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Meaning, Motion and Gesture

In Psychedelic Trance Music

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Introduction

> "*The Spice extends life.*
> *The Spice expands consciousness.*
> *The spice is vital to space travel.*
> *… travel … without moving.*"
> (From the movie "*Dune*" by David Lynch, based on the novel by Frank Herbert, as sampled on Astral Projection's "*Dancing Galaxy*" – track 2 on the accompanying CD)

This quote is emblematic of some of the concepts making up the ethos that has been accompanying the music that will be referred-to here as "Trance" music. The definition of the genre is somewhat elusive, as there are so many genres and sub-genres within popular electronic dance music. This paper attempts to explore several aspects of how motion and gestures are perceived in the music often referred to as "Goa Trance" or "Psychedelic Trance"– named for the beach region of the Southwestern India where it thrived in the first half of the 1990's (and from whence it emanated to the rest of the western world), and for the fascination with psychedelic drugs that is part of its cultural setting. The process by which motion is perceived in music is affected, naturally, by both the music and the listener. It is of interest within the scope of this paper to explore how the factors that set apart Trance music and "the Trance listener" may affect this process.

When examining popular music in a cultural context, a common approach would be to look at the texts set in the music. In electronic dance music, where lyrics are very rarely present, a broader investigation of context is in

order. Even a brief review of some of the recurring themes in the peripheral media establishing the cultural environment that “Psy-Trance” is usually set in, will reveal a persistent interest in everything that is beyond the realm of physical “objective” reality. Trance culture is imbued with a fascination with various transcendental experiences –whether it is about going beyond the physical boundaries of the planet earth and exploring extra-terrestrial objects and creatures, or about going beyond the mental boundaries of known states of perception, cognition and consciousness, with or without the use of psychotropic drugs.

This fascination with altered states of consciousness bears interesting implications for understanding how motion is perceived in this music. The study of kinetic meaning in music is obviously a field within musical semiotics at large, and therefore deals with understanding the process by which a musical element or construct is attributed with extra-musical significance. Any semantic process, being a mental process, is directly affected by the state of mind and consciousness of the observer or listener. Specifically, the experience of space and motion in music is closely tied to psychosomatic experience (see Lidov and Todd). For example, sonic movement in a scalar musical field (such as pitch) can be perceived as analogous to movement of the body. It follows that an altered condition of sensory and kinesthetic perception will possibly have considerable effects on semiotic processes.

Not only the unique state of the listener is noteworthy in this respect, but also the distinctive characteristics of the music. Recorded (or amplified)

music, by virtue of the nature of the medium, is afforded greater control over how it is received in contrast to music played on acoustic instruments. Whether using monaural, stereophonic or any other sound-delivery format – the path from the music source to its intermediate destination (the recording medium or the amplification system) is relatively free from environmental interference. Due to this added control, recorded music can readily be engineered to resemble a specific spatial environment. The primary format in popular music is still stereophonic sound, and trance music employs spatial manipulations in the stereo field as one of its common sonic devices. Furthermore, the use of audio delay and reverberation effects is a common element in trance music that contributes to its unique sense of space.

Electronic music, and synthesized music in particular, expands a previously secondary field in music – timbre. Usually listed fourth after pitch, dynamics and temporal relations, timbre has always been the lesser-inspected attribute in most musicological studies dealing with classical western music. Of these four, timbre is certainly the least intuitively understood and the most complex musical parameter – being multi-dimensional. With the invention of the synthesizer, the term “timbre” grew beyond the selection of instruments in an orchestra. On the one hand, any imaginable sound can now be created from nothing. On the other, sound can be synthesized and then modulated using only selected few parameters. With most of the timbral attributes of a given sound rendered constant – gradual change of any single parameter creates a modulation on a scalar timbral continuum. This new addition to the

set of scalar musical parameters, through which motion can be conveyed, is unique to electronic music. Psychedelic trance music employs synthesized sound as its core if not its entirety. Furthermore, this sub-genre of electronic music arguably demonstrates timbral modulations as one of its key stylistic characteristics.

In one of the prominent books about electronic dance music and its surrounding sub-cultures in the last decade of the 20th century, Simon Reynolds describes this sub-genre with a few obviously derogatory terms: “deodorized”, “upmarket”, “whiter-than-white”. With a collective frame-of-mind idealizing an altered (if not enhanced) human experience as its cultural backdrop and a typical soundscape consisting of mostly synthesized sounds shifting through timbral space, psychedelic-trance music serves as fertile ground for further inquiry into the exploration of musical analogies to physical motion in space. It embodies boundary conditions both by employing an altered “semantic apparatus” (the human listener) and by presenting a synthesized object of study, relatively free from prior preconceptions, due to its use of timbre as its central musical device.

This paper is intended to provide a theoretical and technical background for the study of the means in which kinetic and kinesthetic notions are conveyed in trance music. It can serve as a theoretical point of departure for further inquiry and possibly expand on existing thought in the field of musical semiotics by examining how existing concepts are embodied in Trance music.

Musical Motion and Meaning

> "… What is here criticized as a weakness, is really the strength of musical expressiveness: that *music articulates forms which language cannot set forth.* The classifications which language makes automatically preclude many relations, and many of those resting-points of thought which we call "terms." it is just because music has not the same terminology and pattern, that it lends itself to the revelation of non-scientific concepts. To render "the most ordinary feelings, such as love, loyalty or anger, unambiguously and distinctly," would be merely to duplicate what verbal appellations do well enough." (Langer, 1942, p.233)

Before examining the perception of motion and gesture in Psychedelic Trance music, let us first briefly review a select few established ideas dealing with the matter at hand. In order for us to understand which aspects of kinetic and spatial perception in trance music is unique to the genre, we must understand how music in general works to evoke our sense of space, and through that our emotions. This process is an essential part of the greater system of signification that Langer describes above – a semantic system common to all flavors of the musical medium.

One fundamental concept that is essential to most approaches to the understanding of musical analogies to motion is the isomorphic hypothesis - the idea that music depicts a shape in the known 3-dimensional space that is analogous to its own form. The notion of musical *form* (in the sense of *shape* –as opposed to *structure*), although commonly accepted as valid and used in almost every learned discussion of musical material, merits closer inspection and deconstruction. Sound is a multi-dimensional medium and thus its *form*

can be constructed using any combination of it various parameters. For example, a simple sound of any kind can have a very clearly perceived dynamic contour – its loudness varying through its lifetime. Music - loosely described as a rule-defined subset of all sonic phenomena – gains even more dimensions through the added restrictions of functional systems such as harmony, rhythm, meter etc. Each musical system has its own set of functional parameters in which forms can be perceived. A case in point is Western European music of the 18th – 19th centuries; it displays as one of its more significant parameters the field of tonal harmony. The essence of the classical Sonata form (in the great majority of its instances) is the resolution of tension between two opposing “places” in the tonal space. In contrast - the minimalist music of the late 20th century rarely employs tonality as one of its essential elements and therefore *form* will not be perceived through tonal constructs in this music. Not all sonic and musical parameters lend themselves directly as devices for the construction of *forms*. Music, being primarily a temporal medium, bears its forms in the change of its various parameters over time. Musical *form* is perceived in the gradual change from one value of a parameter to another over the duration of the piece. In order for this to be evident to the listener, the significant parameter needs to be readily perceived as a scalar value on some single-dimensional continuum. The obvious examples are loudness (mentioned above) – which is mostly perceived in accordance to the amplitude of the musical sound wave – and pitch – the psycho-acoustic interpretation of the frequency/wavelength of any periodic component of that sound wave. Gradual change in either of

these two parameters is heard by all able-bodied listeners and can be examined and broken down to its various components like extent, duration, direction etc. Pitch and loudness are two examples of fundamental scalar parameters. Tonal harmony, for example, presents more complex scales like the circle of fifths and the degrees of any given tonal scale. Parameters of discrete nature cannot provide a sense of form because there can be no clear sequence of gradual progressions on a scale and therefore no sense of direction or distance can be measured for these parameters. Where direction and distance can be attributed to change in a musical element, a *form* can be constructed from the aggregate of changes over some time span. This musical form can then be taken as an abstract form and applied to any other conceptual field – a visualized shape in space, an emotive gesture, a path of travel from one place to another, etc.

We can identify the following two key elements in this semantic system: the space in which the form is perceived and the space in which the form is applied. The space in which the musical form is perceived need not be a single parameter. For example, Rink uses an “intensity curve” – “a graphic representation of the music’s ebb and flow, its ‘contour’ in time, determined by all active elements …” – as an analytical tool (Rink, 1999, p. 234). He brings together several musical parameters (harmony, melody, rhythm, dynamics, etc.) in order to derive a shape from the music.

An important space to which musical forms are applied is the somatic space. Lidov focuses on music’s effect on the body in his review of the referential

aspects of music. In this study, he goes a step back to Rousseau's explanation of musical melody as, originally, an imitation of the inflections of the human voice – a product of movement in the larynx (Lidov, 1987). Lidov's focus is on the phase of the semantic process that follows the one described above – beyond the neutral perception of a musical form: How are emotions evoked or expressed through music? His answers hinge on the somatic experience of music. He equates visual *similarity* (isomorphism) in the graphic arts with *causation* in music – the interaction of sound with the body – as the point of departure for the primary basis of reference. He goes on to elucidate how the semiotic process in music transcends this "raw" cause and effect system – "In acquiring signs, sensations and impulses formed in and of the body transcend it to become the mind" (Ibid. p. 71) The transcendence of music beyond its direct interaction with the body induces a semiotic system in which a clear sign typology emerges. Lidov distinguishes between *articulate* elements in music (specified by the composer) that serve as signs, and their *particular* manifestations as expressed by the performers. He brings up the issue of articulation – the condition and result of formal sign systems – in order to show how music works in this realm and beyond it. While the music is written and articulated, it is received as an unarticulated somatic experience. The body is the semantic context in which all musical semiotic relationships exist. It distinguishes two mutually inclusive realms: the objective exosomatic space of objective "coherent three-dimensional geometry and ordered locations" (Ibid. p. 74) and the body itself, within that space, which engulfs a subjective experience of endosomatic space. When a

dancer moves, for example, his motion can be objectively traced in three-dimensional space, but in addition to that, he has his own kinesthetic experience of that motion. A musical shape can be taken to reflect a form in either or both of those spaces. The realm of feeling, according to Lidov, is accessed through psychosomatic isomorphism. A state of mind is depicted using the shape of the subjective somatic experience associated with it. In an attempt to apply shapes to feelings both Lidov and Rink refer to Manfred Clynes's work with "sentic shapes". In his experimental work, Clynes compiled a collection of shapes to represent various emotional states. According to Clynes, emotional states determine brief, temporally absolute modulations in the neuro-electrical voltages of motor acts. These patterns can both be carried out as muscular motion and identified through the senses.

More rigorous empirical work has been reviewed by Todd, who distinguishes two possible mechanisms that may form the neurobiological basis for the association of motion in music: the *vestibulmotor* mechanism, and the *audio-visuo-motor* mechanism. He also brings forth the distinction between two kinds of musical motion: *gesture* and *locomotion*, each kind possibly perceived through either type of motion-perception mechanism (Todd, 1999). The vestibular mechanism – mediated by the motion and balance-sensing parts of the human inner ear – is apparent through the discovery of those organs' sensitivity to acoustical stimulation. Todd shows that the stimulation of the system by a continuous sound, with the energy level of

one of its parameters modulated over time, will give rise to correspondingly modulated vestibular signal. Therefore, music can directly stimulate the human sense of motion.

According to Todd, the audio-visuo-motor mechanism – mediated by the auditory cortex in the brain – deals primarily with the rhythmical aspects of sound and music. The theory is based on the notion of *Receptive Fields* (RFs) in the *visual* cortex in the brain. Motion is perceived visually by dynamic RFs that move with time. Todd cites neuro-physiological evidence of similar RFs in the auditory cortex. This similarity supports the idea that auditory and visual processing in the brain is carried out by similar mechanisms. Todd's focus on rhythmic perception through this mechanism is directed by the observation that the range of temporal frequencies of both auditory and visual dynamic RFs is similar at approximately 0.5 – 32 Hz. Events occurring at the lower frequencies in this range can thus be distinguished from each other and are perceived by this mechanism through the rhythmical attribute of their repetition. Another important idea within the larger scope of Todd's work is his thought that the human experience of rhythm is mediated by two distinct representations: *sensory* and *motor*. In essence, Todd provides a neuro-biological echo to Lidov's ideas about the somatic experience of music. Todd shows how a sensory image perceived in the auditory or visual cortex is interpreted into a sensory-motor image. Furthermore, in an interesting correlation to Lidov's distinction between the body and the mind's role in the musical semantic process, Todd argues that the *vestibular* mechanism is

"more low-level, direct and reflexive", whereas the *audio-visual* mechanism is more "high-level indirect and a product of learning" (Ibid. p. 116)

The process by which a *form* is discerned through an acoustic phenomenon is only part of the bigger mechanism of interest here. The ultimate objective of Clynes, Lidov and their colleagues lies in the understanding of the signified emotional content in music; the perception of forms, movements and gestures is – to a great extent - the means to that end. Langer evokes the concept of "significant form" in her exploration into the distinction between *a piece of art* and an *artifact* (Langer, 1942). Clynes shows in his work how specific forms portray specific emotions and in that lies their significance, but many questions still remain. Emotions are subjective states; to which subject does an emotional state portrayed in music apply? The composer? Performer? Listener? Music can take any of various roles in the emotional state of its participants: a stimulus that arouses emotions, a symptom of the emotional state of the musician, etc. Langer quotes Richard Wagner in saying that music does not express the emotions of any single individual, but rather the abstract notion of the emotions themselves (Langer, 1942, p. 221). Furthermore, she explains, composed music does not necessarily express the composer's emotions; It is composed according to the composer's *knowledge* of the emotions conveyed in the music – "Just as words can describe events we have not witnessed, places and things we have not seen, so music can present emotions and moods we have not felt, passions we did not know before." (Ibid. p. 222)

Trance Culture

> "To dance is to inscribe music in space, and this inscription is realized by means of a constant modification of the relations between the various parts of the body. The dancer's awareness of his body is totally transformed by this process. Insofar as it is a spur to dancing, therefore, music does appear capable of profoundly modifying the relation of the self with itself, or, in other words, the structure of consciousness." (Rouget, 1985, p. 121)

In his study into the function of music in rituals dealing with spiritual possession of the human mind and body, Rouget uses the term "Trance" in its original meaning – a meaning apparently borrowed by those who introduced the term "trance" into popular dance music nomenclature. Interestingly, he points out the capacity of bodily movement (to the sound of music) to affect the dancer's state of consciousness. Dance is an integral part of the "Psychedelic Trance" experience and so is the exploration of altered states of consciousness. In understanding the unique ways in which motion and meaning are present in Psychedelic Trance music, it is noteworthy to get a sense of the cultural setting in which the music is usually heard. Any reasonably complex process of signification will be affected by the cultural context in which it is present.

Psychotropic Drugs

Like most electronic dance music over the past two decades, trance music stems from the House music scene of Detroit and Chicago in the late 1980's. The growth in popularity of the electronic dance scene went hand-in-hand

with the growth in popularity of the drug known as *Ecstasy*. Goa Trance, in general, put more emphasis on hallucinogens - "By the late eighties Goa had evolved into a *dance*-and-drug paradise, albeit oriented around LSD [Lysergic Acid Diethylamide] rather than Ecstasy." (Reynolds, 1998, p. 175) The emergence of psychedelic trance in Goa was affected by the narcotics of choice. Trance music is thought to be geared towards the hallucinogenic experience of LSD as opposed to the stimulant effects of Ecstasy. The use of the hallucinogen often goes hand-in-hand with the sense of spirituality afforded by the altered state of consciousness it induces - those spirituality and state of consciousness being two of the primary social bonds bringing together the trance "tribe" – much like the 1960's hippie culture and its use of LSD. In contrast to 1960's hippie culture: "although LSD is prominent among trancers, few place any ideological meaning to the drug" (Meadan, 2001, p. 47). Some "trancers" even see in the music, and the trance party, alternative modes of reaching a state of mind typically brought on by drugs – a sentiment strongly supported by Rouget's findings.

Connection to outer space/shift in consciousness

The trance ethos is permeated with references to expanded states of being. The advocacy for the use of LSD is part of a broader spiritual ideal of breaking down cultural, social, mental and also physical boundaries. The trance enthusiasts believe that they, through their music and their attitude, can transcend the confines of every day life. They aspire to relate to people beyond the confines of social norms; they aim to experience life in a way

more robust than the “ordinary man’s”; they adopt religious and cultural icons and ideas foreign to their mostly Western origins and they celebrate the idea of extra-terrestrial life. The ideology is conveyed articulately in many peripheral artifacts prevalent in the music and culture. Spoken-word samples incorporated into the recorded music often refer to cultural indexes dealing with these ideas, such as science fiction motion pictures (see the quote from “*Dancing Galaxy”* on page 1 above); the track, album and compilation titles often make reference to psychological, astro-physical and mystical terms; the décor at most trance parties and also at the private dwellings of the “hard-core” enthusiasts is often filled with extra-terrestrial iconography, fluorescent images and pictures of Indian deities.

Even if not all trance participants use drugs as part of their musical experience, or idealize the drug as a necessary condition for complete participation - the use of LSD is an essential part of their cultural world. Both the fascination with outer space and that with altered states of consciousness are closely bound to the use of hallucinogenic drugs. The mental exploration of altered states of consciousness, places and times beyond the physical present under the influence of LSD are commonly known and have been studied in depth. Grof reports at length about the subjective experience of travel through space as well as trans-personal consciousness in the course of LSD sessions. He also describes the spiritual experience of encounters with various deities. The experiences range from visual hallucinations to all-encompassing feelings of super-personal consciousness. For example, some

participants in Grof's experimental LSD sessions reported feeling the consciousness of a rock, while others reported experiencing a sense for the entire planet (Grof, 1975). The LSD experience, whether personal or cultural, has been adopted by the trance subculture. Even those who enjoy the music without actually taking the drug know of its effects and often try to bring into their lives as much of the imagery and thought that customarily accompanies the LSD sessions.

Sonic Elements in Trance

Trance music is most always delivered through an amplified stereophonic sound system. Being electronically produced, it is allowed greater control of several acoustic parameters. It employs these parameters in ways that directly engender the unique ways in which it embodies motion.

Stereophonic Sound

Trance music is delivered almost exclusively in the form of stereophonic recorded or amplified music. Whatever the number of sound generators that are used and whether the music is recorded or performed live, using synthesizers or acoustic instruments, the orchestration is ultimately managed through a stereo mixer that directs all the sounds into two channels – left and right. Although the trance music listener is not always listening at an equal distance from both speakers or with headphones on, trance still makes use of the stereo field to induce illusions of spatial movement of the virtual sound source in the music.

The human brain seeks cues from both ears in order to accurately locate a sound source. A listener uses audible cues based on differences in time and intensity received stereophonically in determining the direction of a sound source. Additional cues are also based on differences in the spectrum of a sound revealed through the directionally dependent filtering of the outer ear (Dodge and Jerse, 1997).

The two main factors measured when hearing a sound stereophonically are the *Interaural Time Difference* (ITD) – the delay between the time that a sound reaches one ear and the time that it reaches the other, and the *Interaural Intensity Difference* (IID) – the difference in volume of the sound received in each ear. In natural setting of a sound source that is not centered, the IID varies according to frequency. Higher frequencies are more affected by the direction from which they are heard (Ibid).

One fundamental effect employed in electronic music is *panning* – changing the relative intensity of a recorded sound between the left and right audio channels. This effect directly modifies the sound's IID and produces the perceived movement of the virtual sound source. The use of panning in Trance music is very common and it contributes to the "transcendental" nature of the characteristic sonic texture – one that would not be regularly encountered as a natural sonic phenomenon.

Reverberation & Delay

Trance music utilizes various electronic sound manipulation devices to impart a sense of space and motion in that space. Stereo panning is one of them, and reverberation is another. Electronic "reverb" effects are designed to imitate the natural reverberation of sound in any acoustical environment. Reverberation results from the reflection of sound waves off surfaces found in the listening environment. Sounds are reflected differently off different surfaces and therefore the original sound reaches the listener's ears followed

by several “copies” of it that travels longer courses as a result of various sonic reflections. The reflected sounds naturally have diminished amplitude in relation to the original. The mixture of the original sound with the delayed versions of it enriches the original sound and often effects a change of perceived timbre (Dodge and Jerse, 1997). The amount and quality of reverberation in a given space are affected by the volume of the space, and the types of objects and surfaces present in the room. Thus, a change in the perceived reverberation applied to a sound in recorded music affects the *virtual space* in which it is set.

Dodge and Jerse list the following parameters that affect how reverberation is perceived: *reverberation time*, *frequency dependence of reverberation time*, *time delay between the arrival of the original sound and the first reflected sound* and *the rate of build up of the echo density* (Ibid. p. 290).

Reverberation time is defined as the time it takes the sound to decrease in amplitude by –60 dB (1/1000). Rooms with larger volumes have longer reverberation times. On the other hand, an increase of the surface area of objects in the room decreases the reverberation time, as does the increase of their capacity to absorb the sound waves. The surface texture of objects also affects the reverberation time.

Objects and surfaces reflect sound differently in various frequency bands. Furthermore, the humidity in the air affects waves according to their frequency. Higher-frequency sounds are attenuated by a greater factor than lower frequency sounds when traveling through humid air, therefore reflected

sounds that travel a longer distance would lose more of their energy in their higher-frequency components.

The amount of time that passes between when the original sound is heard and when its first reflection is heard determines whether the reverberation is distinguished as an echo or it only imparts a sense of the (smaller) size of the room.

A common device found in audio reverberation effects used in music is a feedback loop; this loop applies the same reverb effect to the effect's output, thus sounding additional instances of the original sound at fixed intervals through the reverberation time. A stereo-delay effect is another addition to this mechanism, in which the feedback alternates between the left and right channels, generating echoes oscillating between the two sides of the virtual space.

The perceived spatial setting of the music can be affected, then, by a change in any of these parameters. While in many genres of recorded and amplified music reverb effects are used in order convey a sense of a specific natural space, in Trance these effects are very often used in a way that creates a sonic texture that cannot occur in nature. For example, several sounds may be layered with each of them being affected by different reverb settings. Two sonic objects are heard concurrently: a handclap accompanied by a deep echo - virtually situated in a large hall - and a bass-line bearing no reverb whatsoever as if it was sounded in an infinitesimally small space. Such use of

reverb effects contributes to the setting of trance music in a world outside the natural universe.

The Timbral Domain

As reviewed above, one medium through which forms can be perceived in music – is through the gradual change of a scalar sonic attribute (such as pitch, loudness etc.) The choice of musical timbre was not a candidate for such spatial analogies in traditional music using acoustic instruments, as the instruments could not be arranged on a scale; a violin is not "more" or "less" than a trumpet and there is no simple way to orchestrate a gradual shift between these two points in timbral "space". However, modern studies of timbre and their applications in the advancement of sound synthesis can change role and function of timbre in electronic music and particularly in trance music.

Timbre Fundamentals

In the 19th century, physicist Hermann von Helmholtz conducted the most significant study in the field of timbre up to that time, concluding that tones are made of a waveform enclosed in an amplitude-envelope (Dodge and Jerse, 1997). The envelope was made of 3 parts: Attack – the part of the tone where amplitude rises from zero to its maximal level; Steady state – the part of the tone in which the amplitude is roughly constant; Decay – the part of the tone in which its amplitude falls back to zero. He also supposed that if

a sound invoked a sensation of pitch then its waveform is periodic – recurring perfectly in its entirety at constant-frequency cycles.

Helmholtz followed the work of Jean Baptiste Fourier to characterize those steady-state waveforms. Fourier proved that any periodic wave could be broken down into pure sine wave components that relate to a fundamental (lowest frequency) sine wave in frequency, amplitude and phase. The frequency and amplitude relationships between these *spectral components* are what Helmholtz concluded most affect musical timbre. The *spectral envelope* of a sound is roughly the shape generated by plotting a line connecting the amplitudes of the components on a spectral plot. The *bandwidth* is the width frequency region in which significant components of a complex sound reside (Ibid. p. 51).

The multidimensional timbral space

Since the second half of the 20th century computer technology has enabled further study into the acoustic phenomena of musical timbre and how it is perceived and distinguished. Closer inspection by several scholars revealed the acoustic composition of natural tones to be more complex than Helmholtz had realized. Studies by scholars such as Risset and Grey showed that the spectra of sounds generated by musical instruments do not necessarily remain constant in their amplitude and frequency relationships. Rather, the various spectral components often follow independent amplitude envelopes from the initial moment of attack until the sound has completely decayed.

These studies have provided the scientific understanding for why timbre has not been easily perceived on a scale. On the other hand, some modern studies into timbre have deduced several scalar parameters that affect timbre. Grey, for example, conducted experiments into the perceived similarity of musical sounds and compiled a 3-dimensional relationship between the sounds he used in his experiment, concluding that 3 parameters most affect timbre distinction (Grey, 1975)[1]. Another interesting study is Cogan's phonological theory of tone color. Cogan examines complete sonic spectra of entire musical works, instead of the single instrument, and shows the dynamics of change over time of 13 *oppositions* - attributes of the spectra that can be measured to be negative, neutral or positive in relation to the sound's sonic context (Cogan, 1984). The distinction of scalar parameters that affect timbre, as shown by Grey and Cogan, may have some implications on the perception of form in music using most traditional acoustic instruments. It most definitely impacts the function of timbre in electronic music.

Electronic timbre – a scalar quantity

Since electronic music uses tones that are artificially synthesized, these tones can be manipulated in any of various ways. The use of electronic

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[1]Grey's 3 key parameters for distinguishing between timbre (Grey, 1975): Spectral distribution, the synchronicity (or lack of it) between the behaviors of a tone's partials, and the relative strength of an attack transient (a low-amplitude, high-frequency partial).

synthesis, whether analog or digital, has allowed musicians to control the various parameters of timbre when creating a musical soundscape. For example, a common practice in electronic dance music is to modulate a single timbral parameter of a tone while keeping all others constant, creating a gradual shift in timbre. This use of electronic sound adds timbre to the set of scalar musical parameters through which form may be perceived.

Timbre in Trance Music

Psychedelic Trance, like its precursor genre Acid-House, is based on the sound of the Roland *TB-303 Bassline* synthesizer and other similar analogue synthesizers and their descendants (Reynolds, 2000). One of the key features of these synthesizers is the use of filters on the generated sounds. Besides various side effects that are the hallmark of the "303" sound, these filters allow control of the spectral envelope of the generated sound by controlling the sound's *cutoff frequency* – the filters upper frequency (in the common case of a *low-pass* filter[2]), above which spectral components are attenuated. This practice effects a tone modulation on the single parameter of *spectral energy distribution* according to Grey and Cogan's *narrow vs. wide* opposition (Grey, 1975 and Cogan, 1984). Such a gradual shift in a tone's

[2] The *low-pass* filter is the filter most commonly used in Trance music. For a more elaborate review of various types of audio filters and some of their applications in synthesis see Dodge and Jerse, 1997, chapter 6 – *Subtractive Synthesis*.

bandwidth is heard directly and over time can be perceived as a form just as melody can be perceived as a form in the domain of pitch.

Furthermore, many modern synthesizers apply an *envelope* to the cutoff frequency throughout a single tone's lifetime. Much like the generated sound's amplitude follows a set of attack-sustain-decay parameters so does the cutoff frequency of the applied filter. The more elaborate the *filter envelope* is, the more the sound's spectral composition changes within each instance of a tone. The audible effect is phonologically analogous to the smooth transition between different vowel sounds, such as "*ah…ooh*".

The second dominant filter parameter used in popular synthesizers is the filter *resonance* – a relative level by which the frequency range around the *cutoff frequency* is emphasized. Control over this parameter was designed to allow musicians to emulate acoustic characteristics of traditional instruments that have various *formant* spectral regions – absolute frequency ranges that resonate more than other spectral components. Using a high resonance setting while changing the cutoff frequency generates a distinctive sound as the resonant area passes over and highlights the various spectral components.

The gradual expansion and contraction of a tone's spectral envelope that is a fundamental sonic element in Psychedelic trance music also serves as a more direct kinetic and kinesthetic stimulus in the music. The human ear filters sounds according to the direction from which they reach the listener (Dodge

and Jerse, 1997). Therefore, a sound changing its spectral bandwidth can be heard as revolving around the listener.

Another acoustic phenomenon that is related to the spectral envelope of a tone is the difference in the way sounds of various frequency ranges travel through the air. As high-frequency sounds are more affected by humidity, their intensity is decreased, as they travel through air, by a greater factor than lower-frequency sounds. Therefore, as a filter is applied to decrease the intensity of higher-frequency components of tone, that tone can be heard as traveling away from the listener.

Furthermore, high frequency waves are more directional than lower frequency waves. This is clearly evident when pointing a loudspeaker towards or away from a listener. When listening to a speaker pointed in a different direction, the sound is duller because higher-frequency components are not received at the same level as their low-frequency counterparts. The simple timbral manipulation of the cutoff frequency is similar in sound to the rotation of the sound source.

Meaning and Motion in Trance Music

> "Sometimes there is very little actual perceptual distortion of the environment, but the latter is emotionally interpreted in an unusual way. It can appear incredibly beautiful, sensual and inviting; or comical; very frequently, it is described as having a magical or fairy-tale like quality. Similarly, the emotional impact of sound can be modified. Not infrequently, LSD subjects discover dimensions in music that they were unable to perceive before. In the [LSD] sessions, it appears to be possible to listen to music with one's whole being and with a completely new approach. Frequently, music seems to resonate in different parts of the body and to trigger powerful emotions. One of the most common statements one reads in subjects' reports about LSD sessions refers to the feeling that on the session day they *really* heard music for the first time in their life."(Grof, 1975 p. 40)

Altered States

While the words of an experimental LSD user need not be taken at face value, it does not seem implausible that the psychotropic drugs - amongst the various effects they have – will also affect the perception and appreciation of music. Specifically noteworthy in the above quote are the mentions of the somatic experience of sound and its emotional impact. While Psychedelic Trance music is not necessarily experienced exclusively under the influence of LSD, considering the capacity of music and dance to induce actual trance (Rouget, 1985), it would not be unfounded to explore how an altered state of consciousness may affect the perception of motion in this music. Naturally, approaching a subject that lies beyond the boundaries of common reasoning intellectually leaves more questions than answers.

Lidov emphasizes the role of the human body in the perception of music. A very common experience under hallucinogens is the existence beyond the physical body. Users of LSD often report leaving their body and looking at it from another place in the room or even traveling farther than that (Grof, 1975, p. 187). How would the physical body take part in the listening experience while the listener is having an out-of-body experience? How would the "conscious body" – the somatic presence as felt by the user - take part?

Grof reports out of body experiences that not only transcend the session room, but sometimes also go beyond time and space to far away places (Ibid). These places may be worlds that are not real and are not bound by the physical laws that we know. Following Lidov's distinction of the visual exosomatic world from the endosomatic experience, it is possible to see how this "objective" external realm can be expanded to include such "alternative universes". In this greater exosomatic context we can think of the "objects" portrayed as moving in Trance music as existing in some alternative universe Following that, another question may arise: this objective space is still a figment of the psychedelic imagination, and is actually a subjective experience much like the kinesthetic sense of motion. Would it not then be more easily applied to our endosomatic world, which is more closely linked with our psyche? A nameless object – possibly revolving on its axis, or following some path - imagined through a sonic element in Trance music is not "out-there" but rather "in-here" and is thus more intimately bound to our

state of mind / body. How is psychosomatic isomorphism affected by the exosomatic world being a figment of the listener's imagination?

The exosomatic form reflected through music is projected onto a somatic space in a transcendental state entirely different from our usual experience of the body. In this case the set of possible movement patterns is not limited to what is known from either personal or collective human experience. Our sense of motion, for example, has probably helped us compile over time a "palette" of known movements that we can carry out, whether gestural or locomotive. It is obviously limited by the physical conditions in which we live. It would seem reasonable that we somatically identify musical forms as motion only if they are analogous to some familiar kinesthetic form. Once our "palette" has been expanded by the psychedelic detachment of our senses from our physical body, would we relate differently to various forms in music? For example – the track name "People Can Fly" (Astral Projection, Trust in Trance, track 6), and its embedded quotes[3] deal (at least textually) with human flight (possibly through the experience of LSD). We do not know what movement patterns this hypothetical human flight will take. A similar expansion can surely be applied to the domain of emotive gestures. If we identify and respond emotionally to the shapes cataloged by Clynes – how do

[3] "When you dream there are no rules. People can fly, anything can happen. Sometimes there's a moment as you are awaking, when you become aware of the real world around you. But you are still dreaming. You may think you can fly, but you'd better not try. People can fly." (Spoken by David Duchovny – star of the X-Files - in the motion picture 'Kalifornia' by Dominic Sena (1993))

we respond to a form unknown to us? Grof reports of subjects' experiences of the consciousness of inanimate objects, for example (Grof, 1975, p. 184); what "Sentic forms" would those experiences add to our gestural catalog? Could our world of meaning be expanded?

In addition to the changes of our intellectual faculties participating in the semiotic process, the senses are also altered. The imaginable possibilities for further study into how the various narcotics affect how we sense and perceive music and motion in music are numerous. Grof deals with musical and acoustic illusions together with visual ones. One remark in his summary of the changes reported in acoustic perception, which is particularly relevant to trance music stands out: "… Monotonous acoustic stimuli, such as running water or the buzzing of electric appliances, can be illusively transformed into beautiful music." (Grof, 1975, p. 40) Psychedelic Trance, drawing from its minimalist heritage, is primarily monotonous in its foundations; it almost always displays a steady bass drum pulse accompanied by a relentless bass line. Beyond the appreciation for minute details that any lucid listener sensitive to minimalist music might harbor, the intoxicated listener might enjoy a completely different soundscape.

It is evident then, that the psychedelic experience of music idealized by the trance milieu may expand the boundaries of the musical semantic system - of which motion perception and cognition is a part – in several ways. As noted, LSD is not essential to the Psychedelic Trance experience. Considering the induction of altered states of consciousness through intensive drug-*free*

dance sessions might lead to various other conclusions regarding how motion perception may be affected.

Language

One attribute that Trance shares with most electronic dance music, and that sets it apart from popular music in general, is lack of lyrics. This has afforded trance music freedom on several levels. It allowed it to develop globally, unrestricted by national language barriers and the dominance of the English-speaking world in a way that is congruent with its libertarian ideology. The contrast with lyric-laden pop music is relevant to the issues at hand in the examination of the way the participation in the collective experience of the music is achieved, and how it affects the systems of signification at play.

Much like most popular music – dance music is often appreciated in mass gatherings and its intensity and social significance is derived in part by the shared presence of a great number of people at the venue where the music is presented. Where pop and rock fans sing the lyrics in unison as a way of sharing the appreciation for the music, the participants at a trance party need to find other means in which to bond with their comrades in their shared experience. It would seem that one bonding element in the appreciation of art – in this case music – is the knowledge of the shared familiarity with the piece at hand. The audience singing a song's lyrics from memory obviously provides proof of their prior knowledge of the song. With wordless music, a different placeholder needs to be presented in order to

show familiarity with the track currently being played. The task of articulating a sense of place in the music without the crutches of words takes on added depth and often dance and gestures are called on to fill the gap. Very often trance dancers at a party will seem to be sharing their appreciation of the music, the environment or the people through nothing more than a smile or a slight gesture – trusting that the other person, through the music, knows what the smile is meant to signify in a very inarticulate manner[4].

Trance music goes a step further in "robbing" its practitioners of a common language. The use of acoustic instruments in other musical genres has often afforded listeners with indexical and symbolic meaning for certain sounds, instruments and sonic textures. Even when hearing a song for the first time, the sound of a distorted guitar, for example, in itself provides the pop listener with some context in which to relate to the music – as does the sound of the harpsichord for the Baroque aficionado. This context is necessary as a basis for a shared experience with other listeners. Electronic music (and trance in particular), on the other hand, often employs sounds with little to no historical context. The sounds are, simply put, "out of this world" – out of the cultural world in which most "old fashioned" western music is set. There is no name for each and every sound heard in trance

[4] Trance enthusiasts also typically demonstrate a colorful but limited vocabulary in describing their trance experiences. Gore makes some interesting remarks about the collapse of subjectivity through intense trance-inducing dancing at raves, and its relationship to altered linguistic ability (Gore, 1997, pp. 63-64). This may bear further impact on other semantic faculties.

music, as there is no notation system with which to reduce the music to an articulate medium.

In departing both from verbal language, and – to some extent – from common musical language, Trance breaks further away from any mode of articulation that may be identified in music in general. As Langer puts it - "*music articulates forms which language cannot set forth*" (Langer, 1942, p. 233) – and Trance makes that ever more clear.

Demonstration

> "Sounds like it's having a hallucinogenic effect - not like a drug which is harmful and bad, and just say no kids - but spacey nonetheless." (From the animated comedy series "*Duckman*" as sampled on Cosmosis's "*Just Say No*" – track 1 on the accompanying CD)

The accompanying audio compact disc includes a selection of Psychedelic trance tracks by several artists and some precursors to Psy-Trance. The following review of the first track in this collection - "*Just Say No*" by Cosmosis – is by no means intended as a rigorous analysis, but rather as a demonstration of the various principles outlined above[5]. The use of descriptive kinetic terminology is intentional and will be highlighted.

Timbre

The track exhibits the use of timbral modulation as a central element in the sonic texture. The use of filters in hinted at from the outset when a set off seemingly random *liquidesque* sounds emerge at 0'13" as sounds of water poured out of a bottle. This effect is achieved using a filter with a falling resonant frequency, shown in Figure 1 below. The spectrum analysis shows a

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[5] Although score samples would be called for as part of any text referring to music, there are none in this essay. The domain of pitch, which is at the core of traditional western notation, is either irrelevant or of marginal importance to most of the musical components of this track and others of this genre. Therefore, score clips are not used as a reference pointer in this essay. Time markers in the form *m'ss"* are used instead. The development of a different form of notation that will be more timbre-centric can be the subject of further academic work.

diagonal ridge that shows the salient resonant frequency decreasing from approximately 1440Hz to 40Hz in the 8 seconds sampled.

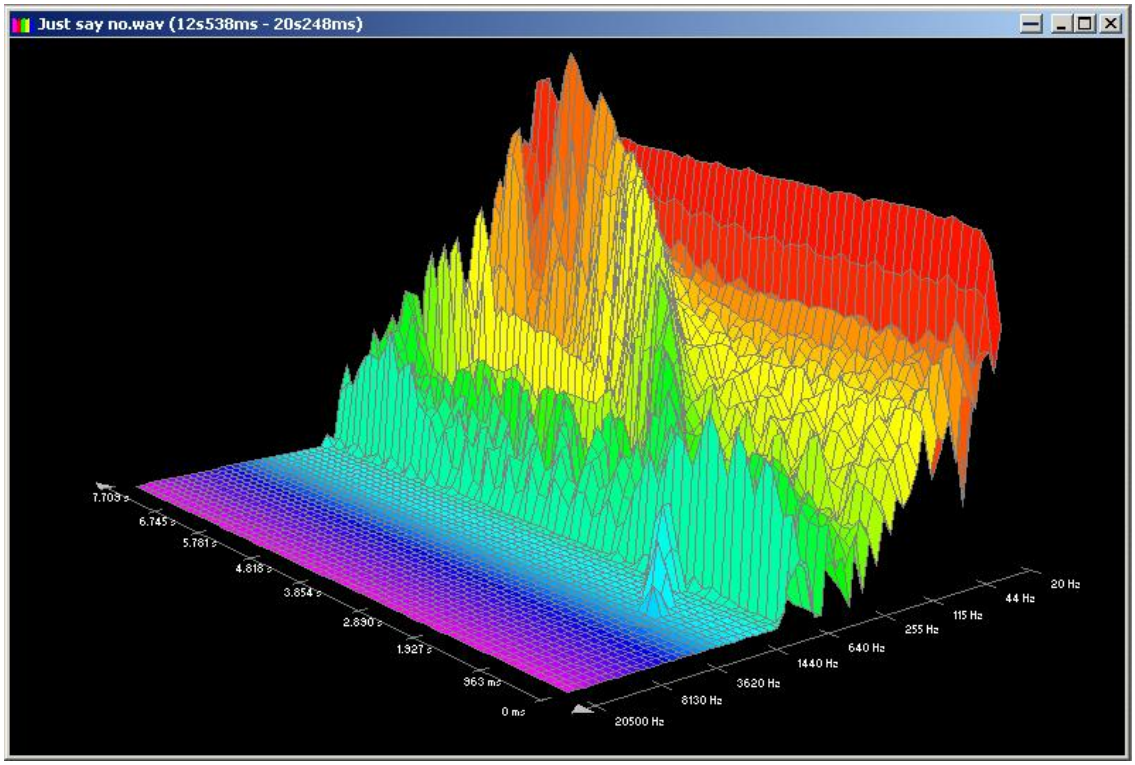

Figure 1 - Decreasing resonant frequency

The first gradual timbral process begins when a bass pulse initiated at 0'46" is slowly transformed into the spoken-word sample bit "*Just say no*" culminating in the pause at 1'44" when the imperative sentence is uttered in its entirety and in full clarity. Although this is not a timbral modulation in its most common form, the fading-in of the sample creates the effect of the words *ascending from under* the vague bass line. The second time this *ascension* is presented (peaking at 6'39"), it is augmented by an additional sound that more clearly is modulated in timbre – bringing on a stronger sense of musical punctuation when the sound stops.

At 1’52” a sonic element is presented that is timbral in essence. Although this element does change over the time that it is present (until 3’03”), each single “note” of this element encompasses a timbral shift, either from a wider spectrum to a narrower one or from a narrow spectrum to a wider one. This element is accompanied at the same time with a bass line that is initially constant in timbre. At around 2’26” this bass line begins steadily expanding in spectrum and an increase in intensity is perceived in the gradual appearance of higher-frequency spectral components. Both these elements expire at 3’03” - the track’s second catharsis.

Reverb and Pan

The track opens with a bass drone that shifts both in amplitude and in stereo location. The tone is generated using an LFO[6] on both these parameters as well as a slower LFO that is applied to the cutoff frequency, effecting a more subtle shift in timbre. This sound establishes the spatial setting of the track from the outset. The perpetual movement between channels conveys a sense of space that applies to the track in its entirety.

At 3’03” a new *spatial* “theme” is introduced. Its distinctive mark is the use of a pronounced stereo-delay effect that literally sets the sound in motion – constantly panning between left and right. Furthermore, this sound exhibits

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[6] LFO –abbr.: *Low Frequency Oscillator*. A modulator which when applied to pitch produces vibrato, and when applied to amplitude produces tremolo. LFO's can be any of the basic waveforms (http://www.angelfire.com/music/creon/begin.htm)

“unstable” timbre in that each note has a different filter envelope applied to it. At 3’56” another such theme is introduced. This new theme does not rely on the delay effect, but rather hovers around until 5’15” constantly changing in loudness and stereo location. This use of panning imparts the sense of motion very directly.

Another notable use of reverberation – a subtler one, only heard through careful listening – is the sonic element first introduced at 1’20” and then intermittently until 1’39”. It is similar to the sounds heard in the first few seconds of the track only that in these instances it is clearly *located* at the back of the space. Its loudness is softer and through reverberation it seems like it has a *space* of its own, in the *rear* of the complete soundscape.

Conclusion

Psychedelic Trance music is unique in many ways. It is guided by an ethos that idealizes experiences that are beyond normal human existence and employs synthesizers and audio processing effects that can create sonic textures that were not imaginable only a few decades ago.

The “trance” state of consciousness, whether induced with or without the use of LSD, affects the way trance listeners perceive music and motion thorough it. Their palette of forms may be expanded to include more shapes with more meanings; their sense of motion is not necessarily limited to the experience of physical motion and they may hear sounds in a way that is completely different from the way they are commonly heard. Furthermore, emotional responses to various stimuli and to music in particular in this state are reportedly more acute; it stands to reason that the perception of gestures and the sense of emotional expression in music are altered as well.

The new sonic possibilities introduced by the advent of synthesis and sound engineering are explored in trance music in ways that are germane to how motion is perceived in music. Timbre modulations both add a new scalar property that can isomorphically communicate forms, and serve as a device for imitating common acoustic phenomena. Stereophonic hearing and the identification of reverberation are two key mechanisms used in spatial orientation and are at the core of trance music; the prevalent sonic texture in Psychedelic Trance music is one in which sounds are perpetually shifting in

the stereo space and are reverberated to varying extents effecting a very distinct experience of space.

Trance music displays combination of a sub-cultural environment and a characteristic sonic texture whose key elements have a direct bearing on several aspects of the perception of motion and gesture in music. In this combination, it is set apart from classical western music and also from related popular music genres. Closer, more elaborate, academic study of the various facets at play in the music (and the cognitive processes) is sure to prove valuable.

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Online Resources of Interest

http://www.bendov.info/heb/trance.html

http://www.chaishop.com/

http://www.interzone.ch/goatrance.html

CD Tracks

1. Cosmosis – "*Just Say No*" (Intergalactic (© 2000 Transient Records), track 2, 7'47")
2. Astral Projection – "*Dancing Galaxy*" (Dancing Galaxy (© 1997 Trust in Trance Records), track 1, 8'16")
3. Astral Projection – "*Cosmic Ascension*" (Dancing Galaxy (© 1997 Trust in Trance Records), track 5, 10'18")
4. Astral Projection – "*People Can Fly*" (Trust in Trance (© 1996 Trust in Trance Records), track 6, 9'55")
5. Atmos – "*Fill The Hat*" (HeadCleaner (© 2000 Spiral Trax), track 1, 13'29")
6. Jam & Spoon – "*Stella*" (Tripomatic Fairytales 2001 (© 1993 Sony Music Entertainment), track 4, 6'19")
7. Sven Väth – "*Ritual of Life*" (Accident in Paradise (© 1993 WEA Music), track 1, 13'08")