and with one exception were all female. Research results must therefore be interpreted in light of this skewed sex variable. Even though they were members of an elective, multi-section course within a total student body of 10,000, it is more likely they represented a larger population of non-professional female music consumers rather than a combined population of male and female consumers.

Ages ranged from nineteen to forty-one with approxi-

mately seventy-six percent of the sample falling between the ages of nineteen and twenty-one and twenty-four percent between the ages of twenty-three and forty-one. Seventy-five percent of the sample were early childhood majors at the sophomore and junior levels. Table 4 illustrates subject information obtained from the EIF.

TABLE 4

SUBJECT INFORMATION

| Category | Number | Proportion |
|---|---|---|
| Academic Major | | |
| Early Childhood Education | 28 | .756 |
| Intermediate Childhood Ed. | 5 | .135 |
| Nursing | 1 | .027 |
| Deaf Education | 1 | .027 |
| English | 1 | .027 |
| Child Development & Family | 1 | .027 |
| Sex | | |
| Male | 1 | .027 |
| Female | 36 | .972 |
| Age | | |
| 19 | 8 | .216 |
| 20 | 28 | .756 |
| 21 | 6 | .162 |
| 23 | 1 | .027 |
| 24 | 1 | .027 |
| 26 | 1 | .027 |
| 27 | 1 | .027 |
| 29 | 1 | .027 |
| 30 | 1 | .027 |
| 32 | 1 | .027 |
| 36 | 1 | .027 |
| 41 | 1 | .027 |

TABLE 4--Continued

| | | |
|---|---|---|
| Classification | | |
| Freshman | 0 | .00 |
| Sophomore | 18 | .486 |
| Junior | 11 | .297 |
| Senior | 4 | .108 |
| Graduate | 2 | .054 |
| Other | 2 | .054 |
| Musical Background | | |
| High School Chorus | 14 | .378 |
| High School Band | 9 | .243 |
| Piano | 20 | .54 |
| Guitar | 0 | .00 |
| Church Choir | 25 | .675 |
| Private Lessons (Voice or Instrumental) | 16 | .432 |

## Evaluation Instrument

The semantic differential as a method of observing and measuring the psychological meaning of concepts has proven to be an accurate instrument for recording affective responses.[2] In a wide variety of studies it has been demonstrated that affective judgments on bipolar adjective scales reliably fall into three major factors. Osgood named these factors Evaluative, Activity, and Potency.[3] Meaningful differences among a variety of concepts have been found using instruments loaded with one of more of these dimensions.

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[2] David Heise, "Semantic Differential Profiles for 1,000 Most Frequent English Words," Psychological Monographs 79:8 (1961):1.

[3] Charles E. Osgood, George J. Suci, and Percy H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press,1967).

A semantic differential scale contains the concept to be evaluated, the polar adjective pair, and a series of undefined scale positions. It has been determined that a few appropriate scales can be used to obtain reliable measurements on any one factor.

Experience indicates that for practical purposes the number of scale positions should number five to nine, with Osgood recommending seven steps.[4] The scales selected for this study were seven-point rating scales, the underlying nature of which has been determined empirically. That is, each set of bipolar adjectives has been empirically tested and are strongly identified with the evaluative factor. For purposes of this investigation adjective pairs were sought that would be general enough to assess aural performance as well as visual/aural musical presentation. An examination of adjective pairs revealed many possible scales but relatively few that were appropriate for the purpose of this investigation. The scales needed to contain "nontechnical" terms that nonmusicians might use to evaluate any musical performance. The adjective pairs selected (sensitive-insensitive, ineffective-effective, bad-good, and positive-negative) met these criteria (see Figure 3). Although adjective pairs with high evaluative loadings were selected for this study,

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[4] Stephen Isaac and William Michael, Handbook in Research and Evaluation (San Diego, California: Edits Publishers), p. 102.

the selection of adjectives on simply their "face value" for a given situation is acceptable.[5] The polar adjectives were arranged so that the favorable end of scales one and four were the same while scales two and three were reversed. A similar practice is recommended by Osgood in an effort to avoid position habit in response patterns.[6] After evaluating each performance using the MPEF scale positions were converted into numerical values which were then subjected to statistical analysis. The negative end of each scale was assigned the number 1 with values progressing to number 7 at the positive end of the scale for these analyses.

## Performance Evaluation By Subjects

Video recorded performances of six solo marimbists were evaluated by thirty-seven subjects during two separate sessions of thirty minutes each, with one day separating each session. The first session occurred on a Wednesday, the second on a Friday. Each performance was evaluated twice; once aurally with the video image electronically blacked-out, and once with the complete visual/aural presentation. Therefore, each subject evaluated a total of twelve performances, six aural and six visual/aural. The performances, presented

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[5] Heise, "Semantic Differential Profiles for 1,000 Most Frequent English Words," p. 7.

[6] Charles E. Osgood, George J. Suci, and Percy H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1967).

in sequence, were randomized to control for order effect. Six randomly selected performances were evaluated during the first session with additional time allotted for orientation. Six performances were evaluated during the second session.

At the beginning of each session, each subject received a packet with one Evaluator Information Form(EIF), one sample Music Performance Evaluation Form (MPEF)(see Figure 3), and twelve blank Music Performance Evaluations Forms. The EIF was completed in its entirety during the first session and the sample MPEF was used only in the initial session. Each MPEF was numbered to correspond with the performance being evaluated. A brief orientation to the recorded sound of the marimba was included in the first session along with specific directions regarding the use of the MPEF (Appendix D). Subjects were asked to listen to each performance before marking on the evaluation form. A Panasonic Model NV-8420 portable video cassette recorder and a twenty-five-inch Zenith Model Y2500W color television were used to present the recorded performances.

## Data Analysis

This study sought to determine whether listeners' ratings of aural presentations of solo marimba performance differed from aural/visual presentations of the same performance. In order to strengthen the research results, a second level of analysis was undertaken to determine whether the

FIGURE 3. MUSIC PERFORMANCE EVALUATION FORM

Performer_____

Place an X along the line that best describes the effect of this performance.

Musical Performance

Sensitive____|____|____|____|____|____|____Insensitive

Bad____|____|____|____|____|____|____Good

Ineffective____|____|____|____|____|____|____Effective

Positive____|____|____|____|____|____|____Negative

---

basic research question varied with respect to the "positive" or "negative" affect presented by some performers. Ultimately the study sought to answer critical questions regarding two crossed independent variables--aural and visual/aural presentations and positive/negative affect. The crossing of these two factors resulted in four distinct experimental treatments: 1) positive aural performance, 2) negative aural performance, 3) positive visual/aural performance, and 4) negative visual/aural performance.

The evaluation of the main effect aural and visual/aural condition was determined by rating each performance as an aural experience only, and again as a visual/aural

experience. The distinction between positive and negative performers was determined a priori by a panel of experienced listeners. Three performers from each of the two categories were randomly selected from a larger population.

To test the basic hypothesis of whether aural evaluation differed from the visual/aural evaluation of solo marimba performance, thirty-seven subjects completed four bipolar adjective scales for each performance. Each performance was presented two times; once aurally with the video image electronically blacked-out, and once with the complete visual-/aural presentation. Six separate performances were therefore evaluated in each condition for a total of twelve times, producing an aural and a visual/aural score on each scale for each of the six performers.

The bipolar scales, each consisting of seven scale steps, were converted into numerical values allowing for the computation of means for each independent variable for each performer and evaluator. In order to determine whether the mean scores for each of the main effects of aural and visual/aural and positive/negative were significantly different, an analysis of variance was computed for each scale. The ANOVA represented a within-subjects $RS_{37} \times (C_2 \times T_2)$ design, or thirty-seven subjects crossed with each combination of a two-way matrix repeating the two levels of aural and visual/aural and the two levels of positive/negative.

The Ryan-Einot-Gabriel-Welsch Multiple Range follow-

up procedure was computed to determine main effect differences, while the Tukey Wholly Significant Difference (WSD) value was computed for each set of simple means following a significant interaction effect.

The analysis of variance yields information about the main effects of particular variables by themselves as well as information about interactions between variables. It is a single composite test to compare all sample means simultaneously and indicate whether a statistically significant difference exists somewhere in the data. While data produced by analyses of variance were important in answering the basic question in this study, another statistical test was needed that avoided giving more weight to an individual's pair of scores (aural and visual/aural) which were several degrees apart than another individual's pair of scores which were only one degree apart. In other words, a test was needed that would assess the presence of a positive or negative shift between the aural and visual/aural peformances without being affected by the magnitude of that shift.

For example, consider a group of four listeners who rated the aural and visual/aural performances of four solo marimbists. The aural scores were 4, 4, 4, 2 (mean = 3.5) and the visual/aural scores were 3, 3, 3, 5 (mean = 3.5). Mean scores comparison would indicate no significant difference. However, this computation fails to account for the fact that three listeners shifted in one direction, while only one

listener shifted in the other direction. The assessment of direction and frequency of the direction of shift is an important aspect of this study.

The sign test was selected in an effort to obtain an unbiased measure of the differences in frequency of shift between aural and visual/aural conditions. It accounts for the frequency of shifts in either direction as well as the direction of the differences between two scores.

# CHAPTER IV

## RESULTS

The results of the study involve a discussion of data obtained in an effort to answer the basic research questions presented in Chapter I. Toward this end the results of analyses of variance and follow-up procedures computed on the dependent variables are presented. Results of the sign test on the frequency of shift direction are also presented.

The independent variable of greatest interest in the present investigation was the differential effect of aural and visual/aural presentations of solo marimba performances. Data gathered through use of the Music Performance Evaluation Form were analyzed to indicate any significant differences among the means for this independent variable. The same data revealed information regarding significant differences and interaction effects among this independent variable of aural and visual/aural presentation and the variable involving performers identified a priori as "positive" or "negative".

The analysis of variance for Scale One involving the bipolar adjectives "sensitive-insensitive" showed a significant difference for the main effect aural and visual/aural

condition (F=5.11, p>.0258). It also indicated a significant difference for the main effect positive or negative performance (F=71.33, p>.0001). Since data revealed no significant interaction (F=2.34, p>.129) among these variables, a follow-up procedure to determine main effect differences was undertaken. The analysis of variance summary table is reproduced in Table 5.

TABLE 5

ANOVA SUMMARY TABLE/SCALE ONE

| Source | DF | SS | MS | F Value | PR > F |
|---|---|---|---|---|---|
| Subjects | 36 | 122.46 | 3.401 | 5.01 | .0001 |
| Aural-Visual/Aural | 1 | 3.47 | 3.471 | 5.11 | .0258 |
| Positive-Negative | 1 | 48.43 | 48.435 | 71.33 | .0001 |
| A V/A-PN | 1 | 1.58 | 1.588 | 2.34 | .1291 |
| Error | 108 | 73.33 | .679 | | |

The Ryan-Einot-Gabriel-Welsch Multiple Range Test (REGWQ) was used to compare the pairs of means for both factors on Scale One in an effort to determine where significant differences occurred. The test revealed a significant difference between the means for both main effects. Table 6 illustrates the results of the REGWQ for Scale One. While interpreting this data it is helpful to know that means with different letters, (e.g., A and B), in the REGWQ column are

significantly different.

TABLE 6

MAIN EFFECT MEANS/SCALE ONE

| Independent Variable | Mean | N | REGWQ Grouping |
|---|---|---|---|
| Condition | | | |
| Aural | 3.97 | 74 | A |
| Visual/Aural | 4.28 | 74 | B |
| Performance | | | |
| Positive | 4.69 | 74 | A |
| Negative | 3.55 | 74 | B |

Data for Scale One indicates that listeners rated visual/aural presentations (mean=4.28, Alpha=.05) more positively than aural (mean=3.97) presentations. Likewise, the means comparison indicates that listeners rated performers identified as positive (mean=4.69) higher than those idendified as negative (mean=3.55).

The analysis of variance for Scale Two involving the bipolar adjectives "bad-good" resulted in a significant interaction between main effects. This may be interpreted to mean that a main effect was significant for a single factor at some point, but did not remain consistent through all levels of the other factor. Therefore, main effect means were rendered useless for further analysis, leaving follow-up analysis on

cell means the appropriate procedure. Table 7 illustrates data obtained from the analysis of variance for Scale Two

TABLE 7

ANOVA SUMMARY TABLE/SCALE TWO

| Source | DF | SS | MS | F | PR>F |
|---|---|---|---|---|---|
| Subjects | 36 | 124.674 | 3.463 | 4.83 | .0001 |
| Aural-Visual/Aural | 1 | 13.280 | 13.280 | 18.51 | .0001 |
| Positive-Negative | 1 | 108.979 | 108.979 | 151.89 | .0001 |
| A V/A-PN | 1 | 5.946 | 5.946 | 8.29 | .0048 |
| Error | 108 | 77.488 | .717 | | |

In order to determine simple effect differences, individual cell means were examined and the Tukey Wholly Significant Difference (WSD) value was computed for Scale Two. Individual cell means produced by the analysis of variance are shown in Table 8. The WSD follow-up procedure produced the results shown in Table 9.

A significant difference between cell means is indicated by any figure larger than the computed WSD value (.52). Data indicates a significant difference between all combinations of means except one. No significant difference was observed between the means of the negative aural and negative visual/aural factors. The results are graphically illustrated in Figure 4.

TABLE 8

INDIVIDUAL CELL MEANS/SCALE TWO

| Source | Mean |
|---|---|
| Positive Aural | 4.76 |
| Negative Aural | 3.45 |
| Positive Visual/Aural | 5.76 |
| Negative Visual/Aural | 3.64 |

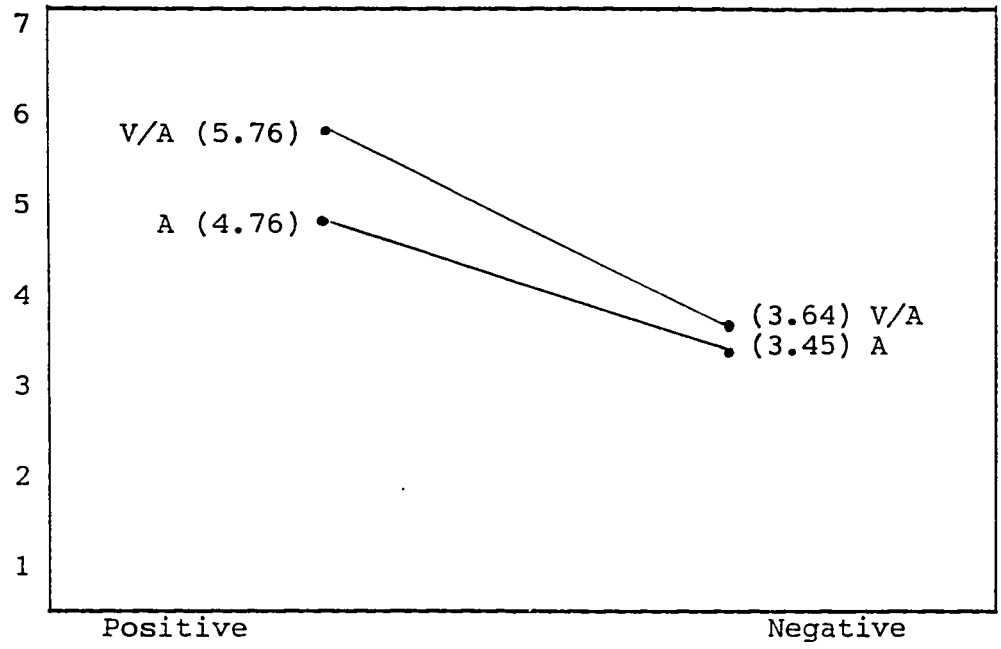
TABLE 9

WSD FOLLOW-UP PROCEDURE/SCALE TWO

| Source | Diff. Between Means | |
|---|---|---|
| Positive V/A - Positive Aural | 1.00 | Sig. |
| Negative V/A - Negative Aural | 0.19 | Not Sig. |
| Positive Aural - Negative Aural | 1.31 | Sig. |
| Positive V/A - Negative V/A | 2.12 | Sig. |
| WSD = .52 | | |

These data indicate a significant difference for both positive and negative performers in both aural and visual-/aural modes, as well as a significant difference between the means for aural and visual/aural presentations for positively identified performers. The means representing aural and visual/aural performances by marimbists identified as negative were not significantly different.

FIGURE 4. GRAPHIC ILLUSTRATION OF CELL MEANS/SCALE TWO




The analysis of variance for Scale Three involving the bipolar adjectives "effective-ineffective" resulted in a significant interaction between main effects (Table 10). A main effect was significant for a single factor at some point in the analysis, but did not remain consistent through all levels of the other factors. Main effects were therefore rendered useless for further analysis.

In order to determine where differences between simple means for Scale Three occurred, individual cell means were examined and the WSD value was computed. Individual cell means produced by the analysis of variance are shown in Table 11. The WSD follow-up procedure produced data illustrated in

Table 12.

TABLE 10

ANOVA SUMMARY TABLE/SCALE THREE

| Source | DF | SS | MS | F | PR>F |
|---|---|---|---|---|---|
| Subjects | 36 | 109.526 | 3.042 | 4.43 | .0001 |
| Aural-Visual/Aural | 1 | 6.493 | 6.493 | 9.45 | .0027 |
| Positive-Negative | 1 | 87.298 | 87.298 | 127.00 | .0001 |
| A V/A-PN | 1 | 6.775 | 6.775 | 9.86 | .0022 |
| Error | 108 | 74.238 | .687 | | |

TABLE 11

INDIVIDUAL CELL MEANS/SCALE THREE

| Source | Mean |
|---|---|
| Positive Aural | 4.52 |
| Negative Aural | 3.41 |
| Positive Visual/Aural | 5.37 |
| Negative Visual/Aural | 3.40 |

A significant difference between cell means is indicated by any figure larger than the computed WSD value (.512). Data indicated a significant difference between all combinations of means except one. No significant difference was observed between the means of the negative aural and negative

TABLE 12

WSD FOLLOW-UP PROCEDURE/SCALE THREE

| Source | Diff. Between Means | |
|---|---|---|
| Positive V/A - Positive Aural | 0.85 | Sig. |
| Negative V/A - Negative Aural | -0.01 | Not Sig. |
| Positive Aural - Negative Aural | 1.11 | Sig. |
| Positive V/A - Negative V/A | 1.97 | Sig. |
| WSD = .512 | | |

visual/aural performances. However, a significant difference existed between positive and negative performers in both aural and visual/aural modes, but a significant difference was found between the means for aural and visual/aural presentations for positively identified performers. The results are graphically illustrated in Figure 5.

The analysis of variance for Scale Four yielded similar results to those of Scales Two and Three. The ANOVA for Scale Four involving the bipolar adjectives "positive-negative" resulted in a significant interaction between main effects. Means for main effects were significant for a single factor at some point, but did not remain consistent through all level of the other factors. Table 13 illustrates data obtained from the analysis of variance for Scale Four.

FIGURE 5. GRAPHIC ILLUSTRATION OF CELLS MEANS/SCALE THREE

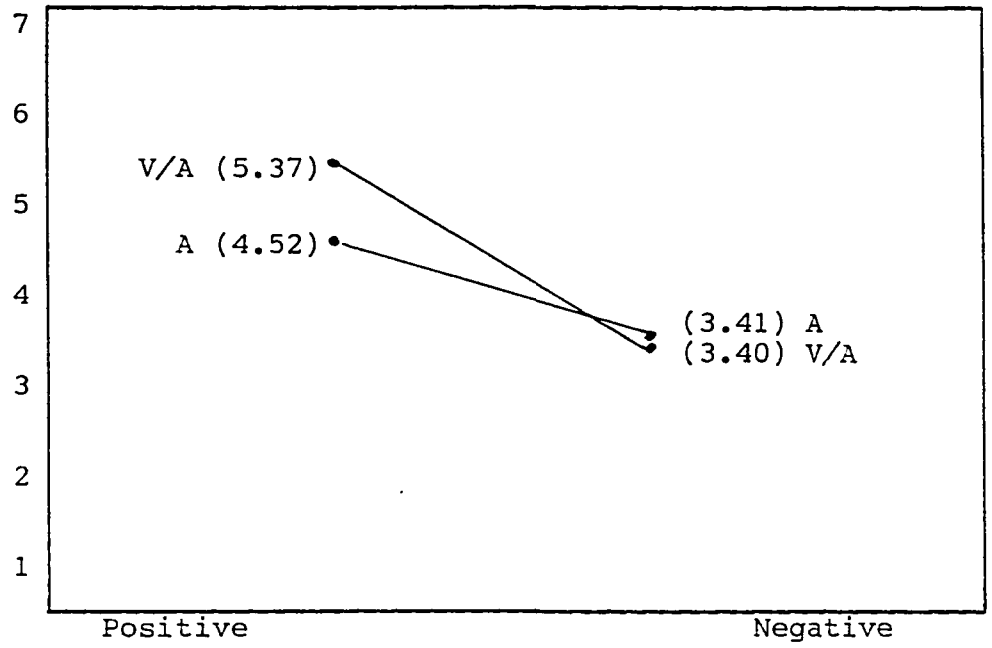



TABLE 13

ANOVA SUMMARY TABLE/SCALE FOUR

| Source | DF | SS | MS | F | PR>F |
|---|---|---|---|---|---|
| Subjects | 36 | 138.918 | 3.858 | 6.04 | .0001 |
| Aural-Visual/Aural | 1 | 4.451 | 4.451 | 6.97 | .0095 |
| Positive-Negative | 1 | 90.397 | 90.397 | 141.58 | .0001 |
| A V/A-PN | 1 | 2.613 | 2.613 | 4.09 | .0455 |
| Error | 108 | 68.955 | .638 | | |

In order to determine where differences between simple effect means occurred, individual cell means were examined and

the WSD value was computed for Scale Four. Individual cell means produced by the analysis of variance are shown in Table 14. The WSD follow-up procedure produced the results shown in Table 15.

TABLE 14

*INDIVIDUAL CELL MEANS/SCALE FOUR*

| Source | Mean |
|---|---|
| Positive Aural | 4.86 |
| Negative Aural | 3.56 |
| Positive Visual/Aural | 5.47 |
| Negative Visual/Aural | 3.64 |

TABLE 15

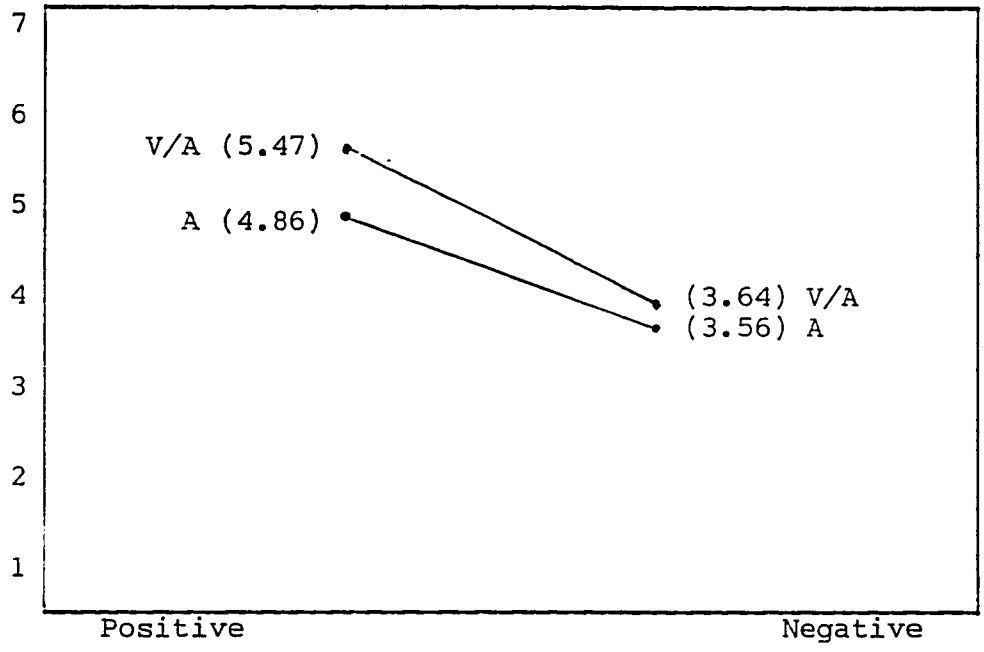
WSD FOLLOW-UP PROCEDURE/SCALE FOUR

| Source | Diff. Between Means | |
|---|---|---|
| Positive V/A - Positive Aural | 0.61 | Sig. |
| Negative V/A - Negative Aural | 0.08 | Not Sig. |
| Positive Aural - Negative Aural | 1.30 | Sig. |
| Positive V/A - Negative V/A | 1.83 | Sig. |
| WSD = .494 | | |

A significant difference between cell means is indicated by any figure larger than the computed WSD value (.494).

Data indicated a significant difference between all combinations of means for Scale Two except one. No significant difference was observed between the means of the negative aural and negative visual/aural performances. The results are graphically illustrated in Figure 6.

FIGURE 6. GRAPHIC ILLUSTRATION OF CELL MEANS/SCALE FOUR




These data indicate a significant difference between positive and negative performers in both aural and visual-/aural modes, as well as a significant difference between the means for aural and visual/aural presentations for positively identified performers. The means representing aural and visual/aural performances by marimbists identified as negative

were not significantly different.

The sign test is useful when comparing the observed frequency of shifts between two related conditions: the conditions in this case being the aural and visual/aural presentations. The sign test focuses on the direction of the shifts between each condition, noting whether the shift is in a positive or negative direction . It evaluates whether the larger number of observed shifts in a particular direction was large enough not to have occurred by chance. The sign test was computed for each dependent variable in an effort to determine whether a significant difference existed in the frequencies of the direction of shift between aural and visual/aural presentations. A significant difference between the frequencies of shift for aural and visual/aural presentations only for positively identified performers was observed for all four scales. The frequencies of shift representing the aural and visual/aural performances by marimbists identified as negative were not significantly different.

Table 16 illustrates the frequencies of the direction of shift for all performers, Table 17 for "positive" performers, and Table 18 for "negative" performers. Table 19 illustrates the results of the sign test for all performers, Table 20 for "positive" performers, and Table 21 for "negative" performers. A significant difference is indicated by any z value larger than $\pm$ 1.96 where alpha equals .05.

TABLE 16

SUMMARY OF FREQUENCIES OF SHIFT/ALL PERFORMERS

| Scale | Number of Positive Shifts | Number of Negative Shifts | Number Without Shift |
|---|---|---|---|
| 1 | 86 | 55 | 81 |
| 2 | 100 | 38 | 84 |
| 3 | 93 | 54 | 73 |
| 4 | 88 | 53 | 81 |

TABLE 17

SUMMARY OF FREQUENCIES OF SHIFT/POSITIVE PERFORMERS

| Scale | Number of Positive Shifts | Number of Negative Shifts | Number Without Shift |
|---|---|---|---|
| 1 | 49 | 26 | 36 |
| 2 | 64 | 14 | 33 |
| 3 | 60 | 22 | 29 |
| 4 | 52 | 24 | 35 |

TABLE 18

SUMMARY OF FREQUENCIES OF SHIFT/NEGATIVE PERFORMERS

| Scale | Number of Positive Shifts | Number of Negative Shifts | Number Without Shift |
|---|---|---|---|
| 1 | 37 | 29 | 45 |
| 2 | 36 | 24 | 51 |
| 3 | 33 | 32 | 46 |
| 4 | 36 | 29 | 46 |

TABLE 19

SIGN TEST SUMMARY TABLE/ALL PERFORMERS

| Scale | Z Score | Probability |
|---|---|---|
| 1 | ±2.52 | .0118 |
| 2 | ±5.19 | .0001 |
| 3 | ±3.13 | .0010 |
| 4 | ±2.86 | .0042 |

TABLE 20

SIGN TEST SUMMARY TABLE/POSITIVE PERFORMERS

| Scale | Z Score | Probability |
|---|---|---|
| 1 | ±2.54 | .0110 |
| 2 | ±5.55 | .0001 |
| 3 | ±4.09 | .0001 |
| 4 | ±3.10 | .0014 |

TABLE 21

SIGN TEST SUMMARY TABLE/NEGATIVE PERFORMERS

| Scale | Z Score | Probability |
|---|---|---|
| 1 | ± .86 | .3898 |
| 2 | ±1.42 | .1556 |
| 3 | ± .00 | 1.0000 |
| 4 | ± .74 | .4592 |

## SUMMARY

An analysis of variance for each of the four dependent variables produced data concerning main effects and interactions. The ANOVA for scale one showed a significant difference between the means for the main effect aural and visual-/aural condition as well as a significant difference for the main effect positive or negative performance. Because no

significant interaction was observed between variables the Ryan-Einot-Gabriel-Welsch Multiple Range follow-up procedure was used to compare the pairs of means for both factors in an effort to determine where significant differences occurred. The test revealed a significant difference between the means for both main effects. Means comparison indicate that listeners rated visual/aural presentations more favorably than aural presentations and "positive" performers more favorably than "negative" performers.

Although individual cell means varied for Scales Two, Three, and Four, data analyzed by the analysis of variance and the subsequently computed WSD value for each of the three scales revealed similar results, although different from those of Scale One. Data for Scales Two, Three, and Four indicated a significant difference between positive and negative performers in both aural and visual/aural modes, as well as a significant difference between the aural and visual/aural evaluation for the "positive" performers. Means for aural and visual/aural performances by "negative" performers were not significantly different.

Data analyzed by the sign test yielded similar results on all scales to those produced by analyzing the individual cell means of Scales Two, Three, and Four between the aural and visual/aural performances. "Positive" performers presented to listeners in a visual/aural mode were rated significantly higher than in an aural mode, while "negative" performers

were not rated significantly different.

# CHAPTER V

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Summary

A number of variables influence one's response to musical performance. Although a performance is traditionally judged on its "aural" content, judgments concerning the perceived quality of "live" musical performance may be strongly affected by the listener's evaluation of "visual" stimuli. Listeners receive messages through visual and aural channels and are likely to be influenced by both.

Other performing arts, such as dance and theatre, recognize the role that visual components play in their respective disciplines. The integration of the visual and aural modes of aesthetic expression is understood in these areas. It is in the realm of concert and recital performance that the impact of visual components on the total aesthetic experience is often taken for granted or ignored. A distinct need exists to examine the influence of visual components of live musical performance on listeners' quality assessment.

The purpose of this study was to determine whether solo marimbists' visual attributes influence listeners' per-

ceived quality assessment. In addition to determining if there is a difference between a listener's perception of aural and visual/aural performance, the study sought to determine the influence of a performer's positive or negative affect. Data gathered could then be used for better understanding live musical performance, as well as to provide the impetus for further investigation of this relatively unexplored domain.

Literature relating to the visual components of music and other arts reveals little insight into the influence of a musicians physical gestures on listeners' response to his performance. No bonafide research in the field of music has been undertaken to specifically examine this important area.

Pursuant to the aim of this study, seventeen marimbists were selected from three universities in North Carolina to video record a solo performance. After a panel of experienced listeners evaluated the recorded performances, the marimbists were placed into either "positive" or "negative" categories based on an overall performance evaluation. Three performers from each of the two categories were randomly selected and evaluated by thirty-seven subjects. During the 1985 Spring term, subjects were asked to evaluate the six selected performers via a tape recorded aural presentation and a taped recorded visual/aural (sound video) presentation using an evaluation instrument consisting of four bipolar adjective scales. The scales, each consisting of seven steps, were converted into numerical values allowing for the computation

of means for each independent variable for each performer and evaluator. Analyses of variance, appropriate follow-up procedures, and the sign test were then computed for each scale.

Results of the study were presented in an effort to answer the basic research question: Is there a significant difference between listeners' evaluation of a solo marimba performance when only the aural stimuli is presented and when listeners view as well as hear a performance? Also, is there a significant difference between a listener's evaluation of a performer identified as "positive" or "negative"?

## Conclusions

Data for Scale One involving the adjective pair "sensitive-insensitive" revealed that listeners rated visual/aural presentations more favorably than aural presentations. Similarly, listeners rated "positive" performers higher than "negative" performers. These main effects were consistent among all factors. In other words, "positive" performers received better ratings than "negative" performers in both aural and visual/aural modes, while visual/aural presentations were evaluated significantly higher than the aural presentations regardless of whether the performance was positive or negative.

Results regarding Scale One revealed an interesting phenomenon. It may be suggested that the concept of "sensitivity" is more powerful in the visual mode than in the aural.

A performer's attempt to produce a sensitive musical event may be more easily perceived by observing his physical gestures than through sound alone. This does not imply that a sensitive visual performance is also aurally satisfying. It does suggest that in some situations the concept of "sensitivity", as judged by individual listeners, may be stronger in the visual mode than in the aural mode.

Scale Two involved the adjective pair "good-bad". Data produced by the analysis of variance revealed a main effect for a single factor at some point in the analysis, but this effect did not remain consistent through all levels of the other factor. A follow-up procedure produced data that indicated a significant difference between positive and negative players regardless of mode (aural or visual/aural), as well as a significant difference between the aural and visual-/aural evaluation only for "positive" performers. The aural and visual/aural performances by "negative" performers were not significantly different. In other words, when listeners experienced performances of performers identified as positive or negative in the aural mode and the combined visual/aural mode, they rated the visual performance of positive performers significantly higher than the aural performance, but rated the aural and visual/aural performance of negative players the same.

Data for Scale Two indicate that the visual/aural mean is consistently higher than the aural mean for "positive"

performers. Data gathered from Scale Three involving the adjective pair "effective-ineffective", and Scale Four with the adjective pair "positive-negative", revealed similar results to those of Scale Two. "Positive" performers received significantly better ratings than "negative" performers regardless of whether they were evaluated in an aural mode or a visual/aural mode. Ratings for positive players who were seen (visual/aural) were higher than when they were only heard (aural). This was not the case for negative performers on Scales Two, Three, and Four.

## Recommendations

Every effort should be made to replicate this study under various circumstances. While the results suggest a significant difference between listeners' evaluation of aural and visual/aural solo marimba performance in certain cases, manipulation of variables in future investigations may provide additional insight into the problem.

Research should be conducted that analyzes the effect on listeners of the visual impact of pianists, vocalists, and other orchestral instrumentalists. Visual attributes of these various performance media may affect listeners in a variety of ways.

Research should be undertaken to determine whether experienced percussionists rate solo marimba performances the same as the experienced listener subjects in this study.

Random samples from a variety of populations will increase data in this investigative area. For example, one should compare the responses of one set of subjects (percussionists) with another set (nonpercussionists) in order to determine whether significant differences occur.

Further investigation might require performers to manipulate specific visual aspects of performance in order to determine the effect on selected listeners. These manipulations of visual attributes could include any part of the performer's physical presentation or any other part of the environment viewed by the listener. Since technology is available that will allow one to mask parts of a video recorded performance, one might omit certain parts of the human body, such as the face or hands, in an attempt to determine which have greater influence on listeners.

Further investigation should determine whether the visual attributes of performers vary with different styles of music. Perhaps "pop" or "jazz" musicians in general create different physical motions than "classical" musicians. If so, what effect do these presentations have on listeners? The possible combinations of variables are enormous.

Research could be undertaken which would test the differences or similarities that the visual aspects of group performances of various kinds have on listeners. Is there a difference between listeners' aural and visual/aural reaction to group performance compared to a solo performance?

There is a need to develop a working vocabulary that will assist musicians in identifying and describing the visual aspects of musical performance. Until a vocabulary is established it will be difficult if not impossible to objectively analyze this phenomenon. The work of Laban and others in the disciplines of dance and theatre can provide the beginning for such an investigation. This point is evident when one examines the written criteria in which the experienced listeners in this study used to describe their reaction to the visual aspects of solo marimba performance. Those statements (Appendix B) clearly indicate a lack of vocabulary to describe one's response to the visual attributes of musical performance. Research toward this aim might eventually provide the impetus to develop a coding system that could aid in analyzing any aspect of the visual presentation needing improvement.

Other bipolar adjective scales may be used in future studies. While the scales in this study were effective in measuring listeners' responses to marimba performance, other scales are available that may yield different results under other circumstances. Further investigation may discover more effective means of measuring listeners' affective responses.

Other studies should make every effort to analyze the influence of all four possible combinations (stratified groups) of "positive" and "negative" affect on listeners.

Given the evidence that listeners tend to rate visual aural more favorably than aural presentations especially when

the visual/aural performance is "positive", and that performers having "positive" visual affect are preferred over those identified as having "negative" visual affect, musicians should strive to develop performance habits which maximize those positive visual elements of their performance as well as the typically understood and practiced aural elements.

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## DISSERTATIONS

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# APPENDIXES

APPENDIX A

EVALUATOR INFORMATION FORM

1. NAME_____
   First Middle Last

2. MALE_____ FEMALE_____

3. AGE_____

4. YEAR IN SCHOOL (Check One)
   Freshman_____
   Sophomore_____
   Junior_____
   Senior_____
   Graduate_____
   Other_____

5. ACADEMIC MAJOR_____

6. MUSICAL BACKGROUND (Place an x beside the categories that apply to you.)

   High School Chorus_____
   Number of Years_____

   High School Band_____
   What Instrument_____
   Number of Years_____

   Play Piano_____

   Play Guitar_____

   Private Lessons in Voice or an Instrument_____
   Number of years _____

   Church Choir_____

   Other Musical Experience_____

APPENDIX B

EXPERIENCED LISTENERS' CRITERIA FOR EVALUATING VISUAL ATTRIBUTES OF MUSICAL PERFORMANCE

Performer 1

| | |
|---|---|
| Listener 1 | Appeared insecure and haphazard at times. I felt he was almost too relaxed in posture and visual attitude. Head bobbed up and down. |
| Listener 2 | Slightly stiff with some sense of awkwardness. |
| Listener 3 | Looked awkward especially when mallets had to be turned (to get sharps and flats). |
| Listener 4 | Performer looked bored and sleepy. Seemed uninvolved. |
| Listener 5 | Aside from wrong notes, there was a lack of tempo control and the rotating head on refrain bothered me. Seemed stiff like he was not interested in what he was playing. |
| Listener 6 | Left hand seemed a bit awkward. Constant head movement was somewhat distracting. |

Performer 2

| | |
|---|---|
| Listener 1 | Good stance. Very little distracting body movement. Seemed comfortable and sure of what he was playing. Movement was smooth as different octaves were played. |
| Listener 2 | Posture and movement fairly relaxed. |
| Listener 3 | Looked economical but still rhythmic in motions. |
| Listener 4 | Seemed minimally involved with the music. Did not convey any real interest in the piece. Somewhat stiff. |
| Listener 5 | Lack of excessive motion. Seemed to give appearance of more control. Directs above "keys". Few disturbing body motions other than required activity. Ends of cadences seemed to "jerk" off the bars--almost an accent. |

Listener 6 Body motions are appropriate to rhythmic characteristics. Flexible and not stiff. Seemed to be involved in the music.

Performer 3

Listener 1 Very smooth for the most part. No distracting body movements.

Listener 2 Movement a bit stilted, manner slightly uneasy.

Listener 3 Except for small flinch where it looked like he forgot what was next, this one was smooth physically and showed the rhythm in his body (aided by faster tempo). Attractive sideways glancing of mallets.

Listener 4 Was somewhat actively involved in the music. Some hesitations in "choreography" make his memory seem tentative. Never looked up.

Listener 5 Seemed uncertain. Wrong notes increased his nervousness. Seems to be grasping for notes. Motion to upper register area seemed awkward--more so the second time due to memory lapse.

Listener 6 Memory slip led to obvious hesitation in moving to next position.

Performer 4

Listener 1 Plays with a little artistic flair in his mannerisms, a little showmanship. The only possible distraction was his facial expressions at times--slight frown, squint due to concentration.

Listener 2 Good physical skills except furrowed brow.

Listener 3 Looked leaden and careful (frowned once or twice--didn't look good), but looked uncomfortable on the grace note figures.

Listener 4 Nothing showed that he enjoyed playing. Seemed a little stiff. Never looked up. Sleeves were too long. Slight head movement that showed some involvement.

Listener 5 Upward leap at end of mf/f phrase (early on) was distracting. Facial expression--dead pan. Sometmes dropped head down on accented pitches.

Listener 6 Had some good facial expression at times. Body movement fairly smooth.

Performer 5

Listener 1 The stroke appeared to be a little uncontrolled at times, rather heavy. Also, his posture was straight up-down. I didn't feel like he was really getting into what he was playing. He appeared a little removed from the performance.

Listener 2 Fairly easy manner.

Listener 3 Looked average--not too uncomfortable, but not too expressive either.

Listener 4 Ending clearly "framed". Little body movement. Seemed somewhat lifeless.

Listener 5 Relaxed/easy motion in wrist. I felt comfortable watching him. Seemed to be nonrestricted.

Listener 6 Smooth movement from one section to another. Somewhat involved in the piece.

Performer 6

Listener 1 He bobbed up and down a little too much for my taste. Also I felt he was a bit heavy handed with the mallets.

Listener 2 Easy manner, free motion of the head.

Listener 3 Could see the flow of rhythm in his body. Grace notes weren't quite as graceful as some other groups.

Listener 4 Was ready at beginning. Slight movements with the rhythm of the piece and visual expressions indicated concentration and involvement.

Listener 5 Seemed shorter than other five players. Bends over the instrument more? Appeared to enjoy what he was playing--"got into it". Periodicity of pattern can't clearly be seen in body motion. Sort of "rolled" with it.

Listener 6 Performance less accurate but more enjoyable. Seems to be really enjoying what he's doing.

Performer 7

Listener 1 Body mannerisms changed with changes in dynamics--loud/heavy weighted approach and soft/light and delicate approach. Good synthesis of music and visual.

Listener 2 Some sense of physical detachment. Almost no head motion.

Listener 3 In comparison to other players, this one looks like he's all arms and like the mallets are just moving at the end of his arms. The move to higher register could be more economical.

Listener 4 "One giant step" to his right was a little distracting. Stiff. Projected nothing visually.

Listener 5 Seems to drift backward and forward at times. Inconsistent on body motion, head completely down most of the time. No contact with audience (if that means anything). Upper arms didn't move. I kind of liked that.

Listener 6 Tall player. Seemed to slump a bit. Not very interesting visually. Faster tempo made movement jerkier.

Performer 8

Listener 1 He seemed sure of what he was doing, even when it didn't come off exactly right. Posture was okay.

Listener 2 Easy manner. He could have been playing well.

Listener 3 Didn't like this guy from the beginning. Don't know why (musical flaws added to dislike).

Listener 4 Looked up, was ready at the beginning. Slight pause before playing helped. Seemed relaxed and involved with the music. Shirt too big. Giant step was distracting.

Listener 5 Took forever to start. Seemed unsure throughout. Wasn't enjoying the musical experience.

Listener 6 Not bad visually. More animated upper body. Bobbing head seems to distract.

Performer 9

Listener 1 Nice approach before he began. Good control of the mallets. Very sure of himself and the music.

Listener 2 Purposefulness and air of assurance in movement.

Listener 3 Looked better than he played (because of tempo). Very eye-catching approach to instrument and "release" at end. Fluid in between. To bad he didn't play slower and better.

Listener 4 Giant step distracting. Seemed tense and hurried. Piece seemed to start without him. No space at beginning.

Listener 5 "Framing" gestures--approach to and from marimba seemed to indicate a strong sense of presence and assuredness. Intense concentration seemed visible; neverousness did not seem to be a factor. A bit too agressive, at times.

Listener 6 Appears physically stronger. More active; faster tempo more interesting and gives more interesting visual effect.

Performer 10

Listener 1 Movement to upper octave was rather jerky, almost like he forgot to move. Also, when things were going well he had a tendency to move his head in meter with the song, when things started getting rough, he froze up more; tension more apparent.

Listener 2 Movements hesitant and stiff, facial expression "concerned".

Listener 3 Liked the fact I could see his face; made him seem more open and vulnerable and made me sympathetic. But didn't move easily between registers and looked like motions were a little large to be efficient.

Listener 4 Calm look seemed to relate boredom. Giant step distracting. Facial expression related his mistake. Looked up--nice! Seemed to be trying to see all the keys at once. Almost leaning back.

Listener 5 Appeared to be bored with piece. As if he had studied it daily for two years. Motions of head changed when feeling insecure. Wobbled. Piano passages looked better than forte. Insecure moving to upper register.

Listener 6 Shirt sleeves too long. Hesitation in position change. Seems to lack confidence.

Performer 11

Listener 1 Very stiff. Head motion at times was very quick; side to side as if he was searching for the notes. The expression on his face at the end gave the impression that he wasn't too pleased with his performance.

Listener 2 A bit stiff in general movement.

Listener 3 Kept his head pretty still which seemed to add to the studied, clunky feel.

Listener 4 Arm movement seemed tight. I think he stoped breathing. Giant step makes me think he'll leave. Some expression at end showed dissatisfaction.

Listener 5 Too cautious--rigid. "Looked" like a beginner. Activity didn't seem to reflect dynamics. Graded him low because of extreme cautiousness. I didn't feel comfortable watching him.

Listener 6 Very stiff upper body. Rolled up sleeves distract.

Performer 12

Listener 1 Used a little exagerated movement at times. Movement from foot to foot didn't bother my visual perception of his kinesics. He looked better than he played.

Listener 2 Easy foot and head motion.

Listener 3 Seemed comfortable and physically "open" (in spite of flinch about "what next"). Liked his body movements especially on the accented notes and the grace note figures. Looked involved.

Listener 4 Hesitation showed insecure memory. Seemed more relaxed as piece progressed. Didn't look up at end. Gave (somehow) a feeling of concentration and interest.

Listener 5 Appeared to have practiced the piece. Body motions consistent with musical repetitions. Seemed to know what he wanted to do with mallets. Felt positive on the whole, even when some notes were missed. Comfort--arms not rigid against torso.

Listener 6 Good body motions which seemed to fit the music. Involvement in the piece. Didn't take him too long to get set for next position when changing. Like the darker mallets better.

Performer 13

Listener 1 Very rigid stance. Both body and mallet movement was jerky. He appeared very unsure of what he was playing to the point that I felt like he was over working himself in an effort to pull it off.

Listener 2 Matter of fact appearance.

Listener 3 His right arm showed economy of motion to the point of looking like a zombie. Looked uncomfortable.

Listener 4 Looked as if he was trying to remember every single note. Giant step distracting. Swats at notes. Nice ending (pause, space after.)

Listener 5 Tensed up most of the time. Jerky motions to change in musical texture/activity. Out of control.

Listener 6 Not sure.

Performer 14

Listener 1 The indecision in his playing was visually apparent. The frequent pauses ruined the continuity and flow of the performance.

Listener 2 He kept going! But physical skills lacking. Hesitation apparent in movement.

Listener 3 Fumbled at beginning, before playing, with mallets and had problems physically all through because he was not sure what was next.

Listener 4 Seemed disoriented. Hesitations! What's next! Looked up at end. Collar turned up like James Dean--nice.

Listener 5 Extremely insecure, lost composure. I felt sorry for the fellow and didn't want to endure the agony.

Listener 6 Sleeves too long. Doens't know the piece. Disoriented at times.

Performer 15

Listener 1 Facial movement was highly distracting. Arm movement backward was very abrupt at certain phrase points which took my attention away from the music.

Listener 2 "Going for it". Physical movement was easy, reflecting involvement with music.

Listener 3 Quirky--at first appealing but bordered on too much. I was taken back by almost vicious approach to the forte chords, but enjoyed the style more than was bothered by it.

Listener 4 Was physically involved. but not too much. It was distracting. Moving the shoulders up won't make more sound for an accent. Seems tense on loud passages.

Listener 5 Shoulder jumps--tense. "Beating" of keyboard in chord section appeared unmusical--"banging away". Motions seemed "mannered" in some way. But, there was something attractive about the "extra" motion.

Listener 6 Mouth movements distract. Pull-back movements don't add to expression and distract. Less exaggerated movements might have been effective.

Performer 16

Listener 1 Indecision in movement hurt the presentation.

Listener 2 Nondescript. Little physical sense of involvement.

Listener 3 Looked average. Memory slip really didn't help "look" of performance.

Listener 4 Seemed less interested as piece progressed. Maybe he was since memory left him. Did not seem tense, but maybe he was too relaxed.

Listener 5 Seems to play with a grace of movement inspite of wrong notes. Recovery from memory lapse not the best--but.

Listener 6 Good appearance. Played confidently even though he made mistakes. Posture generally good.

Performer 17

Listener 1 Looked a little at ease; facial expression wise. The shrug he would do with his shoulders was distracting.

Listener 2 Fairly free movement of body and head.

Listener 3 Could have looked a little more rhythmic with his body but basically he seemed comfortable and fairly involved with music.

Listener 4 Always frowned. Shoulder motion distracting. Occasionally showed mistakes on face. Looked unhappy at end.

Listener 5 Moving to upper register; seems to move way back from the instrument. Funny shoulder jerks at ends of cadence. Like warm appearance.

Listener 6 Jerky shoulder movements were distracting. Final facial appearance should not reflect dissatisfaction. Had a confident appearance at the beginning.

## APPENDIX C

### DIRECTIONS TO EXPERIENCED LISTENERS

1. This is a study of relationships in musical performance--the relationship between aural and visual attributes in "live" performance.

2. You will evaluate several solo marimba performances. All performers will play the same selection, but with varying interpretation.

3. Here is the general procedure:

   a. You will view a video recorded solo marimba performance.

   b. While the performce is in progress, please look directly at the television monitor. If you feel the need to take notes during the performance please do so with the least interuption to visual observation.

   c. After each performce, please complete the ELEF for that performer. Each form is clearly marked with the performer's number. The investigator will announce the number of each performer before each musical presentation.

4. Please look at the form marked with an S.

5. Notice that your answer to question number one involves the aural effect of the performance. In other words, "What did you hear?" Place an X on the scale that best describes your impression of the aural effect of that particular performance.

6. Your answer to question number two is based on what you "see". We are concerned with whether and to what extent any visual attributes compliment or distract from the total musical performance. Notice that you use the same type of scale for question number two.

7. Question number three asks you to briefly describe the criteria on which your answer to question number two was based. What did you see that caused you to rate a performer in a certain way? The differences in visual attributes and musical nuance may be very subtle. Nevertheless, please make a special effort to identify the visual attributes in each performance that affect your perception. Take as much time as you need for this question.

8. The video unit will stop between each performance in order to give you the necessary time to complete the ELEF.

9. Are there any questions?

10. Before we begin with the first performer please listen to the following selection. It is the musical composition that each performer will be playing.

11. The performances include a variety of tempi, and since they were recorded in several settings you may experience a variety of changes in the fidelity of the recordings.

## APPENDIX D

## DIRECTIONS TO SUBJECTS

1. You are going to participate in an important research project related to musical performance.

2. There are no right or wrong answers and your anominity is assured.

3. You are going to evaluate twelve musical performances. Some you will hear only, some you will hear and see on the video monitor. I will tell you before each performance whether it is "aural" or "visual/aural". The video unit will stop after each performance in order to give you time to complete the MPEF.

4. Each performance will be the same selection. In other words, all performers will play the same music. But the interpretation may vary among performers.

5. The performance instrument is a marimba.

6. Each of you have received a packet of materials containing the EIF and several Music Performance Evaluation Forms. Please look at the second page. It is marked with an S in the space to the right of the word "performer". Now, look in the middle of the page under the words "musical performance". You will see four scales, each divided into seven parts, both ends of which have words with opposite meanings--such as, good, bad. These scales are identical on each page of the packet and will be used to evaluate each performance.

7. After you hear each musical performance place an X in the space that best describes your response. Do this for each scale.

8. In using these scales, it is important:

    a. to place an X on every scale
    b. never put more than one X on a single space on a single scale.

9. These performances include a variety of tempi (speeds) and changes in fidelity. The differences may be only slight or very subtle. Please make a special effort to make seperate and independent judgments for each performance.

10. Explain the use of the scales (via sample drawn an chalk board) and that their favorable end is alternated.

11. Work at a fairly high speed in marking the scales. We want you first thoughts about the musical performance. It does not matter why you feel a certain way about any performance--just react honestly and fairly.

12. Before we begin with the first performer, please listen to the following musical selection. It is the composition that each performer will be playing.

13. Please mark the sample MPEF after litening carefully.

14. Are there any questions?

APPENDIX E

INFORMATION REGARDING PERFORMERS' AGE AND CLASSIFICATION

TABLE 22

PERFORMER INFORMATION

| Performer | School | Classification | Age |
|---|---|---|---|
| 1 | ECU | Senior | 22 |
| 2 | " | Senior | 25 |
| 3 | " | Junior | 23 |
| 4 | " | Senior | 22 |
| 5 | " | Graduate | 23 |
| 6 | " | Graduate | 24 |
| 7 | UNC/G | Senior | 21 |
| 8 | " | Junior | 21 |
| 9 | " | Graduate | 29 |
| 10 | " | Junior | 22 |
| 11 | ASU | Sophomore | 19 |
| 12 | " | Graduate | 22 |
| 13 | " | Sophomore | 19 |
| 14 | " | Junior | 22 |
| 15 | " | Freshman | 18 |
| 16 | " | Junior | 20 |
| 17 | " | Sophomore | 20 |

TABLE 23

PERFORMER INFORMATION

| Performer Age | Number | Proportion of Total |
|---|---|---|
| 18 | 1 | .058 |
| 19 | 2 | .117 |
| 20 | 2 | .117 |
| 21 | 2 | .117 |
| 22 | 5 | .294 |
| 23 | 2 | .117 |
| 24 | 1 | .058 |
| 25 | 1 | .058 |
| 29 | 1 | .058 |

TABLE 24

PERFORMER INFORMATION

| Classification | Number | Proportion of Total |
|---|---|---|
| Freshman | 1 | .058 |
| Sophomore | 3 | .176 |
| Junior | 5 | .294 |
| Senior | 4 | .235 |
| Graduate | 4 | .235 |