

The Human Faculty for Music: What's special about it?

John Christopher Bispham^{1,2}

Wolfson College

¹ Leverhulme Centre for Human Evolutionary Studies (LCHES)

Division of Biological Anthropology

Department of Archaeology and Anthropology

² Centre for Music and Science (CMS)

Faculty of Music

University of Cambridge

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Supervisor: Professor Ian Cross

Abstract (short version)

This thesis presents a model of a narrow faculty for music - qualities that are at once universally present and operational in music across cultures whilst also being specific to our species and to the domain of music. The comparative approach taken focuses on core psychological and physiological capabilities that root and enable appropriate engagement with music rather than on their observable physical correlates. Configurations of musical pulse; musical tone; and musical motivation are described as providing a sustained attentional structure for managing personal experience and interpersonal interaction and as offering a continually renewing phenomenological link between the immediate past, the perceptual present and future expectation. Constituent parts of the narrow faculty for music are considered most fundamentally as a potentiating, quasi-architectural framework in which our most central affective and socio-intentional drives are afforded extended time, stability, and a degree of abstraction, intensity, focus and meaning. The author contends, therefore, that music's defining characteristics, specific functionalities and/or situated efficacies are not demarcated in broadly termed "musical" qualities such as melodic contour or rhythm or in those surprisingly elusive "objective facts" of musical structure. Rather they are *solely* the attentional/motivational-frameworks which root our faculty to make and make sense of music. Our generic capacities for culture and the manifold uses of action, gesture, and sound to express and induce emotion; to regulate affective states; to create or reflect meaning; to signify; to ritualize; coordinate; communicate; interrelate; embody; entrain; and/or intentionalize, none of these is assessed as being intrinsically unique to music performance. Music is, instead, viewed as an *ordered* expression of human experience, behaviour, interaction, and vitality, all shaped, shared, given significance, and/or transformed in time. The relevance of this model to topical debates on music and evolution is discussed and the author contends that the perspective offered affords significant implications for our understanding of why music is evidently and remarkably effective in certain settings and in the pursuit of certain social, individual, and therapeutic goals.

INTRODUCTION

In a world such as ours,... it is necessary to understand why a madrigal by Gesualdo or a Bach Passion, a sitar melody from India or a song from Africa, Berg's Wozzeck or Britten's War Requiem, a Balinese gamelan or a Cantonese opera, or a symphony by Mozart, Beethoven or Mahler may be profoundly necessary for human survival, quite apart from any merit they may have as examples of creativity and technical progress. It is also necessary to explain why, under certain circumstances, a "simple" "folk" song may have more human value than a "complex" symphony.

John Blacking (1973: 116)

While most Western definitions of music stress attributes such as combinations of tones, beauty, intelligibility, and expressiveness and suggest that these attributes are criterial in judging whether something constitutes "music",... there are societies and musics where these criteria make no sense at all.

Bruno Nettl (2005: 18)

Time and measure are to instrumental Music what order and method are to discourse; they break it into proper parts and divisions, by which we are enabled both to remember better what has gone before, and frequently to foresee somewhat of what is to come after: we frequently foresee the return of a period which we know must correspond to another which we remember to have gone before; and according to the saying of an ancient philosopher and musician, the enjoyment of Music arises partly from memory and partly from foresight.

Adam Smith ([1777] 1982: 204)

In a brief scene from the recent historical drama 'The Crown' we see a depiction of the coronation of Queen Elizabeth II in 1953 from the perspective of the former King Edward¹ watching it unfold on the television from a crowded room in Paris. During the procession to the altar, the assembled choirs of Westminster Abbey, St Paul's Cathedral, the Chapel Royal, Saint George's Chapel, Windsor and the Royal School of Church Music, together with a full orchestra, conducted by Sir Adrian Boult, perform Handel's Anthem 'Zadok the Priest'. He offers the following commentary with a brief interjection from a guest:

Edward: "The oils and oaths, orbs and sceptres, symbol upon symbol. An unfathomable web of arcane mystery and liturgy blurring so many lines no clergyman or historian or lawyer could ever untangle any of it"

Guest: "It's crazy"

Edward: "On the contrary, it's perfectly sane. Who wants transparency when you can have magic, who wants prose when you can have poetry? Pull away the veil and what are you left with? An ordinary young woman with modest ability and little imagination. Wrap her up like that, anoint her with holy oil and hey presto, what do you have? A Goddess!"

In the following scene we cut to Prince Edward, alone in his garden playing a Scottish folk tune on the bagpipes. Here no verbal commentary is offered.

So in a just a short space of time, on one particular day in history, within one complex cultural setting and from just one individual's viewpoint we have already two vastly contrasting manifestations of music. In the former, we witness grandeur, ceremony and global proliferation through the medium of live television on a previously unprecedented scale. The choice of Anthem, composed in 1727 for the coronation of George II and performed at every monarch's coronation since, suggests historical stability and institutional permanence in what is in fact a time of transformation. The few words direct us - the people - decidedly towards rejoicing the occasion while the somewhat incongruent, some might argue paradoxical, conflation of human institution with sublime blessing is given truth in the forceful declaration 'Zadok the priest and Nathan the prophet anointed Solomon King' and again in the following 'May the King live forever, Amen'. The compositional structure is also perfectly suited to the occasion with a calm harmonically driven string introduction of simple chordal arpeggios being followed by a sudden rousing *forte tutti* entrance signaling a period of transition and the arrival of a new and glorious reality. Most of all, however, the coordinated performance of 480 singers and musicians imbues ineffably a sense of scale, unity, and importance. Without needing to explicate the discursively problematic, it engenders appropriate and convergent emotional states in the performers and audience and a sense of collective togetherness – a phenomenological sense of having shared in a meaningful experience. As such the music not only reflects the affective qualia of the event, it is an active, indeed essential, component in the creation of a new national truth.

In the later solitary scene the Prince plays the Scottish military lament 'Flowers of the Forest', an ancient folk tune originally written to commemorate the defeat of the Scottish army of James IV at the Battle of Flodden in September 1513. It was played at the funeral of H.M. Queen Victoria in 1901 after which it gained substantially in popularity. Thus it could, one imagines, have

¹ Following his abdication as King in 1936 his formal title was HRH the Duke of Windsor.

had personal significances as well as associations with issues of regiment, royalty, public occasion and loss. On the day of the coronation these would no doubt have weighed on his mind. However, it seems likely that any symbolic references would have been subconscious or perhaps a secondary motivation at this time. His face is visibly full of genuine, powerful and complex emotion that defies simple linguistic categorization. The music seems to afford a space in time for reflection, for processing the events of the day and the consequences of his own complex history and values. It is a form of personal regulation, a therapeutic strategy, an experience that is necessarily beyond the scope of words. Indeed, whereas in the first example language could give coarse pointers and articulate some of what was going on, in this context, it could only interfere, impede attention and diminish the ineffable quality of the experience felt and portrayed.

In both cases it is crucial to appreciate that the musical performance and practice is an active integral part of human experience and reality. It is individually and collectively embodied as well as being socially reflective and generative. Its meaning and significances necessarily emerge and project in symbiosis with culture, the intricacies of interaction and the individual experience from which they are born. As we broaden our view from this individual take on a single day to considering a world full of musics spanning recorded history we find that this observation generalizes profoundly and thoroughly. It applies whether it be to infant-directed singing in the !Kung people of the Kalahari Desert (Konner, 1974) or the Hazda of North Central Tanzania ²(Knight et al, 2003), a Senoi Temiar Shaman's accompanied healing song in peninsular Malaysia (Roseman, 1991), coordinated panpipe playing at a festival in Conima in the Peruvian Andes (Turino 1993), A Karelian lament in Eastern Finland (Tolbert, 2008), or Children's play songs or 'Tshikona' - national dance - of the Venda People in South Africa (Blacking, 1969; 73). In all of these, and the countless and multifarious other uses of music across time and geographical divides, we find music to be functioning in regulating emotional, cognitive and physiological states; mediating between 'self' and 'other'; representing cultural symbolisms; and/or in coordinating individual, dyadic or group actions (see Clayton, 2016).

Music is, within and across cultures, not only active and abundant but also wonderfully diverse ranging from Gesualdo Motets to Bob Dylan, an Indian Classical Alap, Mongolian throat singing and Japanese Taiko drumming to mention but a very few. Indeed, such contrasting physical manifestations of music can appear to reveal little if any definite and observable common ground. Further challenging any generalizable account of music is the fact that neither practical nor analytic musical skills, beyond an appreciation of basic levels of surface structure, translate across divides of cultural style, immersion and learning. It can only ever be appropriately and fully heard, felt and understood with a corresponding practice, knowledge and experience of its *complex histories, values, conventions, institutions and technologies* (See Cross, 2001). If one may perhaps postulate cases where music is seen to be something valued yet separate, commercialisable, and/or purely aesthetic in quality then, at the very least, we can counter that these are extremely rare and afforded by very recent technological advances and cultural quirks. Certainly, they could not provide a suitable basis for a generalizable philosophy and understanding of music as a constituent component of human biology, behavior and culture.

If we widen our lens yet further to more broadly incorporate colloquially termed expressions of "musicality" we find an even more encompassing ubiquity. To avoid potentially contradictory statements we should perhaps understand these more precisely to be widespread features of behavior and interaction that are given particular salience and attentional focus in music. Regardless, it is clear that many, if not most, of music's seemingly integral and most significant features are - perhaps extended or abstracted - but certainly not unique to music. They are seeded in common pre-dispositions and ontogenetic trajectories, manifest in our earliest developmental explorations and are dynamically shaped throughout our lifespans. Fundamentally in movement we are continually creating rhythmic and quasi-melodic shapes, sensing, engendering and expressing our individual and collective vitalities (See Stern 2004). In terms, at least, of semantically describable categories of emotion music seems to share with vocal communication in general a common 'code' or set of cues (Juslin & Laukka, 2003). Physical posture and gesture too are inextricable parts in any fully manifest and successful communication (Kendon, 2004), with joint actions and moments of synchronicity providing empathic attunements and generating points of agreement and accord (Gill, 2016). Mutually negotiated intrinsic motive pulses (Trevarthen, 1999) and tonal synchronies (VanPuyvelde, 2015) provide coordinative frameworks for interpersonal interaction, intersubjectivity, attachment, participatory sense-making (De Jaegher and Di Paolo 2007) and the regulation of affect in parent-infant dyads and beyond (Stern, 1985; 2009). In oratory and/or poetry dynamically generated expectancies and accents can add credence and persuasiveness (Woodall, 1981), while meter and cadence can allow emphasis, subversions of expectations, highlight changes in mood of interpretation and/or aid in mnemonic retention. Additionally, broad analogies of combinatoriality, embedded structure, implicitly acquired "grammars", and recursion in music and language show further overlap both in terms of macro design, organizational principles and the cognitive mechanisms of learning and working memory in particular that afford them (see Rebuschat et al. 2012). This latter point, of course, highlights the need for manifestations of musicality to also be understood in terms of the cognitive and corporeal mechanisms and capabilities from which they arise.

Musicality begins, in accordance with an enactive approach to affect and cognition, at the fundamental levels of embodied sense-making, primordial affectivity, and selfhood; at the origins of our existence as complex bio-cultural beings (see Schiavio et al, 2016). As such it emerges from and motivates the dynamic, relational, and transformative interactions between us as organisms

² Knight et al. (2003) argue that these are the two most distantly related human groups currently known.

and our physical and social environment. It can be understood to be working as part of a larger ongoing behavioural process of maintaining adaptive, self-sustaining, dynamical stability through communication. Understanding musicality in this way corresponds seamlessly with broad functional models of animal communication in which signals arise organically from organisms' efforts to manage and assess their surroundings. Developing this framework to human communication and music in particular, Ian Cross (2011) posits that music is operational at distinct, yet possibly overlapping dimensions of meaning and affect. Bearing some resemblance to Runciman's (1998) sociologically based proposal for three principal categories of human behaviour – 'evoked', 'acquired' and 'imposed' - Motivational-structural, socio-intentional and culturally-enactive dimensions broadly reflect iconic physical cues, specificities of the human capacity for culture and learned associations respectively (see chapter 1). Significantly this perspective can accommodate the fact that even non-human species are responsive to a selection of generic structural features of music (McDermott & Hauser, 2005) and that, although musics' meanings essentially result from cultural processes and social contexts (e.g., Bohlman, 2000), we nevertheless appear able to engage appropriately with and/or respond to *some* aspects of musics outside of our own culture (e.g., Balkwill & Thompson, 1999; Krumhansl *et al.*, 2000; Nan *et al.*, 2006). It further provides a necessary platform for comparative perspectives on music (see section II), affording an understanding of continuities between animal and human communication and between ancestral forms of communication, modern-day language and music.

Extending our outlook further still to accommodate the fullness of time we see that a full capacity for music is evidently the result of a complex evolutionary history of continuous and cumulative change. Each initially random mutation will have been assembled gradually upon preexisting biology and genetic coding and will have endured for specific reasons and in response to particular environmental and social pressures. Arguments as to whether something akin to music was ever directly – adaptively – selected for will be discussed in chapter 1 and briefly revisited in the conclusion. Regardless, it is demonstrably a critical constituent part of our species and essential to a full understanding of hominin evolution. Despite complex debates on the cognitive and neurological specifics, it is clear that a complete faculty for music is a phylogenetically emergent mosaic of interwoven and mostly shared, or perhaps exclusively shared, subskills (See Foley 2012; 2016). Consequently music is embedded in afferent and efferent connections with more primary processes. Its many regulatory, affective and psychodynamic effects and functions are necessarily contingent upon the whole and the gregological process of our species' past. Parsimonious cognitive or computer models of music perception and performance risk describing an ostensibly meaningless process if these rooted ancestral connections are not considered. Similarly observations of seemingly musical behaviours in animals can only be understood as being truly analogous to music if similar processes can be shown to underlie the physical correlates of the behavior.

The many issues touched on above will, of course, be expanded on in the main body of this thesis but noticeably, even from this very brief journey opening with two individual instances of music to the broadest possible perspective, we can appreciate that music is both integral to and inextricably interwoven with the full scope of human experience, relationship, history, culture, and biology. This both invites and frames in scope the central questions posed by this thesis: What defines music? Which musical capabilities are domain and/or species-specific? What is unique about music? And what is universally present in music? Essentially what constitutes a narrow faculty for music? – those psychological, physiological, behavioural, and/or cultural features that are both universally present across cultures and yet specific to music³.

Addressing this question has important practical as well as phenomenological and philosophical implications. Although the goal here is not to provide a full definition of music, it is to an important degree a definitional question in that I am seeking to highlight features that are unique to music. A lack of clarity on this issue has led to a situation whereby it is regularly unclear which aspects of an experimentally observed effect, modern-day use or proposed evolutionary functionality are due to specifically 'musical' traits, features particular to an individual cultural manifestation of music, and which are due to other broader communicative or interactive qualities. A viable model of the constituent parts of a narrow faculty for music is an essential step towards clarity, understanding, testable hypotheses and theoretical rationales for the many observed, yet mechanistically poorly understood functions of music. As such it could potentially enhance the applicability of empirical investigations and further insight into how music relates to other human and animal behaviours and broader domains of cognition, communication, affect, motivation, and culture. Furthermore it could perhaps assist our understanding of how diverse

³ The term 'narrow faculty for music' takes its cue from highly influential proposals made by Hauser, Chomsky, and Fitch (2002) [HCF] for comparative investigation into the evolution of language and for a distinction between a broad faculty of language – incorporating all the capacities required for language – and a narrow faculty of language, which describes only capacities that are exclusively operational in linguistic processing and/or interaction. The original HCF paper and related literature, and their contextual relevance, are explored fully in Section II Introduction (p. 62-65). However, it is worth noting already that the need and motivation for identifying an analogous narrow faculty for music are equally as strong. Arguments surrounding the evolution of music have been hotly debated, particularly over the last twenty years or so. However, the lack of a consensual model of the specificities of music – the narrow faculty for music - remains a source of considerable confusion and a barrier to understanding and communication between researchers. It has often not been clear to what extent researchers are discussing features that are specific to particular instances of music or musical style, features that are more accurately relevant to broader categories of cognition and communication (e.g. constituent parts of a broad faculty for music), or features and/or capacities that are, across cultures, unique to music. Particular examples and further discussion is given in Chapter 1. In that chapter, I will also, repeatedly, make the point that it makes sense to focus discussion on the evolution of music predominantly, albeit certainly not exclusively, on features and capacities that are specific to music.

approaches and levels of explanation (e.g. Tinbergen, 1963) are linked in cross-disciplinary studies of music. Specific examples that confirm the necessity for clear and decisive definitions and the potential pitfalls of their absence are given throughout chapter 1. The chapter also concludes with discussion and critique of existing attempts to define music (e.g. Cross, 2003).

Debates on neurological, psychological, and behavioural domain-specificity(ies), cross-species investigations, cross-cultural cognition studies and theoretical perspectives on universals are all central to this investigation, to wider evolutionary perspective on music and to definitional concerns. Each of these complex topics has amassed a considerable body of empirical investigation and literature in recent years all of which provides a foundation for the endeavour in this thesis. This may, therefore, appear a somewhat daunting starting point. Intense debate on all these questions has, perhaps unsurprisingly, been resistant to consistent findings, interpretations and opinion. In particular, efforts to explore universals in music across cultures have met with severe scepticism at times. Fortunately, however, there are also reasons to be optimistic. First of all, any effort to address theoretically any of the debates and concerns of the previous paragraph is necessarily dependent upon consideration of the others. The search is, thus, not an exponentially increased challenge. In fact, once specified, constituent parts of a narrow faculty for music are a more focused category. For example, if we accept the notion of cross-culturally valid correlations in music between global characteristics of sound such as high tempo or descending melodic contour with an induced emotional pull towards high arousal and soothing respectively, this could perhaps qualify as a universal or ‘statistical universal’. However, they cannot be termed as being in any way specific to music as such relationships – assumedly originating in correlates of sound in the physical world and in correlations between signals and the motivational state of an individual – are widely shared in human and non-human communicative repertoires.

Further ground for confidence comes from the fact that, despite the complexities, commonalities and diversity outlined in the previous paragraphs something that we might identify as music does appear to be share some common substance across cultures. It is built on common biological constraints and a shared generic capacity for culture and is consistently prized and cherished, experienced as being intensely meaningful, and inextricably linked with the expression of emotion and the regulation of affect. It is consistently functional and dependably purposeful in cross-culturally comparable situations and social settings. In particular, it is reliably involved in the management of social uncertainty and dependably features as an integral component of ritualistic ceremonies and markers of social change. Further commonalities include being subjectively experienced as being an “honest” signal; promoting empathy and cooperative behaviour; enabling synchronous group coordination; and engendering a feeling of being in a ‘virtual’ and ‘another’s’ time – ‘in communitas’.

We seem, from our particular cultural vantage point and within our individual linguistic taxonomy, to be confident in our ability to consistently identify a seeming abundance of music as such across cultures. Most researchers, following Blacking (1976), have been confident in ascribing to it the status of being a universal component of human culture. It seems logically pursuant therefore that, as we are reliably recognizing, perhaps preconsciously, a suite of behavioural repertoires as being “music”, they share some family resemblance – some common acoustic cues, organizational structure, interactive configurations of features and/or underlying psychological processes. A key point here is that these traits may not be physically or knowingly/descriptively evident but may reflect implicitly learned ontology and/or empathy with the underlying psychological mechanisms and experience.

Following on from this last point I hope to convince that some of the seeming impenetrability of certain questions regarding universalities and comparative appraisals stems from an unhelpful focus on the physical correlates of musical action and on higher-level structural features. We need to note, first of all, that much of what is most critical and/or meaningful is not fully reflected in the acoustically and physically observable products of musical action. In a culture where music can be commercialized as a purely physical entity it may take a leap of faith for many to accept that the material surface is a relatively small piece of the whole and cannot demonstrate the specificities of music. Fundamentally, pitch, pulse and motivation are perceptual and attentional constructs. The latter point is important to appreciate from the outset as it is critical to the central argument in this thesis that music's defining characteristics, specific functionalities and/or situated efficacies are solely the *attentional*-motivational frameworks which root our faculty to make and make sense of music. The reason for describing predominantly an attentional structure lies partly in the approach of focusing on psychological mechanism rather than observable action. More specifically, however, it stems from the notion that attentional control (volitional and non-volitional) is a key mechanism through which we perceive temporally structured events and orient ourselves in a world unfolding through time. According to Jones's (1976) influential and established model we are constantly and dynamically building expectations as to the timing of future events based upon perceived regularities and/or learned patterns. We direct attentional peaks towards these expected moments and in response to violations of expectation. Large and Jones (1990) describe an oscillatory mechanism (see Chapter 2) that, essentially, generates attentional “pulses”. Furthermore, these “pulses” are supposed to underpin all forms of perception in time and all dynamic interactions with the physical and/or social world. Broadly speaking, therefore, pulse is a form of attentional structure that is ever-present in tracking the internal and external “rhythms” of life and living. In all our interactions with others it is an essential social affordance and ultimately a key part of our capacity for culture. An attentional pulse, in this sense, is clearly not specific to music. The central question of chapter 2 therefore is not whether a pulse or “communicative pulse” is unique to music but rather if there are specificities in terms of the root architectural structure of attention in music and the mechanisms involved. Relative/beat-based timing, period correction mechanisms, and the sustained, constantly renewing nature of attention in music will feature heavily in addressing this question. It is also critical to note that my

position is that this question cannot be satisfactorily approached by an acoustic analysis. A musical pulse is often relatively regular/steady but is not, ultimately, distinguished by any absolute degree of regularity (see Chapter 2).

Broadly speaking, an appropriate participation and sensitivity with a musical style may involve implicitly learned expectancies, vocal physiological attunements, unsubstantiated action tendencies, and/or ‘hearing’ pulses or harmonic pitch centres that are collectively implied but not physically present or unambiguous. Effectively a significant proportion of the cognitive, physical, even phenomenological experience is beyond a purely observational comparative investigation. In terms of higher-level structural features, by these stages we are already far too entrenched in particular cultural constructs, learned specifics and a wealth of creative possibility to make absolutely generalizable statements. Musical scales offer an interesting example as they have been argued to show cross-cultural constancy in terms using at least five discrete pitches, differently sized steps between consecutive tones, a dominance of small-integer value intervals (Dowling & Harwood, 1986; Schellenberg & Trehub, 1996); and tonal hierarchies (Castellano *et al.*, 1984; Krumhansl, 1990). However, scales are not an absolute requisite for pitch-based interaction to be “musical” and I would argue that the commonalities listed emerge in distinct cultural settings parsimoniously from the fundamental designs of our perceptual and interactional capacities (Chapter 3). Additionally presenting such features as statistical universals in music can risk conveying a somewhat sanitized account of the particular tensions, feelings, and fragrances of specific cultural practice. In order to encapsulate all instances of musical pitch (including, for example, monotone chanting) whilst addressing the issue in terms of its being a nascent capacity for musicality, we need to explore at the root level - the constructive foundations. Similarly to the discussions on pulse in chapter 2, Chapter 3 will focus upon psychophysiological correction mechanisms involved in producing and/or perceiving sustained pitch. These necessarily involve constantly integrating working memories of the recent past, the events of the current moment, and expectations for the immediate future. As such, the concept of an attentional structure is again central to the argument.

The approach taken in this thesis is, therefore, to focus on describing the core psychological, cognitive and physiological mechanisms required to engage appropriately with the ostensibly most “simple” forms of musical pulse, tone, and motivation - characterised somewhat problematically perhaps (see section II introduction) as tapping an isochronous pattern, humming a sustained pitch and an intrinsic desire/impulse to do so. This is, however, certainly not aimed at providing a reductionist account of music. First of all these are merely the architectural groundwork, the framework within which the complete gamut of human experience can be given space (see below). Secondly, even pared down to its putatively most basic building blocks, we find individual and social complexity and interdependence with the whole; with fundamental timing mechanisms, neurodynamic resonances and motoric and vestibular systems (chapter 2), with breath, vocalization and connections to the mammalian autonomic nervous system (chapter 3); and with fundamental human motivations towards shared intersubjective experience and the management of conscious experience and attentional focus (chapter 4).

I further submit that focusing on attentional mechanisms which can be inferred from acoustic correlates but not perceived directly does not contradict identifications of music that rely, somewhat circularly, on our ability to recognise it, or a certain “musicality”. As a species we are empathetically aware, and attuned to others to such an extent that even the seemingly simplest musical task imbues intersubjective, interattentional and interaffective resonance, and an implicit familiarity of human interaction and motivational states. The methodological approach of focusing on psychological mechanisms addresses a thorough representation of musical involvement and is true to the inherent nature of music and musical experience and to how music is integrated and embedded into the fullness of individual and cultural experience. It, furthermore, spans widely across demonstratively active or passive engagements with music dissolving any false dichotomies between “performer” and “audience”.

Building the following argument primarily on the available theoretical models in music psychology and cognition, the principal premise of this thesis is that components of a narrow faculty for music - features that are both universally present and specific to the domain of music - are *exclusively* the motivational and attentional-frameworks which root our faculty to make and make sense of music. Musical pulse; musical tone; and musical motivation are described here as providing a framework for interpersonal interaction and a structure for the individual or social management of attention, motivation and/or affect. In particular, I will highlight the proposal that music is distinguished from other communicative contexts by the sustained, constantly renewed nature of attention and by associated correction mechanisms of pitch and period that seem to incur awareness of change and of the underlying construction.

Of course it is precisely this particular attentional architecture that also enables persons and groups of people to come together in sustained musical interaction and group synchrony. It is tempting, perhaps, to overstate music’s capacity to provide shared subjectivity, an ability to break through dualistic separation between subjective, inner experience and objective, external world. It can appear at times to enable a complete empathic attunement and understanding of how others feel and embody in sound and movement. However, rather than arguing for something so absolute it is more faithful to describe music enactively as providing a *sense* of having shared an experience (see Schiavio 2015b). It is a space in time in which dynamic regulatory negotiations of affect and mood can be played out. It can efficiently inspire a *convergence* of focal point, emphasis, motivation and emotional states without needing necessarily to align completely individual position, past, accounts, interpretation, and/or experience.

Viewing music’s specificity in this way has a range of implications for how we understand the human capacity for music, its character in our many personal theatres and social histories, and for how we provide a truthful and encompassing advocacy for

the role of music in education, therapy, and society. Understanding music as a particular suite in wider models of behaviour and communication counteracts any well-meaning, but perhaps naively expressed, notion of the “power of music” or of music having a distinctly direct connection to emotion. Music need not be skilled, aesthetically fashioned, concordant, nor even necessarily particularly pleasant. Bohlman (2000) argues persuasively that music need not be beautiful and indeed that this ascription to it only began to make sense when technologies in the West made it possible to reproduce music as a commodity, a product in which the object, ‘beauty’, could lodge. He goes as far as to suggest even that “the more extensively a group community, or society participates in musical performance, the more beauty might serve to encumber its practices and presence.” (Bohlman, 2000: 30). It is easy also to romanticize – privileging times when music provides personal inspiration, transcendence and/or peak experience - and ignore the observation that music is commonly unremarkable. It generally results directly from the ontological condition of embeddedness. As Bohlman (2000: 30) notes: “(M)usic is so much part of other social practices that there is no need to separate it from them or to attribute special qualities to it”. We should not, furthermore, assume a priori that music is intrinsically something positive (e.g. Brown and Volgsten, 2005). We can perhaps posit that features specific to music inherently structure and predispose it towards social interconnectedness, prosociality and a degree of emotional stability. Ultimately, however, its efficacy needs be understood in terms of alignments between the intrinsic drives, vitalities and intersubjectivities of a particular instantiation and any desirable motivational, emotional and/or therapeutic outcomes.

It follows of course that a full analysis and understanding of any musical action or performance needs to be individually resultant from a complete and balanced interdisciplinary study of the specificities of history, culture, cognition, behavior, psychology and phenomenology. Ideally, semiotic, observational, and scientific perspectives as well as applied practice and subjective knowledge all need to be given equal space and weight. A crucial point that is not often voiced is that the fullest possible understanding actually requires a degree of academic restraint and judgment in neither prioritizing features that lend themselves to neuroscientific exploration or experimental paradigm, nor endeavouring to articulate the ineffable. It is inevitably consistent that the latter can only restrict the scope of the experience and contribute to a bias towards the verbalisable. The temptation to add further philosophical obfuscations can in these instances only widen the divide between the academic and experience. To quote Wittgenstein in his philosophical investigations: “in the end, when one is doing philosophy, one gets to the point where one would just like to emit an inarticulate sound” (1953/2010 p. 99).

Blacking (1995, p. 224-225) succinctly described “Music” as being “both the observable product of intentional human action and a basic mode of thought by which *any* human action may be constituted... its value inseparable from its value as an expression of human experience” (emphasis added). Given the possibility of encapsulating selectively from a full breadth of human experience it seems futile to expect any stable commonalities in terms of the themes and substance given space in music. Music has variously been shown to fit comfortably as principal subject in broad models of communication, interaction, therapy, practice, performance, aesthetic experience, ritual, culture and/or social action. However the extent to which each of these is given prominence can vary extensively. Indeed none, I would argue, are definitively critical to identifying something as being music. Rather than being collectively defined by the interior particulars - the multifariously varied manifestations of action and behavior given time within a musical framework - it is, instead, the specific sustained attentional structures that renovate it into something else, connected yet distinct, mundane yet somehow heightened and meaningful.

Essentially I am arguing that what is definitional and unique about music is that it provides a particular attentional framework for managing individual experience and for structuring dyadic and group interaction. It affords an extended experience - a continual phenomenological linking of the immediate past, the perceptual present and future expectation. Features that appear unique to the context of musical engagement do not in and of themselves express or affect anything. Rather they offer a sustainable socio-intentional coordinative strategy – a temporal space in which our our most central human drives towards emotional experience, expression, and regulation; intersubjectivity; social alignment; communicative vitality; cultural belonging; and *communitas* are afforded a degree of stability and reinforced focus. It can be understood as an educational or therapeutic playground, a protracted, liminal, and enhancing field that allows a memorable event – a ritualization and intensification of emotion and meaning. Music is, in accordance with Blacking’s description of it as a primary modelling system of human thought, an indispensable tool of consciousness, a transformative technology of the mind.