Chapter 12
Ecological Validity and Impact: Key Challenges for Music Education Research

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The research and theoretical bases for music education must simultaneously be refined and radically broadened both in terms of their theoretical interest and practical relevance.
(Action for Change, pp. xxxi–xxxvii, this volume.)

Introduction

In order simultaneously to refine and broaden the research and theoretical bases for music education, as well as ensuring their practical relevance, I believe that we have to address two key challenges: ecological validity and impact. These are in a symbiotic relationship. If our research is to have professional impact, it has to be ecologically valid; if it has such validity, it is in a better position to have impact. Research endeavors are likely to be better placed to effect change if we locate them in real-world situations (which is not as easy as it might seem) or ensure that they have an appropriate applicability to such situations. However, the real world is messy, untidy, not always (if ever) predictable, and is often context and person sensitive. Such sensitivity is evidenced in the challenge to the certainties that underlay positivistic empiricism by the diversity of procedures and outcomes evident in much qualitative research (for example, Denzin and Lincoln 2005). We recognize that "truth," in terms of musical behaviors, is a contested concept precisely because "music" and its associated manifestations are the products of individual minds operating in particular sociocultural contexts. Furthermore, an increasing and necessary proliferation of specialist areas of knowledge suggests that it becomes unlikely that any one individual can have an all-encompassing insight into musical behavior and learning. Recent and ongoing neuropsychobiological research into musical behavior (such as Peretz and Zatorre 2003), for example, demonstrates a species wide universality of neurological structures for the processing of acoustic phenomena, including music.

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Nevertheless, we are only at the beginnings of that particular research journey in understanding the implications of such enquiry for music pedagogy, particularly in relation to our local contexts. So "real world" in this context means that we, as researchers, have to make every effort to ensure that we have understood fully all the facets of the thing that we wish to research as part of our research journey. Arguably, one of the prime reasons for so many submitted music research-based articles being rejected on a daily basis by the world's leading journals (up to 75% in some cases) is that expert reviewers are not convinced that the submitting authors have covered all the bases, either in the design or in the execution of their research.

Accordingly, I suggest that the ecological validity and impact of music education research will continue to be limited, unless three basic challenges are addressed. These relate to (i) multivoicedness, (ii) culture, and (iii) understanding the reality of our bodymind reality in relation to the nature of effective music teaching.

The Challenge of Multivoicedness

A one-day research workshop sponsored by the European Science Foundation (ESF 2002) brought together internationally recognized experts from across the European Union, who were interested in the child and adolescent voice. Three overarching areas of specialist research expertise were present: clinical-medical, perceptual-acoustic, and psychological-educational. These umbrella groupings reflected particular emphases in the professional lives of the participant experts, which derived from their work in either clinical settings (for example, as surgeons or clinical phoniatricians), scientific research into the psychoacoustic aspects of voice (including electrical engineering, computer modeling, and general speech/voice science), or applied research into child voice in educational and therapeutic settings. Several findings emerged from the workshop. First, matters that appeared to be scientific "certainties" in the understandings of relative nonspecialists within the group were often regarded with greater circumspection and hedged with more caveats by those with a deeper, specialist knowledge. Second, it became clear that child and adolescent voice behavior could be conceptualized as a "continuum," in which classification categories ranged from "abnormal" to "normal" to "supranormal." Yet, within and between these categories, there was considerable variation in the robustness and extensiveness of existing data sets, often because weaknesses were perceived in such data or because data were lacking. In turn, these variations impacted on definitions; thus the boundaries between the three groupings (abnormal, normal, and supranormal) were (and continue to be) fuzzy and not well defined. As one example, the onset of puberty with its concomitant period of voice change ("mutation") for both males and females raises particular challenges in our definitions of "normal" and "abnormal," of what counts as voice function and dysfunction. Different phases of voice change are often characterized by inaccurate vocal pitch matching, increased breathiness, vocal tiredness, and reduced pitch and intensity ranges in adolescent singers. Outside the period of adolescent voice

change, such vocal behaviors may be indicative of some form of "dysfunction." But within this "mutational" period, one possibility is for these to be regarded as "normal." This, in turn, creates particular challenges in our ability to diagnose vocal health "dysfunction" during this period of adolescent voice change (Williams et al. 2005), not least because there is relatively little research data of any kind on the adolescent female voice compared to its male counterpart. Furthermore, the diagnosis of voice disorder is also likely to be related to (a) the type of voice assessment protocol being used locally (with at least three different official protocols in use in European voice clinics, for example), (b) variations in the perceptions of voice quality at the level of the individual clinician (cf., Krieman and Gerratt 1998, Bele 2004), (c) variations in definition of voice disorder (Martin and Miller 2003), and (d) variation in the perceived nature of appropriate treatment (Rinta and Welch 2008). At the workshop, it was only when all the child voice experts were gathered together in the same room that the fuller picture—with all its uncertainties—emerged.

From the above, we can conclude that areas of specialization (and subspecialization) are designed to provide particular, deep, but (of necessity) only partial insight into the phenomena of human behavior. The customary "ways of knowing" that characterize any one of these specialties are both a strength and a weakness in understanding the whole. It is only when such diverse perspectives and "evidence" become combined that a fuller picture emerges and becomes sustainable. Consequently, a "multivoicedness" (in the widest sense) approach in addressing the diverse nature of reality is an established feature of the best practice in voice clinics, such as in the United States and (more recently) Europe. In such clinics, everyone who has contact with the voice "client/patient" (and not just the senior staff members) is seen as being able to make a valuable contribution to a broader understanding of the clients and their vocal behavior (as "function" or "dysfunction"). Each person's role in the clinic facilitates a different relationship with the voice client. The receptionist, nurse, speech therapist, voice technician, and ear-nose-throat surgeon each have a particular "view" of the patient and their needs, and it is a combination of these "views" that is seen to provide the most effective basis for subsequent treatment.

Multivoicedness is also a characteristic of effective research. This may be formalized into a particular research approach, such as demonstrated by "activity theory" (Engeström 2001, Ryder 2004) in which "object-orientedness" explores the relationships between an individual's actions, needs and the community, as mediated by cultural artifacts, and conventions and division of labor. Other, simpler examples are found in the concept of "triangulation" in the gathering and weighing of evidence, the designation of research participants as "co-researchers" in some forms of action research, as well as in the diversity of perspectives offered through a combination of qualitative and quantitative research approaches within a particular project—a "multi-methods" approach. While there will always be ontological and epistemological imperatives for fostering the best possible match between a research question or hypothesis and a chosen research methodology, our research activity will be strengthened if we provide opportunities for multivoiced perspectives within our chosen research strategy. This is not to say that the lone researcher is incapable of

generating valuable insights on their own, but rather to argue that individuals will have put themselves in a stronger position to generate such valuable insights if they are able to take a variety of informed perspectives into their research focus, including talking to experts in fields that are associated with their topic (see Chapter 5, this volume). This is more than the "triangulation" of different perspectives from within the research focus, such as from various participants, but consulting experts who have critical insight into the ontological and epistemological nature of concepts that are considered to be integral to the individual's research.

The Challenge of Culture

In 2001, the British Educational Research Association (BERA[1]) published an academic "map" of research literatures that impacted on music education. In this "map," an introduction led into a series of linked overviews, focusing first on research concerned with individual musical development, then on the potential impact of musical learning on social group membership and schooling, and concluding with an ethnomusicological perspective of the wider musical community, followed by a brief coda. These writings were based on the perspective of (primarily) UK-based researchers as part of a UK government-funded initiative to generate greater synergies between the worlds of research, policy and educational practice. The purpose of the "map" was to: (i) provide a summative overview of the (then) current breadth and depth of available research knowledge for actual and potential users; and (ii) create a research development agenda that embraced indicators of possible research priorities for the immediate future. This UK-focused "map" became the catalyst for a subsequent special edition of the journal *Psychology of Music* (Welch and Hallam 2004 [Volume 32, 3]). The special edition was designed to contrast the earlier UK-based overview with selected perspectives of music education research that had been undertaken in Australia, South America (Brazil and Argentina), Scandinavia, Germany, Hong Kong China, and the United States.

When juxtaposed in this manner, it becomes clear that, at any given moment in time, different research traditions coexist. Furthermore, our different research cultures are also subject to modification over time, as is demonstrated by shifts in the prime foci of the activities of a particular country's music education research community. In Australia, for example, Stevens and McPherson (2004) note that the research priorities during the 1930s–1970s were on class music teaching and curriculum development. However, there was a much broader research agenda from the 1980s onwards in which instrumental teaching, curriculum evaluation, and creativity were also significant topics. In contrast, music education research in Brazil and Argentina is reported to have had a relatively short history, being mainly developed since the 1980s with a strong European and North American influence (Hentschke and Martinez 2004). Each of these South American countries has had its own priorities: Brazilian researchers have been interested in the concept of assessment (for example, listening, performance, and choral), musical development, compo-

sition, the use of new technologies, and informal music learning, while Argentinean researchers have found the psychology of music field to be a powerful impetus for their studies, such as in cognition, development, performance, singing, teaching and learning, and the education of the professional musician.

Whereas the UK "map" suggested the relative domination (at least until recently) of empirical research, researchers in Scandinavia have been equally interested in historical and theoretical research (Jørgensen 2004), including research into music teacher education (a topic that is relatively under-researched, for example, in the United Kingdom, although more in evidence in the United States). Furthermore, much Scandinavian music education research has been based in "academies of music," whereas the majority of published UK research has been based in university departments of education or psychology. Similarly, until the last 15 years or so, German researchers have been primarily university based, resulting in an academic rather than a practice-based focus to their research (Gruhn 2004). This distinction between "academic" (that is, theory) and "practice" reflects a common phasing in German (music) teacher preparation. University-based subject study has traditionally been given an initial (high) priority, and this has been followed customarily by an extended period of separate classroom-based practice, prior to formal teacher qualification (Viebahn 2003). In Germany, music perception was a major initial focus, as exemplified by the groundbreaking mid-nineteenth century studies in physiological psychology of Hermann von Helmholtz and contemporaries. It is only recently that there has been a greater emphasis on qualitative studies across a wider range of topics, such as in early music learning, multiculturalism, and the place of music in schools and society.

Hong Kong, China, presents us with another research contrast. Since the constitutional and administrative changes of 1997, there has been greater interest in Chinese (traditional) musics (Cheung 2004). Nevertheless, the "one country, two systems" philosophy is reflected in the relative dominance of Western musics in Hong Kong school practice and higher education (as in mainland China, cf. Welch 2008), mainly because preservice music teachers are more likely to have a stronger background in the study and use of Western rather than Chinese instruments, even though they may also be keen listeners of Cantonese popular music. In the past, music was not strongly prioritized in the Hong Kong school curriculum. Consequently, research into music education has only become established during the past decade. The dominant culture is more achievement- and teacher-oriented than in the West, with creative music making being reported as relatively under-represented within the curriculum. The cultural mix is further complicated by the widespread interest in (and use of) new technologies. These may provide increased access by teachers, pupils, and researchers to a wider range of examples of the available musical genres and promote a new range of research in this particular field.

The volume of research in the United States is relatively large compared to that of other countries, reflecting the size of its higher education and school systems. Nevertheless, the United States embraces much of the variety that is found elsewhere in the world (cf. Price 2004). Over time, there have been shifts, especially in the growth of research dissertations from the 1960s and the more recent increasing

appearance of qualitative research approaches within a predominantly quantitative research-focused culture (if judged by the content of many of the leading research journals, such as the *Journal of Research in Music Education* compared with the *Bulletin of the Council for Research in Music Education* since their inception). There are large bodies of research into the postsecondary and elementary phases of education, with proportionately less on secondary (predominantly on vocal, string, and wind ensembles) and preschool.

An important outcome of any such "tour" of the world's research traditions and practices is that it enables us to have clearer and empathic insights into the dominant thinking within our own research culture and to comprehend better our subjectivity in making sense of music education in our own local contexts. Hopefully, we should then be in a better position to effect change, should this be part of our mission, and to understand why certain musical "interventions" may be more or less effective. The increased migration of people and cultural imperatives across geographical boundaries also suggests that it is increasingly important to ensure that "culture" is addressed in our research activities. Examples of why music education and research need to be to sensitive to cultural diversity are found in England, which has seen an increase in the population of minority ethnic groups in the decade from 1991 to 2001 from 6 to 9%, with much larger numbers in the inner cities, particularly London. This changing cultural mix, representing additional numbers of people from South East Asia, the Pacific Rim, and Africa, has changed again since 2001 through immigration from former Eastern European states as part of the formal expansion of the European Community. In the 2001 national census, with regard to religious background, Muslims and Hindus represent 12% of the population of London. Such changes are by no means unique to the United Kingdom. It is essential, therefore, that research (following the "multivoicedness" concept, above), acknowledges, celebrates, and seeks to understand the impact of culture on the ways that we perceive music education.

The Challenge of Understanding the Bodymind in Relation to Effective Music Teaching

As suggested in the opening section, a large body of research has emerged over the past decade into the underlying neuropsychobiological nature of musical behavior. Music is seen as providing a unique insight into a more general understanding of the human brain's structures, processes, and functions. For example, there have been at least three major compilations published since 2001 (Zatorre and Peretz 2001, Avanzini et al. 2003, Peretz and Zatorre 2003), as well as numerous research articles in the world's leading scientific journals. Evidence of the entry of such research into the mainstream is reflected in introductory articles on the neuroscience of music, which have appeared on our newsstands in *Scientific American* (Altenmüller 2004, Weinberger 2004). This neuropsychobiological research agenda is broad and encompasses such macro- and micro-musical behaviors as music

listening, performance on a particular instrument, score reading, pitch (whether "absolute" or "relative"); perceptual processes related to timbre, consonance, dissonance and tonal structures; and research into the perception of musical "syntax," temporal processing, and the effects of instrumental practice.

Collectively, this growing research literature suggests that there are various biases toward particular brain locations, or clusters of locations, in relation to specific musical behaviors. Hemispheric asymmetry is often evidenced, but complex musical behaviors involve different cortical and subcortical areas from different parts of the brain working collectively in neuronal networks (cf. Altenmüller 2003, Peretz and Coltheart 2003). The greater the complexity of the auditory information that needs to be processed, the larger the areas of neuronal networking that are required. In sung music, for example, language ("lyrics") and music ("tunes") are enacted by simultaneous cooperation between areas within the left and right cerebral hemispheres, respectively (Besson et al. 1998), with common cortical processing of the syntactical features of music and language (Maess et al. 2001) alongside an other-than-conscious ability to perceive underlying harmonic structures (Bigand et al. 2001). Moreover, research suggests significant shifts in the networked areas of the brain involved in music processing as a result of educational experiences (Schlaug 2006), such as from being taught to sing (Mithen and Parsons 2008). Similar, multisite networks are activated in other complex behaviors, such as the processing of complex visual images when watching a film (Bartels and Zeki 2004). In particular, specific neural systems for music processing are linked with those for emotion, such as in the analysis of emotional expression in performance or in the generation of an emotional response as a listener.

Taken together, this research into an underlying neuropsychobiological reality is generating important implications for music education research and practice. As an example, the term "bodymind" (Pert 1986) is a concept that has been developed to reflect the underlying integrative reality of the nervous, endocrine, and immune systems (see Thurman and Welch (2000) for its application to the world of voice and singing). How we think and behave is intimately linked to how we feel and to our health and well-being, in general as well as in music.

Within this integration of key bodily systems, our engagement with the expressive arts usually has emotion as a central component. All the expressive arts evoke an empathic physiochemical reaction, whether for a producer or receiver, or both, typically labeled as "feelings" (Hodges 1996, Thurman 2000). Incoming information elicits a triggering of the brain's perceptual and value-emotive categorization networks. These, in turn, trigger related physiochemical changes in other parts of the body (see Preti and Welch 2004). One outcome is that human emotive "communication" can take place through the arts without having recourse to the spoken or written word (Zeki 1999). This is a shared feature of our experience of music.

The interweaving of music with emotion has important consequences for music pedagogy. Our bodymind design means that the music teacher will bring strong emotional associations (whether conscious or not) to any music selected for a curriculum, while the students will also bring a range of powerful emotional

associations to the learning experiences under the umbrella of that curriculum. An essential contributing feature of the effectiveness of the learning-teaching process, therefore, is the relative match/mismatch between these emotional dispositions. These are likely to be reinforced and made explicit by aspects of musical identity (cf. MacDonald et al. 2002) in which age, role, and culture are central. Music is usually an essential part of everyone's personal identity, by which they identify with membership of particular groups and not with others, such as is characteristic of the musical preferences of adolescents (Tarrant et al. 2002). "Whose music?" is a common challenge in music curriculum design. This is not just because of the challenges inherent in understanding the key features of any particular musical genre, but because each genre's sonic design has an acoustic bias that is interwoven with positive and negative emotional associations and notions of self, such as identity.

Ongoing research in England, for example, has sought to understand why so many young people (around 93%) opt out of the formal music curriculum at the age of 14. These young people are not disengaging with music per se, but with a particular form of music, namely that which is represented in the school curriculum. This research is revealing a complex mosaic of musical identities in secondary schools that have powerful effects on whether or not any given individual is prepared to engage with "school music" (Saunders 2006). Alongside the small minority who feel fully connected to the school curriculum are others, for example, who see school music as "irrelevant," or self-label themselves as "non-musical," or who have status as a "musician" among their peers that is perceived to be threatened by the nature of school music activities, and/or who have strong identities with a "counter-culture."

Similarly, research into the music curriculum engagement of Black and Minority Ethnic (BME) pupils in one part of Inner London, where over one-third of the local population speak English as an additional language, has revealed huge variations in the numbers of young BME people opting to study music post-14. Participation rates range from 12 to 62%, depending on how closely the music curriculum is perceived to be aligned to the pupils' own musical identities (Spence 2006). In all such cases from contemporary schooling, powerful emotions are engendered when adolescent self/group identity and music come together.

Consequently, the recent increase in psychological research into music and emotion (for example, Juslin and Sloboda 2001), therefore, is to be welcomed, as is the growth in sociopsychological research—research at the interface between psychology and sociology (for example, identity—MacDonald et al. 2002; communication—Miell et al. 2005)—and into sociopsychological aspects of musical performance, expertise, and practice (for example, Parncutt and McPherson 2002, Sawyer 2003, Williamon 2004, Davidson 2004, North and Hargreaves 2008). Each of these research developments brings important insights to how both musical behavior and development are facilitated or hindered by internal and external factors. More research is essential, however, if we are to understand how to apply these new insights in pedagogical contexts, including how to address the needs of individual learners within educational organizations that are designed around collective provision and groups (such as schools and their classes).

Conclusion

The interweaving of cognitive and emotive responses to musical engagement is an essential component of individual and group musical experiences. This bodymind reality is informed by individual and group biography and happens within particular sociocultural contexts in which musical behaviors may be observed. The rich complexity of the reality of musical experience, of what we bring to the musical moment and of how we make sense of it, as well as how it might be extended in a pedagogical sense, requires a sophisticated ontological and epistemological sensitivity, and one in which "culture" is also acknowledged. The most appropriate research methodology, therefore, should access this integrative complexity through the acknowledgement of a multivoiced research approach. We need to celebrate the unique as well as the generic if we are truly to understand and facilitate musical development at an individual level. The power of a research focus on individual "cases," for example, is that they allow us to critique big theory and to understand more clearly the nature of variability and the concept of "normal." Yet, we also need to have bigger theoretical constructs if we are to make sense of how different or special an individual is. Having a multivoiced approach should enable us to get closer to the essence of our research focus, namely to understand the past and present more clearly in order that we in a better position to promote change in the future.

Note

1. http://www.bera.ac.uk/publications/reviews.php. See also Welch and Adams (2003) "How is music learning celebrated and developed?" to be found at http://www.bera.ac.uk/publications/pureviews.php and which contains a more concise research-based text aimed at teachers, parents and policy makers.

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