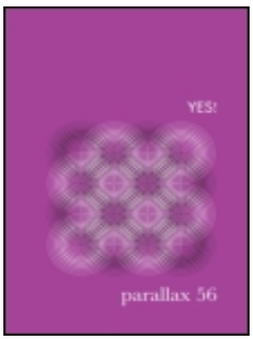

Parallax

Routledge
Taylor & Francis Group

ISSN: 1353-4645 (Print) 1460-700X (Online) Journal homepage: http://www.tandfonline.com/loi/tpar20

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George E. Lewis

To cite this article: George E. Lewis (2007) Mobilitas Animi: Improvising Technologies, Intending Chance, Parallax, 13:4, 108-122, DOI: 10.1080/13534640701682867

To link to this article: https://doi.org/10.1080/13534640701682867

parallax, 2007, vol. 13, no. 4, 108–122

Mobilitas Animi: Improvising Technologies, Intending Chance

George E. Lewis

> *If he is not at once improvising and improvising warily, he is not engaging his somewhat trained wits in some momentarily live issue, but perhaps acting from sheer unthinking habit. So thinking, I now declare quite generally, is, at the least, the engaging of partly trained wits in a partly fresh situation. It is the pitting of an acquired competence or skill against an unprogrammed opportunity, obstacle or hazard. It is a bit like putting new wine into some old bottles.*
> Gilbert Ryle, 'Improvisation'.[1]

Gilbert Ryle's discussion of improvisation in this late essay neatly encapsulates the critical reasons why we should be interested in the practice. If we can conclude that improvisation is the ubiquitous practice of everyday life, a primary method of meaning exchange in any interaction, then one should find it to be a crucially important site for both humanistic and scientific study. Paraphrasing George Lipsitz's observation regarding the epiphenomenon of whiteness, improvisation is everywhere, but it is very hard to see – the reason being that improvisation is fundamental to the existence and survival of every human formation, from the individual to the community, through the postnational body to the species itself – as close to universal as contemporary critical method could responsibly entertain.[2]

At the uninterrogated core of powerful new forms of computer interactivity that challenge traditional conceptions of human identity, we find the primordial human practice of improvisation, and this essay is written in the recognition that the ever-widening role played by interactive digital systems in a globalized cultural, social and economic environment presents a natural point of departure for a similarly wide-ranging re-theorization of how improvisation produces knowledge and meaning.

Live Algorithms: The Rise of the Creative Machine

Canonical new media histories tend to date the advent of interactivity in art making to the mid eighties.[3] However, anyone who remembers the period when 'multimedia' did not refer to computers may find ironic the historical rupture separating the notion of interactivity now on offer from the practices that arose in the computer music communities beginning in the early seventies. This early period produced a number of 'interactive' or 'computer-driven' works, representing a great diversity of approaches to the question of what interaction was and how it affected viewers, listeners and

parallax
ISSN 1353-4645 print/ISSN 1460-700X online © 2007 Taylor & Francis
http://www.tandf.co.uk/journals
DOI: 10.1080/13534640701682867

audiences. Musicians were among the first to design and perform with creative machines and, to this day, many of the most advanced creative machines create music in real time.

The seventies advent of the new, relatively portable mini- and microcomputers signalled a cultural shift in contemporary music in which improvisative musical practices were being reasserted, if not uncontroversially embraced. These forces led to a new medium that composer Joel Chadabe, one of the earliest pioneers, later called 'interactive composition'. The early 'interactive composing' instruments 'made musical decisions as they responded to a performer, introducing the concept of shared symbiotic control of a musical process'.[4] These features of the new software-driven landscape blurred the boundaries between human and machine music-making and called conventional notions of human identity into question, while establishing a critical space to explore communication not only, or even primarily, between people and machines, but between people and other people.

Blunting the social impact of the work, however, was the tardiness of most of these composers in coming to terms with the full implications of their improvisations. The field of interactive music quickly recapitulated the stance of the earlier mainframe-based work in tending to see itself as heir to a tradition of vanguard Euroclassical music that, after the explosions of 1968, had once again retreated from contact with popular culture, political concerns and the social world generally. Unprepared to contextualize their issues beyond the frame of pan-European composition, the questions they raised would be left to a later generation of interactivity artists and theorists whose work became subsumed within the field of 'new media', an area within which this earlier history of interactivity remains essentially unknown and unreferenced.[5]

At least privately, however, these early experimenters realized that integrating improvisation with technology, as an articulated object comprising research, theorizing and performance, can project new models for the study of meaning and sociality. Technologically-imbued art making shows the extent to which critically oriented aesthetic experience can bridge gaps between fields of inquiry, and improvising computer programs – or, more broadly, *creative machines* – both problematize and clarify constructed distinctions between human and machine in ways that illustrate the radical position of Lucy Suchman that 'I take the boundaries between persons and machines to be discursively and materially enacted rather than naturally effected and to be available […] for refiguring'.[6]

Such a machine, incorporating a dialogic imagination in which, as Rimbaud once put it, '*Je est un autre*', is one of the realities of the late twentieth century, forcing a reconsideration of a machine's aesthetic and music-structural agency.[7] Because creative machines manifest self-organizing, interactive musical behaviour that operates both independently and in dialogue with the viewer-auditor's constructing gaze and activities, performances with them are not simulations of 'actual' musical experience, but (to reference sociologist Alfred Schutz's 1964 musing on improvisation) a form of 'Making Music Together'.[8]

In the last few years, an important marker of the growth of these technological practices has been the Live Algorithms for Music (LAM) research network

(www.livealgorithms.org), an initiative created in 2004 by computer scientist Tim Blackwell and composer Michael Young of Goldsmiths College in London.[9] A series of Live Algorithms conferences have included research papers and performance contributions from musicians (electronic and instrumental), composers, artists, software engineers and researchers in computer science, cognitive science, robotics and mathematicians, foregrounding

> the development of an artificial music collaborator. This machine partner would take part in musical performance just as a human might; adapting sensitively to change, making creative contributions, and developing musical ideas suggested by others. Such a system would be running what we call a 'live algorithm'.[10]

To be sure, the musical implications of 'machine intelligence' animated many seventies-era forays into interactive music making. As discourses surrounding AI began to diffuse in the early nineties, however, composers working in interactive computer music began to combine sonorous and sensuous experiences with critical spaces for considering the nature of human interaction. For LAM networkers, improvisation becomes a central component in a conception of 'strong' interactivity, said to be characterized by properties analogous to those found in human performance, e.g. 'autonomy, innovation, idiosyncrasy and comprehensibility',[11] as distinct from 'weakly interactive' or 'reflex' systems in which, for instance, 'incoming sound or data is analysed by software and a resultant reaction (e.g. a new sound event) is determined by pre-arranged processes' that 'might also utilise stochasticity to effect surprise'.[12]

For LAM workers, research on live algorithms for music has implications for new and emerging practices and research into evolutionary computation and artificial life, swarm intelligence, chaotic dynamics, cellular automata, neural networks and machine consciousness more generally. At the same time, LAM's orientation is as much aesthetic as scientific. Indeed, Young and Blackwell feel that strong interactivity 'is exemplified in the human-only practice of "free" improvisation'. In this regard, LAM research consists in 'a marrying of algorithmic music, live electronics and free improvisation'.[13]

These musings make common cause with Suchman's assertion that

> human interaction succeeds […] due not simply to the abilities of any one participant to construct meaningfulness but also to the possibility of mutually constituting intelligibility, in and through the interaction.[14]

In this sense, the improvised musical encounter may be seen as a *negotiation* between musicians, some of whom are people, others not. A program operating in this conceptual space would have the same set of problems as a human musician – problems of behaviour, communication and intersubjectivity. Decisions taken by the computer have consequences for the music that must be taken into account by the human improvisors, an aesthetic of variation and difference that is clearly at variance with the information retrieval and control paradigm that late capitalism has found useful in the encounter with interactive multimedia and hypertext discourses.[15]

The insistence by Blackwell and Young that free improvisation 'rejects top-down organization (*a priori* agreements, explicit or tacit) in favour of open, developing patterns of behaviour', announces a directed musical and interactional aesthetic that functions as a metaphor for larger social and political questions of identity and social organization. Thus, working with creative machines becomes a way of creating a politically inflected, critically imbued aesthetic space in which, as Schutz noted, 'a study of the social relationships connected with the musical process may lead to some insights valid for many other forms of social intercourse'.[16] In that sense, one has to inquire into the reasons for the relative absence of music from contemporary discourses and research in AI, as well as the near-absence of research on improvisation.

First, as Suchman contends, dominant discourses and research directions in AI continue to assume Euroamerican models of human agency and subjectivity.[17] Once that reading and its associated aesthetic assumptions are abandoned, however, what appears is a much wider range of readings in music as to what constitutes 'intelligibility' of machine response, obliging researchers to develop new theories of sonic discourse that produce evaluative criteria for intelligibility above and beyond those required to conduct mundane small talk in natural language.

Toward New Ethnographies of Improvisation

This highlights the necessity to engage new ethnographies that move beyond the fifties' models of jazz-making that still dominate discourses on improvisation in many fields. Hear, for example, AI researcher Rodney Brooks, in colloquy with US National Public Radio commentator Kurt Andersen, who combined rather downbeat critical commentary on my work (without any chance for me to respond) with a recapitulation of an Arnoldian stance on improvisation, interactivity and art making:

> Commentator: Rodney, I guess the computer programs and output devices that he, George Lewis, uses, don't strictly qualify as a robot in your definition.
>
> Brooks: No, but they do at least respond to something they're sensing in the world. They're sensing what the human is playing...
>
> Commentator: Right.
>
> Brooks: ...from that, come to where they play.
>
> Commentator: I wonder if a machine that actually played a trumpet or a trombone or a piano, as opposed to outputting those digital sounds, would get us any closer to a kind of interesting simulation of human musical creation?
>
> Brooks: Well, you might want the robots to be sitting there with the other musicians and making eye contact with them, and understanding the nod and making a little nod back – whose turn it is to take the solo.
>
> Commentator: When do we, uh…get there – that is, machines creating art that we care about?[18]

It is probable that Rodney Brooks and his NPR interlocutor were simply unaware not only of free improvisation as such, but also of the fact that people have been living with creative art machines for nearly four decades. In this context, the work of historian Jon Cruz on nineteenth century American chattel slavery becomes relevant. As Cruz notes, 'Prior to the mid-19th century black music appears to have been heard by captors and overseers primarily as noise – that is, as strange, unfathomable and incomprehensible.'[19] However, as Cruz points out, for slave owners to hear only noise is 'tantamount to being oblivious to the structures of meaning that anchored sounding to the hermeneutic world of the slaves'. To hear only noise is to 'remain removed from how slave soundings probed their circumstances and cultivated histories and memories'.[20]

Similarly, whenever I introduce the work of Albert Ayler to the students in lecture classes, the word 'noise' is usually invoked – in the vernacular sense of 'not music', and 'undesirable'. In fact, not just the so-called 'free jazz' of Ayler, but virtually every extant form of black music has been characterized as 'noise' at some point. In North American culture, the phrase 'all that jazz' effectively uses the noun 'jazz' as a synonym for noise, nonsense or disinformation: 'Don't give me all that jazz'.

When I play computer music (my own, or that of my colleagues) for my undergraduate students, the related term 'random' inevitably appears. Those who know a bit more about computers than the others speak confidently about this 'randomness', as if a computer science background provided a special key to knowing about music made with computers. These students effortlessly transpose from the key of scientific precision into the key of vernacular aesthetics, confidently asserting that, 'this music sounds random and unstructured – like noise'.

Moving ahead in the class, I play an audio example that sounds a lot like Mozart. Now we know (or certainly have been told, at any rate) for many years that the music of Mozart is one of the most vital expressions that humanity has ever produced, leading to a 'Mozart Effect' on cognitive functioning that spawned an industry.[21] Unlike all that jazz, the sublime creations of this Germanic genius are models of structure – 'composed', not 'improvised', the researches and performances of Robert Levin notwithstanding.

Well, it turned out that (surprise), the music on the CD was made, not by Mozart, but by a computer program written by the composer David Cope, a pioneer in the deployment of artificial intelligence within the field of music theory.[22] Suddenly, talk of sacrilege was in the air, as sounds that just a few moments earlier had been part of the very definition of humanity's highest ideals were suddenly transformed into a threatening Frankenstein. Mozart (without quotes) turned into 'Mozart', a character in a morality play about human intelligence.

Regarding both the computer-composed Mozart and the computer-improvised music, the perception of the 'human-ness' of the machine, as well as its quality as art, is clearly made dependent upon an interaction between the aesthetic judgments of listeners and their assumptions concerning the means of production. Despite the apparent assumptions of universality on the part of Brooks and his radio host, in the real,

socially constituted world that robotic entities of this musical kind must engage, such judgments would inevitably vary widely. Thus, the scientist's assertion that no 'human-like' musical interaction can take place in the absence of 'eye contact' demonstrated a lack of connection with the meanings embedded in sound, a logocentric privileging perhaps mirrored in scientific research priorities taken more broadly. Moreover, the notion that visual elements constitute the foundation for the sonic art of music seems curiously detached from our everyday experience, to say the least.[23]

For Alfred Schutz, 'making music together [presupposes] a face-to-face relationship, that is, a community of space'.[24] In fact, this view is problematized by the creative musical machine, an entity that did not exist in its present form in Schutz's time, and which in much contemporary practice embeds not a face-to-face animating metaphor, but a dramaturgy founded, first, upon empathy in the relation between bodies and, second, upon the creation of a community of differences and commonalities between one ear and another. Embedded in this altered conception of space is a theory of listening, hearing and interpretation that lies at the root of any design strategy for creative machines, because we can understand the experience of listening to music as very close to the experience of the improvisor. Listening itself, an improvisative act engaged in by everyone, announces a practice of active engagement with the world, where we sift, interpret, store and forget, in parallel with action and fundamentally articulated with it.

New ethnographies of free improvisation will pose important questions about how order, agency and subjectivity are achieved, maintained and contested, and how new models of 'the expert' might be produced that do not depend for proof of concept upon the simulation of received models of music-making. Certainly, an examination of the work of a later generation of so-called free improvisors, whose transnational and cross-cultural work over the past forty years appears to eschew the structuring cultural forms that so many observers claim as fundamentally constitutive of improvisation, would be key. Here, the pioneering work of guitarist-author Derek Bailey, while exercising wide influence in both the academic and itinerant spectra, has been too little followed up.[25]

Over the past twenty years or so, as a matter of necessity in order to give the work a voice, I've been drawn to strategies of auto-ethnography that complement the ethnographies of technology that people such as Suchman and Bruno Latour have performed. To continue along that path, I want to explore some of my more recent interactions between creative machines and improvising humans – in particular, a presentation of my piece for interactive (acoustic) piano in Spring 2007 at Belfast's Sonic Arts Research Centre, where I pursued the idea of a post-concert discussion, rather than the usual pre-concert discussion of 'what the audience will hear'. Since in improvised music one cannot really know completely what the audience will hear, I was hoping that a question/answer dialogue between audience and musicians about the performance might more effectively reflect the actual experience and process of musical improvisation, in which listeners and performers are encountering the same structures at about the same time, and are both engaged in creative acts.

My collaborator for the concert and discussion was the British bassist Barry Guy, who answered questions with elegance and provided a forthright and evocative description

and critique of the experience he had just had with an ensemble consisting of a creative machine and two humans:

> Well, in the three-way conversation, I'm picking up information from your machine. I'm trying to decode things as much as possible. I have anticipations of things working. I'm working with you on what you're doing in real time. So it's a three-way conversation. I'm going through the same process that George is going through – adding up the information, analyzing it, anticipating – all of these things happen in real-time improvisation anyway. I'm kind of thrown into the middle of it, and you make the best of that situation because that's the life that we're in as improvisors, which is to try and make the story add up, and be surprised.[26]

Crucially informing this kind of work, as well as the LAM orientation that draws upon it generally, is the important British strain in post-1965 free improvised music, of which Guy is a figure of canonical importance. In fact, the aesthetic of my programs since the mid 1980s draws upon an aesthetic of free improvisation informed both by this sociomusical complex and by the Association for the Advancement of Creative Musicians, viewed as a learned and culturally embedded practice. As I wrote in this unpublished manifesto from 1986 on the specifications for a new machine I was constructing,

> There should be as little pre-composed pattern material as possible – no pre-arranged sequences, scales, chord models, dynamics, timbres, motives, rhythm patterns or other material. All of these elements, as well as the input analysis whose results condition the program's choices, must be formed in real time by the program […]. This capability implies that the improviser must accept the program's decisions, or attempt to work around them.[27]

Some twenty years later, Guy's remarks on his Belfast performance with this creative machine indicate the extent to which this viewpoint is shared among members of this transnationally situated sociomusical group:

> It's an enjoyable procedure. I mentioned the word 'frustrating' earlier, because, you know, this was the first time I hit the program and I was thinking, well, how do you negotiate this? But then, once you immerse yourself in it, a whole set of parameters sort of rise up, come over the horizon, and then you're on the journey, and then you're making the best of it […]. Sometimes you feel good with it, other times, well, as I said, it wasn't always plain sailing. But you're still trying to keep a construct there […] you've got to think of the overall span of the playing, so it makes sense.[28]

Recursive Historicities

Approaching the study of the dynamic through which this kind of consensus becomes reproduced transnationally, transculturally and even transhistorically, I come to the

work of Pierre Bourdieu whose text, *An Outline of a Theory of Practice*, could well become a foundational text for a nascent improvisation studies. As such, I want to examine his central thesis in this work, the notion of the *habitus*, in some detail.

Bourdieu's notion of the *habitus* is worked out with and against a parallel ethnography of rural Berber kinship practices. The theory is grounded in a critique of Saussurean linguistic objectivism, which for Bourdieu suffers fatally from the 'inability to conceive of speech and more generally of practice other than as execution, within a logic which, though it does not use the word, is that of the rule to be applied'.[29] We can only go further, Bourdieu concludes, if, in addition to identifying a working set of objective conditions for a given societal interaction,

> we are prepared to inquire into the mode of production and functioning of the practical mastery which makes possible both an objectively intelligible practice and also an objectively enchanted experience of that practice.[30]

Enter the notion of the *habitus*, or what Bourdieu terms 'the durably installed generative principle of regulated improvisations'.[31] In the *Outline*, the *habitus* exists within a recursive, rather than a simply circular logic, being at the same time both generative and analytic. The *habitus*

> produces practices which tend to reproduce the regularities immanent in the objective conditions of the production of their generative principle, while adjusting to the demands inscribed as objective potentialities in the situation, as defined by the cognitive and motivating structures making up the *habitus*.[32]

For Bourdieu, each individual agent acting without objectively structured correlation, nonetheless, 'wittingly or unwittingly, willy nilly, is a producer and reproducer of objective meaning', in the fashion of a computer program's background 'demon' subroutine. Those who produce these actions unwittingly, without conscious mastery, manifest a kind of 'intentionless invention of regulated improvisation'.[33]

New structures appear to be found – the 'trouvaille' – but in fact are always and already present:

> Because the *habitus* is an endless capacity to engender products – thoughts, perceptions, expressions, actions – whose limits are set by the historically and socially situated conditions of its production, the conditioned and conditional freedom it secures is as remote from a creation of unpredictable novelty as it is from a simple mechanical reproduction of the initial conditionings.[34]

Bourdieu sees temporality as critical to the notion of improvisation and the *habitus*. The working out of a strategy of practice takes place both diachronically and synchronically, as in Bourdieu's analysis of Berber gift exchange: 'It is all a question of style, which means in this case timing and choice of occasion, for the

same act – giving, giving in return, offering one's services, paying a visit, etc. – can have completely different meanings at different times.'[35] Here, Bourdieu, like Ryle, is calling for the recognition of indeterminacy and uncertainty as the ground for collective human action. The indeterminacy of memory and history prepare the ground for the 'necessary improvisations' that animate the *habitus*.[36]

Bourdieu's *habitus* is intended to be pragmatic and flexible rather than totalizing, as Michel de Certeau writes: 'Bourdieu has to find something that can adjust practices to structures and yet also explain the gaps remaining between them […T]he acquisition of knowledge becomes the sought-for mediation between structures and the dispositions that produce them.'[37] Thus, it is the recursivity and self-referentiality of Bourdieu's notion that announces its totalism. In de Certeau's acerbic critique:

> As in the traditional image of primitive of peasant societies, nothing moves; there is no history other than that written on them by an alien order. The immobility of this memory guarantees for the theory that the socioeconomic system will be faithfully reproduced in practices.[38]

In the end, however, the *habitus* is performed – *must* be performed – and if the maestro left us with just an outline of the kinds of performances that articulate, drive, excite and animate the structuring structure, what might we gain from simply designating this animating performativity 'improvisation'? Clearly, we gain access through a revised and focused discourse to new descriptions of both individual and social experience – but that depends upon what we think people are doing when they improvise.

Following Bourdieu, I want to sketch in outline form some characteristics of an emerging new definition of improvisation. First, one imagines that such a definition would be receptive to both production (doing) and reception (listening) – or rather, would view listening as a form of doing. This definition would accept and subsume indeterminacy within its purview instead of allowing improvisation to be posed as oppositional to it, accepting the mutually mediating network comprised by intention, improvisation, chance and difference, and asserting the necessary presence of intentionality in the indeterminate space. Theorizing agency instead of conflating it with individual will, such a new definition would find no need to react to the moral undertones emerging from the US experimental music community concerning the desirability of the presence or absence of the ego.[39]

Second, our new definition would disrupt the cherished dichotomy between the practices of improvisation and composition, and would accept the importance of both processes and products (or to adopt a current medical euphemism, 'outcomes') to any notion of the improvisative, rather than valorizing one over the other in a needless apologia for the lack of compositionally oriented structure in the work of artists who regard such lack as neither virtue nor defect. Our new definition would explore the relation of improvisation to local agency, history, contingency, memory, identity and embodiment, usefully reconnecting supposed purely musical questions with their analogues in similar issues surrounding the practice of everyday life itself.

It is not at all difficult to recognize hegemony behind the *habitus*. The conception appears inimical to any drive for social change, and in fact unable to account for it. Thus, my critique of Bourdieu begins with the observation that improvisation's primary threat is twinned – agency bound up with indeterminacy – in other words, subjectivity itself, with all of its attendant dangers and possibilities for change.

This is not the indeterminacy of Cage, which eventually became an inchoate ethical and moral philosophy, wielded on the one hand to combat the nineteenth century Romantic ghosts that dogged every attempt to create new American music, and the cultural competition from African-Americans on the other that threatened to upset the social apple cart in which a queer silence, i.e. the closet, was partially compensated by the privileges of whiteness and maleness.[40] Although there is no particular need to regard Cage as a social theorist, one notes amid the many contradictory writings and interviews the urge to become precisely this, albeit by featuring a curious mix of a radical Kantian autonomy on the one hand – pure, heedless of dialogue with surroundings and lacking any mechanism for performing or achieving community, even with oneself – and on the other, the Biblical universality of Ecclesiastes 9:11, where 'time and chance happen to all'.

These views notwithstanding, in Europe and the United States in the fifties and sixties, improvisation, and in particular 'free jazz', was widely viewed as symbolic of a dynamic new approach to social order that would employ spontaneity to unlock the potential of individuals, and to combat oppression by hegemonic political and cultural systems.[41] What Daniel Cohn-Bendit ('Danny the Red') called the 'uncontrollable spontaneity' of May 1968 in France elicited precisely the fear of the twin threat of agency with indeterminacy.[42]

Of course, at this time, improvisation had its detractors in Europe as well. French musicologist Célestin Deliège, writing in the wake of May 1968, drew upon Adornonian critiques of jazz and mass culture in describing as 'illusory' the notion of a collectively participatory improvisative aesthetic. Such an aesthetic, ostensibly made possible by the contemporary absence of musical rules, would inevitably lead to an art produced by 'everybody'.[43]

Half a century later, the World Wide Web has evolved into a dynamic and constantly changing society that parallels the rise of transnational experimental free improvisation communities. Contemporary digital technology, and the Internet in particular, has become a primary instrument/medium through which improvisation is manifested in everyday life. Anything but illusory, the Web is perhaps the largest technologically mediated collective improvisation ever created – active in all time zones, 24 hours a day – and indeed, produced by 'everybody'. As globalized as anything ever built on this planet (all economic dislocations admitted), the Web assimilates vast asymmetries in agendas (corporate, collective, individual), cultural viewpoints and infrastructure to perform a summing of agencies.

On the Web, individual actions of navigation and choice, improvised in dialogue with local and global conditions both within and outside the network, result in shifting

allegiances that are inevitably transforming histories and cultural memories. At the same time, even as one observes the ways in which flows generated by these activities congeal into transnational communities of imaginativity, a comparison between individual navigation strategies and individual experiments in improvised modes of musical expression, while tempting, risks missing a larger point.

Instead, one might do well to seek out new ethnographies in both of these areas. In fact, new stories here have been slow to emerge – and in the case of improvised music, surprisingly so. Perhaps one of the most successful ethnographic projects surrounding improvisation on the Web emerged, not as a scholarly article, but as a work of new media art. *Listening Post*, an installation by Mark Hansen and Ben Rubin, literally musicalizes, via voice synthesis, the output of Internet chat rooms and other Web forums. 'My starting place was simple curiosity', mused Rubin regarding the origin of the work. 'What do 100,000 people chatting on the Internet sound like?'

> Every word that enters our system was typed only seconds before by someone, somewhere. The irregular staccato of these arriving messages form the visual and audible rhythms of the work. The sound-generating systems are constructed almost as wind chimes, where the wind in this case is not meteorological but human, and the particles that move are not air molecules but words. At some level, *Listening Post* is about harnessing the human energy that is carried by all of these words, and channelling that energy through the mechanisms of the piece.[44]

One is tempted to see *Listening Post* as the representation of a new form of dynamically improvisative cultural memory. But in general, the Web simply doesn't listen, and does rather poorly by sound in any case. Web culture is still primarily about exchanging texts, and the major purpose that Web culture sees for sound is as accompaniment to a set of visual images of cultural memories. Jacques Attali, writing pre-Web, noticed that 'Music is no longer made to be represented or stockpiled, but for participation in collective play, in an ongoing quest for new, immediate communication, without ritual and always unstable. It becomes nonreproducible, irreversible.'[45] But the Web commodifies sound, contains it, packages it and then congratulates itself on its furtherance of sonic cultural memory because the Apple Store supposedly has 'everything'.

However, the improvisation of forgetting constitutes the other term in the deconstruction process. Digital materials have proven far more inimical to preservationist cultural memory strategies than earlier modes. Websites come and go, and the simple nonpayment of a bill can result in information's disappearance down the memory hole. Moreover, the Web's network of actors pulls up a composite world cultural memory – in fact, an intercultural memory. For this reason, Web-based cultural memory's refusal to conform is dangerous, and on one view, this tendency must be contained in some way.

As open-source knowledge production practices became more powerful and widely known (particularly through the publicly edited Web encyclopaedia, *Wikipedia*), ostensibly disinterested epistemic practices said to be the strengths of the open-source

approach were rudely jostled by more conventional articulations of directed censorship and selective editing.[46] Fortunately, this dynamic has also effectively brought to everyday consciousness the disappearance of the notion of static, permanent history and the stability of truth – Foucault for the rest of us.

Here, Homi Bhabha's analysis of the stereotype can be of some use. Bhabha's *stereotype* is

> A form of knowledge and identification that vacillates between what is always 'in place,' already known, and something that must be anxiously repeated […]. It is the force of [this] ambivalence that gives the colonial stereotype its currency: ensures its repeatability in changing historical and discursive conjunctures; informs its strategies of individuation and marginalization; produces that effect of probabilistic truth and predictability which, for the stereotype, must always be in excess of what can be empirically proved or logically construed.[47]

Bhabha's theorization provides a cautionary note concerning the postcolonial condition of cultural memory – namely, that we must vigilantly guard against cultural memory's conflation with simple self-stereotyping. The avoidance is made more difficult by the fact that often enough, the concept of cultural memory itself comes bundled with a repeated anxiety, due to what James Snead, in his important article on repetition in black culture, saw as the use of repetition in ways that encouraged a self-bounded cultural entity to 'maintain a sense of continuity about itself'.[48] Following Bhabha, in certain formulations of cultural memory, a stereotype's 'repeatability in changing historical and discursive conjunctures' is often precisely what is desired – the unchanging and eternal essence, and heroes that never die, or at least not until we do.

In the worst case, cultural memory represents merely the reified remains of that repetition, the structure through which that repetition becomes reified, and also the product of that repetition itself. As Snead observes, however,

> Whenever we encounter repetition in cultural forms, we indeed are not viewing 'the same thing', but its transformation, not just a formal ploy, but often the willed grafting onto culture of an essentially philosophical insight about the shape of time and history.[49]

This is the saving grace that presents itself if we encounter, as Snead hopes, 'repetition with a difference' – namely, that instability, and even the possibility of mutation, can form the basis for an open-ended cultural memory that is always reforming itself in the present, rather than holding anxiously to its own stereotype.[50]

Memory, of course, needs to be refreshed, and this is the originary act of cultural memory. The narratives about cultural memory on the Web that see the matter mainly as a question of stable storage and retrieval processes are challenged by the fact that Web-based cultural memory takes on the same nature as the dynamic random access memory that houses it. At some level, both must be continually refreshed, and in the process, bits of information inevitably become scrambled – mutations driven by indeterminacy that can lead to new information that lies just beyond the purview of

human agency, yet becomes continually reinstantiated through improvisative processes. Instability and the possibility of mutation can form the basis for an open-ended cultural memory that is always reforming itself in the present, rather than holding anxiously to its own stereotype.

Ultimately, improvisation is the lifeblood of the Web, just as it is in the rest of everyday life, even if the Web's relation to physicality and the body is largely represented rather than enacted. Even so, if improvisation is an embodied practice, it is not necessarily in the conventional sense of bodily gesture, since electronic means of accessing brain patterns – the body as data source – can also be a transmission medium for the improvisative exchange of meaning, placing pressure on narratives that purport to use improvisation to challenge mind-body dualism at the same time that these same dualisms are reinscribed through an essentialism of bodily gesture.

In recent years, a fundamentally experimentalist orientation to improvisation has concluded by exposing as utterly prosaic its own fundamental process of creation. Whatever experimental potential remains, then, may not any longer consist in the exploration of inner states – a holdover from nineteenth century Romanticism, as both New York School composers of the fifties and their counterparts in Europe recognized, even while committing the intellectual error of tarring their cultural competitors, i.e. bebop, with the Romantic brush as a strategy of difference and identity formation.

However, the philosopher Vladimir Jankélévitch's fifties work on improvisation indicates that a nuanced neo-Romanticism may yet have something to say to us. In Jankélévitch's psychoanalytically oriented framing:

> In improvisation, the too far-sighted man wants to reclaim the innocence of day-to-day life, and to resolve on the wing the small problems born of the indeterminate moment: he thus disturbs his own adaptation to accident and deprives himself of the temporality that ensured his safety.[51]

On this view, improvisation becomes not so much a practice, but an aspiration toward freedom that, even as it is doomed to failure, nonetheless produces a consciousness that continually transgresses limits and resists their imposition. The ideal here, as Jankélévitch understands, is a kind of mobility of identity that manifests itself in a fundamental mobility of temporality, or what the first century Roman rhetorician Quintillian called '*mobilitas animi*' – *mobilitas* as mobility, inconstancy, changeableness of the mind, and of the soul; a dangerous hybrid formed by agency and indeterminacy whose ultimate outcome is a continuous transformation of both Other and Self.

Notes

[1] Gilbert Ryle, 'Improvisation', *Mind, New Series*, 85: 337 (1976), pp. 69–83 (p. 77).

[2] See George Lipsitz, *The Possessive Investment in Whiteness: How White People Profit from Identity Politics* (Philadephia: Temple University Press, 1998).

[3] See Erkki Huhtamo, 'From Cybernation to Interaction: A Contribution to an Archaeology of Interactivity', in *The Digital Dialectic: New Essays on New Media*, ed. Peter Lunenfeld (Cambridge, MA: MIT Press, 1999), pp. 96–110.

[4] Joel Chadabe, *Electric Sound: The Past and Promise of Electronic Music* (Upper Saddle River, NJ: Prentice Hall, 1997), p. 291.

[5] For a fuller discussion of this history, see George E. Lewis, 'Living with Creative Machines: An Improvisor Reflects', in *Afrogeeks: Beyond the Digital Divide*, ed. Anna Everett and Amber J. Wallace (Santa Barbara: Center for Black Studies Research, 2007) pp. 83–99.

[6] Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions*, 2nd edn (Cambridge: Cambridge University Press, 2007), p. 12.

[7] My own activity as composer since the late seventies exemplifies this approach, which I have characterized elsewhere as 'technology-mediated animism'. See George E. Lewis, 'Too Many Notes: Computers, Complexity and Culture in Voyager', *Leonardo Music Journal*, 10 (2000), p. 33–39 (p. 37).

[8] Alfred Schutz, 'Making Music Together: A Study in Social Relationship', in *Schutz, Collected Papers 2: Studies in Social Theory*, ed. Arvid Broderson (The Hague: Martinus Nijhoff, 1964), pp. 159–78.

[9] See <http://www.livealgorithms.org>.

[10] 'Live Algorithms for Music Research Network – Final Report March 2007' (LAM Research Workshop, Goldsmiths College, London, 2007).

[11] Tim Young and Michael Blackwell, 'Live Algorithms', *Artificial Intelligence and Simulation of Behaviour Quarterly*, 122 (Autumn, 2005), pp. 7 and 9 (p. 7).

[12] Tim Young and Michael Blackwell, 'Live Algorithms', p. 7.

[13] Tim Young and Michael Blackwell, 'Live Algorithms', p. 7.

[14] Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions*, p. 12.

[15] See the account of my approach to constructing and interacting with creative machines in George E. Lewis, 'Too Many Notes: Computers, Complexity and Culture in Voyager'.

[16] Alfred Schutz, 'Making Music Together: A Study in Social Relationship', p. 159.

[17] See her discussion, 'Figuring the Human in AI and Robotics', in Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions*, pp. 226–40.

[18] Rodney Brooks and Kurt Andersen, *Robots*, <http://www.studio360.org/yore/show011803.html> [06/08/07].

[19] Jon Cruz, *Culture on the Margins: The Black Diaspora and the Rise of American Cultural Interpretation* (Princeton: Princeton University Press, 1999), p. 43.

[20] Jon Cruz, *Culture on the Margins: The Black Diaspora and the Rise of American Cultural Interpretation*, p. 47.

[21] The industry, of course, ignored the researchers' major caveat, clearly stated in a newspaper headline and in the researchers' own paper, namely that 'The effect on the intelligence of the students in the study, however, barely lasted longer than the echo of the piano chords. The IQ boost dissipated within 15 minutes, the team reported today in the journal Nature.' See Robert Lee Hotz, 'Study Finds That Mozart Music Makes You Smarter: IQ Scores Improved after Students Listened to a Sonata. But the Gain Is Temporary, Researchers Note', *Los Angeles Times*, October 14, 1993. The original paper on this still-controversial matter is Gordon L. Shaw, Francis H. Rauscher and Katherine N. Ky, 'Music and Spatial Task Performance', *Nature*, 365 (1993), p. 611. For one of a number of skeptical scientific views of the Mozart Effect, see Kenneth Steele, et al, 'The Mystery of the Mozart Effect: Failure to Replicate', *Psychological Science*, 10 (1999), pp. 366–68.

[22] See 'Mozart By Design', in David Cope, *Bach by Design* (Centaur Records CRC 2184, 1993).

[23] Suchman's critique of Brooks's notion of the social appears in the chapter on 'Figuring the Human in AI and Robotics', in Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions*, pp. 226–40.

[24] Alfred Schutz, 'Making Music Together: A Study in Social Relationship', p. 177.

[25] Derek Bailey, *Improvisation: Its Nature and Practice in Music* (Ashbourne: Moorland Publishing, 1980).

[26] Barry Guy with George Lewis, *Transcript of Post-Concert Discussion* (Sonic Arts Research Centre, Belfast, Northern Ireland, April 24, 2007).

[27] George E. Lewis, 'Compositions as Software: Interacting with Machine Behavior in Musical Improvisations' (Studio voor Electro-Instrumentale Muziek [STEIM], 1986).

[28] Barry Guy, *Transcript of Post-Concert Discussion*.

[29] Pierre Bourdieu, *Outline of a Theory of Practice*, Cambridge Studies in Social Anthropology, No. 16, trans. Richard Nice (Cambridge and New York: Cambridge University Press, 1977), p. 24.

[30] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 4.

[31] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 78.

[32] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 83.

[33] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 79.

[34] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 79.

[35] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 6.

[36] Pierre Bourdieu, *Outline of a Theory of Practice*, p. 8. For the discussion of Hegel see page 18.

[37] Michel De Certeau, *The Practice of Everyday Life*, trans. Steven Rendell (Berkeley: University of California Press, 1984), p. 57.

[38] Michel De Certeau, *The Practice of Everyday Life*, p. 57.

[39] For example, John Cage's Puritanist call for an improvisation 'characterized by an absence of

intention', in Richard Kostelanetz, *Conversing with Cage* (New York: Routledge, [1987] 2003), p. 222.

[40] For a discussion of dislocations and asymmetries of race and sexual orientation in 1950s America, see Jonathan Katz, 'John Cage's Queer Silence, or How to Avoid Making Matters Worse', *GLQ*, 5:2 (1999), pp. 231–52.

[41] See Hervé Bourges, *The Student Revolt: The Activists Speak*, trans. Ben Brewster (London: Jonathan Cape, 1968). For a more musically centered account, see Vinko Globokar, 'Reflexionen Über Improvisation', in *Improvisation Und Neue Musik: Acht Kongressreferate*, ed. Reinhold Brinkmann (Mainz: Schott, [1972] 1979), pp. 24–41.

[42] Hervé Bourges, *The Student Revolt: The Activists Speak*, p. 103.

[43] See Célestin Deliège, 'Indetermination Et Improvisation', *International Review of the Aesthetics and Sociology of Music*, 2:2 (1971), pp. 155–91.

[44] Mark Hansen, and Ben Rubin, *Listening Post*, <http://www.earstudio.com/projects/listeningpost.html> [19/08/07].

[45] Jacques Attali, *Noise: The Political Economy of Music*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1989), p. 141.

[46] Until quite recently, much of this activity was anonymous by the design of the Wikipedia's owners, but in mid-2007, the WikiScanner site (<http://wikiscanner.virgil.gr/>) developed a way to track the provenance of Wikipedia edits. Unsurprisingly, many of these edits were shown to have come from corporate and governmental sources, including military and security establishments.

[47] Homi K. Bhabha, *The Location of Culture* (London: Routledge, 1994), p. 66.

[48] James Snead, 'On Repetition in Black Culture', *Black American Literature Forum*, 15:4 (1981), pp. 146–54 (p. 147).

[49] James Snead, 'On Repetition in Black Culture', pp. 147;146.

[50] James Snead, 'On Repetition in Black Culture', pp. 147;152.

[51] The original French version reads as follows: 'Dans l'improvisation, l'homme trop prévoyant veut retrouver l'innocence d'une vie au jour le jour et résoudre au vol les problèmes minute nés du hasard minute: il dérange donc sa propre adaptation aux accidents et se prive du délai qui assurait sa sécurité', in Vladimir Jankélévitch, *Liszt: Rhapsodie Et Improvisation* (Paris: Flammarion, [1955] 1998), p. 111. Author's translation.

George E. Lewis is the Case Professor of American Music at Columbia University, and the Director of the Center for Jazz Studies at Columbia. A member of the Association for the Advancement of Creative Musicians (AACM) since 1971, Lewis's work explores electronic and computer music and installations, and notated and improvisative forms. His book *Power Stronger Than Itself: The AACM and American Experimental Music* is forthcoming from the University of Chicago Press in Autumn 2007.