



PERFORMANCE
PHILOSOPHY

PROMETHEAN AND POSTHUMAN FREEDOM: BRASSIER ON IMPROVISATION AND TIME

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1) Introduction: Improvisation and the Politics of Technology

One of the four contributors to the 2007 Goldsmiths conference on Speculative Realism,¹ Ray Brassier occupies an important place among a diverse group of thinkers who have argued for realist alternatives to philosophies of subjectivity, finitude and deconstruction that had been core to post-Kantian continental philosophy for some years. Some of these new realisms have sought to combat the reflex anti-scientism of the established traditions. Brassier's book *Nihil Unbound* (2007) argues that nihilism—the modern crisis of meaning—is an emancipatory consequence of scientific reason; one which can inform a transcendental realism predicated on the ultimate cosmic extinction of nature. Brassier's later work engages more closely with analytical variants of Kantianism—particularly via readings of the work of Wilfred Sellars—aiming to develop a naturalism that reconciles materialism with a commitment to truth, conceptual normativity and abstraction.

Brassier has also engaged with radical art practice as a way of developing a materialist account of agency that embraces the artificialization of mind and nature as a form of political praxis. His "Unfree Improvisation/Compulsive Freedom" (written for the 2013 collaboration with Basque noise artist Mattin at Glasgow's Tramway) is a dense but rich example of this side of his work. It is a terse but, I hope to show, fertile discussion of freedom in improvisation and its relation to technological futurity. Here, by relinquishing some of the rationalist constraints on agency imposed by Brassier's analytic Kantianism, I intend to use it as a platform for developing a Speculative Posthumanist ontology of performance.

“Unfree Improvisation” begins with a polemic against the voluntarist conception of freedom. The voluntarist understands free action as the uncaused expression of a ‘sovereign self’. Brassier rejects this supernaturalist understanding of freedom, arguing that we should view freedom not as the determination of an act from *outside the causal order*, but as the self-determination *by action* within the causal order. According to Brassier, self-determination is reflexive and rule-governed. A self-determining system acts in conformity to rules but can represent and modify these rules with implications for its future behaviour.

This is only possible—according to Brassier—if we make the rules explicit through language (Brassier 2013b, 105; Sellars 1954, 226). Brassier’s proximate inspiration for this model of freedom is Sellars’ account of language and meaning (1954). Sellars reinterprets Kant’s claim that concepts are rules for unifying experience as a functional semantics, framed in terms of the role of utterances within social practices that prescribe how speakers move from one position in a language-game to another (transition rules), assume an ‘initial position’ (entry rules), or exit the game (outputting actions).

Language-transition rules correspond to materially correct inferences such as the inference that *x is coloured* from *x is red*. Language-entry rules are non-inferential since they are made on the basis of reliable dispositions to discriminate the world in inferentially or practically consequential ways (Sellars 1954, 209–10). As Robert Brandom puts it, statements like ‘This is red’ (uttered in response to red things) are ‘noninferentially elicited but inferentially articulated’ (Brandom 1994, 235, 258).

Sellars distinguishes an automatic and unconscious rule following from a *metalinguistic level* that affords logical resources for reflection and self-awareness. Indeed, for Brassier’s Sellars, thought and intentional action derive from the metalinguistic power to make reasons explicit in ‘talk about talk’ and not from a phenomenological or prelinguistic intentionality (Brassier 2013b, 105; Sellars 1954, 226–8).² Since talk and meta-talk are furnished by such inferential norms, intentional action is likewise constituted. To be free is to be an animal capable of following such shared proprieties. Far from being the expression of a sovereign self acting beyond the causal order, freedom is subservience to collective reasons: ‘Autonomy understood as a self-determining act is the destitution of selfhood and the subjectivation of the rule. The “oneself” that subjects itself to the rule is the anonymous agent of the act’ (Brassier 2013a).

Since Brassier is also an avowed naturalist, it is important, for him, that this capacity for rule following is non-miraculous; that a material assemblage of pattern-governed mechanisms can be ‘gripped by concepts’ (Brassier 2011). As he continues:

The act [...] remains faceless. But it can only be triggered under very specific circumstances. Acknowledgement of the rule generates the condition for deviating from or failing to act in accordance with the rule that constitutes subjectivity. This acknowledgement is triggered by the relevant recognitional mechanism; it requires no appeal to the awareness of a conscious self. (Brassier 2013a)

Now, there are a few criticisms that one can make of this account. For example, Brassier struggles to articulate the relationship between linguistic rules or norms and the natural regularities and behaviours on which they depend. For this reason, I've argued that the normative functionalism associated with Sellars and, latterly, Robert Brandom bottoms out in Davidson-style claims about how idealized interpreters (privy to the relevant facts) might construe a given stretch of behaviour (See Roden 2017). Brassier's position arguably depends, then, on the conception of an interpreting subject it is not in a position to satisfactorily explain. Despite its pretensions to naturalistic virtue, his universe bifurcates between a non-normative material reality and an order of thought that depends on it without really belonging to it.

These metaphysical issues lurk in the background in Brassier's short text on improvisation—particularly in the claim that the act of improvisation involves an encounter between rule governed reason and pattern governed mechanisms. Brassier does not specify how such rules operate in music, or how the encounter between rules and mechanism can occur.

In what follows, I will argue that one reason he does not do this is that such rules do not constrain improvisation or contemporary (musical) compositional practice. Claims about what is permissible or implied in music index context-sensitive perceptual responses to musical events. These responses exhibit tensions between the expectations sedimented in musical culture and actual musical events or acts.

However, I will argue that this account of musical succession provides an alternate way of expressing Brassier's remarks on the relationship between music and history in 'Unfree Improvisation'—one that eschews normative discourse in favour of describing the processes, capacities and potentialities operating in the improvising situation.

This adjustment is of interest outside musical aesthetics and ontology, however, because Brassier's text suggests that the *temporality of the improvising act is a model for understanding a wider relationship with time*: in particular the remorseless temporality explored in his writings on Prometheism, Accelerationist Marxism and Radical Enlightenment (see Brassier 2014). Given that improvisation involves a kind of autonomy and, *pace* Brassier, is not rule governed or constituted by rules, I hope to show that it exemplifies a posthuman conception of freedom that abstracts from the collective notions of subjectivity valorized by his neo-rationalism. It thus suggests a model for understanding how agents (human or otherwise) can respond fluently to the radically open horizons of being I discuss in *Posthuman Life* (Roden 2014).

This paper can, then, be thought of as a staged encounter between the conceptions of agency presupposed in Prometheism and my own Speculative Posthumanism.

Brassier's Prometheism, like Reza Negarestani's 'inhumanism', proposes that *all* reasons are 'artificial': implicit or explicit moves within language games (Negarestani 2014a/b. See Bakker 2014b for a trenchant critique). Consequently, the Promethean rejects all quasi-theological limits on artificialisation and enjoys the wholesale 'reengineering of ourselves and our world on a more rational basis' (2014, 487).

Speculative Posthumanism (SP) does not propose any theological limits to artificialisation. Far from it! However, it holds that the space of possible agents is not bound (*a priori*) by conditions of human agency, including the collective principles of articulation discussed above. Since we lack future-proof knowledge of possible agents based on the transcendental conditions for *human* agency, I refer to such a posthumanism as ‘anthropologically unbounded’. Unbounded posthumanism allows that the results of techno-political interventions could be weird in ways that we are not currently able to imagine (Roden 2014; 2018).

For Brassier, the sliver of humanism worth salvaging is a subtractive version of what Sellars calls ‘the manifest image’—the conceptual framework in which we understand ourselves as reflective subjects responsive to and evaluable within the ‘space of reasons’ (Sellars 1962). Brassier argues that the idea of man as ‘self-conscious rational agent’ is central to any conception of cognition as a ‘self-correcting exercise’; even the explanatory project of replacing the naïve manifest image of persons and things with the rectified concepts of a successor science—e.g. junking phenomenology in favour of some cognitivist account of consciousness (Brassier 2011).

In contrast, for Unbounded Posthumanism there is no *a priori* structure constitutive of subjectivity or agency. Thus, the speculative posthumanist cannot appeal to an idea of rational subjectivity to support an ethics of posthuman becoming.

So, what might autonomy or freedom involve from the purview of unbounded posthumanism—or, in a more speculative mode, what takes the place of the normative conception avowed by Brassier and others? What, if anything, counts as emancipatory as opposed to oppressive violence?

I will argue that the idea of freedom embedded in Brassier’s text on improvisation can be elucidated and developed within SP by comparing the *mechanistic genesis* of improvisation to the predicament of agents in rapidly changing technical systems. Thus, Brassier’s treatment of improvisation retains its wider resonance on this posthumanist reading, though without its normative integument.

2. Harmonic Structure and Succession

I will begin by making use of some analyses of performance practices in post-war jazz and Julian Johnson’s analysis of the disruption of the rhetoric of harmonic accompaniment in the work of Anton Webern to support this model of affective subjectivity in improvisation. I aim to show that our understanding of harmonic tendencies and melodic succession involves highly contextual expectation and sensations rather than the grasp of norms of harmonic or melodic succession. In the next section I will consider how this ‘affective’ model can be incorporated into an account of posthuman agency.

Novice jazz improvisers must internalize a large body of musical theory: e.g., they learn modal variations on the Ionian and harmonic minor scale or ‘rules’ for chord substitution in cadences based on shared tritones. This learning enables musical performance by sculpting possibilities for

action during improvisation. For example, ambiguous voicings involving tritones or fourths decouple chords from a harmonic root, allowing modulations into what otherwise might be distant keys to slide easily over a loose tonal center.

This harmonic know-how consists of recipes for honing expectations and sensations, not the acknowledgement of norms. The statement that a tritone (augmented fourth) belonging to a dominant seventh chord *should* resolve to a tonic reflects listener expectations in diatonic environments where a tonal center is defined in practice. This is not an intrinsic feature of the tritone, though, since each tritone occurs in two dominant chords. For example, the B-F tritone occurs in both G7 (resolving to C) and Dflat7. This provides a recipe for substituting a dominant chord at a tritone remove in perfect cadences.

However, it also allows harmonic series to modulate into unrelated keys. As jazz theorist Martin Rosenberg notes, the use of augmented dominants with two tritones by Bebop players such as Charlie Parker and Thelonious Monk produce multiple lines of harmonic consequence and thus an ambiguous context that is not conventionally diatonic, even if (in contrast to free jazz) some adherence to a tonal center is preserved (Rosenberg 2010).

Symmetrical chords built of fourths (as used by pianists such as McCoy Tyner and Bill Evans) or major thirds have a similar effect, whether in diatonic contexts (where, as 'rootless voicings', they can render the tonic ambiguous by stripping it to the 3rd, sixth and ninth) or in modal contexts where a tonal center is still implied by a pedal bass (239).

Similarly, an alternative model system constructed not from the Ionian mode (conventional major scale) but from the melodic minor scale has allowed jazz musicians to explore more harmonically ambiguous melodic complements to conventional chords. The seventh degree of the major scale (Locrian) is already a 'dark' harmonically ambiguous scale which contains a minor second scale step and a flattened fifth instead of the more consonant fifth (and is often altered minor chords). However, a Locrian mode built on the melodic scale (sometimes known as the 'super-locrian') provides four altered notes with respect to the home key, thus complementing the elasticity of tonal center established by symmetrical or rootless chord voicings (206).

In consequence, the home key in the modal jazz developed by Miles Davis and John Coltrane never prescribes a series of actions but furnishes expectations that can make an improvisation aesthetically intelligible after the fact. As Rosenberg explains, when Coltrane improvises in modal compositions such as 'A Love Supreme' he deploys pentatonic or digital patterns modulated far from the tonal center implied by the 'head' (the tune that traditionally opens or closes a jazz improvisation) and its associated harmonic context:

During his solos, Coltrane performs constant modulations through a series of harmonic targets or, what avant-garde architects Arakawa and Gins would call tentative 'landing sites' (2002: 10) that become deployed sonically over a simple harmonic 'home' through the use of centered and then increasingly distant pentatonic scales from that home. In doing so, Coltrane seeks to widen what I call 'the bandwidth' of melodic, harmonic and rhythmic relationships possible. He does

so as he maintains the coherence of the melodic line (or narrative) through the aurally comfortable shapes (from the perspective of the audience especially) enabled by those very pentatonic scales, despite the juxtaposition of distant and dissonant tonal centers implied by this method. (211–12)

This differential/transformative structure is, perhaps unsurprisingly, characteristic of modernist Western scored music in the classical tradition. In his analysis of Anton Webern's *Three Little Pieces for Piano and Cello*, Op 11, Julian Johnson argues that the opening two bars of the first piece allude to the framing and introduction of melody in traditional song and opera. For example, in baroque recitative the onset of a lyrical melody is frequently indicated by an arpeggiated chord. However, the high register chord that occurs in the first bar of the piece follows a single muted cello note and is followed, in turn, by a descending piano passage, bathetically marking the absence of the expressive melody portended by the chord (Johnson 1998, 277, 272).

Culturally transmitted musical structures consist of context-sensitive patterns of expectation—like the chord/recitative framing relation discussed by Johnson. These exist in tension with the musical act and are transformed in exemplary works. Indeed, As David Huron argues, compositional 'prescriptions' such as Palestrina's explicitly articulated rule that a melodic leap should be compensated for by compensating scale step are routinely honored in the breach:

For hundreds of years musicians have been taught that it is good to resolve a large leap with a step in the other direction [post-skip reversal]. Surely at least some composers followed this advice? The statistical results from von Hippel and Huron imply that for each passage where a composer had intentionally written according to post-skip reversal, then they must have intentionally transgressed this principle in an equivalent number of passages. Otherwise the statistics would not work out. (Huron 2006, 84)

Huron's cross-cultural analysis shows that actual musical practice is consistent with a regression to the mean pattern, whereby melodies tend naturally to cluster around the median of the pitch range (*tessitura*) of the melody. Thus, leaps tend to be followed by compensating up or down movements where they land at the extremes of the *tessitura*, but not where they land near the median pitch.

However, the post-skip reversal heuristic is, it seems, *applied by listeners*. The statistics suggest that applying this heuristic will lead to the correct result 70 percent of the time. It is thus 'good enough' and less exacting than applying regression to the mean, since it does not require the listener to infer the *tessitura* from the melody (85).

It seems that linguistic formulations of musical norms, such as Palestrina's, do not prescribe but indirectly *describe* how musical transitions are modelled and predicted by acculturated listeners—(a thesis that is suggestive in the light of the predictive coding model of mind and agency I will outline in the next section).

When internalized, such procedures offer affordances for manipulating musical material. For example, most novice jazz musicians practice improvising over classical perfect cadences resolving from the second (minor) chord of the major scale to the tonic by way of the dominant seventh (often known as a II-V7-I cadence). This develops a facility for moving through the changes of many standard melodies. However, as Rosenberg reminds us, learning this formula does not prevent one engaging in substitutions that violate such expectations, thereby producing a more harmonically ambiguous environment (e.g., substituting a major seventh chord for a semitone above the tonic—such as, Gminor7, C7, F#Major 7). Indeed, facility with authorized transitions makes it easier to apply these substitutions on the fly.

In the context of improvisation and composition, we are not free in virtue of acknowledging or declining musical norms since these have never been in place other than as loose expectations or recipes. Brassier's neo-rationalist concept of autonomy, then, seems ill adapted to musical contexts, even if we buy into his naturalist dismissal of any sovereign self. If we are to tease out the implications of his text for posthuman agency, we need to formulate an alternative account of autonomy in improvisational contexts that is not predicated on the acknowledgement of musical norms.

3. The Alien Time of Improvisation

An improvisation takes place in a time window limited by the memory and attention of the improviser, responding to her own playing, to the other players, or (as Brassier recognizes) to the real-time behaviour of machines such as audio processors or midi-filters. It thus consists of irreversible acts that cannot be compositionally refined. They can only be repeated, developed or overwritten by subsequent acts.

Improvisation is thus committed to what Andy Hamilton calls 'an aesthetics of imperfection' as opposed to a Platonism for which the musical work is only contingently associated with performance (Hamilton 2000, 172). The aesthetics of imperfection celebrates the *genesis* of a performance itself, its embodiment in a specific time and space.³

If improvisation is a genesis, it implies an *irreversible temporality*. Composition or digital editing is always reversible. One develops notational variants of an idea before winnowing them down or rejecting them. One hits Ctl/Cmd + Z in the DAW (Digital Audio Workstation) when a mix goes bad.

An improvisation, by contrast, is always a unique and irreversible event on the cusp of another. An omniscient being would be incapable of improvising because its options would be given in advance. Unlike the improviser, it could never surprise itself. Its act would be represented before it took place and thus reversible.

It follows that an improvisation *must exceed the improviser's power of representation in principle*. The improvising agent must operate with things or processes that s/he/it cannot fully control or know, including her own mental or body systems. Paraphrasing Amy Ireland's discussion of H. P.

Lovecraft and Michel Serres, improvisation necessitates an alien interloper which constantly threatens to disrupt or divert familiar relationships and forms of succession.

This interloper can be understood as a kind of noise or interference that results from the human subject's inability to master or understand itself as a material system, a natural thing. In French, *parasite* can mean both an organism that lives off its host or interference, static. Serres' book *The Parasite* utilizes this homonymy to explore the necessity with which the interference or chance deviation generates reality by interrupting any rational system or ordering: for example the allocation of living creatures into host and parasite, user and used (Ireland 2016, 220; Serres 2007, 10, 19).

For Ireland, likewise, identifying the *noise*—the parasite—is never an innocent operation. It requires that we adopt a perspective on the relationship between an experiencing subject and the unexperienced 'real' which constitutes experience (see also Thompson 2012).

Viewed from the perspective of the Subject, that impersonal, asubjective real is the parasite: the unexperienced 'outside' that constitutes noise, since it is not ordered according to reason or reasonableness. In terms of the retelling of La Fontaine's tale of the country rat who shares a meal with the city rat, with which Serres begins his work, this noise is signified by the rats whose feasting disturbs the Master sleeping in his townhouse. However, the perspective can be reversed by treating the imposition of rational orders or relationships as a distortion of this fundamentally ambivalent process (Ireland 2016, 221). Thus the Master is a parasite insofar as he interrupts the rats feasting on the remnants of his ortolans:

Who, then, made the noise? The rats, of course. A feast makes noise. Here are the guests, with their little paws; it seems like thunder above the ceiling. Here are the gnashing of their teeth and the scratching of the rodents. All that wakes him up. The noise, then, was called for by noise. (Serres 2007, 66)

By smoothing experience with the imposition of rule governed rationality the human subject constitutes a meaningful world affording manipulation and social interaction: Sellars' manifest image. Yet this subsists within a fundamentally arational nature which does not answer to any normativity. At a cosmic level, it is this Outside that must be repressed in Lovecraft's Cthulhu mythos stories (Ireland 2016, 222) in order to preserve this 'placid island of ignorance in the midst of black seas of infinity'. Yet from the notional position of reality, the manifest image constitutes a distortion of what Ireland, following Nick Land, takes to be the inhuman, 'uninhibited "primary synthesis"'—that is, the real source and being of Being (224).

What appears (for the human subject) as an addressable human world—the manifest image of persons, values and objects—cuts out the intricate web of the sub-personal or impersonal processes that bring it into being. (For a gloss of this sub-phenomenological domain drawn from current cognitive science, see below.)

Brassier veers towards this quasi-eliminative realism at times. It is implied by his naturalistic proposal for explaining the evolution of reasons in terms of the organization of pattern governed physical systems. The freedom of improvisation requires, as he puts it, 'an involution of [or reciprocal interaction between] mechanisms' to compose the ('not necessarily human') agent of the act:

The ideal of 'free improvisation' is paradoxical: in order for improvisation to be free in the requisite sense, it must be a self-determining act, but this requires the involution of a series of mechanisms. *It is this involutive process that is the agent of the act—one that is not necessarily human.* It should not be confused for the improviser's self, which is rather the greatest obstacle to the emergence of the act. The improviser must be prepared to act as an agent—in the sense in which one acts as a covert operative—on behalf of whatever mechanisms can effect the acceleration or confrontation required *for releasing the act.* (n.p. My emphasis)

The claim that there is a potential act needing to be 'released' in a given musical setting might seem to impute rule-like normativity to the improvising situation: something that *ought to be*. However, this claim does not cohere with context-sensitivity and underdetermination of expectation described in the previous section or with Brassier's realist metaphysics, which assumes only a material reality outside of any subjective givenness or life (see Brassier 2007).

The super-context-sensitivity of harmonic implication implies that the significance of an event for the unfolding of an improvisation is not normatively prescribed and, indeed, not given as such. By way of an illustration, Walton et al. cite an anecdote related by the jazz keyboardist Herbie Hancock about his early work with Miles Davis. During one performance he claims to have been certain that he had played a wrong note, until Davis' deft response made it feel right—exemplifying Brian Eno's oblique strategy 'to honor your mistake as a hidden intention' (Walton et al. 2018, 98).

It could be objected here that such 'feelings of rightness' track normative truths: in this instance, one stipulating that the note in question is a token of some normatively sanctioned type. However, this conflates the claim that the note had a perceived *musical value* with the claim that it instantiated a rule of succession to which Hancock assented after Davis response. Firstly, this is psychologically implausible. Given that the note felt wrong before the response, Hancock could not have already internalized this norm. Had he done so, he would have heard the note as requiring the sanctioned response, not as wrong. But the rule could not have been *derived* from Davis response since we have dismissed the assumption that this instantiated a general type with which Hancock was acquainted. Learning a rule requires training and repetition, whereas Davis response was novel and unexpected.

We can say, then, that there is a perception of aesthetic value here, but all that is registered, in effect, is that the players affirmed an event. If there is any tacit normative judgement, it hides in the background presupposition on the part of the players that their affective responses were reliable (see Döring 2014, 134).

Both the pattern generators and the events they produce are radically aseptic; issuing potentialities for action and evaluative affects without prescriptive content (Thompson 2012, 19). Improvisatory events—as in Coltrane’s decentered pentatonics—do not legislate the scope for musical gesture by engendering new norms but, rather, offer material with which Brassier’s ‘covert operatives’ overwrite our values and expectations and produce new models of agency.

These generative systems are phenomenologically unavailable, though realized and produced in the social and material assemblages composing the human world—e.g., pattern-recognizers and pattern-generators embodied and enacted by musicians skilled in finessing the affordances (opportunities for action) of instruments and the events they produce. They are also potentiated in technological artifacts (midi processors, digital and analogue effects, granular synths, tools for spectrum analysis or resynthesis using the fast Fourier transform, etc.).

So, if not normatively constituted, what is the nature of the paradoxically ‘selfless’ freedom compelled by these noumenal interactions? If we exorcise all specters of transcendental thought—Brassier’s normative functionalism included—how do we conceptualize ‘the subjectivity of the act’ or its ‘self-determination’?

I think clues about this selfless self-determination can be gleaned from improvising situations we know about. The real of the improvising situation might have the medusa-headed productivity of Ireland’s primary process, but skilled agents have techniques for co-opting it using the available world of social and instrumental affordances (Debrulle et al. 2012, 1).

For example, in a field study of post-hardcore rock musicians, Alec McGuinness provides a vivid example of musicians using a procedural learning technique to prime a series of musical riffs over which their intentional control is relatively limited. Songs are built by associating riffs with riffs, but, as one informant explains, are varied in performance when it ‘feels right’ to do so:

[S]ometimes there’ll be moments when we’re not looking at each other but all four will either hit that heavy thing, or really bring it down [...] And yeah, those moments [...] it’s priceless, when everyone just hits the same thing at the same time. [...] That’s when you know that that song’s definitely going to work. ‘Cause it’s obviously sort of pressing the same buttons on each of us at the same time. (McGuinness 2009, 19)

So, as with Davis’ overwriting of Hancock’s ‘bum’ note, *releasing the act* can involve a distributed affective response to a ‘felicitous performance’ expressed via the collective performance act itself rather than by application of formal musical rules of which, in the post-hard-core case at least, the performers are avowedly innocent.

The phenomenology of this act is also *dark*. All experience is, I have argued elsewhere, striated with ‘darkness’ (Roden 2013; Roden 2014, 82–104). Having it affords only a partial insight into its nature. Indeed, as Scott Bakker writes, my metaphor understates our abjection and its contribution to the reflex anti-naturalism of much post-Kantian thought:

Darkness actually provides information regarding the absence of information, and we had no such luxury as a child or as a species. We lacked access to any information tracking the lack of information: the 'darkness' we had to overcome, in other words, was the darkness of neglect. Small wonder our ignorance has felt so enlightened at every turn! (Bakker 2014)

Experience seems like a gift through which we engage the world 'transparently'— without a mediating representation or complex cognitive process—because we are almost entirely unmindful of the heavy lifting required to produce it. Under quotidian conditions, we are in the dark about the dark. Techniques like chaining riffs or applying the post-skip reversal heuristic nonetheless allow us to produce and navigate sonic events in the teeth of this metacognitive neglect—in Brassier words, to do 'something with time' even as time 'does something with us' (2014, 469).

This conception of improvisation as the entraining of phenomenologically obscure 'operatives' or 'noumenal engines' coheres with the theoretically fertile Predictive Coding (PC) account of neurocomputation in contemporary cognitive science.

In what follows, I will present a brief overview of the PC approach. My goal here is speculative rather than explanatory: not to suggest that PC is an unassailable or final account of cognition or agency (though it is compelling and rich) but to hint at the functional complexity cooking the improvisator's manifest image. Additionally, an account predicated on the idea that brains are prediction machines will help us to foreground the insurgently 'unpredictable' and open character of improvisation and its pertinence to a posthuman conception of agency.

PC understands perception and action as hierarchically ordered cycles of prediction-error minimization operating at multiple temporal scales and levels of processing throughout animal nervous systems. The predictions are made by generative models (neural networks) in the form of modulatory feedback that gets compared to bottom up 'driving signals' from 'input' layers lower in the processing hierarchy. Where the model fails to predict the driving signal its hypothesis is updated until it issues predictions that match the driving signal, thereby retuning the model to govern the agent's perceptual transactions more fluently.

From the purview of Bayesian epistemology, this updating process is weighted both on the 'likelihood'—how well a hypothesis predicts the evidence (input)—and the 'priors' encoding background expectations which exert their influence from further up in the hierarchy (Feldman 2013, 18). In effect each prior functions as a conditional likelihood in respect of models further up the hierarchy.

Some top-down predictions may code relatively abstract properties of the world in terms of the prior probabilities of coincident features in the environment of the agent, such as that changes in objects are typically caused by changes in other objects. As Andy Clark observes in his surveys of the predictive coding literature, these abstract 'hyperpriors' have organizing features analogous to Kantian transcendental synthesis (Clark 2013, 196, Section 3.3; Clark 2015, 174–5). However, if it

makes sense to talk of 'synthesis' here, it is better seen as the fluent control of agency and self-maintenance than as a conceptual operation whereby a sensory manifold is united under a concept.

One of the most fascinating aspects of the PC account is the way it complicates our folk distinction between perception, inference and intention or will. From this perspective, *intention and perception share the same satisfaction conditions*. In the PC model, actions are predictions embodied as motor patterns at sub-cortical levels.⁴ In action cycles, error reduction will involve the realization of more abstract 'goals' through the minimization of proprioceptive errors; thereby moving the organism into a predicted configuration (Clark 2015, 131; Adams, Shipp & Friston 2013).⁵

Thus, when an improvising pianist explores—say—possibilities for sharing rhythmic or melodic lines between hands, she is augmenting her freedom (or functional autonomy—see below) by sculpting 'dark' generative mechanisms. These are not intuitable aspects of her phenomenological world; though, as per Ireland's discussion of the primary process, they are generative conditions for it (Roden 2013, 172–4).

Only their output is phenomenologically available and, as per the PC account, even these embodied processes are subject to the suppression of sensory awareness of the consequences of fluent action. This is explained under the PC model because active inference can only operate if the 'gain' on prediction error from sensory input is attenuated, according functional primacy to the motor system for the reduction of error (Clark 2015, 213–217). J. Limanowski suggests this may explain the standard phenomenological distinction between the lived and objective body.⁶

When things 'click' in a group improvisation, we feel an affective state or groove that seems shared—'pressing the same buttons in each of us'—perhaps because such states are multifunctional elements which can also be used to perceive others' affective states (see Limanowski 2017, 6).

Such shared states seem to be fundamentally affective, rather than essentially involving beliefs about others' mental states which mediate folk theoretical inferences about the group's propensities for action. Firstly, these affects are not paradigmatic emotions evoking stereotypic expressions or feelings—e.g., fear and fight and flight—but transient potentials modulating action; inflexions in a singular process. Even if it were possible for the subject to intellectually ascribe such subtle influences to some individual or collective, their singularity and transience means their influence is entirely non-inferential. Thus, their influence on performance is plausibly due to their capacity to modulate the action-readiness of the performers, as constrained by the affordances of instruments and learned musical idioms (Gallagher and Allen 2018; Debruille et al. 2012). Such affects are not 'had' or 'owned', as emotions are, but produce changes at the interstices of bodies and assemblages (Thompson 2012, 20).

Secondly, these affects issue in complex dynamical patterns in which spontaneous islands of coherence or 'mirroring' may occur, but also considerable divergence. Walton et al. describe statistical analyses of patterns of coherence between bodily (forearm and head) movements and

playing behaviour of pianists improvising jointly against ostinato patterns, swing backing and drones. For example, the analysis of the right forearm movements over the ostinato pattern, with the two pianists improvising together freely, displays regularly spaced pockets of coordination at multiple temporal scales within the duration over which the ostinato was repeated. This contrasts with the far more homogenous stretches of coherence when the pianists were asked to play in unison, but also with far the patchier dynamics that occurred against the drone (Walton et al. 2015, 5). Finally, they also uncovered surprising multiscale coordination between up and down head movements against a swing track, suggesting that the interaction of performers extends beyond explicit musical gesture to expressive bodily movements that do not enact specific intentions, rendering them inaccessible from a folk-theoretical perspective (6).

The preceding examples also indicate that the generative mechanisms or models entrained in improvisation are not primarily predictive but *differentially productive*, spinning out novel sonic and bodily events. This is compatible with the PC account if it is construed less in internalist/representationalist terms but as a mechanism for implementing fluent embodied behaviour. As Clark (2015) and Feldman (2013) point out, the mechanisms posited by PC do not operate in a stable, changeless environment that could be characterized by a single true 'prior' (the 'Lord's Prior'—see Feldman 2013) but a profligate, alterable reality.⁷ Models that overfit data sets over a time-slice from a mutable environment may be prone to 'overtuning' to agent-irrelevant noise and less adaptable to future events.

This suggests that the capacity for spontaneously variable behaviour found in improvisors may reflect tactics for exploring novel forms of stable behaviour in highly changeable environments. This speculation is supported by experimental work in robotics that suggests that hierarchically organized neural networks that exhibit chaotic behaviour at larger timescales—corresponding, perhaps, to the modulatory influence of higher cortical regions on action—are more effective in selecting appropriate action repertoires. Clark suggests that this modulus may enact hyperpriors treating the world as intrinsically changeable and unstable (see Clark 2015, 274; Namikawa et al. 2011). In terms of Ireland's speculative aesthetics, one could say that the profligate noumenal reality that the subject smooths into a human manifest image is necessarily involved in its own sub-personal, sub-phenomenal smoothing. In short: *it's rats all the way down*.

I think we can understand how such a capacity for endogenous variation might constitute posthuman freedom better by utilizing a conception of autonomy that is not exclusive to discursive creatures (as is the case with Brassier's conception of self-determination).

In *Posthuman Life*, I refer to this as 'functional autonomy' (Roden 2014, 124–149). This idea helps articulate an *unbounded* speculative posthumanism because it applies to *any* self-maintaining system capable of enlisting values for its functionings or of becoming a value for some wider assemblage. A functionally autonomous system might be discursive and social; it might be a superintelligent but asocial singleton that only wants to produce paperclips. It might be something whose existence is utterly inconceivable to us, like a computational megastructure leeching the energy output of an entire star.

A diminution of functional autonomy is a reduction in power. Arthritis of the limbs painfully reduces freedom of movement and thus the ability to cultivate agency in other ways. Acquiring new skills increases 'one's capacities to affect and be affected, or to put it differently, increase one's capacities to enter into novel assemblages' (DeLanda 2006, 50; Roden 2014, 190).

To be sure, success at improvising is not like acquiring a new skill. However, it requires that the agent embraces and is embraced by a reality and time that interrupts any settled structure of values and ends.

This embrace might seem atavistic, divorced from the Promethean prospectus for engineering nature in compliance to reason. But this assumes that the means for engineering nature are themselves compliant, rather than factors which ramp up the unpredictability and uncontrollability of the real. Far from being socially constituted or constructed, technical systems are inputs to the primary process; 'covertly operating', gnawing the dark beyond the manifest image. Thus, I argue in *Posthuman Life*, the systemic complexity of modern technique precludes binding technologies to norms in the long run. Modern self-augmenting technical systems are *so complex as to be both out of control* and characterized by massive functional indeterminacy—rendering them independent of any social prescription or political order we may care to erect around them (Roden 2014, 150–165; Roden 2016).

As the world is re-made by this vast planetary substance, any agent located in the system needs to preserve its ability to acquire new ends and purposes or pay the price of overfitting in unstable environments. Any technology liable to increase our ability to accrue new values and couplings in anomalous environments, then, is of local ecological value (Roden 2014, 191).⁸ This is not because such technologies make agents better or happier—as a non-anthropocentric account, posthumanism has no metric for welfare or flourishing—but preserves them as agents, though not, perhaps, as human.

In this 'posthuman predicament', agency must be febrile, even masochistic (see Bersani 1986). The agent must tolerate and practice a systemic violence against itself and its world; against stable values or identities; performing its intrasubjective equivalent of the deracinative (extra-subjective) noise of modernity's technological and planetary networks.

Conclusions

Improvisation— because it experiments with the 'involved' mechanisms of the performers body and environment—rehearses our seemingly inescapable tryst with the ontological violence of the hypermodern. It thus provides an exemplar of an agential freedom in late modernity. There can be no posthuman aesthetics (any more than there can be a posthuman ethics) because unbinding relinquishes the position from which the aesthetic could be grasped as a generalizable structure. However, this process is *structurally aesthetic* insofar as its nature is formed by iterative experimentation with the limits of what bodies can be or do. Posthuman freedom consists in the

capacity to map and generates the unbounded through ceaseless experimentation with the noumenal sources of agency.

The implications of such agency are paradoxical. Unbound Posthumanism, I argued, places no limits on what an agent or a subject or thought could be. Epistemologically, this can be supported using 'dark phenomenology' arguments to sustain anti-transcendentalist positions (see Bakker 2014b; Roden 2013). However, its implications are post- or even non-philosophical, for, as I argue elsewhere, it forces us to relinquish any constraints on the very idea of agency or thought itself (see Roden 2018). It refuses a position from which to constrain this 'unbounded', which remains open; no longer posed as a space or totality.⁹

Notes

¹ The others being Quentin Meillassoux, Iain Hamilton Grant and Graham Harman.

² As an example of such a metalinguistic resource, Robert Brandom cites the conditional (if... then...) statement as 'the paradigm of a locution that permits one to make inferential commitments explicit as the content of judgements' (Brandom 1994, 109).

³ "Improvisation makes the performer alive in the moment; it brings one to a state of alertness, even what Ian Carr in his biography of Keith Jarrett has called the 'state of grace'. This state is enhanced in a group situation of interactive empathy. But all players, except those in a large orchestra, have choices inviting spontaneity at the point of performance. These begin with the room in which they are playing, its humidity and temperature, who they are playing with, and so on" (Hamilton 2000, 183).

⁴ Reducing prediction error by changing specific body trajectories or relative positions of body parts.

⁵ Thus, constraining the improbability (or more accurately the self-information or 'surprisal') of an environment relative to a probability distribution of environments corresponding to the nature of an encoding agent (See Hohwy 2013, 51–58).

⁶ To do so, he appeals to Thomas Metzinger's claim that our phenomenology is generated by a dynamic phenomenal self model (PSM) representing the modeler as a distinct and always present ('untranscendable') part of its world (Limanowski 2017, 10). The phenomenal world model thus includes a phenomenal self-model but neither sub-model represents the processes that implement them—for example error reduction processes or the transient attenuations of input for reallocation of attention or functional role.

⁷ Jacob Feldman argues that the intuitive way of interpreting the idea of a single true prior—'The Lord's Prior' is frequentist: the single true prior would reflect the objective frequency of events. Such that if an event h occurs with probability p_h in the environment the prior assigns it p_h . That is that the probability of an event, or a probability distribution over an ensemble of events or continuous variable, reflects the outcome of some ideally repeatable experiment such as random coin tosses (Feldman 2013, 15–16). This conception of probability is at odds with the Bayesian account which interprets probability in terms of degrees of belief. Probability thus understood has no objective existence—'To frequentists, probabilities are facts, while to Bayesians they are opinions' (16). More importantly, Feldman suggests, the Bayesian interpretation seems the only way in which we can accommodate either timeless physical laws or singular historical events, neither of which are straightforwardly susceptible to the

frequentist analysis. If frequencies are merely finite data for testing opinions, however, there is no single true prior and the problem of Bayesian updating is redefined as that of harmonizing behaviour to an uncertain and changing world—'separating agent-salient data from noise' as Clark puts it (Clark 2015, 272).

⁸ For example, space technology, nanotechnology, or the use of brain computer interfaces.

⁹ Here, we can exploit an analogy with Badiou's set-theoretical conception of Being as an inconsistent multiplicity or void that is 'not-one, nor composable of ones' (Badiou 2006, 56). However, Badiou certainly has a conception of thought—as evinced in his Parmenidean claim that set theory maps the structure of Being. Unbounded posthumanism, it appears, must relinquish such an ontological construal of the unbounded. The voided horizon of the posthuman cannot be pre-comprehended but it can be preempted and performed.

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Biography

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