

## Music Psychology and Music Education: What's the connection?

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### **Abstract:**

Music psychology is a multidisciplinary and interdisciplinary study of the phenomenon of music. The multidisciplinary nature of the field is found in explorations of the anthropology of music, the sociology of music, the biology of music, the physics of music, the philosophy of music, and the psychology of music. Interdisciplinary aspects are found in such combinatorial studies as psychoacoustics (e.g., music perception), psychobiology (e.g., the effects of music on the immune system), or social psychology (e.g., the role of music in social relationships). The purpose of this article is to explore connections between music psychology and music education.

### **Article:**

*'What does music psychology have to do with music education?'*

Spoken in a harsh, accusatory tone (with several expletives deleted), this was the opening salvo in a job interview I once had. I am happy, many years later, to have the opportunity to respond to that question in a more thoughtful and thorough way than I originally did. Because this special issue of *Research Studies in Music Education* is directed toward graduate students in music education and their teachers, I will proceed on the assumption that most of the readers of this article are more familiar with music education than music psychology. Therefore, the first portion of the discussion focuses on a definition of music psychology, the following section provides a brief overview of the literature in music psychology, with a concluding commentary on the connections between it and music education.

### **Historical Conceptions of Music Psychology<sup>1</sup>**

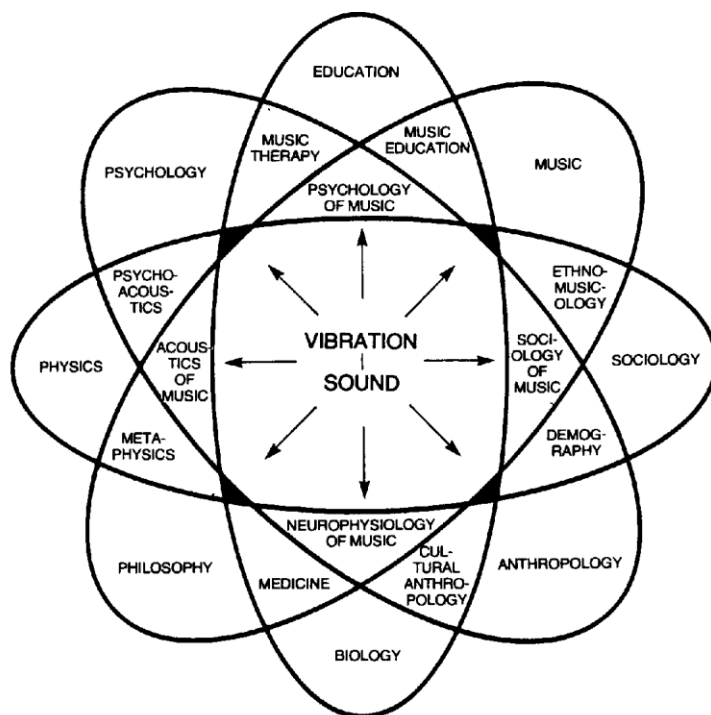
As a college sophomore, I was assigned a term paper for a class and had chosen the grandiloquent topic 'the nature of human musicality'. After several weeks of fruitless searching in the library for relevant sources, I scheduled an appointment with Dr. E. Thayer Gaston. Considered by many the father of modern music therapy, Gaston did not teach any undergraduate classes and to a frightened sophomore he was an imposing figure. When I got in to see him and squeaked out my request in a timorous, quivering voice, his response changed my life. Rather than laughing at me, he said: "Son, musicians are like people in love. They're happy but they don't know what they are doing. If you want to understand musical behavior, look to the behavioral scientists—anthropologists, sociologists, psychologists, and biologists—for they are the ones who understand human behavior. And, music is, after all, a form of human behavior that is governed by the laws and principles that govern all human behavior."<sup>2</sup> My encounter with Dr. Gaston began a lifetime of reading and research in what normally falls under the umbrella of 'music psychology.'

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<sup>1</sup> This section is based largely on Hodges, 1997a.

<sup>2</sup> For a more formal statement of his ideas, see Gaston, 1968a&b. Incidentally, many years later I did complete that term paper in a chapter entitled "Human Musicality." Hodges, 1996.

While there were certainly pioneers, as early as Pythagoras in the 6th century B.C., later Helmholtz (1863), and others in the 19th century, Carl Seashore (1919, 1938, 1947) is considered by most as the father of modern music psychology. Interestingly enough, Seashore (1938) believed that the proper study of musical behavior encompassed physics, physiology, psychology, anthropology, philosophy, and metaphysics. He said that while we might call the whole field the ‘science of music,’ psychologists have taken over the field for want of a sponsor and so they have come to dominate the field thus it is called music psychology. Following the lead of Seashore and Gaston, Charles Eagle, a student of Gaston, created an interactive model for his bibliographic database of music psychology literature (see Figure 1).



**Figure 1**

**Descriptive molecule model of the interdisciplinary world of Music Psychology (after Eagle, 1996)**

This model reflects the multidisciplinary and interdisciplinary natures of music psychology as conceived by some of the pioneering leaders. Accepting Seashore’s rationale and following Eagle’s model, my own definition is as follows: “Music psychology is a multidisciplinary and interdisciplinary study of the phenomenon of music.”<sup>1</sup> Thus, understanding music in its totality requires incorporating input from many different disciplines. Likewise, an interdisciplinary view is critical—integrating ideas from many disciplines, often in such combinatorial studies as psychoacoustics (e.g., music perception), psychobiology (e.g., the effects of music on the immune system), or social psychology (e.g., the role of music in social relationships). Music psychologists, then, are interested in questions such as: How does the mind/brain organize sounds streaming in real time in such a way that they are labeled music and interpreted with meaning and affect? Are there universals in music, such that all people, everywhere, organize musical sounds in similar ways? What are the acoustical properties of

<sup>1</sup> More recently, the term ‘music cognition’ has been used frequently, and to some it represents a slightly different approach than music psychology. Others find no noteworthy difference between the two terms and use them interchangeably. Since a detailed discussion of labeling would take us beyond the scope of this paper, let us for a moment put that discussion aside; throughout this article, the term ‘music psychology’ will be used.

various musical instruments? Are there biological constraints (e.g., in the ear or brain) that put limitations on the ways in which we create and respond to music?

### **Synopses of Contributing Disciplines**

One way of further delineating the field of music psychology is to travel around the outside of the molecule model (Figure 1), stopping at each of the major disciplines (beginning with Sociology and ending with Music). For each discipline, I will provide a brief commentary along with three representative publications.<sup>2</sup> These representatives demonstrate not only ‘vertical’ movement within a discipline, but ‘horizontal’ movement among disciplines as well.

#### ***Contributions from Sociology***

Most of us live in sound-saturated societies. As Merriam (1964) noted:

The importance of music, as judged by the sheer ubiquity of its presence, is enormous.... There is probably no other human cultural activity that is so all-pervasive and which reaches into, shapes, and often controls so much of human behavior. (p. 218)

I invite anyone who doubts the validity of this statement to try this experiment: Go for 24 hours without hearing any music and note the departures from the usual routine that are necessary.

Sociologists tell us that each individual has the potential to respond to music of the surrounding culture. No condition of age, race, gender, mental or physical state, or socioeconomic status prohibits one from a meaningful musical experience. The sociology of music takes us into business and economics, politics, religion, the military, youth culture, and the entertainment and media industries.

Representatives of *sociology's* contributions include *Sing a Song of Social Significance* (Denisoff, 1983), *The Sociology of Music* (Dasilva, Blasi, & Dees, 1984), and *Music, Culture, and Society* (Scott, 2000). An example of interdisciplinary work is *The Social Psychology of Music* (Hargreaves & North, 1997).

#### ***Contributions from Anthropology***

Anthropologists have a message for us that can be stated rather simply but which is profound in its impact on our understanding of the significance of music: *All people in all times and in all places have engaged in musical behaviors*. Elaborating on this theme takes us around the world as well as back in time. Archaeologists search for evidence of ancient musical practices and ethnomusicologists seek to document the role of music in all the world's cultures.

Blacking (1973) eloquently describes a symbiotic relationship between our music and us in a pair of opposing chapters: "Humanly Organized Sound" (i.e., we shape the music) and "Soundly Organized Humanity" (i.e., the music, in turn, shapes us). While all human cultures engage in musical behaviors, the variety of ways in which they do so is staggering. Contributions from anthropology can be represented by *The Anthropology of Music* (Merriam, 1964), *Comparative Musicology and Anthropology of Music* (Nettl & Bohlman, 1991), and *Ethnomusicology: An Introduction* (Meyers, 1992).

#### ***Contributions from Biology***

From biologists we learn that all human beings are biologically equipped to be musical and that there is a synergistic, symbiotic relationship between music and the body. Biology shapes and constrains musical experiences (e.g., limitations of the vocal system so that we can only sing so high or low, or so loud;

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<sup>2</sup> Limiting myself to three titles per topic because of space constraints has meant leaving out many wonderful contributions to the literature. There is no attempt to be comprehensive nor to include only recent publications, rather only to give a brief notion of the breadth of the literature. To that end, choices often reflect the appearance of keywords in the title, making the connections more apparent.

limitations of the hearing system so that we can perceive pitches only so high or low; limitations of only 10 fingers with which to play the piano; etc.). Conversely, musical experiences have profound effects on the body (Bartlett, 1996).

Understanding these relationships requires investigations into such biomusical topics as vision, hearing, the brain, emotions, motor mechanisms, and physiological responses (including heart and pulse rate, electrodermal responses, respiration rate, blood pressure, muscular tension, blood volume, skin temperature, gastric motility, blood oxygen, hormone secretion, and pupillary reflex). Practical applications are made in music medicine, performing arts medicine, and music therapy. Three books that provide examples of contributions from biology are *The Biology of Music Making* (Roehmann & Wilson, 1988), *Biomusicology: Neurophysiological, Neuropsychological and Evolutionary Perspectives on the Origins and Purposes of Music* (Wallin, 1991), and *The Biological Foundations of Music* (Zatorre & Peretz, 2001).

### ***Contributions from Philosophy***

Philosophical inquiry into the phenomenon of music has most often been concerned with the nature and meaning of music, the understanding of beauty, and our emotional responses to music. Those who are surprised to find philosophy included in this holistic view of music psychology might be interested to read this statement: “No metaphysics, however deep, no theory of aesthetics, however firm its philosophical foundation, can discuss the musical experience and ignore psychological points of view” (Révész, 1954, p. 236). The reverse is no less true as Campbell and Heller (1980) pointed out when they discussed how a shift from a Cartesian to a Humean point of view affects our understanding of music perception.<sup>1</sup>

Unfortunately, this has not been one of the more fruitful areas in the field of music psychology. Explicating the musical experience could benefit considerably from more philosophical inquiry, particularly from those who are broadly and deeply read in the ‘science of music.’ Books such as *In Search of Beauty in Music: A Scientific Approach to Musical Esthetics* (Seashore, 1947), *Aesthetics and Psychobiology* (Berlyne, 1971), and *Music and Mind: Philosophical Essays on the Cognition and Meaning of Music* (Fiske, 1990), illustrate philosophical contributions to the understanding of the musical experience.

### ***Contributions from Physics***

Historically, the connections between music and physics are among the most ancient, beginning with the Pythagorean experiments. From that time, through the Middle Ages, when music was placed in the upper quadrivium of the seven liberal arts along with arithmetic, geometry, and astronomy, and continuing forward to today’s advancements in digital sampling and MIDI technology, music and physics have shared a close association.

Acousticians study sound, the fundamental basis for music. From acoustics, further investigations lead to psychoacoustics (a branch of psychophysics). Practical applications of acoustics are made in architecture and engineering, and the physics of musical instruments leads to ergonomics and biomechanics. Researching certain problems can involve mathematics, astronomy, and quantum physics. Here are three illustrative readings from physics: *Introduction to the Physics And Psychophysics of Music* (Roederer, 1975), *The Physics of Music* (Wood, 1980), and *Measured Tones: The Interplay of Physics and Music* (Johnston, 2002).

### ***Contributions from Psychology***

There are an immense number of topics that are explored under the rubric of psychology. Psychologists from each of the major approaches (Freudian, behavioral, Gestalt, developmental, cognitive, humanistic, etc.)

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<sup>1</sup> In the Cartesian view, there is an objective reality, which is a singular Truth, that exists independent of an observer. In the Humean view, the observer determines reality; there are as many truths as there are observers.

contribute unique understandings of musical experiences. A significant body of music research literature falls within each of these psychological orientations.

Psychologists are interested in the perception and cognition of music. Gardner's (1983) groundbreaking theory of multiple intelligences is causing more researchers to look at the role music plays as a human knowledge system. Other important topics include the musical personality, special musicians (e.g., musical savants and Williams Syndrome musicians), the development of musicality, stress in performance, affective responses to music, musical aptitude, and music teaching and learning. Practical applications, particularly in music therapy and music education, are rich in their own research traditions. Three representative contributions from psychology are *The Musical Mind: The Cognitive Psychology of Music* (Sloboda, 1985), *Music Cognition* (Dowling & Harwood, 1986), and *The Psychology of Music* (Deutsch, 1999).

### ***Contributions from Education***

As just one example of the connection between education and music, consider that the American Educational Research Association (AERA) supports a Music Special Interest Group (SIG) for members who are interested in the role of music in the broader educational context. The purpose of this group is, "to solicit research on all aspects of music teaching and learning in all educational contexts, including early childhood, K-12, studio teaching, and university-level instruction" (<http://www.colorado.edu/music/musiceducation/AERA.html>). Music's place among the other arts disciplines in education is reflected in two additional AERA SIGs: Arts and Learning and Arts-Based Approaches to Educational Research. Three books dealing with music in an educational context are *Music in Educational Thought and Practice* (Rainbow, 1989), *Education and Music* (Fletcher, 1987), and *Music, Mind, and Education* (Swanwick, 1988).

### ***Contributions from Music***

Musicians, of course, have made important contributions to the understanding of the phenomenon of music. The composer Bartok, for example, was one of the first ethnomusicologists, working to study and preserve the folk music of Hungary. Three groups have made the strongest and most consistent contributions to the literature of music psychology: music theorists, music therapists, and music educators.

Music theorists have particular insights into the structure of music. Some examples are *A Generative Theory of Tonal Music* (Lerdahl & Jackendoff, 1983), *The Analysis and Cognition of Melodic Complexity* (Narmour, 1992), and *Tonal Pitch Space* (Lerdahl, 2001).

Music therapists have made significant contributions as they have investigated musical behaviors among special populations. Representatives of the literature include *Music in Therapy* (Gaston, 1968c), *Music Therapy for Handicapped Children* (Lathom & Eagle, 1982), and *Music Therapy Research* (Wheeler, 1995). Examples of an interdisciplinary approach are found in *Applications of Music in Medicine* (Maranto, 1991), *MusicMedicine* (Spintge & Droh, 1992), and *A Scientific Model of Music in Therapy and Medicine* (Thaut, 2000).

We come finally to music educators and the contributions they have made to the music psychology literature. Here are just a few titles reflecting ways the previously-listed topics interface with music education:

- Sociology: *Sociology and Music Education* (Hoffer, 1992)
- Anthropology: *Multicultural Perspectives in Music Education* (Anderson & Campbell, 1996)
- Biology: *What Neuromusical Research Has to Offer Music Education* (Hodges, 1997b)
- Philosophy: *A Philosophy of Music Education: Advancing the Vision* (Reimer, 2003)
- Physics: *Improving Acoustics for Music Teaching* (Geerdes, 1991)
- Psychology: *Music Education: Psychology and Method* (Franklin, 1972)
- Education: *Classroom Teacher's Guide to Music Education* (Burnsed, 1999).

Far beyond these examples are the numerous contributions made by many music education researchers. At one time, for example, the University of Kansas hosted a series of conferences entitled Research Symposium on the

Psychology and Acoustics of Music. Nearly every issue of the various music education research journals has one or more articles that could be considered relevant for music psychology. *The New Handbook on Music Teaching and Learning* (Colwell & Richardson, 2002) includes many topics related to music psychology.

Before leaving this brief overview of literature, it is perhaps worth noting a few examples of books that, by their titles alone, would appear to have little to offer to the understanding of the phenomenon of music. *The Hand* (Wilson, 1998), for example, has a chapter entitled “In Tune and Evolving *Prestissimo*,” that provides some wonderful insights into an evolutionary basis for human musicality.<sup>1</sup> Alternatively, consider two books by Oliver Sacks. *The Man Who Mistook His Wife for a Hat* (1987), is ostensibly about a variety of cognitive impairments. However, there are a number of anecdotal clinical reports where music is a central player in the story. In each case, when the focus is on the impairment, we see the individual as impoverished, less than whole. With music, however, “all that was defective or pathological fell away, and one saw only absorption and animation, wholeness and health” (p. 192). Likewise, in *Awakenings* (1983), there are more examples of the power of music:

- Miss D. was relieved from jerking, ticking, and jabbering by hearing music, which produced blissful ease and a flow of movement (p. 57).
- The only thing that animated and restored effortless movement to Rolando P. was music (p. 106; 115).
- Miss A. was split into a dozen schizophrenic fissions, only to be restored by music (p. 148).
- Rosalie B. and Ed M. had grossly abnormal EEGs that became entirely normal when they played or listened to music (p. 283).
- Edith T., a former music teacher, suffered from Parkinsonism that caused her to refer to herself as ‘unmusicked.’ Her cure was to become ‘remusicked’ by imagining music that not only released freedom of movement, but also restored her personality (p. 294-5).

A music educator might say, with some justification, that these stories have more to do with music therapy than music education. However, the way in which Sacks sums up the power of music in these cases—with a quote from T.S. Eliot (1971), “You are the music/ while the music lasts”—speaks to the sense in which music is integrated into the very core of humanity. As a profession familiar with being marginalized, music educators should eagerly embrace examples such as these demonstrating the significance of music.

Allow one final example to stand as a representative for numerous books and articles of relevance. In the 1970s, Carl Sagan (1978) was appointed by NASA to head a team of scientists who were charged with the responsibility for devising a means of communicating with extraterrestrials should the Voyager spacecrafts make contact, perhaps billions of light years away from earth.<sup>2</sup> After lengthy deliberations, this team developed the forerunner of today’s CD-ROM. On it they included greetings in nearly 60 languages, 118 photographs showing a variety of images depicting life on earth, an audio essay on the sounds of earth and more than 90 minutes of music, ranging from a Peruvian wedding song to Chuck Berry to Bach. They chose music because of its ability to convey human emotions. This was, then, the realization of an idea of Lewis Thomas (1974), who previously had written about communicating with extraterrestrials by sending music because it “may be the best thing we have for explaining what we are like to others in space, with least ambiguity” (p. 53).<sup>3</sup>

### **Connections between Music Education and Music Psychology**

The Ann Arbor Symposia (1979-81), an interface between psychologists and music educators, left many in the music education research community convinced that we knew as much or more about psychology than most of

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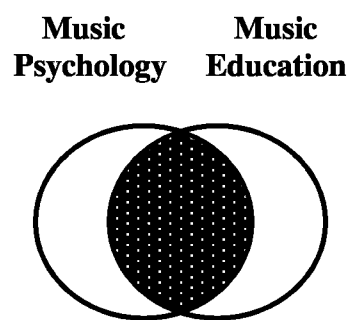
<sup>1</sup> A neurologist, Wilson is also known for other articles and books specifically on music, including *Tone Deaf and All Thumbs?* (1986).

<sup>2</sup> Interested readers can track the current status of the Voyager space missions at <http://voyager.jpl.nasa.gov>.

<sup>3</sup> Thomas then continues with this delicious gem: “I would vote for Bach, all of Bach, streamed out into space, over and over again. We would be bragging, of course, but it is surely excusable for us to put the best possible face on at the beginning of such an acquaintance” (p. 53).

them knew about music education. In a similar vein, I firmly believe that music psychologists have much to learn from music educators. However, since this article appears in a music education research journal, with a presumed readership primarily of music educators, the perspective will be toward what we in music education have to learn from music psychology. An article in a music psychology journal could easily take the opposite point of view.

Previously, music psychology was defined as a multidisciplinary and interdisciplinary study of the phenomenon of music. A similarly brief definition of music education is that “music education prepares people for worthwhile and rewarding musical experiences” (Tait & Haack, 1984, p. ix). Recognizing that there are many possible definitions, let us accept these two at face value, as at least representative of the two disciplines. With this in mind, Figure 2 presents a simplistic view of the overlapping relationship between music education and psychology. This suggests that some topics in music psychology might have little interest to music educators, and vice versa, but that there are many topics of interest to both.



**Figure 2.**  
**Relationship of music psychology and music education**

Considering the overlapping nature of the two disciplines, here are five suggestions I would make to the music education community:

*1. Core concepts from music psychology should be included in the knowledge base of pre-service music educators.* As educators, it behooves us to **read** broadly and to be aware of information that puts our daily work (e.g., conducting a high school choir, teaching beginning instrumentalists, working with young children) into a more global perspective. At my university, all music majors are required to take a course in which they are briefly introduced to core concepts in the physics (acoustics and psychoacoustics), anthropology, sociology, biology, psychology, and philosophy of music. Certainly, time does not permit in-depth explorations of all these topics, but, at a minimum, students are aware that such topics exist, have some notion of the core concepts, and are provided with bibliographic listings for future reference.

Students who graduate with no exposure to these topics may become excellent trainers of young performers, but also might be limited in the same way a voice teacher of mine once was. This fine, older gentleman, nearing his retirement, had had a wonderful career as an opera singer. During one of our lessons he engaged me in some conversation (Probably to avoid having to hear me sing!), and upon learning that I was a horn player was astonished to find out that there was a difference between the notes I read and played and how they sounded (i.e., he had never heard of transposition). One might argue that ignorance of this particular fact had not affected his performing career and, indeed, I suspect that it did not. However, to me it illustrates clearly how we can be

well trained yet poorly educated (at least on this one point).<sup>1</sup> My fervent hope is that the music education profession aspires to develop well-educated teachers, in addition to well-trained ones.

2. *Much of the literature in music psychology is broadly pertinent to music education.* Here are three examples of books from the music psychology literature that deal with core issues in music education. *The Science and Psychology of Music Performance: Creative Strategies for Teaching and Learning* (Parncutt & McPherson, 2002) was written “first for music educators with a specific interest or expertise in music psychology” (p. xi). Developing performers is a major activity of music educators and this source has much to offer in that regard. *Musical Beginnings: Origins and Development of Musical Competence* (Deliège & Sloboda, 1996) provides a valuable collection of information on the development of musicality from the fetus through childhood. In the preface, the editors state, “we hope that our compilation will provide a firm foundation for those who wish to use science to underpin their developments of educational policy or practice” (p. v). Finally, according to the Foreword (Scherer), *Music and Emotion* (Juslin & Sloboda, 2001) presents a “state-of-the-art overview of current thinking” on one of the most important aspects of the musical experience—people’s emotional responses to music.

From these few examples, it should be clear that all music educators have much to learn from the music psychology literature. Practitioners, and those who prepare them, in both preservice and graduate programs, should look to the literature in music psychology as a rich source of fundamental knowledge.

3. *Much of the literature in music psychology is specifically relevant; graduate students and music education researchers, especially, need to be well read in the field.* A number of years ago, Abeles and Porter (1978) published an article entitled *The Sex- Stereotyping of Musical Instruments*. A recent article on that same topic (published in a primary music education research journal) cited Abeles and Porter, but did not cite Gender and Music (O’Neill, 1997), a music psychology reference that provides considerable information on the topic.<sup>2</sup> Researchers, in particular, should be encouraged to be familiar with the literature in music psychology and to search that literature when preparing a related literature section of an experiment.

Although it is a gross generalization to say so, it may not be too far off the mark to note that music psychology tends to focus on basic research, while music education tends to favor applied research. The two forms of research are related in that basic research provides a foundation from which applied research can be launched. Lewis Thomas wrote a brief commentary on the history of medicine (1979), that provides a good example. His thesis was that for most of its history, medicine was practiced in a trial and error fashion and often was unable to ameliorate pain or bring about healing. Mostly this was due to a lack of an understanding of the fundamental processes of the body and of disease. Use of the scientific method (near the end of the 19th century) began the systematic march toward explicating the mysteries of the body. After describing some of the rapid advances made from the 1930s onward, Thomas is emphatic in the necessity of basic research as a prelude to applied research. “But it needs emphasizing that it took about fifty years of concentrated effort in basic research to reach this level” (1979, p. 162). “It was basic science of a very high order, storing up a great mass of interesting knowledge for its own sake, creating, so to speak, a bank of information, ready for drawing on when the time for intelligent use arrived” (1979, p. 164). In a way, music psychology research has been about storing up the bank of information from which music education researchers can draw.

4. *Music educators should be encouraged to publish in music psychology journals and to present at relevant conferences.* As indicated throughout this article, there are certainly a number of individuals who

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<sup>1</sup> Of course, every one of us, no matter how well educated, is ignorant of many things. The point here is merely narrowness versus breadth of preparation within a given discipline.

<sup>2</sup> I am very well aware of how patently unfair it is to point out a single, missing citation. Clearly, no study is likely to include every possible reference, nor is there often a compelling need to do so. Therefore, I implore the reader not to take this as a criticism of the unnamed study, but rather to take it simply as an illustration of how the literature in music psychology can be of benefit to music education researchers.



are active in both music psychology and music education. We can describe these persons in a story told by George Duerksen. As reported in an article he published in 1975, one student said the greatest invention was the thermos bottle. Why? Because “it keeps hot things hot, and cold things cold, and it knows when to which” (p. 61). In like manner, some researchers are active in both disciplines, and they know when to which.

In spite of the foregoing, more music educators should be encouraged to cross over more frequently. An author identification of the past 10 issues of *Music Perception*, a premier music psychology journal, reveals that no music educators were identified among the 106 authors listed. Attendees at recent Society for Music Perception and Cognition and International Conference on Music Perception and Cognition meetings have been overwhelmingly psychologists. Of the musicians who attended, most were music theorists, with only a handful of music educators present. I believe firmly that music educators have much to contribute to the dialog and would highly encourage increased participation.

5. *Wherever appropriate, music education researchers ought to work in collaboration with multidisciplinary research teams.* One of the best ways to foster multi- and interdisciplinary research is to create research teams consisting of specialists from various disciplines. Though it can take some time for individuals to learn a common vocabulary, understand each other’s biases, and so on, there are enormous advantages to be gained when the collective expertise of such a group is focused on a specific research problem.

Let me share two examples from my own experience. I work with a team of neurobiologists and cognitive neuroscientists on brain imaging studies of musicians. To date, we have done studies on pianists, conductors, and singers (Brown, et al., 2003; Fox, et al., 1997; Hodges, 1998; Parsons, 2001), and are currently working on a study of dancers. Because my professional training is as a musician, there are limitations on the neuromusical research I can conduct on my own. Forming this research team allows us to pursue a problem with the combined strength of our various backgrounds and resources.

I also work with a team of musicians and scientists on the BioMusic Project (<http://www.biomusic.org>), a group exploring musical sounds in all species. This team includes a professional pianist, a specialist on Paleolithic flutes, a bioacoustician, an ornithologist, a whale specialist, an expert on vertebrate vocalization, a neurologist, and a biology educator. The sounds of nature, including geophony (the sounds of inanimate nature, e.g., wind in the trees, waterfalls) and biophony (the sounds of animals), have had profound implications for the nature of music. Team members are interested in how the rich sonic environment of the natural world connects to and informs human musicality.

In closing, and to put the finest and most succinct point possible on this extended discussion, I would simply invite all music educators, but especially graduate students and their professors, to view music psychology as an important area of study. Increased involvement of music educators in music psychology can benefit both disciplines.

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