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THE MORPHOLOGICAL AND AUDIATIVE INTERCONNECTEDNESS OF SOUND: EQUIVALENCE IN A MULTIDIMENSIONAL SOUNDSCAPE

Abstract. Article is dedicated to the morphological and audiative interconnectedness of sound: equivalence in a multidimensional soundscape. To underline my goal of aiding guitarists, performers, composers, and researchers, the underlying purpose of this text is the development of pedagogical tools. Drawing on personal recent theoretical and practical research into the morphology of sound and audiation we will explore the notion of ‘equivalence in a multidimensional soundscape’. Correlations between the interconnectedness of sound-based morphologies emanating from extended guitar techniques, and comprehending internal realisation of the senses to hear and feel when sound is not physically present will be assessed. By outlining recent relevant texts that have made forward strides in guitar and music theory, pedagogy, and analysis we gain useful knowledge on all sounds, and listening strategies. To express an all-encompassing mental and visual image of apprehending the value of sound from a morphological and audiative perspective, three-dimensional topological diagrams will be evaluated; a development of previous two-dimensional visualisations from prior work. In regard to morphologies, topics of interest are spectromorphology, spatiomorphology, spectral quality, performance space, and performance aspects. Studying these aspects will help in the understanding of morphological value. Learning to comprehend morphologies in relation to the listening experience will

deepen all round musical abilities. We will therefore investigate audiation through encompassing deep listening, reduced listening, inherent and external qualities, psychological experience, imagination, and improvisation. The perception of spectral motions in space involve dynamic thinking and action, and as more mutual inclusivity is discovered we can start to contemplate more adventurous pedagogical tools from which future.

Key words: morphology, audiation, imagination, improvisation

Introduction. To enable the exploration of the notion of ‘equivalence in a multidimensional soundscape’ I will draw on my recent theoretical research into the *morphology* of sound and *audiation*. We can think of learning to comprehend morphologies in relation to perceiving sounds that are produced after and before we hear them, and audiative activity as internally generated musical abilities.

Correlations between the interconnectedness of the consequences when producing sound-based morphologies emanating from extended guitar techniques, and comprehending internal realisation of the senses to hear and feel when sound is not physically present will be assessed. To express an all-encompassing mental image of apprehending the value of sound from a morphological and audiative perspective, a three-dimensional topological landscape will be evaluated; a development of previous two dimensional visualisations.

There is an underlying need for new principles and methods of instruction that relate to the sounds we hear in today’s world, and how they have become embedded in musical culture. Research into music pedagogy has tended to concentrate on the standard Western pitch related systems, however, in reality we are hearing a lot more noise-oriented sounds in music production; guitar sounds definitely play a part.

Problem statement. The purpose of this paper is the need for development of pedagogical tools. To help expound my principles the text will centre around deconstructing personal recent improvisations and examining the occurrences. In so doing we can

investigate the morphological and audiative interconnectedness of sound.

Analysis of recent research works and publications. A current group of music researchers are focusing on redressing this gap in guitar music learning, and I have drawn much inspiration from their publications. In particular, “The Contemporary Guitar” by John Schneider, 1985 (revised 2015) [20], provides the reader with a very technical and thorough evaluation of the instrument’s development up to the 1970s, and the updated and modernised version brings us to more present times. In addition, “The Techniques of Guitar Playing” by Seth Josel and Tsao Ming, 2014 [13], is dedicated to the presentation and explanation of contemporary guitar techniques.

I should also mention my research books called “Sculpting Sound on the Classical Six-String Guitar”, Volume’s 1 and 2 [23]. Volume 1 presents a critique and exploration of the way extended techniques with particular sound properties are used and notated in the contemporary repertoire for the classical six-string guitar. In Volume 2, a set of practical exercises provide both instrumentalists and composers with a way to perceive, think through, and use a repertory of sounds based on developed and newly invented extended techniques.

Also of importance are a current cohort of music researchers, commentators, and theorists have delved into subjects of interest. They fall into three general categories; advances in guitar theory, pedagogical work based on the theoretical and analytical, and exploration into sound-based music.

Guitar based theoretical texts have seen notable progression recently. For example, Gilbert Biberian’s exploratory on touch “Liber, the Book of Guitar”, Volume 1, 2012 [2], and Ice B. Risteski’s “A New Foundation of Guitar Philosophy”, 2006 [17], where he writes about the need for a classical guitar philosophical pedagogy.

There are many lessons we can glean from studying research about musicians learning processes within pedagogical music research. Here we look to writings on popular music, teacher education, listening, and improvisation. Notable examples are the

pioneering texts by Lucy Green, like her 2002 book “How Popular Musicians Learn: A Way Ahead for Music Education” [12], where she questions the current formal music education systems; John Finney and Chris Philpott’s “Informal learning and meta-pedagogy in initial teacher education in England”, 2010 [9], focus on how student teachers learn to use informal learning in their teaching.

When dealing with the importance of the inner musical ear, we examine Edwin Gordon’s writings; special attention has been given to his 1989 “Audiation, Music Learning Theory, Aptitude, and Creativity” [11], especially his discussions on music creativity, and the teaching of musical fulfilment potential.

As improvisation is an underlying theme here, pertinent texts were reviewed. Essential reading was Pauline Oliveros’ practical research, and here we cite her 2007 article “Improvising with Spaces, Proceedings of the 13” [16]. This qualitative study explores voice and instrument changes that occur in relationships with changing spaces; an important text for understanding spatial transformations practice. Also of significance is “Improvisation and Identity: A Qualitative Study” [18], 2007, by Matthew Sansom, as his analysis examines the psychological characteristics of improvisation.

Since the end of the last century we have seen much theoretical and analytical research work on ‘sound-based’ music. In order to gain a deeper understanding several recent seminal texts from writings on acoustic and electronic relations, pedagogy, and musical space are used.

Marko Ciciliani talks about the relevance to engage with audiative listening in “Musical Experience Beyond Audible Sound and Its Relevance for Electro-acoustic Composition”, 2016 [4]. For example, In “Understanding the Art of Sound Organization”, 2007, Leigh Landy explains the cultural significance of the concept ‘sound-based’ music [14]. Also, to gain insight into the relationships between acoustic and electronic phenomena I turned to Simon Emmerson’s article “Aural landscape: musical space”, 1998 [8]. Of further interest was the refreshing critical and analytical perspective of standard Western music in Trevor Wishart’s “On Sonic Art”, 1998 [24]. Plus the pioneering 1966 work on

experimental music in “Traité des objets musicaux” by Pierre Schaeffer [19].

For educational relationships I looked at Manuella Blackburn’s “Composing from spectromorphological vocabulary: proposed application, pedagogy and metadata”, 2009 [3], where she relates spectromorphology to pedagogical application.

Inspiration on the topic of musical space and a deeper understanding of spatial elements came from Denis Smalley’s two pieces “Spectro-morphology and Structuring Processes”, 1997 [21], and “Space-form and the acousmatic image”, 2007 [22], and Normandeau’s 2009 article “Timbre Spatialisation: The Medium is the Space” [15]. Here we can learn from their analysis of sound spectra through time and space. My usage of these publications has been to expand, develop, and affirm.

The purpose of this research work. With the goal of reaching higher levels of attainment for all musicians, I aim to provide a pedagogical resource on many aspects of contemporary music based on the conceptual thought, all aspects of sound be given equal weight within a pedagogical system focused on the interconnectedness of morphological and audiative actions.

Presentation of the main research material. The two main concepts that underpin the research into sounds are *morphologies* and *extended techniques*. Firstly, the notion of morphology is used as an experiential tool. Expressing guitar music in terms of morphologies means a spectral and structural approach. For example, a *morphology* may be described as the spectral detail of a sound through time; put another way, morphologies are sound objects that engender a spectral continuum. These two mutually inclusive aspects, a spectrum and activity through time provide a framework for understanding and experiencing music’s temporal flow. Secondly, the sonic outcome from the extended techniques I am interested in form spectra that do not follow the archetypal guitar sound convention of attack followed immediately by a stable (though slowly decaying) resonance comprising as much pitch material as possible.

In my music compositional and improvisational structures are developed through aspects that manifest as a consequence of manipulating the placement of consecutive, merged, and combined morphologies. This is tied to the relationships that occur in shaping phrases, being aware of pitch relations, and exploring dynamic levels. Musical contours of phrases are mostly derived from the archetypal or variant models; however, deviations to this are formed by the use of dynamic levels.

Learning to perform morphologies means engaging with the interrelations of sound components and resonance values during the temporal flux of the music. Improvising involves capturing and maneuvering the spectral content involving elements of freedom. Composing is the process of depicting the morphologies in order to produce a score, where the composer strives to apply methods of representation that are as precise and simple as possible. These may have ties with traditional notation when relevant, or such methods may involve graphic symbols to capture the entire duration of the sound.

To *audiate* is to use listening, in all its facets, towards creativity; recognising how auditory perception impacts on the senses, and developing a deeper awareness in regard to sonic life experiences. Models of creative thinking in music may be built from the exploration of sound through instruments, sound manipulation, and environmental elements; studying relationships between imagination and invention by linking to sounds.

In regard to morphologies, topics of interest are spectromorphology, spaciomorphology, spectral quality, performance space, and performance aspects (see Fig. 1); while deep listening, reduced listening, inherent and external qualities, psychological experience, imagination, and improvisation are the audiative areas of concern (see Fig. 2). As more mutual inclusivity is discovered we can start to contemplate more adventurous pedagogical tools, and further the notion of a four, or even five-dimensional arena, from which future nurturing of musicians may be drawn.

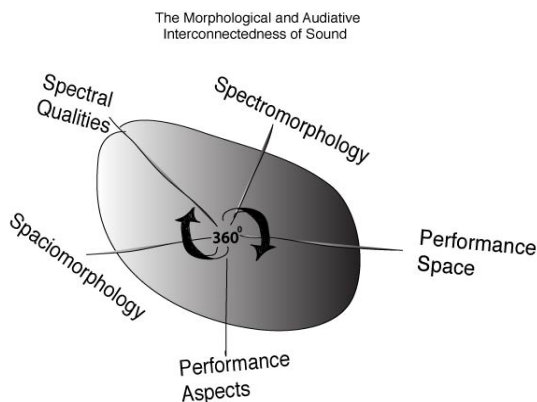


Fig. 1. Morphological Interconnectability

Morphological Interconnectability. To enable a study of the morphology of sound we need to look into the meaning behind the areas mentioned before from a sound-based perspective. Firstly I would like to convey an overview of the changing culture of music. In general, the principles of developing a musical discourse have changed since the mid 20th century, for example, the *note-based* and *sound-based* music dichotomy. And strangely enough, many modern genres incorporate much sound-based music. Landy tells us that, “*sound-based music* typically designates the art form in which the sound, that is, not the musical note, is its basic unit” [14, p.17]. Discourse have changed since the mid 20th century, for example, the *note-based* and *sound-based* music dichotomy. And strangely enough, many modern genres incorporate much sound-based music. Landy tells us that, “*sound-based music* typically designates the art form in which the sound, that is, not the musical note, is its basic unit” [14, p.17].

It is obvious that music grounded on notes is constructed on the standard Western paradigm, fixed on a grid system. Wishart calls it a “Lattice” system; however, he reminds us that “music does not have to be lattice-based at all” [24, p. 11]. Music based on sound is

rooted in timbres heard every day, and includes sounds that may fall between the standard Western notes.

This artistic route is clear to see in compositions for classical guitar; the vast majority of works that include sound-based material – and therefore incorporate extended techniques – are constructed around standard notes [23, p. 117]. Although I concentrate on creating music comprising entirely of extended techniques in my research, in reality an amalgamation of the two systems is inevitable when working in the field, especially as modern ears are accustomed to both.

Sound-based instrumental music procedures focus on creating texture from extended techniques, and strategies are built by managing tension and relaxation in unconventional ways. For example, ambiguity in textural flow is often intentional in the musical movement. Investigation into how pressure and dissipation are accomplished becomes important; the interplay between expressions of uncertainty and lucidity can manifest in various ways. In other words, an exploration into how the passage of sound events and aural expectation become projected strategies.

From a fundamental pedagogical point of view, the reason for learning to play and control extended techniques is that these sonic designs help musicians create textural motion during performance; creating textures to help aid musical outcome is why extended techniques exist in managing goals. Supporting this point, in “Free Composition” (1977) Heinrich Schenker mentions: “The goal and the course to the goal are primary. Content comes afterward: without a goal there can be no content” (p.5). In my performances, a musical event begins and instinctively I feel drawn forwards, anticipating and allowing textures to unfold.

Morphological thinking is concerned with the perception of spectral energies and shapes in space, their behaviour, motion, and growth processes, plus their relative functions in a musical context.

For the musician or listener who is not used to sound-based music the detail of morphological description may be difficult to

follow, however, there is a vast amount of work in this genre. A fundamental principle of music based on spectral morphology may be easily understood as being founded on our experience of sound apprehension. However, some extended techniques morphologies can sound remote from the source. We can see that this derivation is from a shared common base that provides a framework for individual and cultural work. Examining these links is important for all concerned and the language needs to be discovered and defined within a shared natural-cultural basis to make sense.

In order to help understand why and how the music exists, the workings of a sound-based discourse must be explained at some stage; this will also enable a means of articulating problematic reactions to particular work. This is especially important to a music that is strange to comprehend immediately to a lot of listeners, particularly since traditional instrumental and vocal gesture are often absent or not immediately apparent.

Creating musical textures that may or may not be fulfilled by internal representation can cover a wide range of associations; therefore human agency is required to create narrative interest. Furthermore, for me a narration involves at least some sort of indeterminacy to create suspense that serves the characteristic musical attributes and processes of shaping outcome. It is played out within the various aspects of stylistic improvisational convention and normative practice to serve either deterministically or teleologically, it is here that we garner significant discursive attention.

Spectromorphology. To describe the perceived sonic footprint of a sound spectrum as it manifests in time, Smalley coined the term “spectromorphology” in 1986 as a descriptive analysis of sound. It is sometimes employed in the study of electroacoustic music, especially acousmatic music. Denis Smalley talks about Spectromorphology in his chapter “Spectro-morphology and Structuring Processes”, which can be found in the “The Language of Electroacoustic Music” book of 1986 [22]. Since then there have been numerous publications relating to this term and a number of extensions by other scholars within the field of electroacoustic music. In 1997 Smalley publicised a revision of Spectromorphology

(the revision is also available in both French and Italian) in the “Organised Sound” article “Spectromorphology: explaining sound-shapes”.

His term refers to the apprehension of morphological developments in sound spectra over time, and it implies that the “spectro” cannot exist without the “morphology”: a sound has to be shaped and therefore must have sonic content.

For my musical work it is extremely useful to apply Smalley’s theoretical typological and morphological principles to the usage of extended-technique guitar morphologies; especially as motion and structuring processes are key to his theoretical system. Fundamentally Smalley defines spectromorphology thus: “An approach to sound materials and musical structures which concentrates on the spectrum of available pitches and their shaping in time” [22, p.61]. Louise Rossiter reminds us that his terminology, “has become the most widely referenced general framework for the classification of sound types and their potential musical functions”. I have yet to find a better explanation for morphological musical theory.

We can now amalgamate the standard ‘pitch’ and ‘timbre’ domain into the concept of a “spectrum”, encompassing all perceivable frequencies. It also becomes obvious that the spectral aspect is integrally connected to a temporal evolution: “spectra are perceived through time, and time is perceived as spectral motion” [22, p.65]. For me this equates to the wide-ranging field between pitch and noise. Taking mixed groupings of certain similar and different extended guitar techniques, I investigate aspects of expressing guitar music in terms of a spectral and structural approach to archetypal and variant sounds; in short, ‘guitar morphology’.

An *archetypal* morphology may be defined as an attack force followed immediately by a resonance that decreases in spectral richness as the sound decays through time. With the creation of variants, this archetypal attack/resonance model can be developed further in various ways. Although a single morphology can be regarded as a sound object in its own right, by combining

successions and combinations of morphologies musical pieces are formed.

Compositional and performative strategies can be developed to form pedagogical approaches using Smalley's spectromorphological structural functions vocabulary. Moreover, this can be seen as a methodological practice comparable to pitch-set theory or Schenkerian analysis for students. In addition, advancements of these procedures could be used as tools to aid player decision-making.

Spatiomorphology. Spatiomorphology is concerned with spatiotemporal elements, the existence of both space and time; the synchronous possession of spatial extension and temporal duration. We can think about exploring the distribution of spectra emanating from an acoustic instrument to points in a defined space using a network of speakers. This is similar to Robert Normandeau's description of the technique he called *timbre spatialisation*. He states that the spectrum of a sound may be, "recombined only virtually in the space of the concert hall" [15, p.278]. Here personal thoughts turn to the potential of managing the diffused sound spectra through the nature of its own topographical structure, and exploring the morphology of such a distribution.

Smalley tells us that the discussion of space is strongly connected with spectromorphological content: "We needed to know about spectromorphology before we were in a position to understand space" [21, p.53]. He invented the term "spatiomorphology" to conceptually highlight the special concentration on spatial properties used in his compositional process.

For me, working with the notion of spatiomorphology offers an opportunity to immerse the listener into an intimate personal soundworld. Furthermore, this concept leads to various areas of research that need to be addressed, such as developing effective frameworks for controlling timbre spatialisation, evaluating the potential scope for morphological modelling as sound shapes and spatial texture evolve, and methods of organising and directing loudspeaker configurations.

Spectral qualities. The spectral quality of a sound resides in areas of spectral space. Smalley explains: "Each piece of music will

have its upper and lower boundaries within which spectromorphologies act” [21, p.44]. Morphologies behave in various ways, for example, remain stable or evolve, flowing through ranges and frequencies with varying degrees of energy in a controlled or unpredictable manner. Also, they may proceed facilely within a narrow range of activity, or in leaps.

Smalley again: “The word ‘spectrum’ is used to refer to the internal components which make up sound, whether we actually hear these components or not” [21, p.45]. For a guitar player the design of the spectrum is directly related to all aspects of their own personal technique and level of musicianship.

Another facet of spectral quality is that we may also think about the construction of factors that influence the creation of proximal space; do the sounds have a perspective of being close or far away. Taking dynamic level as an example Smalley tells us that when we normally have, “experience of the movement of a sound from distal to proximate space (it) involves a change in the spectral resolution of the sound” [21, p. 45]. Although I may create spectra with an impression of close by or far away, the listener will hear this as some kind of movement in space. Spectral space is about controlling the perception of space and spaciousness.

Blackburn explains some of the concepts around spectromorphology by employing visual shapes and symbols. Some of the diagrams, “indicate ‘snap-shots’ of spectral space where time corresponds to the horizontal axis and frequency to the vertical. In these visualizations, shape corresponds to amplitude and timbre, while relative positioning of shapes corresponds to spectral occupancy” [3, p.2]. Although her text is very useful and enlightened, her diagrams are two-dimensional in appearance and would be of more value with a level of sophistication that showed greater dimensionality.

Performance space. It is evident that performers have an essential role in bringing the music to life by introducing gestural qualities, enhancing musical structures (micro and macro), and providing a personal interpretation. Careful consideration of the

performance space is an area that warrants looking into seriously, and therefore takes its place in Figure 1 alongside the other topics.

This is in line with Oliveros thinking in “Improvising with Spaces”, where she expounds a contemporary view of the acoustic relationships in auditoria. Oliveros says: “The relationship of spatial acoustics and the acoustics of musical instruments is a complex matter that needs more attention and investigation by all concerned” [16, p.2]. She leads the way by explaining about the importance of using the sensitivity of our hearing, voices, instruments, technology, and multi-channel systems, as well as shared experiences and perceptions to achieve acoustical explorations.

Morphologies may be transformed by carefully listening within natural spaces in various ways. For example, in her Deep Listening sessions she advocates rehearsals involving listening meditation before sounding the space. Oliveros tells us, “listening brings about new possibilities and feelings. Listening to space changes space. Changing space changes listening” [16, p.4]. Interestingly, this phenomenon Oliveros terms the ‘listening effect’. Composer and pioneer Pauline Oliveros founded the practice of “Deep Listening” in 1998. It is a way of listening in every possible way to everything possible.

Equally important is Emerson’s application of the notion of the “frame”. Described as a delineated area of interest that can be applied progressively from the largest to the smallest scale, “from a landscape (bounded by the acoustic horizon), part of which we designate an arena, within which we find a stage, upon which we frame an event” [8, p.11]. By using technology we can think about developing more subtle levels of specious sound into closer focus within the event.

Using this approach we can think about suggesting areas of perception that involve more detailed information, and an environment where we create our own stage by relocating our bodies to particular parts of the soundscape.

Performance aspects. Here we must cover technique, tone production, and style. It is physical activity that produces sound-making gestures on the guitar, a causal chain linking action to

source; morphological consequences through human agency are the result. My sense of touch, whether applying nail, fingertip or an implement becomes the supplier of energy. Smalley explains: “A gesture is therefore an *energy–motion trajectory* which excites the sounding body, creating spectromorphological life” [21, p.5]. From the perspective of performer and observing listener three elements are occurring, the visual, tactile, and aural; processes concerned with muscle pressure and relaxation, exertion, and resistance.

For me, the gesture process is bidirectional. For example, I play an extended technique on my guitar causing a resultant morphology, conversely when I listen to the morphology the human element behind is heard, caused by the gestural activity; intentional acts and emotive elements are present throughout the process, including imagination. Relatedly, Smalley says: “Everyone uses this *spectromorphological referral process* when listening to recordings of instrumental music” [21, p.5]. We listen to the music and also automatically gain a wealth of psycho-physical information by decoding the human activity behind the morphological information.

Furthermore, when listening to a recording, or not being close enough to the performer at a concert, the sounds heard may be difficult to decipher. We may be uncertain how the sounds behaviour was made. For example, we may be unsure of how the pitch trajectory was accomplished. My hope is that it will become possible for composers to create guitar music where the gestural cause–source relations are even more adventurous and imaginative. For me, this remote order of invention is a rich area for compositional and improvisational exploration.

Audiation. I am going to talk about audiative interconnectability in regard to the topics of deep and reduced listening, inherent and external qualities, psychological experience, and improvisation.

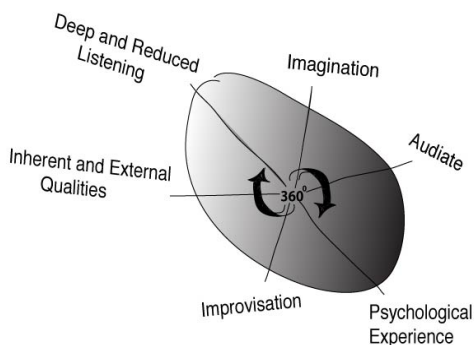


Fig. 2. Audiative Interconnectability

The point will be to work toward forming a method for aurally recognising small alterations in timbre and emphasising the importance of the whole sound when a single morphology, or groups of morphologies occur in various combinations. The aim is to develop a progressive and radical forward-thinking pedagogical audiative system that embraces a storehouse of specially selected techniques as equal in value.

Music educators are expected to teach the complex undertaking of helping pupils to be creative. Therefore, an ever-developing set of tools is essential for forward-looking pedagogical improvement, instructions that will help students to bring out and realise their inner potential. Knowing the details of a sound from one's mind, or inner ear, before physically hearing is undoubtedly extremely useful. Teaching students to hear and comprehend music rooted in the imagination is key.

According to Gordon: "Unless one can audiate what is seen in notation before he[*she*] produces sound on an instrument as dictated by the notation, what he(*she*) is reading will have only theoretical meaning for him[*her*]" [11, p.5]. The result is an

academic rather than a musical meaning; the player will learn a lot more about the music itself by developing a sense of the musical sounds before interpreting the notation.

This raises the notion of learning to audiate before learning to read music. I would advocate teachers using various improvisational methods and helping the student to understand creative performance; however, discussion on improvisation and creative performance methodologies is for another, maybe future paper.

An ability to audiate will inevitably engage the ability to recognise how past, present, and future impact on the senses. My belief is that studying the aspects arising from audiation will help anyone interested in sound to develop a higher sense of awareness in regard to sonic life experiences from childhood to the present. Moreover, I would encourage music lovers to engage in future personal sound experiments. For example, organise listening trips in various environmental situations.

Inherent and external qualities. The main personal focus here is on comprehending the subtle detail of existing and newly discovered classical guitar techniques. Concentrating on particular techniques, the aim is to extend awareness of sound apprehension. For instance, can we hear the minute changes inherent in these sounds through time and chart differences in the spectra?

There are two aspects to guitar morphologies, *inherent* and *external*. I will explain sound events along with their intrinsic relationships within musical pieces. However, Smalley reminds us, “a piece of music is not a closed, autonomous artefact: it does not refer only to itself but relies on relating to a range of experiences outside the context of the work” [21, p.4]. Therefore, as a cultural construct, a fundamental external basis is necessary so that the inherent can have meaning. The important point is that, “the intrinsic and extrinsic are interactive” [21, p.4].

As far as I am aware, in music for acoustic instruments there is no term that represents a link between fundamental morphological qualities and external referential sound associations. However, for *acousmatic* music an expression has been invented that describes this

connection. Acousmatic music is a form of electroacoustic music that is specifically composed for presentation using speakers, as opposed to a live performance. It stems from a compositional tradition that dates back to the introduction of *musique concrète* in the late 1940s.

Smalley uses the term *source bonding* to represent the activity of morphologies from inside the work to the sounding world outside. His definition relates to the natural tendencies of sounds sources and causes, and the relationships of sounds to each other, as they give the impression to have mutual or associated origins.

My contention is that *source bonding* should be brought into the instrumental music arena. It is present in guitar playing, and may be discovered through the various physical activities that occur in sound-making; put another way, when human agency is involved source bonding will occur.

Through cultivating methods of apprehension unhindered by preconceptions, Oliveros tell us: “One of the Deep Listener's goals is to listen to each and every sound exactly for what it is, nothing more, nothing less” [16, p.4]. The important aspect for me is to examine how *source bonding* and *extended techniques* can be applied to a pedagogical approach by discovering musical links for future teacher-performer-composer communication.

Deep listening and Reduced listening. Engaging with Oliveros “*Deep Listening*” principle we can learn to, “remove cognitive filters in order to experience deeper forms of audition” [16, p. 4]. My intention is to develop tools to describe the features of perceived sounds, and explaining how they work in the context of the music.

For an all-inclusive approach, a method for aurally recognising small changes in timbre is useful. Here we can tap into existing electroacoustic research, in particular the concept of *reduced listening*. This type of concentration occurs through focused and continual listening. For Smalley, “it is an investigative process whereby detailed spectro- morphological attributes and relationships are uncovered” [21, p.5]. In order to pay full attention on refining the detail and quality of sounds, the listener tries to suppress any distractions. Smalley again: “Reduced listening is therefore an

abstract, relatively objective process, a microscopic, intrinsic listening” [21, p.5]. Therefore, concentrating on the characteristics of the sound is essential [19].

Smalley and Oliveros concur, as they focus attention on how listening is an act of cognition; it can shape perception. This form of perceptual scrutiny is generally employed in the creative process. I believe it is important to bring this type of listening into the performer-listener and audience-listener arena. However, care must be taken to teach the importance of maintaining a balance between *reduced listening* and *deep listening* together with *inherent* and *external* threads. For example, being aware that over-analysed morphological listening may lead to detrimental effects on intrinsic-extrinsic aural observations; I sometimes want to allow the music to play on my senses and not be thinking analytically.

When we combine my thinking behind guitar morphology with inherent and external listening plus the processes of reduced and deep listening, together with Smalley’s writings on spectromorphology, we may form the basis of moving towards a pedagogical audiative system. Meaning is embedded in the musical syntax, which is directly related to the workings of the inner and outer ear, as well as the source bonding aspect. It is our job as educators to really understand these three aspects and teach them to our students, enabling an all-encompassing view of the morphology of sounds in general.

Psychological experience. The knowledge of effective contemporary guitar pedagogy has moved forward a pace in recent times. Quite a few new books have emerged. For example, Schneider’s “The Contemporary Guitar” (revised edition) traces the extraordinary rise of the instrument in concert music over the past century, and “The Techniques of Guitar Playing” by Josel and Ming provides a comprehensive survey of contemporary performance techniques on the classical guitar. Furthermore, Ice B. Ristetki remarks that, “the psychology of student development and learning has become more sophisticated in its ability to provide an intelligent and informed context for guitar teaching decision-making” [17,

p.92]. My philosophy has always been that best practice should meet the needs of each individual student.

For further development, I note that music study has tended to concentrate on theory, writing notation, and analysis. There is little research on how human gestural activity impacts on musical performance. This may be because it is customarily expected. For example, a phrase played on the guitar incorporating pitch content may sound like it sings, echoing a vocal presence. This can have a psychological as well as physical effect on the listener. Interpreting the source-bonding threads and extracting meaning is an eventual goal of this line of thinking, alongside the expressive and emotional significance of inherent and external musical qualities. Describing musical gestures through morphological value will help musicians enhance interpretive skills and listeners to identify significant behaviours.

Earlier we have seen how spectral quality is connected to spectral space and proximal space (see p.9). From a pedagogical standpoint, training and experience in listening to music can strengthen one's capability to connect and interpret the structural relevance of spatial information in many situations.

In regard to personal space and territory, psychological and sociological influences feature in performance and listening scenarios. They are key components in the perception of space as a communicational element. For example, Frank Ekeberg Henriksen comments that: "Distance, intimacy and the expansion of musical space into the listener's psychological private sphere can be a powerful means in musical expression and communication" [6, p.60]. He is talking about how spatial depth and distance are central components in defining the aspects of virtual space, where proximal articulations in spatio-musical structures can engage with psychological space and personal distance. Learning to listen deeply in a given space is an effective means of developing interpretative skill.

Imagination. Musical imagination is a vast subject. Therefore, here I will focus on making a few observations that relate

to my research, touching on morphological sound source, illusion and imagery, as well as pitch-to-noise structures.

When thinking of the millions of people who have experienced listening to guitar music, it is obvious that an underlying process of conscious and unconscious visual and aural training has occurred; it may be referred to as a culturally acquired familiarity of sounding gesture. However, in much contemporary guitar music that contains passages of extended techniques the sound-making becomes remote from the generally recognisable.

The playing of extended techniques can transform the source, the ear becomes dubious about the cause; the morphological nature takes us into the realm of the imagination. On the subject of musicians breathing life into contemporary music, which he calls *animation*, Biberian's book "Liber" is on the theme of articulation. He tells us: "a rich and daring imagination (is) of paramount and fundamental importance" [2, p.15]. All musical endeavours are both an empirical and a creative process requiring imagination and technical knowledge, and we can link this to articulation of sounds in a particular space when dealing with spatial musical elements. Connecting to the illusory nature of space Enda Bates reminds us that, "space is so much broader and harder to define than other musical parameters" [1, p.6]. We must also consider that perception of this attribute often requires fantasy.

Furthermore, by using extended techniques in musical spaces we can think about alluding to the imagination of the listener. In his recent thesis Ciciliani talks on this phenomenon in regard to the listening imagination. He says: "There is nothing mysterious about auditory imagery as it is something that is performed whenever we try to remember a piece of music" [4, p.6]. I agree with his conclusions because when we invent sounds in our imagination it involves drawing on experiences and recombining them in various ways. Moreover, the multifarious role that imagery can play links to auditory experience if the music is actually sounding or imagined. This audiative connection is important for many forms of experiences that take place in the inner ear in respect to musical understanding.

It is obvious to me that my memory and imagination are constantly adding to hearing sensations. This constant internal activity appears to mean every sound that comes along is filled with associations and meanings that accord to a given context. I associate this to using the consecutive, merged, and combined morphological structuring system mentioned earlier, creatively enabling a poetic exploration of personal imagination, where improvisation plays a significant roll.

Improvisation. Let us now build on the idea of apprehending and manipulating spectral content involving elements of freedom. As we know, in its basic form improvisation can be described as spontaneous, extemporaneous musical creation. However, we must factor in inherent patterns involved in the cultural context. For example, a dissonant complex chord may still be associated with a specific tuning type embedded in a particular familiar culture.

Extended classical guitar techniques are used frequently today in works that incorporate improvisatory elements; a variety of styles are employed. On occasion the works may include historical references. For example, “Consonancias y Redobles” (1974) by Azio Corghi is inspired by quotes from a 16th Century musician, and also has associations with my musical language ((Corghi has drawn from the work ‘El Maestro’ by Luis Milan (c. 1500-c.1561). Musical fragments are taken from *Fantasia XVI* of Book 1)). Here Corghi encourages the player to develop a wide range of interpretive freedom. For instance, his performance notes open with: “While interpreting the graphic symbols and signs, the player must realise the formal tendencies of the material with personal fantasy and improvisation” [5, p.1]. (taken from the composer’s performance notes).

Corghi incorporates passages that involve bi-tones, seeking to blend imperceptibly from one state to another. For example, he includes bi-tones that transform into mute taps. Fig.3 shows the relevant score sections.

For my pedagogical approach I encourage the developmental learning of elements of freedom within the area of structuring consecutive, merged, and combined morphologies as this will help

towards enrichment of improvisational skills. The key musical point is forging a method for expressing spectral content temporally. See *Sculpting Sound on the Classical Six-String Guitar, Volume 2*, page's 210 and 213 for further details.

Consonancias y Redoubles by Azio Corghi

The image displays a musical score for a guitar piece titled "Consonancias y Redoubles" by Azio Corghi. The score is divided into several sections: "Bi-tones", "Transform section", and "Mute taps". The "Bi-tones" section features a complex rhythmic pattern with many notes. The "Transform section" is a short, transitional passage. The "Mute taps" section shows a series of notes with a wavy line above them, indicating a specific technique. The score is written for a six-string guitar, with a key signature of one flat (B-flat) and a time signature of 6/8. The notation includes various musical symbols such as notes, rests, and dynamic markings. The score is presented in a clear, professional layout with a white background and black text.

Fig. 3. Corghi's bi-tone to mute tap transformation in *Consonancias y Redoubles*

In the pieces written specifically for personal research, elements of freedom occur in passages where decisions need to be made about choosing fret positions, dynamic levels, placing of morphologies in the time continuum, or a mixture of the three. The player learns to start building phrases by establishing a method for making apt performance decisions.

We can now engage with an ontological meaning and the dynamics of discussing interplay in the improvisation arena. Sansom observes that through the evolution and dissolution of the tensions between the various improvisational relationships, "the music becomes representative of the dialectical and creative process central to the formation of identity" [18, p.13]. This emphasises my theory

that when creativity, music-making activities, and human interactions when elements of freedom are used simultaneously it amounts to a semiotic ordering encounter. When improvising the musician is immersed in a real-time exploration of, and investigation into, the relation between the symbolic and the aesthetic; translating into the problematic artistic areas of representative identities working on many levels, for example, expressive, poetic, emotive, indicative, and mimetic.

Sansom's study also reveals a teleological and societal importance in improvisation production. Relating to purpose and meaning that centres on the dynamics of creativity in its earliest form. He explains: "It is in the movement and interaction of continua that the production of meaning in musical communication exists, and that through these processes the subject finds degrees of definition and form" [18; 13]. We may acknowledge that characteristics are expressed through active actions that help to orientate individuality in the interactive and relational flux of events.

Conclusions. My aim here has been to present a teleological journey that will aid guitar performers, composers, and researchers. In Figure 4 we have Figure's 1 and 2 side by side forming a holistic view that enables observation into equivalence in a multidimensional soundscape more easily. The objective is to develop a pedagogical system that gives equal weight to all of the topics mentioned in Fig. 4.

In order to better reflect on personal sound perception abilities I have tried to convey the idea of a third dimension in the diagrams, designs that convey an idea of three-dimensional objects on a two-dimensional surface. For the future I can envisage development of figuration's to encompass further dimensions; one example being four-dimensional designs that appears as special visualization.

The objective for this paper has been to cover a number of aspects that relate to how morphologies and listening concatenate. I

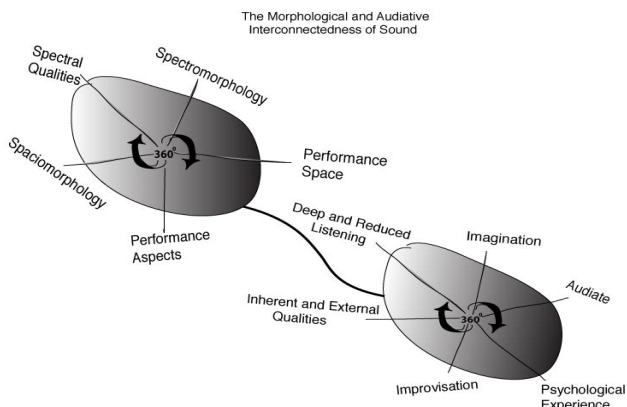


Fig. 4. Combined Morphological and Audiative Interconnectability

have concentrated on an approach that can generate starting points for further study into creation of sound activities, and applying a vocabulary to areas of pedagogy in order to provide ideas for teaching methods and fostering an awareness of morphological functionality. My findings here will inevitably lead to further investigation into all the morphological and audiative areas mentioned above.

To further this research my intention is to use the material to produce an approach based on informal learning. Informal Learning and Pedagogy (ILP) can be traced back to Green's work *Musical Futures* on how popular musicians learn. "Musical Futures" is a project that set out to research informal learning and pedagogy in music in English secondary schools (initially funded by the Paul Hamlyn Foundation). One of the projects in Hertfordshire was researched by Lucy Green and was specifically based to her writings. The essence is in her concluding recommendations, which are: "Playing music of one's own choice, with which one identifies personally, operating both as performer and composer with like minded friends, and having fun doing it must be high priorities in the quest for increasing numbers of young people who benefit from a

music education which makes music not merely available, but meaningful, worthwhile and participatory” [12, p.216].

The key to this pedagogical system would be based towards an orientation where pupils are seen as curriculum makers. For an in-depth understanding of ILP, see Informal learning and meta-pedagogy in initial teacher education in England John Finney and Chris Philpott. The role of the tutor in this system would be one of observing and guiding with the goal of making self-directed music. Students would develop music based on own choices where they operate as performers and composers; value creation and a spirit of enjoyment will be central to being meaningful and worthwhile.

In order for a morphological approach to work, educators will have to notice the importance of the whole sound that is produced. I would advocate a paradigm shift, a move away from pitch emphasis, giving equal emphasis to the morphology of sounds, alongside spectral qualities and other factors such as style, technique, tone production, performance space, and psychological experience. The Figure’s show the interconnectedness of the considerations involved. The goal is learning to comprehend all aspects of what is heard and understood when a musical sound or gesture occurs. Not only for guitar sounds, this model can be extended to all instruments and audible events in the environment.

I would like to put forward the idea that morphological musical thinking is a dynamic activity that involves perceiving spectral energies and configurations in space. Once thought about, it is a straight-forward experiential principle. As we have seen, everyone hears sounds and associates those sounds with experiences from life. This fits my core belief in musical dedication and imagination, and has helped me to develop a general philosophy that fits into my world, namely ‘the musical poetry of everyday life’.

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МОРФОЛОГІЧНИЙ ТА АУДІАТИВНИЙ ВЗАЄМОЗВ'ЯЗОК ЗВУКУ: ЕКВІВАЛЕНТНІСТЬ У БАГАТОВИМІРНОМУ ЗВУКОВОМУ ПЕЙЗАЖІ

Анотація. Стаття присвячена морфологічному та аудіативному взаємозв'язку звуку: еквівалентності в багатовимірному звуковому пейзажі. Основна мета цього тексту – розробка педагогічних інструментів допомоги гітаристам, виконавцям, композиторам і дослідникам. Спираючись на власні недавні теоретичні та практичні дослідження в галузі морфології звуку та аудіювання, ми досліджуємо поняття «еквівалентності в багатовимірному звуковому пейзажі». Будуть проаналізовані кореляції звукових морфологій, що виходять із розширених гітарних технік, і розуміння внутрішньої реалізації почуттів, щоб чути і відчувати, коли звук фізично не присутній. Описуючи останні релевантні тексти з теорії гітари і музики загалом, педагогіки та аналізи в цілому, ми отримуємо корисні знання про всі звуки і стратегії прослуховування. Щоб висловити всеохоплюючий ментальний і візуальний образ сприйняття значення звуку з морфологічної та аудіативної точки зору, будуть проаналізовані тривимірні топологічні діаграми; розвиток попередніх двовимірних візуалізацій. Що стосується морфології, то інтерес представляють такі теми, як спектроморфологія, просторова морфологія, спектральна якість, простір продуктивності та аспекти продуктивності. Дослідження цих аспектів допоможе в розумінні морфологічного значення. Навчання розумінню морфології у зв'язку з досвідом слухання поглибить усі музичні здібності. Тому досліджується аудіювання, з охопленням глибокого слухання, редукованого

слухання, внутрішніх та зовнішніх якостей, психологічного досвіду, уяви та імпровізації. Сприйняття спектральних рухів у просторі включає динамічне мислення та дії, і, коли виявляється більше взаємної інклюзивності, ми можемо почати обмірковувати більш авантюрні педагогічні інструменти, за якими – майбутнє.

Ключові слова: морфологія, аудіювання, уява, імпровізація

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МОРФОЛОГИЧЕСКАЯ И АУДИАТИВНАЯ ВЗАИМОСВЯЗЬ ЗВУКА: ЭКВИВАЛЕНТНОСТЬ В МНОГОМЕРНОМ ЗВУКОМ ПЕЙЗАЖЕ

Аннотация. Статья посвящена морфологической и слуховой взаимосвязи звука: эквивалентности в многомерном звуковом пейзаже. Основная цель этого текста – помочь гитаристам, исполнителям, композиторам и исследователям, разработка педагогических инструментов. Опираясь на недавние личные теоретические и практические исследования морфологии звука и слуха, мы исследуем понятие «эквивалентности в многомерном звуковом ландшафте». Будут проанализированы корреляции между взаимосвязью морфологий на основе звука, возникающих из расширенных гитарных техник, и пониманием внутренней реализации чувств – слышать и чувствовать, когда звук физически отсутствует. Излагая недавние актуальные тексты, которые сделали успехи в теории гитары и музыки, педагогике и анализе, мы получаем полезные знания обо всех звуках и стратегиях слушания. Чтобы выразить всеобъемлющий мысленный и визуальный образ восприятия ценности звука с морфологической и слуховой точки зрения, будут проанализированы трехмерные топологические диаграммы; развитие предыдущих двухмерных визуализаций. Что касается морфологии, интересными темами являются спектроморфология, пространственно-морфология, спектральное качество, пространство производительности и аспекты производительности. Изучение этих аспектов поможет

понять морфологическое значение. Обучение пониманию морфологии в зависимости от опыта прослушивания углубит все музыкальные способности. Поэтому мы будем исследовать аудиацию, охватывая глубокое слушание, ограниченное слушание, внутренние и внешние качества, психологический опыт, воображение и импровизацию. Восприятие спектральных движений в пространстве включает в себя динамическое мышление и действие, и по мере того, как обнаруживается большая взаимная инклюзивность, мы можем начать размышлять о более авантюрных педагогических инструментах, за которыми – будущее.

Ключевые слова: морфология, слух, воображение, импровизация