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idea journal

co-constructing body-environments

vol. 17, no. 02

2020

the journal of IDEA: the Interior design +
interior architecture educators' association



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**the journal of IDEA: the interior design +
interior architecture educators' association**

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- (b) being an authority on, and advocate for, interior design/interior architecture/spatial design education and research.

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**co-constructing body-environments:
provocation**

Presenters at *Body of Knowledge: Art and Embodied Cognition Conference (BoK2019)* hosted by Deakin University, Melbourne, June 2019) are invited to submit contributions to a special issue of idea journal "Co-Constructing Body-Environments" to be published in December 2020. The aim of the special issue is to extend the current discussions of art as a process of social cognition and to address the gap between descriptions of embodied cognition and the co-construction of lived experience.

We ask for papers, developed from the presentations delivered at the conference, that focus on interdisciplinary connections and on findings arising from intersections across research practices that involve art and theories of cognition. In particular, papers should emphasize how spatial art and design research approaches have enabled the articulation of a complex understanding of environments, spaces and experiences. This could involve the spatial distribution of cultural, organisational and conceptual structures and relationships, as well as the surrounding design features.

Contributions may address the questions raised at the conference and explore:

- + How do art and spatial practices increase the potential for knowledge transfer and celebrate diverse forms of embodied expertise?
- + How the examination of cultures of practice, Indigenous knowledges and cultural practices offer perspectives on inclusion, diversity, neurodiversity, disability and social justice issues?
- + How the art and spatial practices may contribute to research perspectives from contemporary cognitive neuroscience and the philosophy of mind?
- + The dynamic between an organism and its surroundings for example: How does art and design shift the way knowledge and thinking processes are acquired, extended and distributed?
- + How art and design practices demonstrate the ways different forms of acquiring and producing knowledge intersect?

These and other initial provocations for the conference can be found on the conference web-site: <https://blogs.deakin.edu.au/bok2019/cfp/>.

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introduction: unknowingly, a threshold-crossing movement

Julianna Preston

Executive Editor

idea journal

It is in this special issue that the editorial board holds true to our promise to expand the horizons and readership of *idea journal* while reaching out to associated and adjacent art, design and performance practices and drawing connections to seemingly distant disciplines. The articles in this issue have provenance in a 2019 conference event, Bodies of Knowledge (BOK), which was guided by a similar interdisciplinary ethos. With an emphasis on cultures of practice and communities of practitioners that offer perspectives on inclusion, diversity/neurodiversity and disability, this conference, and this subsequent journal issue, aim to increase knowledge transfer between diverse forms of embodied expertise, in particular, between neuroscience and enactive theories of cognition.

This brief description suggests that there are shared issues, subjects and activities that have the potential of generating new understanding in cross-, inter- and trans-disciplinary affiliations and collaborations. My experience in these modes of inquiry points to the importance of identifying what is shared and what is not amongst vocabulary, concepts, pedagogies and methods. Holding these confluences and diverges without resorting to strict definition, competition or judgement of right and wrong often affords greater understanding and empathy amongst individuals to shape a collective that is diverse in its outlooks, and hopefully, curious as to what it generates together because of that diversity.

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The breadth of the knowledge bases represented within this issue necessitated that the peer reviewer list expanded once again like the previous issue. It was in the process of identifying reviewers with appropriate expertise that the various synapses between scholarly and artistic practices became evident. It is these synapses that shape sturdy bridges between the journal's existing readership, which is predominantly academics and students in interior design, interior architecture, spatial design and architecture, and the wide range of independent scholars and practitioners, academics, and students attracted to BOK's thematic call for papers, performative lectures and exhibitions. At the risk of being reductive to the complexity and nuances in the research to follow, I suggest that the following terms and concerns are central to this issue, aptly inferred by its title, 'Co-Constructing Body-Environments': spatiality; subjectivity; phenomenology; processual and procedural practice; artistic research; critical reflection; body: experience. All of these are frequent to research and practice specific to interiors. In this issue, however, we find how these terms and concerns are situated and employed in other fields, in other ways and for other purposes.

This is healthy exercise. To stretch one's reach, literally and metaphorically is to travel the distance between the me and the you, to be willingly open to what might eventuate. Imagine shaking the hand of a stranger—a somatic experience known to register peaceful intent, respect, courage, warmth, pressure, humour, nervous energy, and so much more. This threshold-crossing movement is embodied and spatial; it draws on a multitude of small yet complex communication sparks well before verbal impulses ensue. This significant bodily gesture sets the tone for what might or could happen. Based on my understanding of the research presented in 'Co-Constructing Body-Environments,' I propose that this is a procedure in the Gins and Arakawa sense that integrates theory and practice as a hypothesis for 'questioning all possible ways to observe the body-environment in order to transform it.'⁰¹ I call this as *unknowingly*—a process that takes the risk of not knowing, not being able to predict or predetermine, something akin to the spectrum of 'throwing caution to the wind' and 'sailing close to

the wind'. My use of the word 'unknowingly' embraces intuition where direct access to unconscious knowledge and pattern-recognition, unconscious cognition, inner sensing and insight have the ability to understand something without any need for conscious reasoning. Instinct. The word *unknowingly* also affords me to invoke the 'unknowing' element of this interaction—to not know, to not be aware of, to not have all the information (as if that was possible)—an acknowledgement of human humility. I borrow and adapt this facet of unknowingly from twentieth-century British writer Alan Watts:

This I don't know, is the same thing as, I love. I let go. I don't try to force or control. It's the same thing as humility. If you think that you understand Brahman, you do not understand. And you have yet to be instructed further. If you know that you do not understand, then you truly understand.⁰²

Unknowingly also allows me to reference 'un' as a tactic of learning that suspends the engrained additive model of learning. Though I could refer to many other scholarly sources to fuel this concept, here I am indebted to Canadian author Scott H. Young's pithy advice on how to un-learn:

This is the view that what we think we know about the world is a veneer of sense-making atop a much deeper strangeness. The things we think we know, we often don't. The ideas, philosophies and truths that guide our lives may be convenient approximations, but often the more accurate picture is a lot stranger and more interesting.⁰³

In his encouragement to unlearn—dive into strangeness, sacrifice certainty, boldly expose oneself to randomness, mental discomfort, instability, to radically rethink that place/ your place/ our place, suspend aversions to mystery—Young's examples from science remind us that:

Subatomic particles aren't billiard balls, but strange, complex-valued wavefunctions. Bodies aren't vital fluids and animating impulses, but trillions of cells, each more complex than any machine humans have invented. Minds aren't unified loci of consciousness, but the process of countless synapses firing in incredible patterns.⁰⁴

In like manner to the *BOK2019* conference which was staged as a temporally infused knowledge-transfer event across several days, venues, geographies and disciplines, I too, ingested the materials submitted for this issue in this spirit of unknowingly. The process was creative, critical, intuitive, generative and reflective—all those buzz words of contemporary research—yet charged with substantial respect and curiosity for whatever unfolded, even if it went against the grain of what I had learned previously. For artists, designers, architects, musicians, and performers reading this journal issue, especially academics and students, this territory of inquiry may feel familiar to the creative experience and the increasing demands (and desires) to account for how one knows what one knows in the institutional setting. 'Explain yourself,' as the review or assessment criteria often states. If you are faced having to annotate your creative practice or to critically reflect on aspects that are so embedded in your making that you are unaware of them, I encourage you to look amongst the pages of this journal issue for examples of how others have grappled with that task such that the process is a space of coming to unknow and know, unknowingly.

Figure 01:

Meeting the horizon; A still image from *Shore Variations*, a 2018 film by Claudia Kappenberg that reimagines *Waning*, a 2016 live art performance by Julieanna Preston. <https://vimeo.com/user11308386>.

There are a few people I would like to acknowledge before you read further. First, huge gratitude to the generosity of the peer reviewers, for the time and creative energy of guest editors Jondi Keane, Rea Dennis and Meghan Kelly (who have made the process so enjoyable and professional), for the expertise of the journal's copy editor Christina Houen and Graphic Designer Jo Bailey, and to AADR for helping to expand the journal's horizons.

Okay, readers, shake hands, consider yourself introduced, welcome into the *idea journal* house, and let's share a very scrumptious meal.

acknowledgements

I am forever grateful for what life in Aotearoa/ New Zealand brings. With roots stretching across the oceans to North America, Sweden, Wales and Croatia, I make my home between Kāpiti Island and the Tararua Ranges, and in Te Whanganui-A-Tara/ Wellington. I acknowledge the privilege that comes with being educated, employed, female and Pākehā, and the prejudices and injustices that colonialism has and continues to weigh on this land and its indigenous people. I am committed to on-going learning and practicing of Kaupapa Māori.

notes

- 01 Jondi Keane, 'An Arakawa and Gins Experimental Teaching Space; A Feasibility Study,' *INFLExions* 6 (2012), accessed 29 October 2020, http://www.inflexions.org/n6_keane.html.
- 02 Alan Watts, *Creating Who You Are* (Video) (n.d.), accessed 29 October 2020, <https://vimeo.com/76888920>.
- 03 Scott H. Young, 'The Art of Unlearning' (2018), accessed 29 October 2020, <https://www.scotthyoung.com/blog/2018/04/12/the-art-of-unlearning/>.
- 04 Young, 'The Art of Unlearning.'

musicking as ecological behaviour: an integrated '4e' view

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abstract

In this article, I bring together research from ethnomusicology, ecology, neuroscience, '4E' cognition theory and evolutionary musicology in support of the idea that musicking, human musicking in particular, can best be understood as an emergent ecological behaviour. 'Ecological' here is used to mean an active process of engaging with and connecting ourselves to our various environmental domains – social, physical and metaphysical – and although I will focus on musicking, these concepts may apply to other artistic behaviours as well.

The essential ideas from the Santiago theory of cognition, the work of Maturana and Varela and one of the foundations of contemporary 4E cognition theory, are that we as living beings 'bring forth' both the inner and outer worlds we experience, and this process (cognition) is common to all life. Music is also a process (not an object), one that emerges from properties of life itself and serves to link body/mind and environment. Understood this way, 'co-constructing body-environments' applies to the arts in general.

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musicking, ecology, 4E cognition, ethnomusicology

introduction

For me, the aesthetic response is what Gregory Bateson referred to when he said, 'beauty is the pattern that connects.' I interpret that to mean that the aesthetic response, the perception and apprehension of beauty, becomes a sort of resonance: we see and feel our own individual mind expand to include something that we previously didn't assume to be part of us.⁰¹

David Dunn

There is a well-known parable, originally from ancient India, in which four blind men are introduced for the first time to an elephant. Each is introduced to a different part of its body, so that when asked to describe the elephant, each description may be accurate in itself, but no coherent or consistent understanding of the animal emerges. In our efforts to grasp the phenomenon of human musicking today, we are faced with a similar predicament. We have understandings derived from multiple disciplines and cultural traditions, each of which offers useful insights, but which individually lack the necessary integration to enable us to see 'the whole elephant.'

My purpose in this article is to propose an inclusive approach to understanding musicking, transcending long-standing divisions among discipline-based perspectives, among diverse cultures and cultural practices, and fundamentally, among divisive ways of thinking about body, mind,

and environment. In beginning with the elephant parable, I am by no means intending to imply blindness on the part of any cultural traditions or disciplinary approaches; to the contrary, my purpose is to draw on the insights from as many of them as possible. Further, my hope is that this will not be only a theoretical exercise but potentially enriching to creative artistic endeavours as well. Mindful of the fact that this journal is primarily focused on spatial design practices, an area in which I have no expertise, I would just add that this approach to understanding musicking might also suggest some interesting avenues for exploration in spatial design.

I will argue that musicking is essentially an emergent ecological behaviour of our species. After discussing some background issues and defining some terms, I will present and discuss an overview of a range of work by ethnomusicologists. A comprehensive conception of musicking must be broad enough to encompass the conceptions and practices observed in diverse cultural contexts around the globe. As it is broadly accepted now that musicking is a species-wide behaviour (inclusive of this diversity),⁰² I will next argue that we must account for its foundation in characteristics of our lives as organisms in the ecosystem of our planet, i.e., neither isolated as a species nor as individuals. Here I will draw on work in 4E cognition, and in particular, one of the contributing sources to the field, the Santiago theory of cognition. The central point of this theory is that in all cognition, living beings 'bring forth' or co-

construct ourselves and our environments. Neuroscience can also offer important insights into both the impact of musicking and the particular capabilities of our brains and bodies that enable human musicality. In turn, these characteristics of modern humans did not appear instantaneously with the origin of our species but have emerged from roots deep in the nature and processes of life itself, and this will require some brief discussion of biocultural views of our evolution.

background issues and definitions

I have proposed elsewhere my definition/conception of musicking as ecological behaviour but will present it again here for ease of reference.

Musicking is an activity of human beings involving sound and time, the function of which is to facilitate and enhance our connection with our environment. Environment here includes three mutually-related realms or domains: the social realm, the natural/physical world, and, as understood in many cultures, the metaphysical or spiritual realm.⁰³

As preparation for the discussion to follow, I need to expand several points. While my use of 'ecological behaviour' in itself may be puzzling, I ask the reader's patience as the meaning of that term is the subject of this entire article. Before continuing, I also ask the reader to note my use of 'function' here rather than 'purpose.' I will return to the teleological question in more detail in connection with emergence and evolution, but it may help to

keep this point in mind throughout; cognition is a universal function of life, all varieties of organisms exhibit this function in different ways, and its breadth and universality are emergent characteristics, not externally-imposed purpose.

Concerning 'musicking,' readers familiar with Christopher Small's work in identifying music as 'not a thing at all, but an activity, something people do'⁰⁴ may also recall his observation that 'the act of musicking establishes in the place where it is happening a set of relationships,' and that the meaning of musicking for us lies in these 'relationships between person and person, between individual and society, between humanity and the natural world and even perhaps the supernatural world.'⁰⁵ The advantages of Small's approach are two: it is enactive and relational (with the environment), and the concept is culturally inclusive, although Small draws most of his examples from the Western tradition.

The second point concerns the significance of the three realms in my definition (and Small's). These realms are really not distinct from each other in essence—I have no wish to promulgate Cartesian dualism—but with that understanding, it may sometimes be helpful to consider the distinctions, if for no other reason than we tend to behave somewhat differently in interacting with each. The thinking underlying musicology generally is, or at least has been, that music is primarily an intra-species social phenomenon. This might seem reasonable, given that most musical activities involve social interactions of some kind, but if

we consider them only in that dimension and examine them only through social theory, we isolate our musicking from its natural broader context, and from the beliefs, conceptions and subjective experiences of people in many cultures around the world, past and present.⁰⁶

Third, my definition appears to ignore human 'linguaging' (by not distinguishing musicking from it). A full discussion of the relationship between linguaging and musicking is well beyond the scope of this article, but, as Gary Tomlinson points out, 'in fundamental features musicking is neither language-like nor symbol-like.'⁰⁷ Ian Cross cites Pinker and Jackendoff's claim, 'language is a mapping between sounds and meanings'⁰⁸ to illustrate the distinction that language relies on mutually-agreed-on referential meanings for sounds, while music may or may not do so.⁰⁹ Cross argues that music's 'floating intentionality' allows for a different type of communication from the linguistic. I would add that it allows for connection to aspects of our environment including *but not limited to* the human domain, and that this concept might apply to other arts as well.

Fourth is the question of non-human musicking. That human musicking and certain behaviours of other species resemble each other to varying degrees is part of the reason we can gain from considering these behaviours as belonging to our ecosystem as a whole. In focusing on human musicking in this writing, I am not separating it from related activities of the rest of life on our planet, and in fact am advocating its inclusion. I am claiming that to see 'the whole elephant,' we

need to begin by considering ourselves as living organisms in an ecosystem, neither disembodied floating intellects nor isolated from the processes of all of life within and around us.

Finally, some discussion about 'ecology' may also be helpful here. The word itself is used in many ways today; sometimes to mean study of any complex system, sometimes as a substitute for 'nature' or 'environment,' and sometimes in the technical sense of scientific inquiry concerning the relationships between organisms and their environments. The significance of ecology in this article is threefold. First (although this may be the least critical of the three), in the philosophical sense, it conveys the importance of seeking to understand musicking from the broadest possible perspective. Second, the relevant key insight from the Santiago theory is essentially an ecological one in the scientific sense, derived from study of the interactions between organisms and environments. And third, my claim is that musicking is a mode of cognition, in itself essentially a mode of interaction with and exploration of our environment; it can therefore be understood as a way of knowing, learning or inquiry about human-environmental relationships, i.e., *ecological*, albeit not necessarily in the scientific sense.¹⁰

Support from ethnomusicology

If we hope to say anything meaningful about music as a species-wide phenomenon, we must attempt to embrace the extraordinary diversity of musical practices around the world, not limiting our scope to a single or narrow range of cultures. For this reason,

while it would be a more traditional approach to present the theoretical background for my argument before delving into the other relevant disciplinary approaches for supporting evidence, I turn first to the collective work of ethnomusicologists to explore what people actually do, experience, and feel or think about what they do when they engage in musicking.

There are some obvious problems with methodology here, given that I am aiming to assert something universal about a diverse and still-being-explored set of practices. First, there is no one, to my knowledge, who has attempted to study all the musics of the world. In order to be as comprehensive as possible, besides surveying books and journals in the field, I've now examined all of the nearly 400 articles on individual music cultures in the *Garland Encyclopedia of World Music*,¹¹ a collection of case studies by reputable scholars in the field. Second, the output of the ethnomusicologists' work is their discourse about their experience of the music, or their discourse about their observations of the musicking participants, or even their discourse about the discourse of the participants about *their* experience; it is thus not musicking in itself. And, the language or terminology used is not consistent from researcher to researcher, let alone from culture to culture.¹² I am thus not claiming that this research *proves* anything, only that it provides reasonable, broad support for my thesis: people *feel* that musicking connects them to something outside themselves (as Dunn suggests in the passage cited earlier.)

While such a survey obviously cannot claim to be exhaustive, my purpose is to demonstrate what might be surprising to a non-ethnomusicologist reader – the worldwide ubiquity of the conception of musicking as connective in one or more of these three realms. Looking for universals (beyond the trivial) among the surface characteristics of the musics has proven unproductive,¹³ and the diversity of functions and contexts for musicking means that any search for universals in that arena must be made with full cognizance of and respect for that diversity, first understanding each culture in its own terms.

In Figure 01 below, I present a schematic representation of what might be called a meta-analysis of the ethnomusicological literature from this perspective. The outer layer contains a sampling of common functions or events involving musicking, and the middle layer suggests a set of broader categories into which the first collection might be grouped. None of the elements in either layer are mutually exclusive, nor (obviously) are the sets exhaustive, nor is there necessarily any linear correspondence between elements in these two layers. The centre contains what I am calling the 'root function' – a meta-category inclusive of all the others. The schematic can then be read either outside-to-inside or the reverse; the first direction describes, in a sense, a process of discovery (delving further into diverse specifics leading to broader functional principles), while the reverse direction might be said to trace the emergence of diversity from a common root.

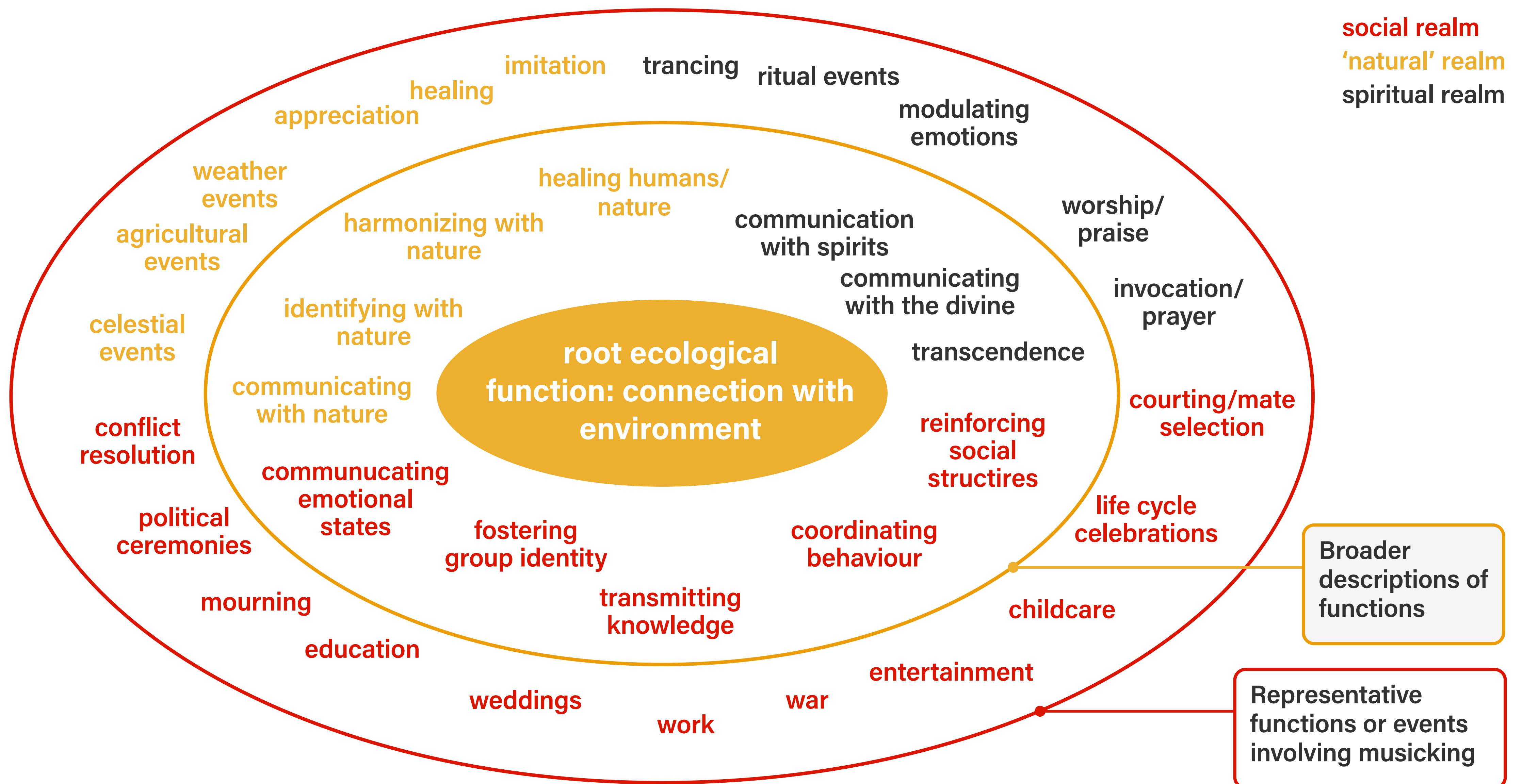


Figure 01:
Schematic of the author's meta-analysis of functions of musicking.

To illustrate, here are some examples exploring musicking's connective functions, first in the realm of 'nature,' understood here as short for the non-human material environment. (Having recognised and acknowledged the inherent problem in using dualistic language that separates human from environment or 'nature,' I choose here to skirt further terminological discussion.¹⁴)

Henry Stobart, writing about music in the Bolivian Andes, explains the prevailing understanding that *animu* (roughly 'energy') is the property of all living things, which here include rocks and celestial bodies, and that all music and sounds possess animu as well. The same music played for human weddings

is thus performed at ceremonies 'wedding' a mountain to agricultural land in preparation for the growing season, and ox-horn trumpets are played to heal the moon during a lunar eclipse. He writes, 'It is thus through the medium of (musical) sound, and its influence on the animu contained in bodies, that intensely powerful emotions are communicated and transformations or actions are brought about.'¹⁵

Brian Diettrich writes about the embodiment in music and dance of close relationships between people, the ocean, and its inhabitants in Oceania. Discussing 'summoning fish,' he notes:

Pacific communities created entire genres and practises of music that uttered the importance of fish to survival and sustenance. At the same time, fish were and are more than food, and the study of expressive practices suggests the significance of participatory relationships with fish.¹⁶

Interestingly, he also notes that these relationships expressed in song include warding off potentially dangerous ones; musicking engages key elements of the environment, positive or negative.

Steven Feld cites anthropologist Colin Turnbull in discussing the music of the Mbuti pygmies of Central Africa.

Song is used to communicate with the forest, and it is significant that the emphasis is on the actual sound, not on the words.... The sound 'awakens' the forest... thus attracting the forest's attention to the immediate needs of its children. It is also of the essential nature of all songs that they should be "pleasing to the forest."¹⁷

Feld continues, 'As a cooperative social activity, singing fosters heightened sociability both directed to and in the presence of the forest.'¹⁸

Note that in just these three examples, we find functions that might be categorised as anything from communicating a range of emotions to offering assistance to the environment, attracting needed support to

repulsing danger, modelling ideal human behaviours, and so on. Two other categories of functions often found in the literature are constructing place and identifying with elements of nature.¹⁹ Each of these, in turn, can be understood as aspects of connecting with the natural environment.

Turning now to the spiritual/metaphysical dimension of the environment, we see again diverse specific expressions which can be grouped or categorised and understood at a deeper level as essentially connective.

Paul Berliner, writing about the music of the Shona people of Zimbabwe, notes:

In the past, as today, the *mbira* [a metal-keyed lamellaphone] has been used in traditional Shona religious ceremonies to create the essential link between the world of the living and the world of the spirits. The *mbira* is believed to have the power of projecting its sound into the heavens, and attracting the attention of the ancestors....²⁰

Monique Ingalls has studied the role of singing in evangelical Christian conferences in the U.S., and notes the importance of singing to 'the transformative personal experience of God,'²¹ writing:

Likewise, the performance of 'O Praise Him' at the Passion Conference provided a telling illustration of how the worship space is imagined and performed as a sonic interchange between heaven and earth....

The bridge section is where this musical action is finally accomplished: the sung vocables can be understood as the 'joyous noise,' as earthly and heavenly songs become one.²²

David Turner explains that, among the Aborigines of Australia, the didgeridoo player and singer, through their music, cross to the 'other side' of existence and return, stating that 'music is the principal means of accessing the "eternally uncreated" domain we have translated as the "Dreamtime."²³

Marina Roseman²⁴ explains that in the cosmology of the Temiar people of Malaysia, humans and all entities in our environment (plants, animals, landforms) share a homologous structure involving two kinds of souls, one of which can also become unbound and interact with unbound souls of other entities. In a dream state, the unbound soul of a medium forms a bond with an unbound soul of another entity/spirit guide and a song is bestowed on the medium; in healing ceremonies, this song is sung by the medium with a human chorus who follow along, enabling the medium and spirit guide to diagnose and treat illness.

The music of the beating [bamboo] tubes mediates between the rainforest's pulsing sounds and the body's beating heart, bringing nature spirits into conjunction with the human spirit, collapsing the boundaries between nature and culture.²⁵

Once again, the conceptions of the spiritual realm are diverse, and the categories of connective experiences vary from fusing with various spiritual beings (human ancestors or others) to invocation or prayer, to communication between or shifting planes of existence, but there is a deeper commonality in that musicking connects participants to this realm. I should also note here that another common function that could be included in discussion of the non-material realm is the use of music to modulate one's own emotional or spiritual state, often discussed as its primary function.²⁶ The Temiar example in particular illustrates the interconnectedness among all three realms and the artificiality of separating them; as the group participates in the healing ceremonies, they reaffirm their link to the spiritual, the natural and to each other.

Connection in the social realm is the easiest to recognise and most common. A full exposition of the range of specific interpersonal connective functions is beyond the scope of this article, but consideration of a short list of categories of functions should make the point clear: expressing or sharing emotional states, fostering group identity, manipulating others, enabling coordinated activity, transmitting knowledge, and reinforcing social order and behaviours. And of course, the various functions associated with the other two realms are most often carried out in group settings. I have found not a single example in the research literature of a culture which does not mention at least one such social bonding function of musicking. It's clear from the descriptions that the musical activity functions to facilitate the connecting of individuals,

regardless of the terminology used, so I can assert a scholarly basis in support of what is surely common knowledge; one function of musicking is to connect people with each other.

To recapitulate, my aim in this brief overview of ethnomusicological work has been to show that people from cultures everywhere conceive of and experience musicking as something that connects them to something outside of or larger than themselves. I am asserting that musicking everywhere is a mode of cognition, ecological in its nature, that ethnomusicology provides us with varied descriptions of people's experiences of the ways musicking *functions*, not its purpose. Figure 01 and the categories as presented are clearly drastic oversimplifications, but I believe they represent a process that can encompass a vast quantity of information and enable us to link our continuing theoretical exploration to an inter-cultural foundation of lived experiences and beliefs; we can begin to see a homologous relationship 'inside' the cultural diversity. It remains for us to learn more about the precise nature or source of that feeling of connection, and this suggests that we next consider musicking from the perspective of what we know about how living organisms interact with their environments, i.e., ecology itself.

the santiago theory: ecology and a non-dualistic view of cognition

The work of Chilean neuroscientists Maturana and Varela (commonly referred to as the Santiago theory of cognition)²⁷ provides a framework for understanding human cognition, including the capabilities inherent in musicking, in the context of fundamental processes of all living things in their relationships with their environments. Scholars in a range of disciplines have incorporated elements of the Santiago theory into their own fields,²⁸ and I am not the first to do so in music. I have presented elsewhere an overview of the theory and some of the possible applications to the understanding of musicking,²⁹ so here I will focus on just a few of the key points.

Autopoietic ('self-making') unities (i.e., all living things) are at once, (1) distinct from their environments (requiring a semi-permeable membrane), (2) operationally self-contained entities (consisting of a set of molecular functions which, utilizing materials from the environment, reproduce the structures they embody), and (3) embedded in and interdependent with their environments. This 'dual-but-not-dual' relationship with their surroundings necessitates *cognition*, which, in the Santiago theory, is the embodied process by which all living things interact with their environments; any autopoietic unity, regardless of the level of complexity of its internal structures, must 'know' its environment and respond to it with effective behaviour in order to continue autopoiesis. Cognition thus emerges in a continuum across different life-forms.

Although we may both be enjoying the spinach I ate for dinner, a bacterium in my mouth will know a world somewhat different from the one I experience. Maturana and Varela (hereafter the Santiago authors) argue therefore that each organism 'brings forth a world' according to its own capabilities and autopoietic needs; there *are* such things as my mouth and spinach, but my 'knowledge' of them will be different from that of my biome partners.

Groups of cells can form what the Santiago authors call a *metacellular* organism, or second-order autopoietic unity. Such an organism (e.g., most of the plants and animals we know in ordinary life) functions to conserve the autopoiesis of its individual cells and to conserve the pattern of organisation (or adaptations) and interactions of the larger entity. Each component cell brings forth and interacts with its own world, but beyond that, the actions and interactions of the component cells collectively bring forth the world of the metacellular, according to its pattern of organisation.

Neurons, as living cells, *also* detect changes in their environments and alter their own internal states, coupling with and triggering changes in the cells to which they are connected. In complex organisms, neurons interact with three different environments: the external environment (as senses), the motor system, and (mostly) with other neurons. Cephalisation results in tremendously increased structural plasticity and flexibility of response.

The intense interconnectedness of a complex nervous system opens 'new dimensions of structural coupling for the organism, by making possible in the organism *the association of many different internal states with the different interactions* in which the organism is involved.'³⁰ In other words, organisms with sufficiently complex nervous systems bring forth a complex internal world along with the external world, and link them together. This, I will argue, is a key step in understanding the function of musicking.

In summary, the Santiago theory suggests a universal biological correlate for the diverse cultural descriptions (reported by the ethnomusicologists) of the sense of connection experienced in musicking. These descriptions are not just abstract artistic ideals, but also manifest bodily, neurobiological phenomena. Emphasising that this is correlation, not causation, my point, argued capably by Thomas Fuchs, is the principle that 'mind' and 'body' are not separate but rather are two aspects of the same thing, life itself.³¹ Enabled by this interconnectedness, humans bring forth not only the external world or environment but an internal world, and link the two worlds together. We can thus understand cognition as ecological behaviour, and thus have the foundation for considering musicking as a mode of cognition that supports this ecological function by linking our worlds.

musicking as cognition: 'embodied, embedded, enacted and extended'

A full discussion of current cognitive philosophy and science is beyond the scope of this article, but I believe that my thesis concerning musicking is consonant with and supported by this work. Much recent thinking in this field involves what Evan Thompson³² calls '4E cognition;' cognition is embodied, embedded, enacted (or enactive) and extended. The central question when studying cognitive phenomena concerns identifying 'the right boundaries for a unit of analysis,'³³ and the answer is increasingly thought to be a brain-body-world ecosystem, a complex and dynamic interaction among elements and processes. Focusing on any smaller unit, such as considering only mental or neural activity, or only social/cultural interactions, cannot fully explain cognitive behaviour (any more than any one blind man can explain the elephant.) Hutchins explains that the common notion that 'thinking is something that happens in the brain as a consequence of interaction with the world' is not accurate; rather, 'thinking *is* interactions of brain and body with the world. Those interactions are not evidence of or reflections of underlying thought processes. They are instead the thinking processes themselves.'³⁴

Both Hutchins and Thompson emphasise the role of cultural practices in cognition. As noted in my conception of musicking, the social or cultural realm is one aspect of the environment or ecosystem in which we participate and cannot be excluded from the 'unit of analysis' if we are to understand the phenomenon of musical behaviour. The

connecting relationship is bi-directional. Hutchins defines a practice as cultural 'if it exists in a cognitive ecology such that it is constrained by or coordinated with the practices of other persons.'³⁵ Referring to work by Vygotsky, Hutchins explains that 'all higher-level cognitive processes appear twice. They appear first as inter-psychological processes [between individuals, cultural] and only later appear as intra-psychological processes ['internal' mental activity].'³⁶ As I will discuss further when turning to consideration of the evolutionary role of musicking, Hutchins argues that the development of these intra-psychological processes in turn created selective pressures favouring the development of neural capabilities, rather than (or at least in addition to) the reverse. Culture and biology coevolve.

The central tenets of the 4E approach – that there are deep-level interconnections (even continuities) among the processes of life, body, and mind, between organisms and their environments, and between action and perception – are non-trivial and suggest consideration of musicking, along with other arts, as a mode of 4E cognition as well as a cultural practice. To briefly illustrate the potential for exploring this relationship further, musicking is obviously *embodied*, linking brain (the neural capacities that support musicality) and body, in both the production of and interaction with musical sound. Musicking as behaviour is *enactive*; it is engagement, not abstraction or passive information processing. The environments, social and physical, and the cognitive agent mutually shape each other and the sounds, so musicking is *embedded*.

And, not only the use of instruments but the expanded sense of self often reported in musicking suggest that it can be described as *extended* cognition as well. Note again the passages from David Dunn and the ethnomusicologists cited earlier.

Many cognitive philosophers caution against relying too heavily on neuroscience for a comprehensive picture of cognition, but neither should the study of neural phenomena be completely ignored if we're to 'know the whole elephant.' Neural activity constitutes a significant component of the ecosystem and our behaviours. Turning back now to the connective function of musicking, and Maturana and Varela's understanding of how organisms modify their own internal structures in interaction with the environment, I will briefly explore recent findings in this area.

Neuroscientist Gerald Edelman's theory of neuronal group selection³⁷ suggests that, beyond the effect of genes on the initial anatomy of the brain, the network of synapses is ultimately formed and strengthened by the neurons' own activity, which in turn is 'selected' by behavioural experience. This supports Hutchins' idea that interactive behaviour with the environment shapes the physical brain. In terms of the Santiago theory, the highly interactive and reciprocal connections among groups of neurons, which Edelman calls 'reentrant organization,' enable the synchronised, coordinated activity that ultimately forms the basis for the collectively-brought-forth inner world of a complex organism.

Other recent research in neuroscience³⁸ supports the notion that musicking serves a connective function within the environment of the brain itself. Although some controversy remains, it appears there is no single 'music module' in our brains. Rather, musicking engages multiple brain systems – auditory, temporal, motor, emotional, and so on – and in particular, inter-hemispheric connections across the corpus callosum. Again, this is not to suggest that neural network behaviour *causes* the experience of musicking, but rather that, musicking, as a behaviour, powerfully modifies our neural networks in the direction of connectivity. Furthermore, it's important to note that the behaviours, including musicking, which foster this interconnectivity are not *only* neural; they are enacted by and in the 'brain-body-world ecosystem.' Culture and biology correlate and coevolve.

E. A. Di Paolo argues that adaptivity (an active, temporal, regulatory mechanism) is a necessary complement to autopoiesis to complete our understanding of agency and the kinds of behaviours we see in living organisms. In a sense, cognition is not passive; we have an 'innate drive' to know our environment.³⁹

To summarise, the understanding of musicking as ecological behaviour which I am proposing dovetails with current directions in 4E cognition studies and neuroscience. It may be, then, that all modes of artistic endeavour are rooted in the dual appearance of the non-dualistic nature of life itself, and specifically the fundamental drive of complex living beings to 'know,' to link our subjective worlds with our environments.

emergence and coalescence: getting here from there

As interesting as the debates about the status of music (or any other art) as adaptation, exaptation, technology, etc. might be, I will largely sidestep them here. However, as I have outlined it, musicking is a ubiquitous and very complex behaviour, so we need to at least briefly consider how it came to be so. Steven Pinker, while assessing music as 'auditory cheesecake' wrote, 'As far as biological cause and effect are concerned, music is useless. It shows no signs of attaining a goal such as long life, grandchildren, or accurate perception or prediction of the world.'⁴⁰ Aside from the issues with the details of his argument (which have been widely addressed), it seems to me that the underlying issue is Pinker's narrow view of evolution and adaptations and the assumption of the primacy of biological causation.

Gary Tomlinson's assessment is that adaptationist arguments, whether 'for' or 'against' the importance of music in human development, fail because of seeking 'a unilateral explanation for a manifold phenomenon.'⁴¹ In Tomlinson's view, we need to consider more than the co-evolutionary feedback cycle between organism and environment, although this is already much more complex than the linear 'selection by nature' model. He adds to the system the idea of cultural epicycles, evolving processes in themselves, which emerge from, are connected to, and feed back into the larger cycle but also are able to develop somewhat independently.⁴²

Tomlinson considers the emergence of modern musicking as the gradual coalescing of the range of neural and cognitive capacities required for this complex behaviour. Some of these are specific to auditory cognition (e.g., discrete pitch and timbral perception, vocal learning and rhythmic entrainment); others are seemingly more abstract, but actually involve our environmental relationships, engaging the three domains I suggested earlier. Examples of these which Tomlinson refers to include 'thinking-at-a-distance,' and theory of mind.⁴³ These are more than formalised abstractions. I believe that they can be understood as examples of connecting inner and outer worlds, and thus as manifestations of the innate processes of living, having emerged along with the complexity of modern humans as organisms.

Tomlinson's ideas are entirely consonant with two other contemporary approaches. Many researchers from a range of disciplines now are concerned with 'musicality,' defined as, 'a natural, spontaneously developing set of traits based on and constrained by our cognitive and biological system.'⁴⁴ Terrence Deacon suggests that complex behaviours and abilities emerge not from rigid selection by environmental pressures, but rather when 'relaxed selection' allows integration of diverse complementary functions. He also suggests, in parallel with Tomlinson, that regular behaviours 'created what amounts to a socially constructed artificial niche,'⁴⁵ which lead to selection favouring traits that support those behaviours.

To summarise, in the history of our species, the developing biological capacities, some of them shared with other species, merged with the behaviours that both arose from and enhanced them, and from these interactions emerged musicking. As we found in the thinking of cognitive scientists and philosophers, our understanding of complex phenomena in our own lives and environments seems to require adopting a perspective that, in itself, recognises and embodies our interconnections, and transcends Cartesian divisions and dualities.

concluding, looking beyond

Ethnomusicologist Anthony Seeger, referring to the Suyá, the Kaluli, and the Pythagoreans, observes:

...in all three cases song is the result of a particular relationship between humans and the rest of the universe, involving an unusually close relationship and merging of states of being into a single combined state of being expressed through music. When humans, birds, animals, or other aspects of the universe are conjoined, the result is song.⁴⁶

I want to return to my point that musicking connects 'us' (here meaning our brought-forth inner worlds) to our external environments, the brought-forth outer worlds. As living things, we are of course always connected to our environments, at least passively. John Dewey writes, 'Mountain peaks do not float unsupported; they do not even just rest upon the earth. They *are* the earth in one of its

manifest operations.'⁴⁷ His point, of course, is that our artistic endeavours *are* manifest operations of life on earth, not abstract or disembodied intellectual exercises. In a similar vein, Daisaku Ikeda writes, 'A living work of art is life itself, born from the dynamic fusion of the self (the microcosm) and the universe (the macrocosm).'⁴⁸ It is clear from our growing understanding of fields from the human microbiome to 4E cognition and beyond that at some level, boundaries imposed by language are misleading if not dangerous. With that said, music is widely experienced as connecting humans with entities perceived as Other. Thus, music may connect what language divides.

The drive to 'know' the environment, to successfully bring forth the world and behave effectively in it, is innate in all autopoietic beings. Given the increased complexity and plasticity of our nervous systems, musicking serves this more intentional process, in which we actively seek to explore, to know, to *connect* with the external environment, linking it with our inner states.

As a composer, performer, student and educator of musicking, this line of thinking has led me to reconsider the ways in which I engage in these activities. It has deepened my appreciation for our common humanity underlying the diversity of musical concepts and practices. It has led me to ask how I might create music that *works* like an ecosystem, that encourages the kind of resonance David Dunn referred to in the quotation at the top of this article (although of course there is no *one* way to do this).

Furthermore, the perspective that when we engage in musicking, we connect with the Other, in some way enlarging the world we experience, suggests that musicking may be a vital practice for healing the rifts, social and ecological, that plague and threaten our world today, and that we as artists may have an increasingly important contribution to make to the future of our planet. In this context, Penelope Gouk writes:

There is, it seems, an inescapable relationship between the way we configure our inner and outer worlds, not only as individuals but as larger communities and even nations. "Music" (and all the activities this term may encompass) is itself a powerful expression of that configuration, as well as a means of altering it.⁴⁹

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notes

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- 05 Small, *Musicking*, 13. Noting the similarity to my 'three realms,' I feel impelled to point out that I first wrote about this several years before Small's book came out.
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