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Documenting acousmatic music interpretation: a developmental framework based on cross self-confrontations

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ABSTRACT

The investigation of acousmatic music interpretation as a distinct activity from composition calls for the investigation of appropriate documentation frameworks. This paper investigates the relevance of cross self-confrontations to capture all dimensions of interpretation of acousmatic music from a dialogical and developmental perspective. This study is the second phase of the project *Interpretation Spatiale des Musiques Electroacoustiques* (ISME), following a theoretical investigation of acousmatic music interpretation. It is based on the automated re-enactment of several performances conducted during an acousmatic interpretation workshop and masterclass at LaBRI-SCRIME in 2015. The analysis presents the practical and theoretical relevance of the framework in relation to the dimensions of acousmatic interpretations conceptualized during the first phase of the project based on semi-structured interviews.

KEYWORDS

Acousmatic music; interpretation; sound projection; documentation framework; cross self-confrontations

Introduction

The concept of acousmatic music emerged in the 1970s, building on the tradition of *musique concrète*. The history of the use of the word acousmatic in a musical context – from a footnote written by Jérôme Peignot (1960, 116) to its embrace by composer François Bayle in the 1970s (see Bayle 1993, 19) – has been discussed many times (e.g. Bayle 1993; Battier 2007; Bonnet 2016). Acousmatic music requires the performance of a fixed media work on a loudspeaker orchestra also called ‘acousmonium’ (see Bayle 2007), especially in the francophone electroacoustic community. Since then, the relevance of the notion of interpretation for a fixed media work as well as its means and goals has been a subject of inquiry, distinct from the compositional process. The word itself is controversial and several composers and performers prefer the terms diffusion, sound projection or spatialization, while others stand by it (see Boutard and Féron 2019). The authors initiated in 2014 the research project *Interpretation Spatiale des Musiques Electroacoustiques* (ISME), which aimed at studying acousmatic interpretation over a two-phased mixed-methods research design. The first phase was based on semi-structured interviews

with twelve francophone composers and performers engaged in this activity. The details of the selection of participants are explained in Féron and Boutard (2015). The second phase consisted in the capture of acousmatic performances followed by confrontations between participants and automated re-enactments of these performances (Féron, Boutard, and Cochard 2017).

From a documentation perspective, the results from the first phase of the ISME project have been presented in Boutard and Féron (2019). From the same perspective, in this paper, the authors analyze the data collected from the second phase based on the outcomes of the first phase. Considering that interpretation of electroacoustic music is a critical vehicle for the transmission of a repertoire (see for example Barrière and Bennett 1998), we propose a documentation framework building on several research instruments in work and music psychology, empirical musicology and information science.

Theoretical background

Documentation framework

From a documentation perspective, we argued (Boutard and Féron 2019) that different goals for acousmatic music documentation may lead to different methodologies. Based on a grounded theory study, which led to two broad categories (i.e. *definition of interpretation* and *organization of interpretation practice*), we proposed eight dimensions for documenting acousmatic music interpretation, namely: (1) musical; (2) technical; (3) anthropological; (4) psychological; (5) social; (6) cultural; (7) linguistic; and (8) ontological. Theory development led to two broad perspectives on documentation. The first – *documentation of acousmatic interpretation as an expertise* – relates to enacted/expressed information (see Bates 2006) in relation, notably, to the dual entity composer/performer and the work to be performed. The second – *documentation of acousmatic interpretation as a profession* – relates to the questioning of acousmatic interpretation as a professional endeavor, notably in relation to the idea of a potential repertoire. Both perspectives build on a specific subset of these dimensions, namely, dimensions 1–4 for the former and dimensions 5–8 for the latter.

The study presented in this paper builds on *documentation of acousmatic interpretation as an expertise*. The goal is to propose an original empirical framework to capture all dimensions (musical, technical, anthropological, and psychological) presented in Boutard and Féron (2019). This framework, which we will detail in the following sections, is grounded in the confrontation methods developed by Clot (2008) and used by Boutard (2016) in the context of mixed music (the combination of instrumental and electroacoustic compositional techniques). It also capitalizes on recent developments in empirical and historical musicology.

Traces of the activity

Generally speaking, Speer and Hutchby (2003) remind us of the long methodological tradition of audio/video recording usage in multiple research domains since the 1940s, in both the collection and analysis across social sciences. In 2006, Knoblauch (2012) stated that video recording was commonly used for data collection and analysis in the

social sciences for twenty years. The field of music research did not part from this tendency and Elschek (1989) argues that, 'from the early days of comparative musicology to the present, technical equipment and recording media have played an outstanding role' (p. 21).

The specific development of stimulated recall techniques (see a description in Dempsey 2010) is critical in the music research context. Stone and Stone (1981) re-contextualize them: 'the feedback interview, though seldom labeled as such, is not a new research strategy [...]. Ethnomusicologists who play back audiotapes, show photographs, present musical instruments for participant comments implicitly, at least, use elements of this technique' (p. 215). Whichever label we use, feedback interviews, self-confrontation interviews and stimulated recall interviews have been used in music research beyond ethnomusicology (e.g. Donin and Theureau 2007; Dempsey 2010; Donin and Féron 2012; Pohjannoro 2014), but also outside of the academic context. For example, in 1985, Cadence Jazz records released the free improvisation record *Borbetomagus* (Borbetomagus 1985) with the free noise trio *Borbetomagus* – Don Dietrich, Donald Miller, and Jim Sauter – accompanied by four musicians: Milo Fine, Tristan Honsinger, Toshinori Kondo, and Peter Kowald. Bob Rusch from Cadence Jazz records conducted on August 16th 1985 an interview with the three members of *Borbetomagus* which was featured on the back cover of the record, also published in 1985. The recording itself was made on October, 18th 1981, approximately four years before the interview. In the middle, Bob Rusch transformed the discussion into a stimulated recall interview based on the whole performance of the third track, a 3'40" improvisation entitled *Concordat No. 14*. Comments were transcribed with timing. Here is an extract of this interview with Bob Rusch (CAD), Jim Sauter (JS) and Donald Miller (DM):

- CAD: Let's listen to 'Concordat 14' again.
 (:03) J.S.: It's just starting to evolve. These improvisations start and someone would take a direction, in this case it was Honsinger and everyone's sort of peppering what he's laying down and it starts to evolve, in this case it evolves very quickly and another direction comes in.
 (:27) D.M.: I'm pulling the treble strings up from the bridge and bowing with the violin bow and I'm wrenching the A and B strings about one inch from where they are normally and bowing it a few inches beneath that and it's all going through a distortion box as well.

This excerpt shows that stimulated recall techniques can bring up descriptive statements of the activity at multiple levels of abstraction, either general performance ideas and trends (i.e. JS) or very specific actions (i.e. DM). In all cases, it usually focuses on what is done and documented in the recording. As we will discuss, we are interested in documenting more than what is done, which calls for a different framework of data collection.

Clarke (2004) comments on the data used in this tradition of enquiry, underlining that

the data for this kind of approach are usually of two kinds: first, a sound recording of one or more performances, and second, a sound recording of the commentary by one or more of the original performers, or another commentator. The commentary is often made by a person who listens to the original sound recording of the performance, stopping the recording as often as he or she likes to make whatever comments are appropriate, and possibly doing so on more than one occasion. (p. 91)

In the context of compositional processes, Donin and Theureau (2007) bring another dimension to the traces of the activity and resort to what they call ‘situation simulation interview’ – a methodology with roots in situated action (see Donin and Theureau 2007). During these interviews, they do not limit their research instrument to the use of audio and video recordings but also bring in elements traditionally used in the domain of sketch studies and beyond, using all traces of the compositional activity: ‘[...] Donin brought the study of the creative process from the quiet, well-ordered professional archive to the busy and often messy environment of the composer’s studio’ (Sallis 2015, 134).

Confrontation methods

Confrontations methods in music research have taken multiple forms relevant to our framework. Schober and Spiro (2014), studying shared understanding during jazz performances, adopt a model of confrontations where participants are confronted individually (and diachronically for each participant in the course of two interviews) with recordings of the activity, namely, a duet improvisation session. This model of simple self-confrontation of a collective activity is complemented by an external expert, providing feedback in the same fashion.

Some forms of stimulated recall techniques build on cross-confrontations between several participants. In this context the participants comment conjointly while confronted with the recording of the activity. Some of these have also been used outside of academia. For example, in the context of the Experimental Sound Studio’s Quarantine Concerts series, Ken Vandermark (KV) analyses elements of Claire Rousay’s (CR) performance during an interview with the musician (Vandermark and Rousay 2020), and plays back the video of the performance according to a segmentation that he conceptualized. Here is an extract of the interview (55’54’’) emphasizing that segmentation process and the reaction of participants with non-verbal cues (we use the symbol § in all transcriptions to indicate the synchronization of verbal content and physical gestures):

KV: [...] there is this really nice moment between these two quote-unquote parts, as I have designated them, where you can see you thinking, at least it’s my §perception§ of it, like ‘do I go, continue with this? do I continue with aspects of this? ...’ and there is a moment where it almost becomes like a separate piece but it relies on this three tones pattern with a couple of metallic objects and then this bell. And that keeps going for a while, It’s.. this is only a couple minutes long but it is super effective. [...]

§CR nods§

This second example provides us with another hint at the benefits of a cross-confrontation technique. KV expresses something beyond what is done, discussing what could have been done, which in this case may be fostered by the context of free improvisation, rather than the hermeneutic activities of the two protagonists. The specific method of cross self-confrontations (Clot 2008), which we use in our study, systematizes the capture of the activity beyond what is *realized*. Clot and Faïta (2000, 35) refer to this as the *real* of the activity. Kostulski and Kloetzer (2014) put it this way: ‘according to this method, we consider what the subject is actually doing, as well as the dynamic of

possibilities and impossibilities – objective and subjective, individual and collective – that lead to the observable results of the work’ (p. 58).

From a developmental perspective, we may take a last example outside of the academic context (even though the instigator is not an outsider) of an interaction method between participants: the series *Play – Talk – Play* instigated by Rodrigo Constanzo and Angela Guyton (Constanzo 2020), which title speaks for itself. This method, which does not include recording elements, reminds us of the first step of Schober and Spiro (2014) – i.e. a non-mediated and immediate a posteriori reflection on the activity prior to the stimulated recall – but, in this case, with a continuation of the action (rather than a stimulated recall follow-up) which seems to integrate the idea of an interplay of developmental and dialogical epistemologies (see Engeström 2014). Discussions, in this context, touch on the specific part of the performance that just happened, as well as comparisons to other situations of improvisation that one of the participants may have been confronted to during a previous performance (e.g. Audrey Chen in the first episode of the series). Engeström (2014) notes that,

based on dialogicality, any situation is constituted of a ‘here-and-now’ and a ‘there-and-then’ aspect of the encounter. This constitution means that a ‘here-and-now’ situation (a peculiar view to interaction) is criss-crossed by other places and temporalities, as well as by absent third parties (a peculiar view to dialogue). (p. 122)

Cross self-confrontations, as proposed by Clot (2008) in the domain of work psychology, are grounded in the cultural-historical development perspective of Vygotsky (see Cahour and Licoppe 2010, p. h) and in Bakhtin’s notion of genre, generalized to all activities (see Clot and Faïta 2000). Marková (1994, 27), notably, has discussed the complementarity of the work of Vygotsky and Bakhtin. Cross self-confrontations aim at developing controversies between participants (see Kostulski and Kloetzer 2014), where the dialogical movement between the professional genre and the individual style of the activity brings to light the *real* of the activity (Clot and Faïta 2000).

Position

Our study’s primary instrument is the framework of cross self-confrontations. Clot and Leplat (2005, 307) mention that the documents used in these confrontations may not be video recordings. Keeping in mind the extension of document types presented by Donin and Theureau (2007) in the context of compositional processes, we based our confrontations on mixing console recordings. In this context, participants may not only discuss the activity as recorded in the automation data but also act upon the traces of the activity by manipulating the sliders at the console, interacting with the automation in real-time, as we will see in the analysis.

Finally, building on the protocol of Schober and Spiro (2014), we collected an external expert’s feedback on performances. We used these commentaries as material for interaction with participants, when needed, during confrontations, as well as during analysis for highlighting certain decisions from participants. This framework’s outcome will be discussed in relation to its relevance for the documentation of acousmatic interpretation, following Boutard and Féron’s (2019) conceptualization.

Data collection

Context

The experiment took place in a 98 square feet room of the LaBRI-SCRIME (Université de Bordeaux) in June 2015. The specific setup of the acousmonium was based on the configuration designed by the French musical company MOTUS and consisting at least of two rings of speakers and diagonals of filtered speakers (Figure 1). Four electroacoustic pieces were selected for this study: Piece 1) *Rebonds* by Jean Michel Rivet (5'53''); Piece 2) extract from *Luminétude* by Ivo Malec (2'49''); Piece 3) *Nouvelles des voyageurs* by Laurent Soulié (8'16''); and Piece 4) the *Sanctus* from Michel Chion's Requiem (2'31''). The selection criteria included the possibility to have composers attending a round table on interpretation, and, for the repertoire, a list was proposed, at our request, by the guest expert for the masterclass (see below). All excerpts and pieces were subsequently reviewed independently by two composers/performers, the goal being to select excerpts and pieces for the study with a potential to foster various interpretation strategies.

The four performers – Edgard Nicouleau (EN), Jérôme Marchand (JM), François Dumeaux (FD) and Christophe Ratier (CR) – were selected according to convenience and purposive sampling, which introduced a limitation with an all-male configuration. The scientific protocol, the mode of selection for the pieces and the participants, as well as the implementation of the technical set-up are detailed in Féron, Boutard, and Cochard (2017) but Table 1 proposes an overview of the main steps.

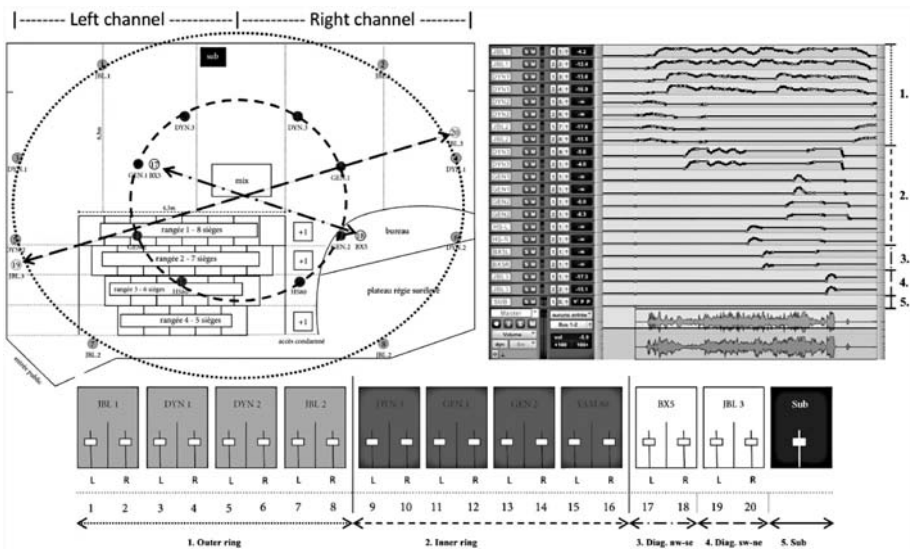


Figure 1. Setup for the acousmonium speakers (top left), the mixing console (bottom), and an example of a recording of the activity at the console (top right): in dotted line, the outer ring; in dashed line, the inner ring; in wider dashed lines, the two filtered diagonals.

Table 1. Stages in the implementation of the data collection protocol.

Winter 2015	Selection of the four performers.
April 2015	Selection of the four musical pieces in collaboration with electroacoustic composers.
11 may 2015	Transmission of the pieces to the performers.
1 and 2 June 2015	Acousmonium installation and tuning.
3 June 2015	Rehearsal sessions for each performer.
4 June 2015	Live performance of the pieces during a concert-workshop with audience.
5 June 2015	Self and cross confrontations sessions without audience.

Technological setup

The first stage consists of the quantitative data collection of mixing console actions recording data. This type of approach parallels the research in gesture data capture (Jensenius et al. 2007) as well as computational and comparative musicology (Cook 2004; Rink, Spiro, and Gold 2013). Clarke (2004) reminds us of the technological evolution of performance capture:

[...] a survey of the existing empirical work on performance demonstrates that by far the largest body of research has examined data derived from the direct measurement of keyboard performances. Until the mid-1980s, this was only possible by building a specialized technical setup [...], or by using synthesizer keyboards. From the early 1980s, synthesizer keyboards could be connected to tone generators and computers using a specific digital communication protocol called the Musical Instrument Digital Interface (MIDI), making it possible to record and store on a computer all the keyboard events of a performance. (p. 79)

In parallel, according to Knowles and Hewitt (2012),

the major shifts in the relationship between recording studio techniques and live performance can be seen to have occurred following the introduction and broad uptake of MIDI communications protocol and affordable digital audio technologies in the 1980s. [...] In the realm of live sound production, digital mixing consoles became commonplace throughout the late 1990s, providing the opportunity to store, recall and automate mix and processing setups via stored scenes and/or time based automation.

Similarly to studies of keyboard performance (see Bernays and Traube 2014), the data from the digital mixing console in relation to each speaker were thus recorded for each performance as shown in Figure 1 (top right). Because the pieces are fixed media and therefore have a specific duration, a direct comparison of interpretations for one piece can be performed quantitatively in relation to actions at the mixing console, globally or for each pair of speakers, but recording of console data also allows for the re-enactment of the performance with automation techniques. The performer may thus become a listener of her or his own interpretation.

For the framework of cross self-confrontations, 2 groups of 2 performers were formed. In each group, musicians performed in public the same two works during the workshop-concert. EN and JM performed the pieces 1 (i.e. Rivet) and 2 (i.e. Malec); FD and CR performed the pieces 3 (i.e. Soulié) and 4 (i.e. Chion). Nathanaëlle Raboisson (NR), a recognized expert on acousmatic interpretation and a member of the MOTUS musical company, was invited to participate in the workshop-concert in the morning and to give a masterclass to the students of the Bordeaux conservatoire in the afternoon. NR provided us with precise feedback with related timing collected in real time during performances. While not initially part of the methodological framework, it was decided to

integrate this feedback in the research process. The feedback was thus used during confrontation interviews as input for verbalization requests from the researchers, and its methodological relevance will be discussed in the following sections.

Automated re-enactment during confrontations

While the first phase of data collection consisted of the technical recording of the performances (quantitative data), the second phase consisted of conducting the confrontations interviews (qualitative data). Technically speaking, confrontations consisted of re-performing automatically their performance, just like a player piano, on the acousmonium in the same performance hall and on the exact same loudspeaker orchestra using the console data collected during the first phase. Performers were also able to interact with the mixing console in order to explain a specific point of interpretation as well as to go back or forward in time. First, during self-confrontations, performers were confronted with their own performance and asked to comment on it. At this stage, the researchers could build on the expert's feedback to collect comments on specific actions. Second, during cross self-confrontations, both performers of the same group commented on each performance, the performer leading the comment being the one that is not performing in the recording (that is to say, one performer commented on the other performer's performance while the other one reacted to the comments). [Table 2](#) provides the duration of all self-confrontations and cross self-confrontations.

During cross self-confrontations, researchers had a minimum of interactions with the participants aiming at keeping the discourse at the level of the expertise. The self-confrontation and cross self-confrontations were video-recorded with cameras positioned on both side of the performers in order to record the sliders of the console and the gestures of performers when they comment or act on the performances ([Figure 2](#)). A stereo pair was added in front of the performers to capture verbal exchanges.

Analysis

Foreword

The goal of this paper is to analyze the relevance of this methodological framework in relation to the dimensions of acousmatic interpretation (Boutard and Féron 2019). We will thus not go into the details of the analysis in relation to the quantitative data, which will be the subject of a different publication, but focus on several paradigmatic interactions between participants pertaining to our conceptual framework. We related the dimensions of what we called *documentation of interpretation as expertise* (Boutard and Féron 2019) in relation to the structure of human activity in activity theory: activity;

Table 2. Duration of self-confrontations and cross self-confrontations interviews (first name is the interview leader).

Participants	Piece 1	Piece 2	Participants	Piece 3	Piece 4
EN	19'15"	20'40"	CR	13'10"	12'10"
JM	15'25"	16'25"	FD	12'40"	11'55"
EN & JM	23'00"	10'40"	CR & FD	19'45"	10'15"
JM & EN	16'20"	12'20"	FD & CR	16'40"	8'30"



Figure 2. The two camera angles used during cross self-confrontations. Christophe Ratier (standing at the console) is discussing with François Dumeaux (sitting in the front row).

actions; and operations. We argued that ‘while the *D1* musical dimension of interpretation describes the general activity in relation to its motive, the *D2* technical dimension of interpretation primarily relates to actions, those goal-oriented conscious tasks that performers realize in the course of the activity of acousmatic interpretation’ (p. 110).

We further related the interplay between actions and operations (which are typically not conscious and may emerge as improvisations, see Kaptelinin and Nardi 2009, 63) to the *D3* anthropological dimension and *D4* psychological dimension.

Authors such as Bødker (1996) have shown the relevance of video analysis, from an activity theory perspective, for studying artifacts in use in terms of break points and focus shifts in the activity. Our specific interest is in the manifestations of genre and style from a developmental perspective, following the method of cross self-confrontations. Still, we are attentive to the expressions of the activity in terms of actions and operations in relation to the tool, which is, in this case, the acousmonium. While not focusing on the instrumental genesis, in the sense given by Rabardel and Bourmaud (2003), we acknowledge the critical importance of the tool from a developmental perspective. This position is represented in our framework by the use of the console during confrontations, that is to say, as a tool for re-enactment as much as a tool for embodied commentaries.

Self-confrontations

Intentions

Building on the traces of their activity, the performers are able to describe their intent in relation to the *D1* musical dimension, as operationalized in the *D2* technical dimension. EN, for example, points at a specific moment of his performance of Malec’s work, and states: ‘here, I tried to “oppress”, [...] to bring it back to the [inner] ring while maintaining the initial volume [...]’.¹ Looking at the console recording (see Figure 3) we can trace his gesture. EN has been quite active on the front side of the outer ring, as he describes at the beginning of the replay. At the moment that he stops the recording, at about 0 min 45 s from the beginning of the work, he had brought the GEN2 pair up (during the performance), followed by the GEN1 pair (the other two pairs of the inner ring, that is to say the front and back pairs, were already up at a stable dynamic level) while slowly decreasing the front pairs of the outer ring. This example shows a basic mapping between a verbalization and the operationalization of the performance actions. It also shows the micromanagement operations, epitomized by the constant

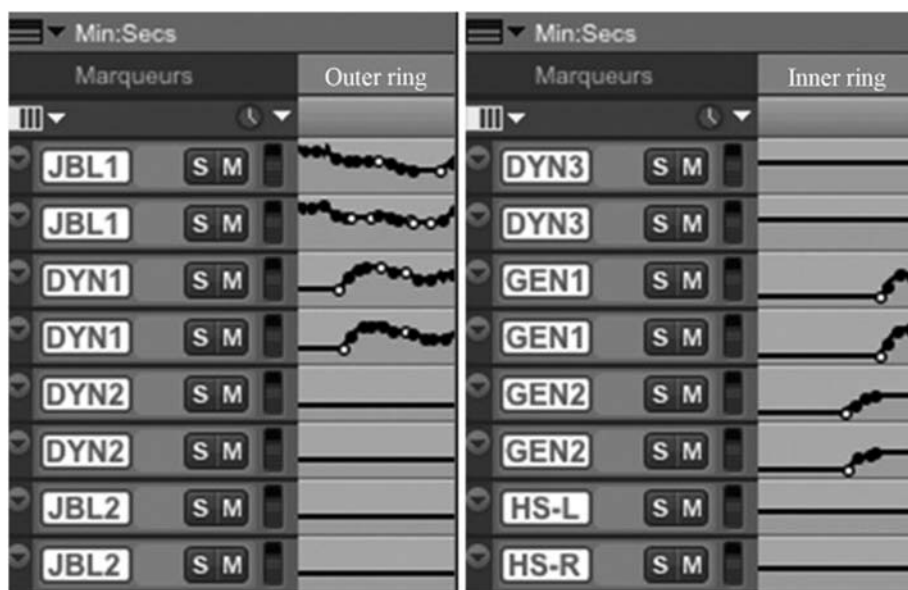


Figure 3. Interpretation of Malec’s work by EN from 0 min 36 s to 0 min 45 s: Outer ring on the left, inner ring on the right.

adjustments and rectifications of the trajectories of each speaker pair, that only the presence of the quantitative data may track.

EN, in a traditional acousmatic fashion, works in pairs, maintaining the original stereo content of the piece. This position is a positive representation of the notion of respect of the work within the D1 musical dimension. The opposite view (a personal reading of a work) is exemplified by JM, who decides to modify the balance of the stereo content in his interpretation of Rivet’s piece (see [Figure 4](#)), building, notably, on a literal interpretation of the audio content (with direct references to a basketball game). JM couples the JBL1 and DYN1 left speakers on the one hand and the JBL1 and DYN1 right speakers on the other hand (and similarly with the pairs of DYN2 and JBL2), creating a panning movement during the quiet transition between two parts of the piece.

Interpretative mistakes

The second element that the self-confrontations emphasize is the verbalization of mistakes made by performers. FD, in relation to his performance of Soulié’s piece, for example, states: ‘and here I go back to playing with these little cracks, but I didn’t do it when they started, only after the second or the third. [...] that is a little bit of a shame’. Verbalizations of mistakes are common during the four self-confrontations.

Still discussing mistakes, EN makes explicit references to another aspect of the performance that relates to the *D3 anthropological dimension*, which documents the technique from an anthropological perspective including human and non-human agents. Commenting on his performance of Malec’s piece, EN states: ‘too late, here. I was running behind. [...] usually, I note this. I note “8 minutes 20” or something similar’.

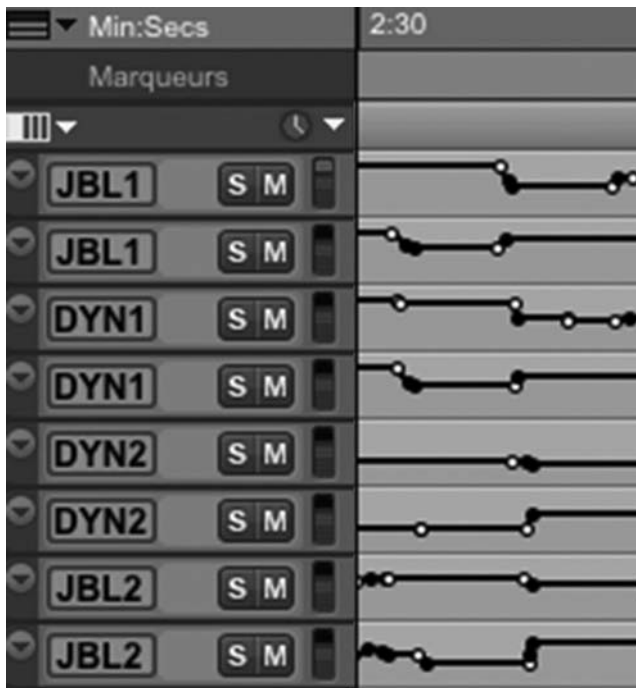


Figure 4. JM's interpretation of Rivet's work on the outer ring from 2 min 30 s to 2 min 55 s.

Other performers make converging statements but rather focus on their use of the visualization of the waveform rather than precise timing instructions taking the form of a performance score. These choices represent each performer's approach to the instrumentalization (see Rabardel and Bourmaud 2003) of the acousmonium, specifically in relation to information technologies.

Cross self-confrontations

Genre and style

Cross self-confrontations bring to light the elements of interpretation across multiple dimensions. For example, FD and CR discuss their respective interpretation in relation to the *D1 musical dimension*, especially in relation to the idea of respecting the work as it is composed (already discussed in relation to self-confrontations). FD, as such adhering to a more traditional idea of acousmatic interpretation, is questioning CR's choices in terms of general dynamics, believing that CR's interpretation creates dynamics profiles that are not necessarily present in the original piece. FD's comment on CR's motive (D1-related) is thus built upon an analysis of actions relating to the *D2 technical dimension*. The elements of interpretation by CR show an interesting negotiation between the formal and timbral content of the work on one hand and the interpretative intent of the performer. In addition, this topic emerges independently both during the cross self-confrontation and in the feedback collected from the expert. During FD's review of CR's performance of Soulié's work, FD starts the discussion:

- FD: [...] this is very filtered.
 CR: yes
 [...]
 CR: starting here, this is what I wanted, to really filter it.
 [...]
 CR: because there is actually a little bit of that [already in the piece].
 FD: yes, it's true, it's true.
 CR: so, the idea is to accentuate that [...]

The external expert NR does a similar interpretation of his choice, stating that it is adapted to the sound of the work but it could also be viewed as a misrepresentation of the work because it doesn't support the less filtered part of the sound present in the work (on the contrary, NR acknowledged a relevant use of the diagonals of filtered speakers at approximately 4 min 20 s). This example shows a good convergence in the analysis between all stakeholders, even though NR takes a more critical stance informed by her position on interpretation, that is to say, more precisely, her perspective on the *D1 musical dimension* and its constitutive notion of *respect of the work*.

FD and CR's confrontation also highlight what is considered to be similar in the interpretations, showing furthermore the construction in the notion of similarity. Both performers comment on the last part of the work, stopping the replay at converging moments. While FD stops to comment at 7 min 57 s in Soulié's work, during his self-confrontation, CR, commenting on FD's interpretation, stops the replay a little bit before that at about 7 min 50 s:

- CR: you are still accompanying the scratchings
 FD: yes
 CR: that is nice, it really brings it to the front. And I don't know, there is ... it is a little bit like me, you open everything.
 FD: yes, we have more or less the same choices for the end.

The quantitative data help us contextualize these statements and the 'more or less'. The combination of the quantitative and the qualitative data is useful for defining a segment in this specific work (about 30 seconds long) according to acousmatic interpretation gestures. The recording of their actions, displayed in [Figure 5](#), shows that both interpretations until around 8 min have a rather stable use of both rings with 'full' opening, converging with CR's analysis. At the time FD stops the replay though, CR's interpretation had started sharp gestures to bring a focus on the front while FD kept a similar spatial opening. The wave form on the other hand – not pictured here – shows a widely different level in both interpretations (FD had previously commented on the general level of CR's performance, which he considered to be too high).

This exchange between FD and CR and the related data is a good example of the notion of style and genre of the activity, as defined by Clot and Faïta (2000). While the general goal seems to proceed from a common understanding of the piece and what it entails in terms of interpretation, that is to say at the level of the genre, the individual styles of the performers bring different interpretative strategies that are visible, to a certain extent, in the quantitative data.

A discussion between EN and JM about the interpretation of Rivet's piece is an opposite example. EN, on the one hand, focuses on the classical dimensions of interpretation of

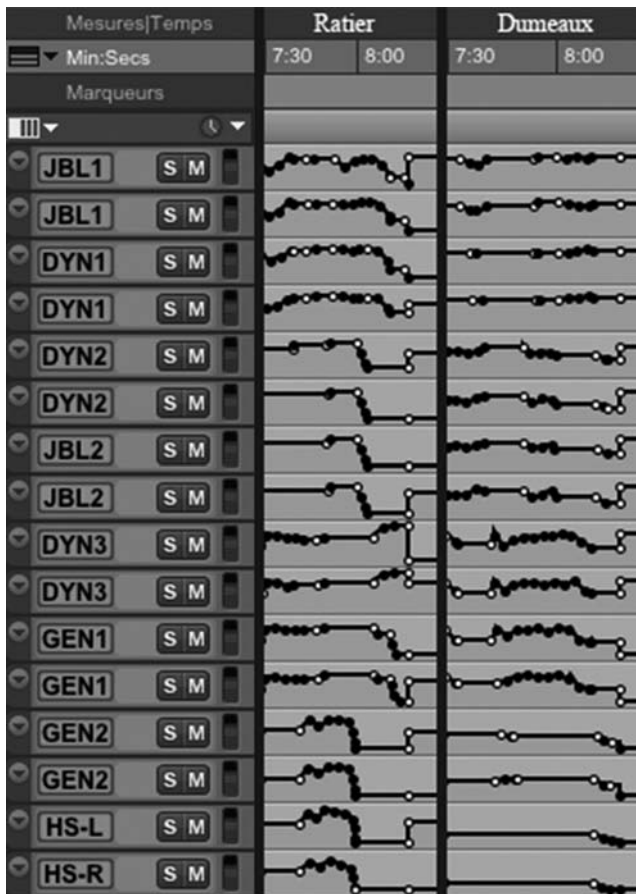


Figure 5. Comparison of interpretation of Soulié's work by FD and CR from 7 min 30 s to the end (limited to both speaker rings)

acousmatic music, relating thus to the *D2 technical dimension*. JM, on the other hand, focuses on the metaphorical elements of the work.

EN: I try to disconnect from this hyper-anecdotal dimension [a reference to JM's use of the reference of the work to a basketball game to spatialize the sound as if he were at the center of the game] and really go with timbre, rhythm, and spatialization.

However, during the discussion of JM's interpretation, similarities are discussed:

EN: It's good. You don't move much and it's enough.

JM: Well, it's a little bit like you.

EN: Well, at this moment, \$I'm doing this, at this moment.\$ I'm fiddling [*bricoler*]
SEN reenacts small scale simultaneous back and forth movements at the consoles

JM: Yes but during the next part, what you were saying about masking.

EN: Yes, yes.

JM: [...] We are on the same principles [*dispositif*] but not the same part.

In this exchange, we switch from the idea of style and genre in relation to an interpretative gesture for a specific part of the work to the exemplification of interpretation

strategies relating uniquely to the *D2 technical dimension*, moving away from the *D1 musical dimension*.

Expertise

Two of the participants, namely EN and FD, had some teaching experience at the time of the confrontations. The expertise discrepancy between EN and JM is probably larger in comparison to the other pair. This translates in the cross self-confrontations in several ways. First, EN has a tendency to take the lead even in situations where JM is supposed to be driving the confrontation (i.e. during the discussion of EN's interpretation). Second, the modalities of the confrontation involve more gestures directly at the console, complementing the verbal description. An example during the cross self-confrontation of JM commenting EN's performance of Rivet's piece brings both elements together and turns the confrontation into a pedagogical discourse, which EN is familiar with:

EN asks JM to stop the replay.

EN:

What I am trying to do in these movements, is to find a point of equilibrium §where, when I am here§, as soon as I move something, it will emerge.

§EN comes to the console and acts on the volume of the JBL1 pair while the playback is stopped§

JM:

yes, yes, I totally understand.EN:

[...] And so after that, I had several §small actions like that§, being very minimal in the movement, but that minimal movement is able to produce a contrast.

§EN re-enacts the moves at the console§

EN uses the console to emphasize his discourse regularly during the interviews as compared to the others. EN feels the need to bring the discourse back to the verbalization of operations. In doing so, he pushes forward the idea of expertise and the link between actions and operations, as well as, in parallel, between the *D2 technical dimension* and the *D3 anthropological dimension*.

The use of video, in this regard, is critical as it emphasizes reflexivity, as defined by Knoblauch (2012) in the context of video analysis:

by reflexivity we do not mean that actions are reflected consciously. On the contrary, most studies do address what may be called routinised, implicit knowledge or social practice. Reflexivity means that actors do not only act but also 'indicate', 'frame' or 'contextualise' how their action is to be understood and how they have interpreted a prior action to which they are responding. (p. 75)

Video allows for this contextualization, in relation to cross self-confrontations, in a situation where participants may engage with the tool and the data. Knoblauch (2012) adds that,

the possibility of interpreters and analysts making use of reflexivity does not only demand that they know the culture they are studying. It also demands that they understand situated action, rather than an a priori theory of communicative action. Such an understanding also means that analysts who have not participated in the phenomenon that was recorded are able to make sense of what is going on in the actions and interactions. (p. 75)

The embodied demonstration of EN brings a relevant justification for thinking about reflexivity not only in relation to the analysis, but also in relation to a documentation framework from a cultural-historical development perspective, where actors of the domain may build on previous confrontations and related data.

Affects

During the same cross self-confrontation, JM brings the *D4 psychological dimension* in the discussion:

- JM: You don't really like this piece? Did you get bored a little bit?
 EN: It is a difficult piece in terms of diffusion. So, the first time I listened to it in studio, I thought 'ah great, there are beautiful contrasts of timbre. It is going to go in every direction', I am going to have fun. But I didn't think about the rhythmic problems, the dynamic elements that he put in it. Then [...] I thought 'it's not going to be that easy'.

These elements of potential fun or boredom in the interpretation of acousmatic music and how they translate into the actual performance are the types of notions emphasized by the D4 dimension, which depicts the interplay between affect and activity (see Barbier 2017). Boutard and Féron (2019) mention that this dimension is not the most prominent in their data. Similarly, in this study, statements relating to D4 are rare but apply to different levels. While the previous example relates to the interpretation of the whole piece, CR discussing with FD his interpretation of Soulié's *Nouvelles des voyageurs* will emphasize feeling temporarily unsettled after an interpretation mistake:

- CR: (laughs) failed.
 FD: I think I may have done it too.
 CR: Yes, I think it unsettled [déstabilisé] me, this failure.

This very simple example shows the continuous interplay between affect and action, modifying in some way the course of the performance.

Towards a developmental documentation framework

When Donald Miller and Jim Sauter commented on the recording of Borbetomagus' free improvisation during the stimulated recall interview, they discussed what was done. The cross self-confrontations bring a dialogical and developmental perspective to the study of the activity. The activity is thus not limited to what is done, but also includes what was not done and what should or could have been done (see Clot and Faïta 2000). The confrontation method provides, systematically, the grounds for the verbalization of this 'thickness' (a term used by Clot to portray this broadening of the scope of the activity aiming at documenting the *real* as opposed to the *realized*). It appears in multiple forms, whether it is explicit during non-axiological comparative statements – for example, EN stating 'ok, here you broaden it. Here, I am already louder, at this moment' – or implicit during axiological statements – for example EN affirming, during the same cross self-confrontation, 'yes, here, it works fine. This broadening to the outer ring, this way, while being louder. It works fine'.

The data analysis provides exemplifications of this 'thickness' in relation to all dimensions of the conceptual framework of Boutard and Féron (2019) for the documentation of

acousmatic interpretation as an expertise, namely, D1, D2, D3 and D4 – the last one being the less directly represented in the data (see the discussion between JM and EN presented above). While aiming at the same goal (in relation to the constitutive elements of the *D1 musical dimension*), actions (as documented in the *D2 technical dimension*) may be different according to each performer. This is exemplified in the aforementioned discussion between FD and CR about sharing the same general idea of the interpretation for a specific part of a work, while the implementation portrayed in the console data shows a more complex reality in terms of actions and operations. Another example of this ‘thickness’, in direct relation with D1, involves a basic relation to dynamics; JM during the cross self-confrontations, discussing EN’s performance of Rivet’s piece, states: ‘I think the piece can adapt as long as you respect this kind of [sound] pressure that starts building here; in my opinion, it works. We did two very different things, or rather quite different, and both work’.

The relevance of our framework in relation to a developmental perspective is best exemplified by an interaction between EN and JM during a cross self-confrontation. EN, initially not looking at the console, reacts to JM’s construction of a new panning effect (i.e. uncoupling two speaker pairs, as discussed previously, while not using the two filtered diagonals in the acousmonium setup. See [Figure 4](#)). He looks at the sliders, sees the configuration, smiles and then replays the segment. He nods briefly and comments: ‘it works fine. It’s a choice [*parti pris*]. By subtraction, like that, it works fine. [...] During the decrescendo’. Then, after the dynamics inversion of the diagonal, during the transition, EN nods more insistently and adds: ‘It’s a good direction [*piste*] this. [...] but it contradicts the composer. [...] you add something that is compositional [*de l’ordre de l’écriture*]’. EN and JM discuss then what is and what is not allowed in acousmatic interpretation, taking NR as a reference point, as she, according to them, would disagree with JM’s choice. On the contrary, NR appreciated JM’s transition, while she regretted that EN did not mark it, in some way, during his own interpretation. This exchange between EN and JM leads EN to a statement that resonates with our framework’s choice. After a short pause, he states: ‘It’s an idea that I would appropriate, you see ... if I had to do it again [...]’.

Kostulski and Kloetzer (2014) emphasize the developmental function of dialogical thinking. Kostulski (as cited in Kostulski and Kloetzer 2014, 60) defined controversies as ‘... a form of discursive activity, more precisely a deliberative and reciprocal activity that deploys opposing arguments in dialogue – arguments with the characteristic of being drawn from generic and historical themes within the profession’. The controversy between JM and EN is a paradigmatic example of this argument. The role of NR in this controversy, is that of an embodiment of the genre, that is to say that, in this discussion, NR, also reinforced by the prior masterclass, epitomizes, for JM and EN, accurate acousmatic interpretation in terms of goals and ensuing actions.

The addition of external feedback in the analysis has several benefits for the proposed framework. First, it operates as a guide for the stimulated recall interview, while keeping the discourse within the context of the expertise. Second, it demonstrates, by comparison, the analytical abilities of participants at multiple degrees of expertise during confrontations.² As opposed to Schober and Spiro (2014), we do not provide these comments directly to the performers for validation or invalidation because we are not interested in the formal evaluation of individual intentions. Rather, we use the expert’s feedback as another tool to investigate the genre and style of the activity, similarly to the way Clot and Faïta (2000, 30)

propose to use a panel of experts to select video material for the confrontations. As Clot (1993) puts it, 'there is no better safeguard against the fetishism of an intentional subjectivity than the work of M. Bakhtine' (our translation). The intention is polyphonic and we may thus consider, from the perspective of a dialogical epistemology, a mediated intentionality (see Davis 2019) that is not conflated with a subjectivity.

Conclusion

The documentation framework that we developed, based primarily on cross self-confrontations, has shown how it may, from a developmental perspective, put into light all dimensions of interpretation proposed in Boutard and Féron (2019) in the specific context of a *documentation of interpretation as an expertise*. The ability to combine the qualitative data and the quantitative data brings a relevant context to study the activity in relation to its constitutive actions and operations. The use of video recordings during confrontations as well as the ability of practitioners to act upon the traces brings a consideration for the reflexivity of actors in their process of verbal and embodied discussion about their domain of expertise.

The oxymoronic aspect of the concept of a developmental documentary framework is the element which allows us to go beyond questions relating to documentation of performance (broadly speaking) in terms of authenticity and representation (Phelan 1993; Jones 1997), fetishization (Jones 2011), interdisciplinarity of documentation processes (Sant 2014), and primary or secondary status of documents (Berryman 2018). From a pragmatic (in the general sense of the term) perspective, the ability to act upon the documentation literally and theoretically poses the question of the kind of implementation required for operationalizing a developmental documentation framework for acousmatic interpretation. Looking at proposals for acousmonium virtualization, such as the one from Barrett and Jensenius (2016), we may look in that direction for future research. Similarly, building on the tools developed by Raboisson and Couprie (2017) could benefit the management and comparative analysis of quantitative data. From these grounds, we can think about the relationship between documentation and preservation (e.g. Molloy 2014) and the relevance of designated standards (e.g. Varela and Lee 2018; Boutard and Féron 2019).

Notes

1. All statements from participants in this paper are our translations from French to English. When the word is difficult to translate adequately, we add the original word in square brackets and italics.
2. The ability of practitioners to discuss their craft also speaks to our use of examples of inquiry methods in non-academic settings, in a context where musicians develop strategies to expose their self-analysis in multiple ways (as demonstrated by book series such as Hips Road's *Arcana* or, more recently, Shelter Press' *Spectres*), and how they may cross-pollinate with academic research.

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References

- Barbier, J.-M. 2017. “Affects, Émotions, Sentiments.” In *Encyclopédie d’analyse des activités*, edited by J.-M. Barbier and M. Durand, 823–849. Paris: Presses Universitaires de France.
- Barrett, N., and A. R. Jensenius. 2016. “The ‘Virtualmonium’: An Instrument for Classical Sound Diffusion Over a Virtual Loudspeaker Orchestra.” *Proceedings of the International Conference on New Interfaces for Musical Expression NIME’16*, 55–60.
- Barrière, F. and G. Bennett, eds. 1998. *Proceedings Volume III of the 1997 Works of the International Academy of Electroacoustic Music / Bourges: Composition/Diffusion in Electroacoustic Music*. Bourges: Mnémosyne.
- Bates, M. J. 2006. “Fundamental Forms of Information.” *Journal of the American Society for Information Science and Technology* 57 (8): 1033–1045.
- Battier, M. 2007. “What the GRM Brought to Music: From Musique Concrète to Acousmatic Music.” *Organised Sound* 12 (3): 189–202.
- Bayle, F. 1993. *Musique Acousmatique: Propositions Positions*. Paris: Institut national de l’audio-visuel: Editions Buchet-Chastel.

- Bayle, F. 2007. "Space, and More." *Organised Sound* 12 (3): 241–249.
- Bernays, M., and C. Traube. 2014. "Investigating Pianists' Individuality in the Performance of Five Timbral Nuances Through Patterns of Articulation, Touch, Dynamics, and Pedaling." *Frontiers in Psychology* 5: 157.
- Berryman, J. 2018. "Art as Document: On Conceptual Art and Documentation." *Journal of Documentation* 74 (6): 1149–1161.
- Bødker, S. 1996. "Applying Activity Theory to Video Analysis: How to Make Sense of Video Data in Human-Computer Interaction." In *Context and Consciousness: Activity Theory and Human-Computer Interaction*. B. A. Nardi, 147–174. Cambridge, MA: MIT Press.
- Bonnet, F. J. 2016. *The Order of Sounds: A Sonorous Archipelago*. Translated by R. Mackay. Falmouth: Urbanomic.
- Borbetomagus. 1985. "Borbeto Jam." Cadence Jazz Records.
- Boutard, G. 2016. "Solo Works of Mixed Music with Live Electronics: A Qualitative Enquiry in Timbre and Gesture from the Performer's Perspective." *Musicae Scientiae* 20 (3): 361–391.
- Boutard, G., and F.-X. Féron. 2019. "Documenting Acousmatic Music Interpretation: Profiles of Discourse across Multiple Dimensions." *Journal of Documentation* 75 (1): 99–119.
- Cahour, B., and C. Licoppe. 2010. "Confrontations with Traces of One's Own Activity." *Revue D'anthropologie des Connaissances* 4 (2), a-k.
- Clarke, E. 2004. "Empirical Methods in the Study of Performance." In *Empirical Musicology: Aims, Methods, Prospects*, edited by E. Clarke and N. Cook, 77–102. New York, NY: Oxford University Press.
- Clot, Y. 1993. "Passer à l'action? Remarques sur la psychologie des sociologues." *Futur Antérieur* 5: 16–17.
- Clot, Y. 2008. *Travail et pouvoir d'agir*. Paris: Presses Universitaires de France.
- Clot, Y., and D. Faïta. 2000. "Genres et styles en analyse du travail: Concepts et méthodes." *Travailler* 4: 7–42.
- Clot, Y., and J. Leplat. 2005. "La méthode clinique en ergonomie et en psychologie du travail." *Le Travail Humain* 68 (4): 289–316.
- Constanzo, R. 2020. *Amplifiers & Explosions / Play Talk Play*. May 2. <https://rodrigoconstanzo.com/2020/05/amplifiers-explosions-play-talk-play/>.
- Cook, N. 2004. "Computational and Comparative Musicology." In *Empirical Musicology: Aims, Methods, Prospects*, edited by E. Clarke and N. Cook, 103–126. New York, NY: Oxford University Press.
- Davis, T. 2019. "Instrumental Intentionality: An Exploration of Mediated Intentionality in Musical Improvisation." *International Journal of Performance Arts and Digital Media* 15 (1): 70–83.
- Dempsey, N. P. 2010. "Stimulated Recall Interviews in Ethnography." *Qualitative Sociology* 33 (3): 349–367.
- Donin, N., and F.-X. Féron. 2012. "Tracking the Composer's Cognition in the Course of a Creative Process: Stefano Gervasoni and the Beginning of Gramigna." *Musicae Scientæ* 16 (3): 262–285.
- Donin, N., and J. Theureau. 2007. "Theoretical and Methodological Issues Related to Long Term Creative Cognition: The Case of Musical Composition." *Cognition, Technology & Work* 9 (4): 233–251.
- Elschek, O. 1989. "Film and Video in Ethnomusicological Research." *The World of Music* 31 (3): 21–37.
- Engeström, Ritva. 2014. "The Interplay of Developmental and Dialogical Epistemologies." *Outlines. Critical Practice Studies* 15 (2): 119–138.
- Féron, F.-X., and G. Boutard. 2015. "Construction d'une enquête sur l'interprétation des musiques acousmatiques." *Proceedings of Journées d'informatique Musicale* 2015.
- Féron, F.-X., G. Boutard, and P. Cochard. 2017. "Confronter les musiciens à leur performance: Description d'un dispositif méthodologique pour étudier l'interprétation acousmatique." *Proceedings of Journées d'informatique Musicale* 2017.
- Jenseni, A. R., N. Castagné, A. Camurri, E. Maestre, D. J. Malloch, and D. McGilvray. 2007. "A Summary of Formats for Streaming and Storing Music-Related Movement and Gesture Data." *Proceedings of the 4th International Conference on Enactive Interfaces*.

- Jones, A. 1997. "'Presence' in Absentia: Experiencing Performance as Documentation." *Art Journal* 56 (4): 11–18.
- Jones, A. 2011. "'The Artist is Present': Artistic Re-enactments and the Impossibility of Presence." *TDR/The Drama Review* 55 (1): 16–45.
- Kaptelinin, V., and B. A. Nardi. 2009. *Acting with Technology: Activity Theory and Interaction Design*. Cambridge, MA: MIT Press.
- Knoblauch, H. 2012. "Videography: Focused Ethnography and Video Analysis." In *Video Analysis: Methodology and Methods*, 3rd ed., edited by H. Knoblauch, B. Schnettler, J. Raab, and H.-G. Soeffner, 69–83. Frankfurt am Main: Peter Lang.
- Knowles, J., and D. Hewitt. 2012. "Performance Recordivity: Studio Music in a Live Context." *Journal on the Art of Record Production* 6. <https://www.arpjournal.com/asarpwp/performance-recordivity-studio-music-in-a-live-context/>.
- Kostulski, K., and L. Kloetzer. 2014. "Controversy as a Developmental Tool in Cross Self-Confrontation Analysis." *Outlines. Critical Practice Studies* 15 (2): 54–73.
- Marková, I. 1994. "Sociogenesis of Language: Perspectives on Dialogism and on Activity Theory." In *Sociogenesis Reexamined*, edited by W. de Graaf and R. Maier, 27–46. New York, NY: Springer.
- Molloy, L. 2014. "Digital Curation Skills in the Performing Arts – an Investigation of Practitioner Awareness and Knowledge of Digital Object Management and Preservation." *International Journal of Performance Arts and Digital Media* 10 (1): 7–20.
- Peignot, J. 1960. "De la musique concrète à l'acousmatique." *Esprit* 28 (280): 111–120.
- Phelan, P. 1993. *Unmarked: The Politics of Performance*. New York, NY: Routledge.
- Pohjannoro, U. 2014. "Inspiration and Decision-Making: A Case Study of a Composer's Intuitive and Reflective Thought." *Musicae Scientiae* 18 (2): 166–188.
- Rabardel, P., and G. Bourmaud. 2003. "From Computer to Instrument System: A Developmental Perspective." *Interacting with Computers* 15 (5): 665–691.
- Raboisson, N., and P. Couprie. 2017. "Une expérience de captation et d'analyse de l'interprétation acousmatique." *Proceedings of Journées d'informatique Musicale* 2017.
- Rink, J., N. Spiro, and N. Gold. 2013. "Motive, Gesture and the Analysis of Performance." In *New Perspectives on Music and Gesture*, edited by A. Gritten and E. King, 267–292. Aldershot: Ashgate.
- Sallis, F. 2015. *Music Sketches*. Cambridge: Cambridge University Press.
- Sant, T. 2014. "Interdisciplinary Approaches to Documenting Performance." *International Journal of Performance Arts and Digital Media* 10 (1): 3–6.
- Schober, M. F., and N. Spiro. 2014. "Jazz Improvisers' Shared Understanding: A Case Study." *Frontiers in Psychology* 5: 1–21.
- Speer, S. A., and I. Hutchby. 2003. "From Ethics to Analytics: Aspects of Participants' Orientations to the Presence and Relevance of Recording Devices." *Sociology* 37 (2): 315–337.
- Stone, R. M., and V. L. Stone. 1981. "Event, Feedback, and Analysis: Research Media in the Study of Music Events." *Ethnomusicology* 25 (2): 215–225.
- Vandermark, K., and C. Rousay. 2020. OPTION Interviews—Claire Rousay. Experimental Sound Studio. <https://www.youtube.com/watch?v=8jxQTS6wios>.
- Varela, M. E., and N. H. Lee. 2018. "Language Documentation: A Reference Point for Theatre and Performance Archives?" *International Journal of Performance Arts and Digital Media* 14 (1): 17–33.