

BOOK REVIEW

Cognitive Bases of Musical Communication. By Mari Riess Jones and Susan Holleran (Eds.). Washington: American Psychological Association, 1992.

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The *Cognitive Bases of Musical Communication* is a collection of 16 articles from an invited conference held at the Ohio State University in 1990. It provides a wealth of contemporary thought, data, and theory on music cognition from the disciplines of psychology, music, philosophy, linguistics, and cognitive science. I was delighted when the publication of the

book coincided with the time to select the focal text for my graduate psychology course in music cognition. Here the work of many major contributors to the field was presented in a manner somewhat more accessible to students than condensed journal articles. Fresh perspectives outside traditional psychology were represented. Materials were loosely connected and unconfined by a narrow issue or point of view. The choice of the book for the graduate class turned out to be a good one.

While several of the authors either review or heavily quote their past work, when placed in the context of the book, this material takes on new meaning. Similarities in positions become more clear, new issues emerge through juxtaposition of diverse ideas, strengths become apparent, and paths for future work are revealed. As well, some of the problems of the discipline as a whole can be seen. In this regard, the multidisciplinary nature of the book drew my attention to our problems of communication. Here is what I mean.

Editors Jones and Holleran ask at the outset "...What exactly does music communicate and how does it do this?" (p. 1). Though it appeared many times in the text, the term communication was never defined. The reader, of course, can make sense of the word, but not necessarily the sense intended. In some contexts, communication seemed to refer to its use in the *Mathematical Theory of Communication* (Shannon & Weaver, 1949) where, "The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point" (p. 32).

This technical view of communication seemed consistent with "Communication is central to many influential theories of cognition" (p. 1) if theories refers to information-processing psychology or the mind-machine metaphor. In the field of music itself, Leonard Meyer (1967) has acknowledged influences of Shannon and Weaver. Jones and Holleran pay special tribute to Meyer, an invited observer to the conference (p. xii). His work is also directly referenced by more than one third of the contributors, two of whom had been his doctoral students.

In the introduction, Jones and Holleran state "Communication, virtually by definition, assumes a low level of uncertainty with respect to some shared idea of speaker and listener or, in the case of music, of performer/composer and listener" (p. 4). The reference to uncertainty and the words "by definition" seem to allude to information theory which is closely aligned with the mathematical theory of Shannon and Weaver. In her own article, "Attending to musical events," Jones suggests that "an important and basic aspect of communication involves the way any musical or linguistic interaction effectively controls the attending of the parties involved and in so doing establishes for them a shared perspective from which to assess the event itself" (p. 91). In an information theory context, this might be understood as the composer, performer, and listener using the same code, thus making possible the reception of the same message. Jones concludes: "A listener's acceptance of one or another perspective may be partly under the control of the composer, via the score, and partly modulated by artistic devices of the

performer, but ideally it is a shared perspective and this is the essence of communication" (p. 108). The notion of shared perspective seems close to the Shannon and Weaver notion of reproduction at the receiver of the message at the source.

Other statements about communication do not fit with the technical framework described above. Jones' own article begins with "communication is something that occurs among living things" (p. 91). But the mathematical theory of communication arose in the context of nonhuman machine transmission of information and incorporated both inanimate and animate systems. This emphasis on human exchange implies a different framework, a different perspective if you will, from that of the mathematical theory which so well fits the examples described earlier. The role of human interaction in communication is not without its champions. For example, Colin Cherry (1966) in his classic text *On Human Communication* states "Communication is after all a social affair." This framework more readily incorporates Jones' claim that "Yet musical understanding remains at the heart of musical communication" (p. 49). These concepts do not translate easily into the more technical framework which I referred to earlier.

It is the goal of a new science to define its terms. I think that the book shows the need for attention to this goal for psychomusicology. Ambivalence with regard to the meaning of communication is but one kind of example. There are other examples where the same term, such as affect, is used differently by different authors (e.g., Raffman, Shaffer, Jackendoff). Using the same symbols in discourse does not guarantee a meaningful exchange. The true exchange occurs only if the symbols used by both parties refer to the same things (cf., Carey, 1991). In scholarly writing about music, terms like affect and tonality may mean different things to different people, and sometimes different things to the same person in different contexts. The use of the same terms may however give the illusion of a meaningful exchange.

The Acoustical Society of America finds it necessary to regularly review its standard definitions for terms such as pitch, frequency, and loudness. If even with seemingly simple terms like these, problems arise, how can we manage without standard definitions of terms like tonality, affect, emotion, emotional, expectation, expressive, score, phrase, chromaticism, mixture, tonicization, and communication? Questions about the correct understanding and interpretation of music, to which much of the book is directed, are especially difficult to address without precise terminology.

The theme of correct understanding of music was raised first in Kraut's paper which focused on indeterminacy of translation. It was followed by Raffman's notions that shared emotions such as sense of stability constrain music structure, Sloboda's evidence for similarity and difference in specific emotional responses, Brown and Butler's evidence for disparities from the preferred key choice, Jones' notions of flexibility in attention, Deutsch's evidence for hearing an ambiguous interval in one or another way, Palmer's notions of individual and shared choices in performance, and Shaffer's notions about music interpretation within and between performers. The mod-

els of Lerdahl, Jackendoff, Narmour, Bharucha, and Gjerdingen also imply the question of generality to various communities of listeners.

Questions posed about correct interpretation can apply as readily to scholarly writing as to music. Jones' research reveals how we may attend to different features of music, on the long- and short-time span. Similarly, we may attend to different features of the results from an experiment, for example, in terms of the performance of individuals or of groups. Different communities of scholars may propose different correct ways of interpreting data. Past experience in one of these particular scholarly communities would naturally lead to adoption of one rather than another interpretation, or to one rather than to another method for data collection.

Just as there are music constructs to be understood before conducting research in music communication, so there are methods of scientific research to be adhered to. If it were standard practice that empirical music research entailed both a thorough understanding of the music stimulus and a thorough appreciation of experimental design principles, our progress might be greater. Yet, there are few individuals who have had the luxury of time to master these various disciplines. It may be that as a result, artist and scientist must learn to work together in order to benefit from these necessary but different knowledge bases.

The book represents a wide range of methodological rigor. The traditional behavioral scientific method is represented in the work of Jones and Krumhansl, for example. There are several instances of other methodologies referred to by authors as "casual," "informal," or "pilot" studies. To give a simple example, Shaffer contrasts the performance of one pianist who received a score without expressional markings as compared to the performances of three other pianists who received the marked score. Differences between the performances under the two conditions of score annotation suggested the importance of these annotations on interpretation. Shaffer admits, however, to this being pilot data and that, in spite of sophisticated analyses, there is really not enough data to determine whether the results reflect individual differences or the experimental manipulation of the score.

Another example is provided by Butler's "casual" research on tonality. In one example, he played the strings of a violin in two different series in which "two pitch strings were presented to nine music students. The strings were: (a) $D\flat^4$ - $A\flat^4$ - $D\flat^4$ - $A\flat^3$ - $D\flat^4$; and (b) G^4 - C^5 - G^4 - C^4 - G^4 ." Each series was presented only once. Six of the nine students chose the $D\flat$ as the tonic for the first sequence and C^5 for the second. Yet, he says, the same intervals (octaves, fifths, and fourths) made up the two structures. This, he claims, provides evidence that a perceptual theory of tonal pitch relations cannot be based on only an inventory of intervals. His procedure violates many principles of psychological research design. There are many confounding variables which have not been controlled. The order of the presentation of the series was the same for all listeners. Only one example of each was played. Intensity of the individual tones was not controlled. The listeners may have felt pressure to conform with others in the room. In another study, the listen-

this case, the listeners may have been under even greater pressure from their teacher to perform as he would wish. What was the reward and the role of the reward? The listener was forced to interpret what the experimenter meant by "correct" tonality. What would the results be like under instructions in which the listeners were asked to choose the tonic in the absence of reward or notion of correct response?

While David Butler deserves much credit for conducting experiments, we nevertheless must ask "at what point does an observation becomes worthy of report to the scholarly community?" To highlight this question, I will refer to Narmour's proposal in his article of a hypothetical experiment, in which listeners were presented with a context of three tones followed by a probe and they were asked to rate how surprised they were by the probe. In one of the contexts, the probe satisfied both intervallic and registral implications. In other contexts, the probe satisfied only one of the two possible implications, and in the remaining examples, the probe satisfied none of the implications. Thus, the three different contexts predict three different levels of surprise. This hypothesis translates readily into a psychological experiment/demonstration. But how much care should be taken with the methodology before the data become worthy of report? Ideally, the data to test the theory underlying the hypothesis should be derived from a controlled setting, with clear instructions, concern for presentation order effects, and so on. At least one might have more confidence in such evidence than if it were obtained under casual conditions. It might be easy to fail to support the theory under lax conditions yet when care is taken the evidence may emerge (Cumming's 1992 reference to research inspired by Narmour's theory, i.e., Schellenberg & Krumhansl, 1991; Krumhansl & Schellenberg, 1990).

The conference on which the book was based was one of 18 conferences sponsored by the Scientific Conferences Program initiated in 1988 by the American Psychological Association (APA) Science Directorate. The first purpose of the APA program was to provide a broad view of a specific topic and to encourage interdisciplinary participation when appropriate. The second purpose was to "assure timely dissemination of the findings by publishing carefully crafted scholarly volumes." The present book which was published less than two years after the conference has achieved the goal of timeliness. I congratulate editors Jones and Holleran and those at APA in the careful proofing of the text. I noted only a few typographical errors, and the odd sentence that was flawed. There are a few areas where greater editorial care could have been taken, but the APA criteria of carefully crafted, interdisciplinarity, and breadth of coverage seem to have been well satisfied. The quality of some of the data do distinguish the book from a refereed scientific journal but this both lends a dynamic to the book that reflects its origin in a conference and raises the question of methodology in psychomusicology.

In summary, *The Cognitive Bases of Musical Communication* provides an excellent record of contemporary thinking about music and the cognitive sciences. From its broad perspective, the book directs us toward the diffi-

dards while at the same time providing and encouraging multidisciplinary. I'm left with a final thought: whereas it is important that we learn to speak the same language or, in other words, share perspectives, it is also important that we be attuned to when we are sharing a language and when we are not.

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Author Notes

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