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THE OCULARCENTRIC OBJECTIFICATION OF MUSICAL EMBODIMENT IN COGNITIVE CAPITALISM: COVID-19 AS AN ALLEGORY ON THE MULTIPLE SENSES OF TOUCH

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7.1 Introduction

Triggered by the Covid-19 pandemic, this paper attempts a problematization of the notion of touch in musical performance. The de facto crisis of musical haptics due to physical and social distancing is here considered in the context of a wider phenomenon, namely the ocularcentric objectification of musical embodiment. This reduction of musical embodiment to its visual dimension has been a long, historical process, accelerated by the political economy of cognitive capitalism, including Covid-19 as a catalyst of pre-existent tendencies. By revealing a crisis of touch, the ongoing sanitary crisis invites us to further reflect on the meaning of musical haptics, beyond the visual properties of embodied gestures and beyond tactility in the design of tangible user interfaces. In that sense, Covid-19 becomes a modern allegory on the multiple senses of touch, similar to the allegories of the senses in Flemish Renaissance painting.

7.2 The ocularcentric objectification of embodiment in contemporary musicology

The role of embodiment in musical performance has been emerging as a central theme in the context of musicology's 'performative' and 'embodied cognitive' turns.¹ Tradi-

¹For a good overview of the performative turn in musicology, please refer to Lalitte (2015); Clarke and Cook (2004); and Pace (2017). For the embodied cognitive turn, please refer to Leman (2008).

tionally, the body was considered as a transparent tool for the realization of composers' intentions that were codified in notated musical works; today, it is valued in its own right as the central mediator between matter and mind, between culturally diverse musical phenomena and meanings, and between musicians and listeners alike.

In previous work (Antoniadis, 2013), I have claimed that this focus on embodiment takes specific forms of ocularcentric² objectification, which privilege the visual dimensions of musical performance. I have suggested that the historical development of post-WWII discourses on the performing body follows the general scheme proposed by the cultural anthropologist Jean-Jacques Courtine (2006): 'Where once we had subjects without bodies, now we find bodies without subjects' (p. 166). Vivid examples of this ocularcentric objectification of the body may be found in Stefan Drees' (2011) overview of body discourses in music after 1950, as well as in Harry Lehmann's (2012) philosophical examination of the digital revolution in music.

According to Drees (2011),

the body is set on stage not only in terms of the sonic outcome of performative acts, but also with regard to its visual aspects as artistically relevant *object*. This results in the conception of the body as a medium [...] (p. 13., Translation and italics by the current author.)

Thus, the liberation of the body from the performative restrictions of the past coincides with a liberation from the monopoly of disembodied sonic ideals. Through the visual perception of bodily actions and images, music becomes an affair of the eyes as much as of the ears. For Drees, this implies that musicology can expand to include previously neglected genres, such as installations and performance art. This shift from the bodiless compositional subjectivity of the past to an audiovisual projection of the musical body corresponds to Courtine's objectification schema.

Similarly, and with direct reference to the French curator and art critic Nicolas Bourriaud (2002), Lehmann considers this expansion as the emergence of a 'relational music'. Absolute music is explicitly judged to be irrelevant in a digital culture, and music is understood as forging relations to images, performative actions and words, or what Lehmann (2012) describes as the strategies of 'visualization, theatricalization, semantization' (Visualisierung, Theatralisierung, Semantisierung) (p. 218). A shift from the traditional musicological dichotomy between absolute and programmatic music towards a new one, between visible and invisible music, seems to have emerged.

Moving on towards more systematic approaches to musical embodiment influenced by 4E cognition (embodied, embedded, enactive and extended), this ocularcentric objectification is manifested in the very theories of embodied gestures. I will refer here to Jensenius et al.'s (2010) overview of relevant literature, as well as to Shaun Gallagher's 'integrative theory of gesture' (Gallagher, 2005) and Marc Leman's communication model through corporeal articulations (Leman, 2008). In all these cases, I am interested in the fuzziness between the components of musical gestures that are visually conveyable, representable and communicable (defined as 'body image' by Gallagher), as opposed to their components that are irreducible to internal or external representations (defined as 'body schema').

²The term 'ocularcentric' is adopted here from Jay (1994).

Typically, bodily gesture assumes the role of a link between physical movement and meaning, or as Jensenius et al. (2010) put it:

(..) the notion of gesture somehow blurs the distinction between movement and meaning. Movement denotes physical displacement of an object in space, whereas meaning denotes the mental activation of an experience. The notion of gesture somehow covers both aspects and therefore bypasses the Cartesian divide between matter and mind.
(p. 13)

To explain musical gesture's hybrid nature, Jensenius et al. adopt typologies and methodologies that bear unmistakable iconic elements. For example, the distinction between communicative, control and metaphoric gesture (Jensenius et al., 2010, p. 14), adopted by McNeil's (2000) approach in linguistics, reveals ocularcentric characteristics that permeate these distinctions: Regardless of whether gestures accompany speech to various degrees, according to the *Kendon continuum* (Kendon, 2004) in communicative models, whether they are an integral part of computational systems (the control model of gesture in human-computer interaction), or they are abstracted as musical concepts through metaphor, they are invariably objectified in visual terms. A good example of this objectification is offered by Jensenius et al.'s methods of musical gestures' analysis, which include interlinked spatial and functional components. Spatial components include performance scenes, body positions, and frames of action, similar to Laban's notion of the *kinesphere*, whereas functional components include the well-known distinctions between sound-producing, communicative/expressive, sound-facilitating and sound-accompanying gestures (Cadoz, 1988; Dahl et al., 2010). Strikingly, the visual analysis of gesture is maladapted to the open-ended, nested, coarticulative nature of dynamic musical gestures developing in multiple temporal planes.

The aporias cited above (hybrid nature of gesture as bridging the mental and the physical and its functional compartmentalization and fragmentation) are addressed in Shaun Gallagher's 'integrative theory of gesture', based on a distinction between body image and body schema. His theory is developed through the merging of two families of gesture theories (motor and communicative) and experimentally confirmed through the study of a deafferented subject, Ian Waterman, who despite his lack of proprioception, is able to gesticulate even in a blind condition.

Gallagher (2005) takes an important step away from the ocularcentric constitution of gesture, through the distinction between body image and body schema:

I defined body image as a (sometimes conscious) system of perceptions, attitudes, beliefs, and dispositions pertaining to one's own body. It can be characterized as involving at least three aspects: body percept, body concept, and body affect. Body schema, in contrast, is a system of sensory-motor processes that constantly regulate posture and movement—processes that function without reflective awareness or the necessity of perceptual monitoring. (p. 38)

This distinction becomes fundamental for his integrative theory of expressive gesture, whereby it manifests as a distinction between *morphokinetic* and *topokinetic* properties: the former are related to linguistic, cognitive, communicative, body image properties, whereas the latter are related to proprioception and are controlled by body schema. The fact that Ian Waterman can control morphokinetic (but not topokinetic) properties of

gesture under non-feedback conditions indicates that expressive gestures rely on a completely different mechanism than instrumental or locomotive actions. They are inextricably linked to communicative and linguistic mechanisms that require no proprioceptive or visual guidance, even though they may themselves be visible. As for their topokinetic characteristics—the ones that firmly place gestures inside an objectified visual space of spatial coordinates—they are controlled by the ‘blind’ processes of body schema. In that sense, the relation between gesture and visibility is more convoluted than many taxonomies of gesture indicate. A final touch on the ocularcentric objectification of musical embodiment may be found in Marc Leman’s (2008, pp. 160–162) model of musical communication between performers and listeners, based on what he terms ‘corporeal articulations’. Corporeal articulations are bodily movements that encode the performer’s musical intentions and become transmitted to the listener in the form of biomechanical energy through a mediator: the musical instrument. First, the performer’s biomechanical energy is transferred to the instrument, a part of it transformed into sound and another part bounced back as haptic feedback. This haptic feedback, in combination with sonic and visual feedback, creates a closed loop, which is crucial for the performer’s control of the instrument and for the illusion of body transparency, the fact that the instrument feels like a prosthetic extension proper of the body. Then, the performer transmits the sonic and visual energy to the listener, who can decode its meaning through mirror processes, meaning the imitation, explicit or implicit, of the original corporeal articulations and her mimetic resonance to them. This model allows for great interpretational latitude in that corporeal articulations may carry semantic meanings that are different for the performer and the listener, but universal in their sensory materiality. Crucially, this materiality irreducibly includes the visual modality, which is at least as central as sound in the transmission and meaningful decoding of corporeal articulations between performer and listener. As for touch, it invariably remains attached to the notion of haptic feedback, a fact to be problematized shortly.

7.3 Covid-19 as a catalyst for the ocularcentric rendition of embodied experience into data in cognitive capitalism

The ocularcentric objectification of the musical body is further illuminated through its biopolitical origins and neoliberal mutations, which lead to the political economy described under the rubrics of cognitive capitalism (Moulier Boutang, 2007; Neidich, 2013) and surveillance capitalism (Zuboff, 2019), and accelerated through the ongoing sanitary crisis of Covid-19. We will describe these developments in reverse order, starting with the current crisis and gradually unfolding the wider historical horizon that contains it.

The imposition of biopolitical lockdowns, curfews and socio-physical distancing measures on a global scale since March 2020 has been almost unequivocally justified across the political spectrum as an inevitable necessity in order to relieve systematically underfunded national health systems under neoliberal regimes during the pandemic stress, and to flatten the epidemiological curves to compensate for limited testing and ICU capacities. In the context of the ensuing financial meltdown, art forms based on an economy of physical presence and performer-spectator co-existence, such as live music perfor-

mance and theatre, have entered an existential crisis unprecedented since World War II.³ Performing musicians' financial resources are collapsing, due to both the elimination of income from live concerts and the reinforcement of streaming services' domination, which was already a factor in the growing precarization of professional musicians prior to Covid-19.⁴ The 'wet markets' of wild animals,⁵ epicentres of modern epidemics since the end of the 20th century, are revealed to be intimately linked to the 'wet markets' of music: the immoderate and avaricious proximity of humans and animals, as the generator of *zoonotic diseases*⁶ in the context of the wider ecological crisis, threatens inter-animality (*interanimalité*) and inter-corporeality (*intercorporéité*) (Boccali, 2019 after Michel Foucault) as the foundation of the musical act. The physical co-existence between musicians and listeners/spectators, a 'wet market' of impulses and products of the musical body, of excited emotions, sometimes of tears, sweat and blood, is now though at the disposal of yet another 'wet market': the musical body is appropriated, 'slaughtered' and turned into an object of transaction in the markets of streamed digital data among interconnected brains. The French economist Yann Moulier Boutang (2007) defines this configuration as 'wetware' (brains) and 'netware' (network) the biological and social layers complementing the traditional distinction between software and hardware, in the context of what he terms 'cognitive capitalism' (p. 89).

More generally, Moulier Boutang defines cognitive capitalism as the third stage of capitalism, after mercantilism and industrial capitalism. Its main feature is the appropriation and capture of the multiplicity of human experience by digital forms of capitalism. This general definition is articulated through fifteen different markers (Moulier Boutang, 2007, pp. 85-94), which outline the new relationships between advanced information and communication technologies, new forms of consumption and production defying the patterns of industrial capitalism, and the ubiquitous importance of the appropriation of *tacit or implicit knowledge*, including, for example, the knowledge of how to play an instrument. In his own contribution that is more oriented towards the culture industry, Warren Neidich (2013) defines four basic characteristics of cognitive capitalism, namely, the predominance of knowledge as commodity, the new conflicts between capital and immaterial labour, the new forms of computational machinery and a new relationship between cultural and neural plasticity (p. 15). It is here explicitly claimed that not only does the appropriation of knowledge shape culture and economy, but also that the outputs of this interaction feed back to the very constitution of the human nervous system, producing positive externalities such as innovation and seamless human-machine virtuosity, as well as negative ones, such as the psychopathologies commonly associated with cognitive capitalism (lethargy, stress, depression, tunnel vision and burn out). As far as the political economy of the arts is concerned, these characteristics of cognitive capitalism are usually associated with questions surrounding intellectual property, copyright, open access, intangibles, innovation and entrepreneurship—a good example would be the cur-

³<https://www.culture.gouv.fr/Sites-thematiques/Etudes-et-statistiques/Publications/Collections-de-synthese/Culture-chiffres-2007-2020/L-impact-de-la-crise-du-Covid-19-sur-les-secteurs-culturels> (access 07.01.2021)

⁴<https://www.weforum.org/agenda/2020/05/this-is-how-covid-19-is-affecting-the-music-industry/> (access 07.01.2021)

⁵https://en.wikipedia.org/wiki/Wet_market (access 07.01.2021)

⁶A zoonotic disease (or zoonosis) is an infectious disease that has jumped from a non-human animal to humans. <https://www.who.int/news-room/fact-sheets/detail/zoonoses> (access 20.05.2021)

rent discussions around the exchange value of streaming in relation to the precarization of musicians during Covid-19. Nevertheless, this text aims at a different target, namely at the ‘molecular’ level of musical performance as embodied interaction and how these political economies do and will shape it in the future.

This molecular level of performance-related data takes us to the latest twist of cognitive capitalism, defined by the US social psychologist Shoshana Zuboff (2019) as ‘surveillance capitalism’. In her research over the last 20 years, Zuboff offers a cartography of the unregulated ‘wild west’ of what she calls ‘body rendition’. The term ‘body rendition’ expands on the appropriation of human knowledge by the apparatuses of cognitive capitalism, as Moulrier Boutang and Neidich had already described it. It can be defined as the appropriation of embodied manifestations of human behaviour in the form of a ‘behavioural surplus’ of interaction data, which are used by the GAFAM⁷ corporations for behavioural prediction, modification and eventually control. As Zuboff puts it, ‘ownership of the new means of behavioral modification eclipses ownership of the means of production as the fountainhead of capitalist wealth and power in the twenty-first century’ (Zuboff, 2019, p. 18). The human body is re-imagined as a behaving object to be appropriated for indexing and research, through a variety of data, which range from interaction data in the form of click-rates to GPS location data, movement acceleration data and intimate biometric monitoring.

Before speculating about how such performance-related data may be changing musical performance in the near future, it is important to stress musicians’ central contribution to the very development of these interactive technologies. Crucially enough, the increasing virtuosity and performativity required at the user level through the historic development of human-computer interaction, from command lines to graphical user interfaces and eventually to tangible user interfaces and forms of augmented or virtual reality today (the so-called third wave of human-computer interaction), has been directly influenced by music performance. As the Canadian computer scientist and designer William Buxton (2008) puts it,

the real objective of the system’s designers was to study human-computer interaction, not to make a music system. The key insight of Ken Pulfer, who spearheaded the music project, was that to do this effectively he needed to work with users in some rich and potent application domain. And he further realized that music was a perfect candidate. Musicians had specialized skills, were highly creative, what they did could be generalized to other professions, and perhaps most of all—unlike doctors, lawyers and other “serious” professions—they would be willing to do serious work on a flaky system at all hours of the day and night. (cited in Holland, 2013, p. 3)

Just as today’s users interact in clicks and steps or tweets and notifications, performing musicians have always been interacting in breaths and beats, cues and signs, and the relation between the two is reciprocal, meaning that an increased ‘musicalization’ of cognitive capitalism interfaces and an increased rendition of performance data shape each other. Given the added fact that the most democratized systems today feature combinations of graphic user interfaces on the internet, it becomes clear that an ocularcentric constitution of these musical behavioural data is the norm rather than the exception.

⁷ Acronym standing for ‘Google-Amazon-Facebook-Apple-Microsoft’, as used in the relevant bibliography.

Before moving on to the variety of musicians' responses to Covid-19 and how they affirm the central role of ocularcentrism in the audiovisual cultures of the new era, it is worth stressing the historical background of these developments, namely the fact that the objectification of musical embodiment has been a constant in music history through its technological mediation: technology has always been performance's ontology.

Firstly, one may consider the very biopolitical origins of musical performance itself, through the formalization of disciplinary techniques of the body, the increasing institutionalization of music education, the abstraction and symbolization of the musical act in the form of notation, the emergence of the notion of musical work and the strict hierarchies between composer and performer. Wolfgang Lessing (2014) has vividly shown the shifting meanings of the notion of performing technique, from a disciplinary method enforced from the outside to an internalized self-monitoring, a surveillance technique of the self, and it is here claimed that such developments foreshadow developments in human-computer interaction. Secondly, the history of music technology itself, defined by Douglas Keislar (2009, after Marshall McLuhan) as a series of 'mutilations' and 'augmentations' of materials and agents, affirms that the shock of Covid-19 is nothing but a catalyst for diachronic processes of abstraction and absorption of musical performance in the current apparatuses of cognitive and surveillance capitalism: 'mutilating' the physical co-existence and 'augmenting' its digital liquidization, the current crisis extends the historical process of an 'alchemical transformation', from pure praxis, to symbols, to the registration of physical energies and to their final rendition as digital data. Following the reflections of the French philosopher Jean-Luc Nancy on the ontology of technology, one could consider these diachronic processes of abstraction in musical performance as a 'dehiscence'⁸: not an opposition to nature, but rather a bifurcation of the organic nature of musical performance, the creation of a relationship to itself. In this conception, the body forms a constant between real and virtual wet markets, whether in terms of an animality to be slaughtered or of networked and diffused brains.

7.4 The last unassimilable frontier in cognitive capitalism: an enactive conception of touch

This double crisis in the economy of the performing arts, which are based on physical presence, has provoked a multitude of creative responses, both artistic and technological, which fuel speculation about the future of live music. From solidarity concerts improvised on balconies to the virtual concert halls of established festivals; from the anarchic proliferation on social media of concerts by precarious musicians in their most intimate private spaces to the near monopoly of the teleconference platform *Zoom*, which has become the new wall of our online communications, including rehearsing and teaching; from the struggle against latency in the live transmission of auditory signals to the efforts

⁸Dehiscence indicates the spontaneous splitting in plant structures in order to release their contents, such as seeds or pollen. Here is the original quote by Nancy: 'La technique ne peut être opposée à la nature, elle ne peut même se manifester comme dénaturante ou comme destructrice de la nature qu'à partir de sa provenance naturelle. . . . Cette différence n'est pas une simple distinction de propriétés : elle se présente comme une déhiscence, c'est-à-dire comme le décollement interne d'une même ligne ou d'une même surface (à la manière dont s'ouvrent les anthères d'une fleur).' (J.-L. Nancy, 2020, p. 65)

for a rapid democratization of new interactive technologies and networked performance, various questions arise. What would be musical performance's destiny in a situation of generalized digital mediation of audience-performer interactions? Could a culture of physical and social interaction simulations in a virtual hall ever be a substitute for real experience? Can we distinguish between physical distancing and social distancing? Beyond telematic performances in the form of 'Zoom concerts' with poor image and sound quality, what exactly could the potential integration of physical interaction, for example movement or haptic data, bring about in the context of the Internet of Things (IoT), or of an augmented/virtual reality of the concert? What are the repercussions concerning the remuneration of virtual musicians or the copyright for live concerts that remain online?

My provisional answer to these questions lays bare the ocularcentric constitution of musical performance in the Covid-19 era: an audiovisual abstraction of musical performance, through democratized but low-quality machinery of live signal transmission, or even high-quality virtual concert halls, in the condition of a diffused Bentham *panopticon*⁹ safeguarding a two-way surveillance, both of the musician performing for the invisible crowd of solitary eyes and ears, and of the audience, whose metadata are constantly tracked, indexed, evaluated, deanonymized and sold by the invisible 'data barons' of GAFAM, remains agnostic as to a dimension that interconnects physical presence, intercorporeality, social interaction, sonic vibration, energy circulation and affective potential. This dimension is touch.

One should not rush though into simple conclusions as to potential remedies of this lacuna of touch in the Covid-19 era, including the integration of haptic interactions in the current audiovisual apparatuses or in forms of virtual and augmented reality: the notion of touch I am referring to here encompasses a range of phenomena beyond sheer tangibility, vibration, or haptic/force feedback design for virtual instruments, as explored for example in Papetti and Saitis (2018).

Drawing on my previous work on piano touch from a continental philosophy and radical embodied cognition point of view (Antoniadis, 2021), I attempt a deconstruction of the normative perception of touch as physical contact, through its enactive rethinking in terms of movement coarticulation, multimodal diffusion, limit experiences and body transparency. A final word will be on the relationship between touching and listening, which opens these reflections to the communicative, social and deprivatized aspects of musical performance. In that sense, touch will be considered as a real, non-metaphorical feature that permeates through the communicative chain composer-performer-listener, and as a metonymy for a musical ecology, which is invariably physical, mental and social (Guattari, 1989).

From a philosophical point of view, touching has never been a transparent concept. Jacques Derrida's main contribution in what is a virtual encyclopedia of the philosophy of touching (Derrida, 2000/2005) is the deconstruction of a rudimentary phenomenology: touching is not simply about physical contact with a surface, about tactility, about immediacy and presence, about a specific modality, or a specific sensory organ. Touch is

⁹The panopticon is a type of institutional building and a system of control designed by the English philosopher and social theorist Jeremy Bentham in the 18th century. The concept of the design is to allow all prisoners of an institution to be observed by a single security guard, without the inmates being able to tell whether they are being watched. <https://en.wikipedia.org/wiki/Panopticon>

rather a cascade of mediations in all senses, which render accessible something untouchable. It is about interruption, tact, discreetness and tangents, as opposed to penetration and violence, especially so in the case of palpable effort against the resistance of a limit and its non-invasive transgressing. Paraphrasing Aristotle, Derrida (2005) writes,

(..) but ever since Aristotle suddenly hit on the manifold *aporia* of touch (*aporia*, he said then, and *aporeseie*); ever since he, Aristotle, foresaw all the obscurities of the tangible: touch isn't clear, *ouk estin endelon*, he says furthermore; it's *adelon*, inapparent, obscure, secret, nocturnal. (p. 4)

He further summarizes the qualities of touch that render it obscure, its Aristotelean *aporias*, as follows:

- Is touch a single sense or a group of senses?
- If touch is a single sense, what is the organ of touch?
- Is flesh the organ of touch, or is it the medium, the real organ being inward?
- Is the subject of touch (*haphe*, tactility) the equivalent of sound to listening?
- Are there senses that work from a distance and those that require contact? Or do all senses require some form of contact? (p. 5)

Through this summary, Derrida testifies to the multimodal diffusion of the sense of touch. He indeed comes to respond to Aristotle's *aporias* in the following passage:

(...) though it is obvious or 'clear' [*delon*] that, first, the 'organ' of touch is 'inward' or internal; second, flesh is but the 'medium' of touch; third, 'touch has for its object both what is tangible and what is intangible [*tou haptou kai anaptou*]' (ibid., 424a), one keeps asking oneself what 'internal' signifies, as well as 'medium' or 'intermediary', and above all what an 'intangible' accessible to touch is - a still touchable un-touchable. (p. 5)

The issue of an untouchable becoming touchable is inextricably linked to the experience of a limit:

How to touch upon the untouchable? Distributed among an indefinite number of forms and figures, this question is precisely the obsession haunting a thinking of touch—or thinking as the haunting of touch. We can only touch on a surface, which is to say the skin or thin peel of a limit (and the expressions 'to touch at the limit', 'to touch the limit' irresistibly come back as leitmotifs in many of Nancy's texts that we shall have to interpret). But by definition, limit, limit itself, seems deprived of a body. Limit is not to be touched and does not touch itself; it does not let itself be touched, and steals away at a touch, which either never attains it or trespasses on it forever. (p. 6)

In other words, according to Derrida, touching has an integrated failure of accessing what it actually reaches for, as it by default stops at a non-bodily, non-invaded limit. The destruction of this limit, say through penetration or violence, would immediately signal the destruction of the very notion of touch. The limit is to be transgressed otherwise.¹⁰

¹⁰Beyond the current focus on touch, a complete theory of sense-making in musical listening as transgression of immediate perception is offered in Reybrouck (2017). In this, it is argued that the surpassing of first-hand

Haptic perception has also been a focus of study in radical embodied cognitive science¹¹ through the notion of dynamic touch. In his overview, Anthony Chemero (2009, pp. 154–160) has focused on work by Shockley, Carello, and Turvey (2004), who define a touch-specific affordance. According to this research, common illusions in the perception of objects through touch, such as the size-weight illusion,¹² can be addressed not through a supposed erroneous computation, or judgment of the object's weight as analogous to its size, but through touch-specific information directly accessible in the object. To show this, Amazeen and Turvey (1996) experimented with the so-called tensor objects, which are specially designed objects of identical shape, size and overall weight, where the weight is, however, distributed in different parts of the object. The different distribution of weights produced different moments of inertia when the subjects attempted to wield them, whether having visual contact with them, or even when the objects were occluded and the subjects could only feel them. As a result, the researchers showed that humans perceive correctly the weight through the object's inertial potential as felt on their wrists. The point of Shockley et al. is that this inertial potential, or as they call it *moveability* of an object, is a touch-specific affordance: information available in the environment, into which humans can effectively tap through dynamic touch rather than through visualizations and representations.

Having investigated some basic features of touch (its multimodal diffusion, its mediating, transparent and transcendent nature, and its role in dynamic perception through active exploration), we will now see how it relates to listening as theorized in embodied cognition. Setting aside the fact that direct cross-modal correspondences between touch and sight have already been documented (Blakemore, 2005) in the context of mirror neuron research (Gallese, Fadiga, Fogassi and Rizzolatti, 1996; Rizzolatti, Fadiga, Gallese and Fogassi, 1996; Rizzolatti, 2002), that is, the listener may be feeling touch just because of seeing it, I will rather pursue the ecological idea that touch as action is encoded in the different modalities involved in Marc Leman's communication model already presented in the first section. In light of Leman's theory, an enactive conception of touch allows for its non-metaphorical, energetic transmission to the listener, beyond the narrower sense of touch as the performer's haptic feedback.

First, touch is transmitted in terms of movement coarticulation. The modes of tactile contact in musical performance are hardly decouplable from coarticulated bodily movement and from the design of the instrument as a prosthesis to the performer's body. For example, the normative *legato* touch in piano playing cannot be considered aside from a proper synchronization of the several anatomic parts, which allows for a certain pattern of energy transmission to the hammers and the dampers of the instrument. In that sense, touch is an organic, inextricable part of what Leman calls corporeal articulations.

multimodal perception involves mediate knowledge based on cognitive and affective categories, spanning a continuum between concrete representation and abstract symbolization and involving distinct temporal categories ('in time / outside of time').

¹¹The main feature of radical embodied cognition in relation to (non-radical) embodied cognition is the rejection of mental representations and mental computations as explanatory tools. In their place, radical embodied cognition employs tools from ecological psychology, describing the interactions of organisms and their environment, and dynamic systems theory, describing the way systems are changing over time.

¹²Given two objects of equal mass, people (both children and adults) judge the one with a smaller diameter to be heavier. For example, they judge a comparatively small pound of lead to be heavier than a comparatively large pound of feathers.

Second, we defined touch in terms of its multimodal diffusion. Beyond the stimulation of tactile mechanoreceptors, the qualities of touch as movement are codified in other modalities, predominantly sound and vision. The expanded palette of touch in these actions is not only felt by the performer, through the resistance they induce, but also by the listener, through the transmission of their multimodal blueprint.

Finally, touch in the sense of experiences of a limit is transmitted through the listener's empathetic resonance and mimetic interaction. For example, forms of physical constraining of the performer require physical effort against the imposed resistances, which is literally felt and re-enacted by the listener. Moreover, this social dimension is further amplified by the bodily existence of many listeners in the same physical space, an idea initially developed by Maurice Merleau-Ponty (1964) under the notion of *intercorporeality*. In short, the cross-modal qualities of touch, the visual components of the related actions and the empathetic resonance to the exerted effort do not require a semantic representation of the psychophysical resistances, but create the conditions for a primordial experiencing by the listener.

The enactive definition of touch in terms of movement coarticulation, multimodal diffusion, limit transgression and body transparency offers a model for energy circulation in the 'aesthetics of presence', as formulated from a theatre studies perspective by Erika Fischer-Lichte (2004). In what she calls 'the soft concept' of presence, the sheer appearance of the phenomenal (as opposed to the script-related, semiotic) body of the performer and its coexistence with that of the spectators is a sufficient condition for an effect of presence to arise (one may note here the resonance with Merleau-Ponty's notion of intercorporeality cited above). Later on, it is not the sheer bodily existence, but rather the surrounding physical space and the spectators' active attention, which grants the event an enhanced quality of presence, what she calls a 'hard version' of presence. In the last twist of Fischer-Lichte's argument, a 'radical concept' of presence consists in the activity of actually sensing the embodied mind in its unity and the production and distribution of performative energy to the audience through techniques of the body. She cites the work of the Polish theatre director Jerzy Grotowski and the US theatre director Robert Wilson, whereby the musical qualities of physical movement enable the primordial experience of touch discussed above.

In Grotowski it was the concurrence of impulse and reaction, in Wilson there were the techniques of slow motion, rhythmicization and repetition, which evoke to the spectators the impression of a specific presence (*Gegenwärtigkeit*) and enable them to energize themselves (Fischer-Lichte, 2004, p. 170. Translation by the current author.)

More importantly in relation to the audiovisual abstraction of Covid-19, she concludes that '[a]n aesthetics of the performative is in this sense an aesthetics of presence, not of presence effects, an aesthetics of emergence, not of appearance' (ibid., pp. 171, 175). This sort of presence and energy circulation that pertain to an enactive perception of touch are crucially not representable and not simulable through the screen-based interfaces of cognitive capitalism.

7.5 Conclusion: Zoom walls as a modern allegory on the multiple senses of touch

In the previous sections, an overview of the ocularcentric objectification of musical embodiment was attempted. Starting off with historical and systematic aspects in contemporary musicology, the phenomenon was further situated in the Covid-19 period. This current period functions as a catalyst for weaving together several biopolitical threads in music performance, ranging from the origins of the body's objectification in Western art music to embodiment's appropriation through analogue and digital music technologies. It was argued that amidst these developments, the sense of touch in music remains an unassimilable frontier. Due to its qualities beyond tactility, namely its enactive definition in terms of movement coarticulation, multimodal diffusion, limit transgression and body transparency, it can hardly be reduced to its visual dimension. In this way, it functions as a model for a genuinely anti-visual and anti-representational corporeality in music, which remains multimodal, interactive and dynamic, tailored as a diffused complex system of energy circulation.

The equally decentralized *panoptica* of *Zoom* walls intensify the current sense of touch deprivation in musical performance. Similar to Flemish Renaissance allegories, they evoke the sense of touch through its very lack, capitalizing on mediation and representation.¹³ Unlike the conscious limitation of means nurturing creativity though, as in the case of these allegories, our networked visual reductionism tends to operate as an enforced substitute of embodied experience: rather than attempting to explore ways of re-enacting the sheer range of action and energy circulation that define touch beyond tangibility, these means reveal a lacuna, which paradoxically and profanely renders desirable a 'musical contagion' in the midst of a pandemic.

In one of her responses to Covid-19, Catherine Malabou elaborates on the ambivalence of touch as contagion and its political dimension. Her object of analysis is Giorgio Agamben's notion of the contagion as 'a touch that disenchant and returns to use what the sacred had separated and petrified'¹⁴ (Agamben, 2007 in Malabou, 2020, p. 221). In this sense, the imposed distancing in musical performance is both an act of consecration of touch, a juridico-political abstraction and purification of the musical act in a state of exception, as well as the catalyst for a 're-contamination', for the restoration of the primacy of touch in the musical communicative chain. Malabou's point is that 'exception cannot function without its aura, that is without the accursed share that constitutes it as exceptional. Contagion is transgressive. Instead of repressing it, let's make transgression contagious again' (p. 226). It is exactly the transgressive nature of an enactive notion of touch that becomes palpable through its absence in the current crisis and the promise of its return in the world after.

¹³A telling example is to be found in Jan van Bijlert's masterpiece *A Courtesan Pulling the Ear of a Cat*, *Allegory of the Sense of Touch*. Beyond the central depiction of an act of touch (the playful pulling of the cat's ear by the courtesan), it is rather the future expectation of the cat's violent reaction (communicated through its angry facial expression), as well as the suggestive nudity of the courtesan's back (potentially triggering the fantasy of a tender, sexualized touch), that communicate exclusively through the visual channel a complex experience, essentially multimodal and dynamic. The depiction of touch transgresses the painted surface and tells another story (an allegory, from Greek *allos*=another and *agoria*=story-telling) with potential moralistic overtones. <https://eclecticlight.co/2017/04/15/painting-the-impossible-touch/> (access 07.01.2021)

¹⁴Agamben (2007), *Profanations*, Brooklyn: Zone Books

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