

TIMBRE AND THE “ZONE OF ENTANGLEMENT” IN ELECTRONIC DANCE MUSIC: RE-THINKING MUSICO-SOCIAL ONTOLOGIES WITH THE MYCELIAL TURN

— FEATURE ARTICLE —

MARIA PEREVEDENTSEVA
UNIVERSITY OF SALFORD (UK)

ABSTRACT

This article weaves together relational tendencies in recent scholarship spanning philosophy, mycology, psychopharmacology and timbre studies in order to argue that timbre’s unbounded ontology and cyclical re-use across electronic dance music (EDM) history affords listeners experiential access into radically distributed modes of being. Taking its cue from the biological structure of fungal mycelium, from whose flowers the psychoactive compounds of many psychedelic drugs are derived, this study builds on established models of EDM’s affectivity to propose that timbre in EDM manifests a psychedelic and specifically social form of consciousness. Highlighting the potential for entrainment that EDM’s synthesised timbres make possible, a conception of timbre as a mycelial “zone of entanglement” is put forward, in which the material and cultural, individual and social and spiritual and fleshy dimensions of the listening experience are folded into a reverberant unity, in turn encouraging a negotiation of the ethics that this entanglement entails.

KEYWORDS: timbre, mycelium, ontology, psychedelics, electronic dance music

MARIA PEREVEDENTSEVA is a Lecturer in Musicology at the University of Salford. In 2022, she completed her PhD at Goldsmiths with a thesis titled ‘Something for Your Mind, Your Body and Your Soul. Timbre and Meaning in Electronic Dance Music’. She is a co-founder of the Music and Online Cultures Research Network (www.mocren.org) and has chapters forthcoming in the *Cambridge Companion to Electronic Dance Music*, a volume on *Music Studies After the Internet*, and a *Handbook of Popular Music Methodologies*. Email: <m.perevedentseva@salford.ac.uk>

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INTRODUCTION

Mushrooms are having a moment. Authors including Anna Tsing (2015), Tim Ingold (2018) and Merlin Sheldrake (2020) have brought the curious lives of these non-plant, non-human organisms to widespread public attention, highlighting how the “anarchic filigree” of hyphae that constitute the mycelium root structure of fungi problematise notions of the individual and constitute the “ecological connective tissue” through which “much of the world is stitched into relation” (Sheldrake 2020: 7, 52). The symbiotic tendencies of fungi, which create resource-distribution networks between themselves and plant partners (the so-called “wood-wide web”), as well as their remarkable capacity to thrive in hostile climates, have spurred diverse research efforts exploring their potential to improve the resilience of natural ecosystems and create sustainable new materials for use in fashion, construction and many other fields. Given their cultural currency, fungi are also making marks in artistic circles. For example, YouTuber MycoLyco harnesses the creative potential of the electrical signals that communicate across fungal bodies to create modular synth jams (MycoLyco n.d.).

Recent trends in philosophy also tend towards relational, nondualist ontologies, exemplified in the resurgence of timbre scholarship since the mid-2000s. Timbre is now understood to straddle the “great binarism” of the material-immaterial divide, with its conceptual unity dependent on the interplay between spectral, temporal and spectrotemporal functions of frequency sinusoids, covaried with embodied perceptions of pitch and rhythm (Wallmark 2022: 12). Models of mind-world continuity also characterise next-generation research into the effects of psychedelic drugs. These studies often invoke dual-aspect monism as a unifying concept that neutralises distinctions between mind and brain to theorise how increases in neural connectivity under psychedelics affect behaviour and social outlook (Heal et al. 2018). Psychedelic states, of course, have also long interested scholars of electronic dance music (EDM), especially forms derived from Black American house and techno as they mutated alongside the incipient rave culture of the late 1980s and 1990s. In this literature, the ego-dissolution associated with psychedelics is mirrored in theories of an ideal oceanic oneness achieved in peak moments of dance floor ecstasy—a state of “*jouissance*” that dissolves the parameters of individuality into effervescent, communal, pre-subjective and pre-linguistic affect (Malbon 1999; Gilbert and Pearson 1999: 64).

In this study, I consider these related theoretical trends to be indicative of what I call the “mycelial turn” in scholarship. Below, I think through the interlinked renaissance of three strands of inquiry—mycology, psychopharmacology and timbre—to argue that timbre in EDM manifests a psychedelic and specifically social form of consciousness through affiliative entrainment. In so doing, I suggest that timbre in EDM challenges traditional philosophical boundaries between mind and body, affect and meaning and self and other, embodying the ecology of life that Ingold dubs the “zone of entanglement” (2016: 106). As such, I argue that timbre reveals in microcosm the bonds and continuities along which encultured life is lived.

THE MYCELIAL TURN

Building on Alan Rayner’s suggestion that the “whole of biology would have been different had the mycelium—rather than . . . a mouse or a sea-urchin—been taken as the prototypical exemplar of the organism”, anthropologist Tim Ingold questions the viability of both humanistic and scientific inquiry rooted in the ontology of the “blob” (2018: 215). He asks, “what if we were to think of the person, like the fungal mycelium, not as a blob, but as a bundle of lines, or relations, along which life is lived”, and proposes a conception of the world as one made up of “intricately enmeshed relations rather than one already divided into discrete and autonomous entities” (Ingold 2018: 215–16). Similar leanings towards less bounded conceptions of being can be found across a broad spectrum of recent theoretical work. Ecological theorists voice convictions that “relations and structures are both metaphysically and causally more basic than objects and properties” (Buccella 2021: 3.1). Psychologist Kenneth Gergen echoes this point and argues for a vision of human being and action in which “the very idea of the individual person is a byproduct of a relational process” (Gergen 2009: xxvi). Theories of extended mind are likewise motivated by an impulse to get away from the notion of consciousness as a “private mental space”, suggesting instead that both the tools that humans use in accomplishing various tasks, as well as social interactions and institutionalised practices, can be considered aspects of consciousness (Gallagher 2013: 4).

Elizabeth Grosz’s concept of the “incorporeal” pushes these ideas further in an attempt to circle round to an expansive understanding of consciousness as rooted in the body and enmeshed with worldly matter. From her disciplinary background in philosophy, she argues that the material and ideal are not “two substances but two ways in which the real is distributed” (Grosz 2017: 251). This leads her to propose that “there is always something in the organization of matter”, and thus of the material world inhabited by other incorporeal entities, that “contains the smallest but perhaps most significant elements of ideality”, without which “even the most elementary forms of organization and orientation” would be impossible (Grosz 2017: 251, 250). Therefore, through the incorporeal, ideality, consciousness and the orientation towards social organisation can be viewed as “attenuated” attributes of materiality (Grosz 2017: 253). The play on words implicit in the concept articulates a parity between the real and the ideal, and indicates the existence of something real that is not of the body, as well as corporeality’s incorporation of that something into its processes of becoming. Put another way, Grosz’s incorporeal ontology recognises that qualitative relations—and the yearning for relations—are prerequisites for the organisation of all living forms into ever more complex formations. The relational, associative ontology of fungal mycelium appeals to all of these projects by rejecting both dualism and individualism as archetypes for cognition and social life.

Like the linguistic turn of the mid-20th century and the affective turn of the 1990s, the mycelial turn can be thought of as a loose coalition of intellectual tendencies that attempts to renew the frameworks used to theorise foundational concepts like meaning,

being, consciousness and the self, and their positioning in relation to society, culture and the wider environment. With its privileging of communication and continuity across the human–non-human divide, the mycelial turn seeks to re-enchant models of agency and coexistence put forward by (post)structuralism, cybernetics, and actor-network theory. Furthermore, it seeks to move past the perceived “semiophobia” that underpinned the aversion to culture and discourse animating affect theory, and concerns itself instead with the cultures of nature and the symbiotic transfer of genes, traits and resources (Boysen 2018: 225). Its conceptual preoccupation with collaboration is also reflected methodologically in its entwining of disciplines ranging from biology, philosophy and computational science to anthropology, linguistics and the arts. In short, the mycelial turn constitutes both the study and performance of radical relationality as it sutures biocultural life, and the promiscuous cross-referencing in the ensuing paragraphs should be taken in that spirit.

Ruminating on the growing momentum behind similar trends, Rob Nixon argues that the metaphor of the wood wide web “dramatize[s] interconnectedness rather than centering agency in a bounded, sovereign self”, and that its surge in its popularity represents a “yearning for systemic changes that reduce social abandonment” (2021: 367, 354). He draws a parallel between the market in neoliberal economics and the megaforest sustained by mycorrhizal networks formed between tree roots and fungi. Both are superorganisms comprised of “clustered communication” between diverse processes and lifeforms but represent diametrically opposing strategies for dealing with resource distribution and growth: whereas the market prioritises competition, extraction and inequality, the megaforest relies on long-range cooperation, “self-interested altruism” and “diffuse intelligence” (Nixon 2021: 256–257). Tsing’s lyrical paean to the matsutake mushroom similarly frames the biology and economics of its cultivation as a model for survival in capitalist ruins, and it notes how matsutake trade is sustained by the negotiated coexistence of complementary and divergent natural and cultural interests and cycles of destruction and rebirth (2015: 273). In both of these texts, the renewed interest in plant communication and the mycelial networks that facilitate it appear symptomatic of a desire to reimagine the rapidly disintegrating neoliberal world order.

In a political sense, then, the mycelial turn represents a search for alternative ways to manage the hyperconnectivity of competing ecosystems and recalibrate relations between individuals and collectives. Similar egalitarian ideals, of course, also animate many musical countercultures, among them EDM which, with its wide-eyed mantra of Peace, Love, Unity and Respect (PLUR), strives to liquidate boundaries of race, class, gender and sexuality stratifying its dancing crowds. Tavia Nyong’o, however, takes a critical view of this oceanic conception of dance music’s collective affectivity. In her persuasive re-reading of Freud, she reminds us that the oceanic is not pure regression into a “prelapsarian” unity but rather an “exhilarating extension” of human senses and faculties that constitutes an inescapable part of living and loving with others (Nyong’o 2008: 108, 107). Ultimately, she argues, “the oceanic feeling-tone becomes . . . nothing more nor less than ordinary affect, worthy perhaps of note, but not, in itself, a means for social transformation” (Nyong’o 2008:

109). Similarly, for Mark Fisher, the political “failure” of EDM is tied up precisely with the failure of the affective unity of dancing crowds to manifest more politically productive long-term relationships (Reynolds 2017). At the end of the rave, its warm ocean congeals once again into Ingold’s blobs, and isolated individuals are left at the mercy of the affective machinations of external forces.

The intervention into this problematic that the mycelial turn enables has to do with its retention of a concept of the self. The mycelial self, however, is not as a prisoner of discourse which tries at every opportunity to dissolve the ego-institution that holds it captive, but a meaningful multiplicity whose agency is sustained via concrete relations to other (non)human entities. As Nixon writes, “it is a biological and ontological error to construe the individual and the collective as polar opposites” (2021: 263). Moreover, Sheldrake makes the important point that the partners in a mycorrhizal relationship do not form a “third” organism but rather remain always themselves, in their cultural and species-specific particularity (2020: 139). The mycelial refutation of the ontology of the blob, therefore, does not seek to eliminate difference in encounters with an other. Instead, it recognises an already existing *matereal* relationship and seeks ways to manage differences among related parties in order to sustain life and enable collective flourishing.

Furthermore, a mycelial understanding of group behaviour and its potential for goal-directed change goes beyond the swarm analogy popularised by new materialist thinkers (e.g. Bennett 2009; Goodman 2005, etc.). This is because, properly speaking, members of a swarm remain discrete entities, whereas mycelium is constituted by thread-like fungal hyphae whose tips are densely interwoven, making it impossible to dismantle the network by picking them off individually (Sheldrake 2020: 53). Applying this idea to the cultural formation of a raving crowd makes it possible to think about the longevity of the relationships that make it up, and how the sentiments of unity expressed during peak experiences may be able to initiate lasting reorientations to others. As a living, growing tissue that signifies “time in place”, mycelium adds depth and continuity to more established static spatial metaphors of dancefloor populations (Tsing 2015: 234). In this view, the prized ephemerality of EDM happenings, and the ephemeral communities that they create, are more than hallucinatory mirages because the relations that make them up extend beyond individual events, even while the structures of their entanglements transform.

The mycelial principle of continuity thus offers a new way of conceptualising the unity and cohesion of EDM as social life, and it leaves open the possibility of its transformation into new states that reconfigure transient relationships as sustainable social bonds. Unlike the oceanic model, a mycelial paradigm sees the opening-up of relations and extension of organismal boundaries as a prerequisite for, rather than end-goal of, any transformation. Moreover, a mycelial model recognises the continued existence of the particular interests, politics and orientations of its constituents: the listeners who have arrived at this juncture via their own culturally- and behaviourally-contingent paths. On its own, however, this updated construct cannot tell us anything about the qualitative specificity of this musico-social matrix. What is it like for EDM listeners to be, think, feel and know as part of this

extended living entity? To answer this question, it is necessary to analyse the forms of contact and communication particular to this mode of communion in a way that centres music rather than the social interactions that traditionally form the focus of ethnographic studies of the dancefloor. After all, the music of EDM outlasts the time and space confines of individual raves, accompanying fans through their everyday engagements and weaving a connecting thread between them even when they are spatially dispersed.

Timbre represents an apt vehicle for analysing these kinds of continuous relations for several reasons. First, the re-use of particular synthesised timbres throughout EDM history—the Korg M1 organ, rimshot snares, the “hoover” and countless other examples—constitutes its own circular economy of meanings that sustains specific subgenre communities across time. Second, timbre’s material-immaterial ontology itself encapsulates the incorporeal contact between listeners and the environment that the mycelial turn seeks to theorise. Moreover, as I show below, timbre cognition shares striking similarities with altered states of consciousness experienced under the influence of psychedelic drugs, which also often play a part in peak unitive EDM experiences. Thus, after a foray into psychedelic neuroscience, I will return to timbre to argue that it manifests a substantive, spatially unmoored zone of entanglement that keeps the mycelial matrix of EDM relations alive during, between and beyond those most intense collective moments of dance floor communion.

Before that, however, it is wise to sound a brief note of caution. The mushrooming of popular literature on fungi and plant communication in recent years has raised the fears of some mycologists that the principles of this inter-species collaboration, which are only beginning to be understood, have been exaggerated in order to advance a moralistic agenda (Popkin 2022; Karst, Jones and Hoeksema 2023). For example, the portrayal of the wood wide web as an altruistic “social network” of tree families can all too easily ignore the complex dance along the “mutualism–parasitism continuum” that Justine Karst describes as characterising all symbiotic plant-fungi relationships (Wohlleben 2016: 3; Karst et al. 2008: 1032). So, even though the scholarly consensus currently holds that mycorrhizal networks do exist and trade resources like carbon and glucose, it is not known whether, and to what extent, this type of resource-sharing benefits partners more than hosts. As such, these mycological discoveries are not yet ready to dethrone the (itself distorted) Darwinian principle of competition as the driving evolutionary force, so any temptations to luxuriate in New Age sentiments of one-worldism should be kept in check.

Maintaining a critical stance on this does not refute the present argument. A mycelial model of EDM’s musico-social ontology need not be seen to imply a totalising superorganism into which listeners are subsumed in their pursuit of musical pleasure. In other words, in challenging blob ontology, the mycelial turn does not go so far as to eradicate any notion of the embodied and encultured self. However, irrespective of whether the mutualism of fungal networks represents altruism proper, this mutualism belies an awareness of the presence and (both complementary and contradictory) interests of the incorporeal *more-than-self*. Therefore, while it is inadvisable to make any grand claims as to the scalability of such collectivist impulses, the metaphorical allure of the “ancient tendency” towards

entangled life holds firm (Sheldrake 2020: 158). In instrumentalising the ontology of the fungal mycelium as a model for social relations, it is this insistent orientation to the more-than-self that this study retains going forward.

PSYCHEDELICS AND TIMBRAL CONSCIOUSNESS

Profound perspectival shifts such as those afforded by mycelial thinking are now understood to be key outcomes of the use of psychedelic drugs such as psilocybin mushrooms and LSD, itself derived from the ergot fungus. Both psilocybin and lysergic acid are endogenously synthesised secondary metabolites of fungi which share a structural relationship with the neurotransmitter serotonin. Unlike primary metabolites, their ecological function is itself somewhat social, serving to reinforce the vitality of the fungal organism’s inter-species partners by promoting better chemical resilience (Kennedy 2014: 28). Given the significant similarities between insect, animal and human modes of neural transmission, this suggests that the behaviour-altering effects that these metabolites evolved to have in insects and animals should obtain when these substances are ingested by humans as well (Kennedy 2014: 56). Indeed, because of the pivotal role played by serotonin in a vast swathe of biological processes ranging from breathing to learning, memory and mood, the modulation of serotonergic processes is believed to lie at the heart of the cognitive and behavioural changes that characterise the psychedelic experience (Lebedev et al. 2015: 3138). Below, I provide an overview of the neuroscience of psychedelic states—highlighting its mycelial emphasis on prosociality and connectivity—and articulate its links to timbre cognition via the theory of connectome harmonics.

Working at the forefront of the new wave of psychedelics research, Robin Carhart-Harris and Karl Friston (2019) have theorised the REBUS model (RELaxed Beliefs Under pSychedelics) of the psychology of the psychedelic experience, based on the Bayesian brain and the related principles of free energy and entropy. In this framework, core mental concepts, habits and beliefs are believed to be hierarchically encoded and embedded in deep neural networks that optimise probabilistic representations of the organism’s interaction with their environment. This involves the continuous comparison of low-level sensory input with previously encoded high-level representations, with the aim of minimising prediction error by updating expectations according to best-fit prior beliefs. Maintaining the integrity of this system depends on “compressing” or otherwise de-emphasising low-level stimulus signals which may interfere with higher-level models and cause psychologically disturbing feelings of surprise (Carhart-Harris and Friston 2019: 322). Free energy, in this sense, is a measure of surprise, with increases of free energy and entropic neural activity believed to correlate positively with the perceived richness of subjective experience, until a critical threshold is breached and the experience shades into psychosis (Carhart-Harris and Friston 2019: 317).

According to REBUS, psychedelics work by binding to the 5-HT_{2A}R serotonin receptor subtype which is especially prominent in the cortex and other high-level association regions belonging to the Default-Mode Network (DMN), which represents a “uniquely deep”

collection of networks responsible for metacognition and perspective-taking (Carhart-Harris and Friston 2019: 322). The “definitive mind-manifesting function” of psychedelic drugs is believed to be their disruption of the normal workings of the DMN, such that signals from lower-level sensory, cognitive and emotional networks are able to feed through to the surface of consciousness without being filtered out by high-level priors (Carhart-Harris and Friston 2019: 323). Operationally speaking, the psychedelic activation of 5-HT_{2A}Rs decreases the amplitude of low-frequency cortical rhythms which correlate with resting-state DMN activity and confer top-down expectations about perceptual stimuli, weakening the brain’s ability to “entrain and constrain emotion and perception to a central narrative” such as “the self” (Carhart-Harris and Friston 2019: 324–25). The dysregulation of the brain’s hierarchical organisation, in turn, opens the doors to enhanced neural criticality, a cognitive state maximally poised between order and disorder in which a relaxation of prior-held beliefs can coincide with their revision. Carhart-Harris and Friston have termed this the “anarchic brain” (2019: 333). In this condition, lower-level emotional, cognitive and sensory stimuli exert a level of influence that is otherwise dampened, which is believed to have powerful therapeutic effects by weakening the neural “top-heaviness” of a variety of psychopathologies (Carhart-Harris and Friston 2019: 333). In the most general terms, REBUS posits that we are indeed creatures of habit, and that psychedelics create opportunities for the temporary rewiring of those habits which may ultimately lead to more lasting neurological change. To date, some significant observed effects of the anarchic brain include increased sensitivity to context and sensory stimuli, increased emotional empathy and decreased feelings of social exclusion (Vollenweider and Preller 2020).¹

These recent findings corroborate decades (if not centuries) of anecdotal accounts of psychedelic experiences during which people believe they have reached profound new insights about themselves and the world they inhabit, many of which involve heightened feelings of ego dissolution and communion with others. The archetypal psychedelic ideal of unitive consciousness frequently extends beyond empathic prosociality into more wide-reaching perceptions of oneness with objects and other non-human organisms populating the environment, often by endowing those entities with new meanings and agencies (Richards 2016: 68; Pokorny et al. 2017: 754). Therefore, the noetic quality of oneness achieved under psychedelics may be explained by increased neural criticality which minimises feelings of disturbance or surprise, making fluid the boundaries that segregate networks and the concepts they undergird and allowing those under the influence to feel a sense of ease and continuity with the world as it is.

There is also a potentially significant place for music, sound and timbre in aiding this process. In experimental settings, music has been shown to provide a sense of guidance through the space and time of a psychedelic trip, and to increase perceptions of emotional “openness” and “resonance” between self and the social environment (Kaelen et al. 2018: 510). This is mirrored in musicological work, where LSD’s common effects of dechronicization (defined as the sense of moving outside of conventional perceptions of

time), depersonalization and dynamization are read into various musical manipulations of listeners' impressions of time and space (Hicks 1999: 63; see also Bannister 2019). Furthermore, although speculative, Carhart-Harris and Friston suggest that meaningful metrics for understanding the increased perception of “harmony” in the body-mind under psychedelics could be a result of the synchronised nesting of cortical rhythms in states of criticality (2019: 339). This hypothesis is based on pioneering work by Selen Atasoy et al., who have proposed a unifying account of complex patterns of neural signalling based on what they call “connectome harmonics” which represent “frequency-specific building blocks of cortical activity” (2018: 289). Their theory posits that, similar to the ways that harmonic waves undergird coordinated spatiotemporal activity in other natural phenomena, structural connectivity in the brain is dependent on the synchronised oscillation of neuronal traffic in different regions, with composites of particular frequencies and amplitudes being associated with particular networks and states of consciousness. Specifically, the authors observe that the loss of consciousness (whether natural or drug-induced) confines neural activity to a narrow range of frequencies and amplitudes, whereas the enhanced consciousness associated with psychedelic states activates a broader range of the connectome harmonic spectrum and increases overall cortical connectivity (Atasoy et al. 2018: 289). In effect, these “harmonic brain modes” are conceived of as stacks of individual oscillatory frequencies, akin to the frequency partials that make up sound tones and help to determine pitch and timbre; at one point in the article, Atasoy et al. even liken psychedelic consciousness to a “rich symphony” (2018: 278, 289).

Aside from the pleasing timbral analogy of a given state of consciousness having a particular spectrotemporal profile, another important aspect of the work on harmonic brain modes pertains to the present argument around timbre and EDM. This relates, on the one hand, the confinement of neural activity to low frequencies ranging from 0.05–500 Hz, with psychedelic drugs specifically affecting frequency ranges below 100 Hz, to the similar privileging of bass and sub-bass frequencies in EDM production and performance, on the other. This parallelism suggests that, despite a current lack of scholarship investigating the cognitive mechanics of timbral entrainment, the engineering of EDM basslines—especially the use of techniques like LFOs, typically pitched below 20 Hz—could afford a structurally deep level of synchrony between listeners and the auditory environment of EDM. That is to say, it seems plausible that the possibility of synchronising the body-mind to the periodicity of frequency sinusoids that create the percept of timbre could be included in the definition of entrainment as the “the temporal dynamics of interacting rhythmic systems” (Clayton et al. 2020, 136). Recent studies working under the General Resonance Theory paradigm have shown that both endogenous and exogenous rhythms, including in speech and music, can induce synchronisation with the neural activity of specific cortical regions and alter consciousness (see Young 2022 for a review). Moreover, in an exciting development, Kristin Weineck et al. have newly discovered that neural entrainment is stronger to spectral flux than the more commonly-studied parameter of a sound's temporal envelope, especially when listening to slow, familiar and spectrally complex music with a steady beat (2022: 14–5). As

such, it seems likely that the spectrotemporal characteristics of complex electronic timbres commonly found in EDM could induce entrainment with the harmonic modes of listeners' cortical rhythms in different conscious states.

Recent publications by Maria Witek (2019) and Luis-Manuel Garcia (2020) have made compelling arguments regarding the importance of rhythmic entrainment, vibration and sympathetic resonance to the “vibe” of oceanic unity sought from the EDM experience. Witek, in fact, makes a direct (though hypothetical) link between the “extended consciousness” ideally achieved in the rave to the neural hyperconnectivity induced by drugs like LSD and MDMA (2019: 108). Garcia, meanwhile, underscores the importance of cultural ties and emotional contagion in facilitating what he calls “affective attunement” to the vibe of the dance floor (2020: 10). I want to build on this work and argue that timbre in EDM—both ontologically and in terms of the specific vibratory properties of the synthesised timbres that characterise EDM as a metagenre—plays a key role in rewiring perceptual habits and reconfiguring organismal boundaries to enable a relational, radically distributed and specifically social form of consciousness. Seen in this way, timbre itself is psychedelic in the true sense of the word, manifesting the embodied mind and the musical, social and cultural relations it is enmeshed in and emerges from.

Consider the iconic Reese bass. First used in Kevin “Reese” Saunderson’s (1988) techno track “Just Want Another Chance”, it eventually found a new life across the Atlantic, underscoring countless jungle and 2-step releases and influencing the more extreme bass experimentations in dubstep and grime. This bassline is created by overlaying saw waves to achieve phase cancellation, lending the sound its distinctive throbbing, pulsating quality. In one of the most celebrated examples—Groove Chronicles’ (1997) anthem “Stone Cold”—the Reese appears to be supplemented by an LFO which further exaggerates this internal pulse, inducing a hybrid of timbral and rhythmic entrainment through auditory-motor coupling to the gestural onsets of its slow, low-frequency undulations, and creating an embodied sensation of a dynamic interior core that is tantalisingly close to overflowing its perceived bodily confines.² Furthermore, the inaudible sub-20 Hz frequencies of the LFO manifest in perceptible changes to the bassline timbre by sculpting its internal composition. Per the theory of harmonic brain modes, this too could be entraining listeners to the cortical rhythms that coordinate psychedelic neural hyperconnectivity, thus amplifying the unitive, unconstrained consciousness that these states promote. So, while in need of empirical testing, the potential for the entrainment of brain and body to the timbre of the Reese bass succinctly articulates the continuity between self and environment that I propose electronic timbre affords.

Towards the end of their REBUS article, Carhart-Harris and Friston make a delicately whimsical, almost naïve, proposition. They suggest that the structural organisation of the dual-aspect brain/mind “recapitulates” the organisation of social systems, implying that the proven increases in prosociality and liberal attitudes as a result of taking the drugs could thereby prime users for taking action to remodel the social world in their mind’s image (Carhart-Harris and Friston 2019: 336). My argument might tentatively recast

this isomorphism as the embodied mind recapitulating the structural organisation of the mycelial networks that cultivate the chemicals that facilitate such transformations. Timbre, moreover, in sharing and making palpable that deeply relational and unbounded structural constitution, could be another agent that enables listeners to grasp the “continuousness” of their relations to each other and the environment they dwell in (Carhart-Harris and Friston 2019: 339). Below, I further probe the psychedelic qualities of timbre cognition and its potential for affiliative entrainment. I then conclude with a brief consideration of the ethical implications of this connectivity.

TIMBRE AND THE SOCIAL

In her study of 1990s rave communities in San Francisco, Cornelia Fales (2018) observes an unusual degree of implicit perceptual learning and timbral awareness among scene participants. She reasons that, partly due to the nature of the synthesised timbres employed, and partly because of how they are arranged in tracks and live DJ performances, listeners are able to hear timbre in itself, rather than relying on a default evolutionary mode of hearing that overwrites the phenomenal qualities of timbre with a fixed concept (usually the identity of the sound source). Fales likens this reconfiguration of cognitive processes to the effects of MDMA which, in similar ways to those of LSD and psilocybin described above, “dissolve[s] the default synthesis tendencies of the auditory system” and “undoes one of the final procedural steps in processing simultaneous acoustic elements into efficient chunks of perceived sound” (2018: 35). She argues that, like the drug, EDM allows listeners to ask, “what am I hearing at this exact moment?”, thereby “break[ing] the flow of undifferentiated sound received passively and reflexively” and “bring[ing] otherwise implicit auditory details to attention” (Fales 2018: 31). Fales’ speculations suggest that the types of electronic timbres that make up EDM are perceived uncoupled from everyday sound sources, thus encouraging EDM listeners to enjoy the “unconstrained cognition” characteristic of psychedelic states (Kennedy 2014: 119). This lack of constraint, in turn, enables listeners to perceive timbres in all their strangeness and fullness, without “disturbing” feelings of surprise at having contravened entrenched high-level beliefs.

This is significant, firstly because the therapeutic benefits of psychedelic drugs may lie in their potential to rewire perceptual habits, and secondly because electronic timbre apparently mimics the effects of psychedelics in EDM settings. Taken together, these propositions suggest that the concerted recycling of particular timbres across EDM’s epochs and subgenres could, over time, allow for the consolidation of new, unconstrained modes of cognition. Eventually, this could lead to newly habituated forms of listening that are, from the outset, undergirded by enhanced neural plasticity. Therefore, regardless of whether an EDM listener is under the influence of psychedelics at a given moment, their neural architecture, having undergone this perceptual “training”, will be primed for attuning to sensory, environmental and contextual stimuli, thus inducing the associated feelings of continuity between self, music and world.

A limitation of Fales' theory is precisely that it does not consider the implications of this heightened timbral awareness for the social dynamics of EDM (surprising given the well-known pro-social effects of MDMA as an empathogenic drug, and her own disciplinary background in ethnomusicology). She remains invested in a conception of the mind and mental life more generally as radically separate from the "real" world, over-emphasising the cognitive processes that take place above the neck and seemingly dismissing the importance of embodied gesture and auditory-motor coupling to timbre perception. In recent years, this latter point has received conclusive empirical backing (Wallmark et al. 2018). From the embodied cognition perspective central to mycelial thinking, timbre is only truly cognitively accessible through gesture, which structures the listening environment from the viewpoint of action and gives embodied, material existence to what remains otherwise in the realm of the virtual. Maintaining this link is key to understanding EDM as a form of socio-cultural contact between listeners and their world that the present argument seeks to advance.

A more philosophically compelling conceptualisation of the relationship between the material and the ideal that timbre enables is given by Isabella van Elferen in her 2020 book *Timbre: Paradox, Materialism, Vibrational Aesthetics*. In it, she seeks to overcome the binaries between acoustic and perceptual ontologies of timbre by proposing that timbre exists as a "vital relationality" along a "vibratory continuum" that unites all worldly matter (van Elferen 2020: 190, 13). She argues that the material sensation of sound constitutes the connecting link between the respective poles of the (real) sounding object in vibratory motion and the "non-object" that is the phenomenon of timbre (van Elferen 2020: 139–141). Furthermore, van Elferen posits that timbre constitutes a form of virtual agency that animates energy transfer along the vibrational continuum. She likens this to a Newton's cradle, writing that timbre brings together the potential of the "meta-acoustic" and inaudible into a "performative knot" that is the aesthetic event (van Elferen 2020: 139–160). By distributing agency throughout the ecology of "radical immanence" that constitutes the musical assemblage, she ultimately argues that timbre breaks down barriers between subject and object and cause and effect, and shows the "redundancy of onto-theological dualism" as agency surges through the network, activating "interactive feedback" (van Elferen 2020: 157).

On the face of it, van Elferen's vital materialist account of the musicking assemblage in which timbre holds together the extremities of the vibrational continuum appears to satisfy the criteria for a relational timbral ontology that I called for above. However, her insistence on voids, limina and the aporetic qualities of timbre, which in the book are only ever analysed from the perspective of a solitary listener, means that all of the actors in her assemblages are, in fact, rather limited in terms of their agency. This is because they can only ever connect two points, whose singularity means that they cannot be triangulated according to established laws or habits to foster intersubjectivity and shared meaning. In his critique of actor-network theory, Ingold writes that because "networks still presuppose dyadic relationships between separate entities", "the relation itself has no material presence" (2008: 210). Eugene Thacker similarly distinguishes between connectivity and collectivity in his polemic against vital materialism. Connectivity in a network, he claims, does not

necessarily equal collectivity, and the mere act of being connected does not automatically entail activism or agency (Thacker 2004). Van Elferen’s preferred analogy for timbre’s relational power—the Newton’s cradle—is telling in the uniformity of agency possessed by its constituents; each isolated sphere (or blob) imparts an almost identical amount of energy which is transferred linearly along the material–immaterial continuum, prioritising homeostasis over the possibility of transformation of any sort. Like the oceanic model of musical affect discussed above, therefore, the relationships established in van Elferen’s timbral assemblage can only go so far as temporarily negating a sense of self. Riffing on Rimbaud, she writes that “in music more than any other relational form, I is another” (van Elferen 2020: 158). On the other hand, a mycelial model can offer an expansion of the perimeter of this self such that, like the mind-manifesting consciousness induced by psychedelic drugs, it is perpetually, tangibly and qualitatively entangled with other selves.

An example of this radically open musico-social ontology can be found on DeepChord’s (2018) LP *Immersion*s. The overall sound-world of the record is in keeping with the ambient and dub techno styles that Rod Modell has cultivated across his DeepChord, Echospace and cv313 projects since the early 2000s, and with the explicitly psychedelic aesthetic of the Astral Industries label on which it was released. Online, the two sides of the record are listed as “Immersions I” and “Immersions II”, though the vinyl itself has no inscriptions to indicate which side is which—both begin and end with fades, are around 18 minutes long, deceptively fast at 140BPM, and share the same instrumentation. This is comprised of muted 4/4 kicks; brushed hi-hats; a woody, anacrusic percussive lick and a syncopated chime, both treated with reverb and delay. The arrangement is completed with two high-pitched, translucent pads and several synth lines placed front and centre of the sound stage, which approximate environmental sounds of lapping waves, fluttering and rustling. Aside from the timbral composition, the form of the record itself is presented as essentially boundless. It can start and end at any point and continues indefinitely, with only the surface crackle of the vinyl providing any external measure of the passing of time, itself locked into an infinite loop.

What is especially interesting about *Immersion*s from a timbral standpoint, however, is that it thwarts timbre’s evolutionary function of generating a coherent schema of object location in the space-time of the auditory environment. The soundstage of the recording is unbounded and curiously arranged; kick drums, conventionally expected to provide depth and gravity, are instead suspended in mid-air, and thickly connotative timbral indices of the forest and the ocean are superimposed onto one (infinite) frame. The instrumental lines, while recognisably distinct in terms of their spectrotemporal profiles, are difficult to discretise into individual streams because of their slow fade-ins and near-imperceptible attack onsets. Everything is exquisitely round, with pads expanding and contracting through filter and amplitude envelope modulations akin to the breathing walls experienced on LSD. The reverb on the chimes creates its own luminous micro-climates, reminiscent of the space-making techniques of dub-reggae, pulsating in concert with the earthy strokes of the hats which resound, paradoxically, near the bottom of the audio field. The absence of

definitive timbral and rhythmic onsets means that, in gestural terms, this music is always already in motion. The proprioception of the listeners who enactively perceive its timbres is similarly distributed across and entrained to all the cyclical processes that make up the track. In other words, the listener's virtual body-mind in the recording is fantastically open-ended—more than one, more than self. In a social listening setting, this becomes especially palpable as other listeners similarly (but not always simultaneously) entrain to the various timbral skeins of this living tapestry, becoming integrally entwined in its fold.

The retention of others *as others* in a mycelial framework, alongside the concurrent recognition of their being inextricable from (more-than-)selves, brings an ethical dimension to timbre's entanglements. Zachary Wallmark writes that timbre "does much of the perceptual work 'revealing and connecting' us . . . to the 'materially binding,' ethically motivating presence of others", and in doing so, constitutes "an ethical wager" that requires an empathic understanding of others' needs and capabilities (2022: 187, 189). Like Garcia and Witek, discussed above, I believe that the multiple levels of entrainment afforded by EDM's complex array of interlocking periodic cycles could play a key role in enabling these empathic ties. I wish to extend their theses to suggest that timbre, alongside groove and the unspecified vibrations they invoke, likewise works to bring the participants of EDM's multifarious communities into deep states of synchrony from which mind-manifesting empathic relations and shared meanings can arise. In an earlier work, Garcia argues that an emphasis on tactile textures in the sounds of EDM inclines participants towards an affect of "embodied intimacy" (2015: 60). Here I want to push those ideas in two directions: beyond the haptic qualities of timbre alone to include also their cultural meanings, and beyond the spatial proximity of the dance floor to include all listeners that have made contact with these sounds across the metagenre's history.

This, to my mind, is the social consciousness that a mycelial, psychedelic conception of timbre affords. It brings with it a social contract to protect and renew in a sustainable way the social bonds through which dance music cultures emerged, and which are nurtured—or sometimes harmed—by continued participation in its rituals. To be clear, in suggesting that timbre enables trans-historical contact, I do not mean to imply an equivalence in the quality of each listener's experience of this contact. This is where the mycelial emphasis on retaining difference is most crucial, and where it has the most wide-reaching political ramifications. With respect to the Reese bass, alongside its psychosomatic qualities, its potential for trans-historical contact is also significant for the ways in which it entangles listeners with the complex history of cultural exchanges that fed the development of EDM. In effect, the history of this gesture unites the so-called "discontinuum" of Detroit techno with the diverse ecologies of British and other Afrodiasporic bass musics that have continued to rework many of the same idioms (Eshun 1998: 131). In allowing access to this, sometimes terse, often imbalanced, field of cultural interpenetration, timbre in EDM enlivens the urgency of the questions that cultural differences pose. In other words, it encourages listeners to re-evaluate the ethics of these exchanges, and their own cultural positionality in relation to the communities involved, in embodied and visceral ways. The different types of

access to material and symbolic resources that cultural identity and background enable in everyday life, therefore, cannot be indiscriminately smoothed over through the psychedelic prosthesis of timbre: the specific links and origins that timbres establish in particular dance music communities must be acknowledged. However, if timbre has prosocial effects similar to those of group synchrony through rhythmic entrainment, then timbre in EDM could facilitate tacit, situationally-specific social bonds which, in turn and over time, could enable more explicit types of communal meaning-making to collectively negotiate the politics and ethics of this cultural access.³

Affiliative entrainment to timbre thus constitutes a necessary first step in inviting listeners into mycelial zones of entanglement. In these zones, the material and cultural, individual and social, and spiritual and fleshly dimensions of the listening experience are folded into a reverberant unity, re-articulating the cultural specificities of individual listeners' life experiences while showing them to be irreducibly interdependent. Of course, it is not realistic to expect this unitive condition to arise in every instance of EDM listening, and history has shown that EDM's PLUR credentials are frequently undermined by inequality, discrimination and abuse. As is the case with all complex social formations, equilibrium is fragile, fleeting, and reliant on the fortuitous coming-together of multiple biological, chemical and cultural factors: the listeners' perceptual acuity for hearing timbre and relating this to other sonic features; their experience with and knowledge of the musical culture in which they are participating; their individual background, behavioural dispositions and mood and many others. Like the psychedelic experience itself, the neural criticality that underpins timbre cognition and entrainment is thus highly pliable and prone to environmental influences that can instantly take a turn for the worse, leading to feelings of anxiety and other mental and physical disturbances.

Yet, I would argue that due precisely to the entanglement of all of these factors in social listening settings, timbral entrainment can also generate a drive to sustain those relationships via other, more concrete, means. This goes back to Nyong'o's point about genuine social transformation requiring more than an undifferentiated oceanic affectivity. In the timbral zone of entanglement, listeners are made aware that they are partaking in a social experience that extends beyond what they usually consider to be their selves, thereby prompting a collaborative rationalisation of this newly manifested way of being. In bringing EDM's variegated histories and cultures to the surface of cognition, therefore, specific timbres that have repeatedly inscribed themselves onto EDM's historical grooves suffuse what van Elferen has negatively described as timbre's "neutralized space-time" with incorporeal cultural substance (2020: 204). Furthermore, this substance reverberates across EDM's musico-social matrix, spurring on further cross-cultural entanglements into the future. The potential of psychedelic drugs to reprogram cognitive habits towards more socially-oriented behaviour, and the apparent reinforcement of that potential in the timbral construction of EDM, thus makes tangible the yearning for relations characteristic of the mycelial turn.

CONCLUSION

In interrogating the ontological assumption of the “blob” by drawing together philosophical trends that suggest a mycelial turn in scholarship, this article has attempted to connect a relational understanding of the ontology of timbre in electronic dance music to a more fundamental reconsideration of how we as human beings are thought to exist in and experience the world. I have argued that timbre, like psychedelic drugs, is mind-manifesting. That is to say, timbre brings the operations of perception and cognition to the experiential surface and extends them through the environment by showing the essential continuity of mind, body and world. I have drawn a parallel between the increased plasticity in the organisational structure of the mind-brain under psychedelics and a mycelial model of social and cultural life, which also prioritises a unitive-with-many organismal ontology. Furthermore, I have proposed that affiliative timbral entrainment in EDM settings makes palpable the social and cultural connections that weave together disparate lifeworlds. In doing so, I have attempted to extend the oceanic model of EDM’s vibratory affectivity to highlight timbre’s ability not only to loosen the bounds of the self but also bind it ever-tighter with others. Finally, in overlaying social and timbral relations that are always cultural, and always particular, I have argued that the mycelial musico-social matrix of the EDM listening experience necessarily entails ethical considerations, and that the empathic forms of contact that timbre enables prime listeners for the meaningful negotiations of those ethics as they strive to sustain the musical ecosystems that they, in turn, are sustained by.

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NOTES

- 1 Despite broad consensus around the idea that psychedelics affect perception by altering neural connectivity through serotonin receptor agonism, interpretations differ as to the role of the DMN, the possibility of isolating causes for specific neurological changes and the generalisability of the results obtained from different small-scale studies. For example, alternatives to REBUS propose that psychedelics elicit hyperconnectivity and increased suggestibility by flooding the central neural “switchboard” of the thalamus, thereby increasing global connectivity with sensorimotor and salience networks, rather than by disrupting top-down processing (Avram et al. 2022; Kennedy 2014: 106).
- 2 In a recent study of EDM production practices, Ranghild Brøvig-Hanssen et al. (2021) have shown that timbral manipulation plays a fundamental role in the programming of microrhythmic nuances upon which pleasurable perceptions of groove are based. Their findings highlight the interdependence of different sonic parameters in achieving particular psychosomatic effects. So while my focus in this article is on the timbral basis of entrainment

rather than the more established focus on rhythm, it is important to recognise that the one necessarily entails the other, and vice versa. At a given level of mathematical abstraction—and indeed in the fullness of the perceptual present of musical listening—rigid conceptual distinctions between rhythm, pitch and timbre become far more porous.

- 3 In their paper outlining the Music and Social Bonding (MSB) hypothesis, Patrick Savage et al. (2021) argue that music reinforces affiliative relationships among groups by fostering predictability via periodicity and repetition, both of which facilitate entrainment through synchronisation and auditory-motor coupling. Martin Clayton et al. (2020), meanwhile, make a distinction between largely unconscious sensorimotor synchronisation of listeners with periodic musical features, and more intentional acts of interpersonal coordination that can take place over extended timeframes. These states of synchrony are thought to foster prosocial behaviour by creating what Ian Cross has called a shared spatial and temporal “framework for social and intentional action”, which serves to suppress tensions in situations of social uncertainty (2008: 152). While entrainment to timbre remains under-theorised, it is likely that the established importance of real or inferred periodicity in enabling entrainment means that consonant electronic timbre—as a composite of periodic waveforms—can likewise enable affiliative entrainment that drives listeners into structurally deep synchrony.

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