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Documenting acousmatic music interpretation: profiles of discourse across multiple dimensions

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Abstract

- **Purpose** : Extending documentation and analysis frameworks for acousmatic music to performance/interpretation, from an information science point of view, will benefit the transmission and preservation of a repertoire with an idiosyncratic relation to performance and technology. This paper presents the outcome of a qualitative research aiming at providing a conceptual model theorizing the intricate relationships between the multiple dimensions of acousmatic music interpretation.
- **Design/methodology/approach** : The methodology relies on grounded theory. 12 Interviews were conducted over a period of 3 years in France, Québec and Belgium, grounded in theoretical sampling.
- **Findings** : The analysis outcome describes eight dimensions in acousmatic performance, namely: musical; technical; anthropological; psychological; social; cultural; linguistic; and ontological. Discourse profiles are provided in relation to each participant. Theory development led to the distinction between documentation of interpretation as an expertise and as a profession.
- **Research limitations/implications** : Data collection is limited to French-speaking experts, for historical and methodological reasons.
- **Practical implications** : The model stemming from the analysis provides a framework for documentation which will benefit practitioners and organizations dedicated to the dissemination of acousmatic music. The model also provides this community with a tool for characterizing expert discourses about acousmatic performance and identifying content areas to further investigate. From a research point of view, the theorization leads to the specification of new directions and the identification of relevant epistemological frameworks.
- **Originality/value** : This research brings a new vision of acousmatic interpretation, extending the literature on this repertoire's performance with a more holistic perspective.

Introduction

The development of electroacoustic music during the second part of the twentieth century raised new questions concerning live performance in concert. Could a musical piece which is fixed on a physical medium and diffused through loudspeakers be 'interpreted'? In 1997, the *Académie Internationale de Musique Electroacoustique de Bourges* dedicated their proceedings to Maurice Leroux, the first interpreter of electroacoustic music, who performed the collaborative work entitled 'Symphonie pour un homme seul' by Pierre Schaeffer and Pierre Henry at the Théâtre de l'Empire in Paris on July 6th, 1951 (Schaeffer, Henry, Poullin, Arthuys, & Collin, 1955). Leroux performed with a device called the 'Portique potentiométrique de Relief', which was conceptualized by composer Pierre Schaeffer and designed by engineer Jacques Poullin. The interpreter held a transmitter coil which he moved within a space defined by four receiver coils. His movements allowed for the creation of sound trajectories among multiple loudspeakers positioned in the concert hall (Poullin, 1955, p. 16). Sound systems used for diffusing electroacoustic music became more and more sophisticated until the development of the loudspeaker orchestra in the 1970s. It was here that the term acousmatic music first came into usage. First employed by Schaeffer, it was adopted by François Bayle in the 1970s to equate acousmatic music with an art of projected sounds (Bayle, 1993). In 1973, at the Groupe de Musique Expérimentale de Bourges (GMEB) in France, Christian Clozier developed the GMEBaphone, which is considered to be the first loudspeaker orchestra. In performance, sound material is divided into frequency bandwidths which are allocated to specific groups of speakers. Through the use of a mixing console, the performer is able to control the level of each speaker group (Clozier, 1997). The following year, in 1974, the composer François Bayle developed at the Groupe de Recherche Musicale (GRM) his first *acousmonium* (see figure 1), which, according to his definition (Bayle, 1993, p. 45-46), is an ensemble of various loudspeakers with different timbral qualities, placed throughout a concert hall.

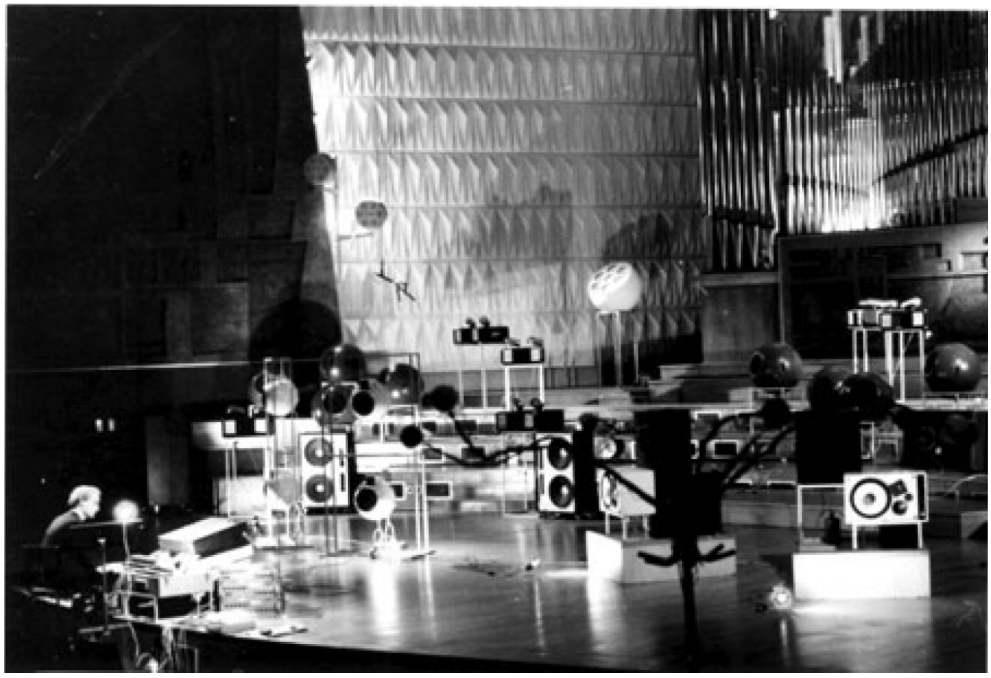

Figure 1. François Bayle in front of the GRM acousmonium installed in RadioFrance (Paris). Adapted from Bayle, 2007. Photo Magison.

The question of musical interpretation of a work fixed on a physical medium has given rise to much debate. Barrière (1997) notably insists on the fact that, "contrary to many preconceived notions, the performance of an electroacoustic work is never the same from one concert to another" (p. 205). Following this statement, we may consider the impact of interpretation on the preservation of cultural heritage: "an interpretation, a performance (in electroacoustic music as much as in instrumental music) never destroys the work, even when it is excessive. On the other hand, the absence of an interpretation can kill the work", Boesch comments (1997, p. 221).

In this context – and similarly to statements in performing and new media arts (e.g. Molloy, 2014, Post, 2017) – documentation for long-term preservation is critical. We thus build on Sant's (2017) advocacy of "[…] a shift from using performance documentation as a generic (and frequently contentious) term to thinking about documenting performance as the simple process of creating and organizing documents towards providing documentation that is available for long-term access" (p. 1). For Sant (2017), "we must focus less on documents that are commonly misconstrued as documentation and focus more on the processes of documenting where the ultimate aim is systematic documentation, ideally through standard methods of archiving proposed by library and information science" (p. 2). The question of acousmatic music is paradigmatic for documenting processes as fixed media act as material for performance rather than acting as documents representing a performance. Methodologically speaking, it provides us with a significant shift from studies that have focused on the documentation of contemporary instrumental (or mixed) music (e.g. Boutard, 2016). While performance may be conceptualized itself as a document, performance-as-document (see Lee, 2018), we will discuss here performance documents and models that may support both documents by intention and documents by attribution (Meyriat, 1981, Roux, 2016), grounding new interpretations of these works.

According to Landy (1999), "[...] the fact that the vast majority of scholarship [on the topic of electroacoustic music] emanates from within the [electroacoustic music] community might not be an ideal situation. The terms emic and etic, which are used in ethnomusicology and fields having an association with anthropology, come to mind." (p. 61). From the perspective of interpretation, examples include: the Cahiers Recherche/Musique of the INA-GRM (Chion, 1977); Thélème Contemporain's round table published in the journal Ars Sonora (Planel *et al.*, 1996); and the international academy on electroacoustic music organized by the GMEB in 1997 on the topic of composition/interpretation (Barrière & Bennett, 1998). Previous and current documentation projects encompassing acousmatic musique include the *acousmathèque/acousmaline* from the GRM (Teruggi, 2001, Barrachina & Saint Martin, 2007), the *Online Repository for Electroacoustic Music Analy*sis (Gatt, 2013), and the *Electrodoc* documentation center from Musiques & Recherches (see Anderson, 2012). These projects focus mostly on composition.

From an information science point of view Weissenberger (2013) proposed a framework for defining Music Information Objects (MIO) representation with three sub-classes (*symbolic*, *interpretive*, *derivative*) aiming at joining emic and etic perspectives. Building on Landy (1999) and Weissenberger (2013), we propose to join these perspectives by grounding the framework in practitioners' discourses while supported by an information science perspective. We may also relate this process to Beghtol's (2003) conceptualization of the relationship between "professional" (i.e. developed by information professionals) and "naïve" (i.e. oriented toward advancing disciplinary knowledge) classifications.

The FRBRoo model has been used in the context of contemporary music (e.g. Bonardi, 2015) and popular music (e.g. Smiraglia, 2015) but never for acousmatic music. While pure FRBR may not be suitable for modelling performance (see Lee, 2018), FRBRoo provides us with a formal tool for relating performance and performance documentation (Doerr, Le Bœuf & Bekiari, 2008, Pendón Martinez & Bueno de la Fuente, 2017). The goal is thus to discuss from a sociocognitive perspective (Jacob & Shaw, 1998), for acousmatic music, how conceptual frameworks grounded in practitioners' discourse may fit MIOs' representation – incorporating the symbolic, interpretive and derivative perspectives – and a formal model such as FRBRoo.

Methodology

From October 2014 to November 2017 we conducted 12 semi-structured interviews with musicians with renowned expertise in the composition and interpretation of acousmatic music. The scope of the research was limited to French-speaking artists, for several reasons: 1) the ability of the researchers to analyze the data; 2) the presence of a large international francophone acousmatic community, as well as 3) the historical relation of the domain with French-speaking countries. The authors conducted interviews in France, Belgium, and Québec across a wide range of approaches and schools, following the principles of Strauss & Corbin (1994)'s grounded theory, aiming at theoretical saturation (Glaser & Strauss, 1967). The participants included 8 men and 4 women, this discrepancy is noted as a second limitation. The distribution of participants' expertise is presented in figures 2 and 3. Participants include pioneers from the 1960s to the 1970s, the next generation of the 1980s, and more recent musicians who started in the 1990s and early 2000s and who have already acquired relevant expertise (see figure 2). Six participants interpreted more than one hundred works from other composers while three have mostly played their own works (see figure 3). The former category (i.e. more than 100) is unrelated to the five categories of the distribution articulated by figure 2, as it includes at least one

participant from each one of them, and is also unrelated to the geographical distribution as it includes participants from France, Belgium and Québec.

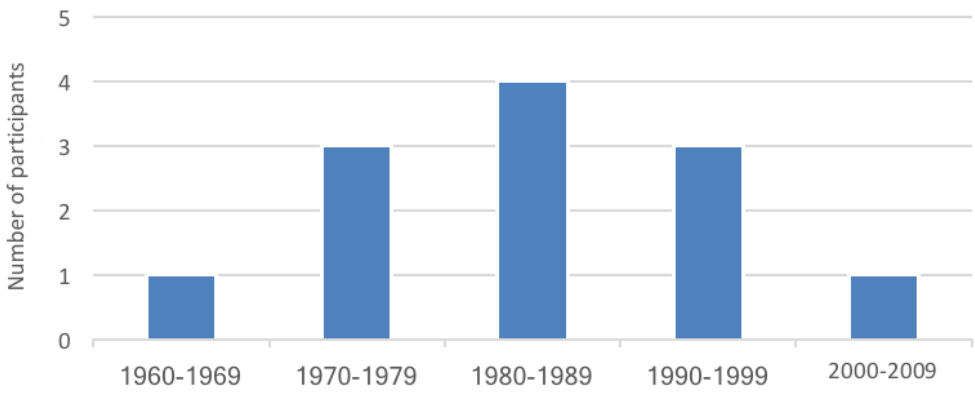

Figure 2. First experience in acousmatic interpretation. Distribution of participants per decade.

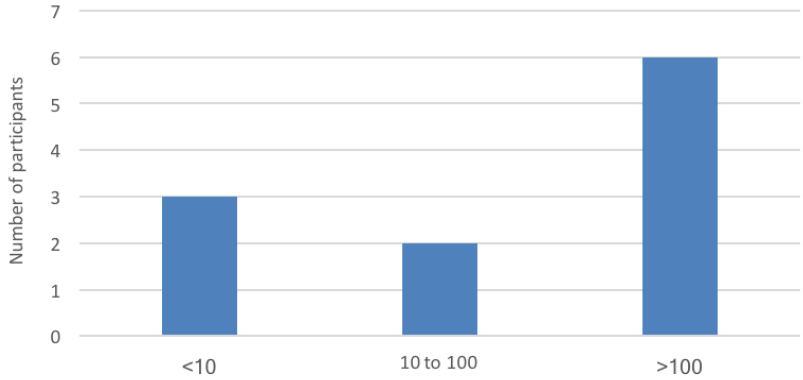

Figure 3. Number of interpretations of other composers' works. Distribution of participants between three categories: less than 10; between 10 and 100; more than 100.

Interviews lasted approximately between 30 minutes and 130 minutes, and total about 75000 words for about 1100 segmented items. Sampling was driven by theoretical sampling (Glaser & Strauss, 1967), aiming at maximizing transferability (Guba, 1981) with multiple perspectives on interpretation and different aesthetical backgrounds among participants (e.g. schools of interpretation in terms of techniques as well as technology).

We piloted the questionnaire with two potential participants for construct validity. The finalized resulting questionnaire is structured in four parts for a total of eleven questions (see Féron & Boutard, 2015). Each part comprises a set of questions ranging from the more abstract to the more specific, in order to collect a wide range of perspectives on interpretation and not to influence a focus on any one of them. The goal of the interview analysis is descriptive, following Kvale & Brinkmann's (2009) typology, seeking to "chart key aspects of the subject's lived world" (p.106) and developing "theoretical conceptions of a topic […] to inductively develop an empirically grounded theory through observations and interviews" (p. 106).

As an introduction to the questionnaire, participants were provided with a short definition of acousmatic music in order to restrain the type of works we were discussing. Specifically, we provided the following definition: “any work composed in studio, fixed on media and diffused on loudspeakers during a concert, without any other live sound source”. The first part of the interview relates to the general definition, goals, and strategies pertaining to acousmatic interpretation. While this paper focuses on these questions, the content of the analysis comes from all parts of the data collected according to the topics that participants brought up throughout the semi-structured interviews. The questions were phrased so as to not influence a specific dimension of interpretation, for example the technical perspective over the social perspective. All questions and answers, relative to the interviews, are translated from French to English by the authors. The three questions pertaining to the first part of the interview were the following:

1. What does ‘interpretation of an acousmatic work’ mean from your point of view?
2. Musically-speaking, what goals are you trying to achieve during the interpretation of an acousmatic work?
3. What strategies and means are you using to achieve these goals?

The second part relates to preparation work and contains only two questions which deal with preparation prior to being on location and in the concert venue. The third part, consisting of three questions, relates to the technology used for the performance. The final part, consisting again of three questions, concerns the differences and similarities between interpreting other composers’ works and the composer’s own works (whenever both roles are relevant).

The coding of the interviews was performed by both authors in a sequential (each coder revising the coding of the other coder and then jointly discussing it) and continuous fashion throughout the analytical process to improve dependability (Guba, 1981). This process included the writing of the memos. Coding of previous interviews was continuously revised according to the emergence of new categories following the inclusion of new data.

The multiples dimensions of acousmatic interpretation

Two main categories emerge from the analysis in relation to the scope of the research implemented in the semi-structured questionnaire. These categories are: *Definition of interpretation* and *Organization of interpretation practice*. The latter provides us with structured and detailed insights into the preparatory work, off-site and on-site, as well as socio-economic constraints for the production of acousmatic concerts. The hierarchical structure of the conceptualization resulting from the grounded theory analysis of the data emerged inductively from the more concrete concepts to the more abstract concepts of these two main categories.

This paper focuses on the first of these two main categories, that is to say, the definition of interpretation as it provides us with a direct framework for the conceptualization of acousmatic interpretation documentation relevant to the information science perspective of this research project. This category is divided in eight sub-categories which depict multiple perspectives on the conceptualization of ‘interpretation’ in the context of acousmatic works (see Table 1). All participants’ citations are translations from French by the authors. Participants are referred to with the code P-XX, where XX is the participant’s number.

Definition of interpretation							
D1 Musical dimension	**D2 Technical dimension**	**D3 Anthropological dimension**	**D4 Psychological dimension**	**D5 Social dimension**	**D6 Cultural dimension**	**D7 Linguistic dimension**	**D8 Ontological dimension**

Table 1: General structure emerging from grounded theory in relation to the first main category, *definition of interpretation.*

The D1. musical dimension

This category relates to the characterization of acousmatic interpretation in relation to a musical work. Three subcategories representing different perspectives have emerged.

The first approach – D1.1 *respect of the work* – emphasizes the work-driven aspect of interpretation. Participant P-04 brings up the idea of an expressive range that is fostered by the work. This notion is best described by Savouret (1997): "Another type, and which hopefully has great future possibilities, is that of an electroacoustic text on fixed support, which may nevertheless be rendered infinitive with full blessings from the composer by any action (any conjugation of parameters) providing they respect the integrity of the piece and do not sway it from its original intention" (p. 353). Correlative to this statement is a need for understanding the work from a structural point of view to a broader context relating to aesthetic schools and types of work. These points relate to other dimensions of interpretation that we will discuss further in the subsequent sections, but a core idea pertaining to this category is the conceptual convergence between a recording and a score. Acousmatic interpreter and theorist, Prager (2012) states: "the acousmatic work is already produced, structured, shaped on a physical medium. For the performer, this is the equivalent of an original score. Musical intelligence can only be achieved through the integration (comprehension and analysis) of the medium, prior to any technical action" (p. 9, our translation). Bayle (1996) highlights the critical importance of analysis for interpretation. Following this idea, several participants emphasized the possibility of real interpretation mistakes – sometimes experienced first-hand by the participants, who had their works performed by performers other than themselves while being present during the performance. Also, part of this category is the idea of providing a coherent interpretation and of a work-driven style of interpretation.

The second approach – D1.2 *highlighting the musical content* – complements the first one but emphasizes the activity itself and its relation to the performer's analysis of the work. A paradigmatic statement is provided by P-02: "[…] bringing to light the meaning, the form, the structure, the phrasing, the composition itself for the listener, that is to say, serving the work, enhancing it, exemplifying it". At this point, it is necessary to state that several theoretical frameworks have been proposed in the literature as pertaining to the analysis of electroacoustic music, including Schaeffer (2017), Roy (2003) and Smalley (1986).

The third approach – D1.3 *a reading of the work* – contrasts with the first approach by emphasizing the intentional and personal aspect of interpretation, the creativity of the performer, which may go against the idea of respecting the work and the integrity of its content. The distinction between D1.1 and D1.3 is not clear-cut, it showcases a negotiation between a subject (the interpreter) and an object (the work): "works, at the moment they leave the studio, do not belong to us [composers] anymore. So, as long as there is minimum respect […], but then it's open [to interpretation]" (P-03). In a later statement, this participant shifts focus from respecting the composer's work to the respecting the performer's choices despite the fact that he, as the composer, has a different reading of his own work.

The D2. technical dimension

The technical dimension of interpretation focuses on practice and goal-oriented human-technology interactions. Sub-categories emerging from the analysis include: D2.1 *Interpretation parameters*; and D2.2 *Playing praxis*.

D2.1 – Interpretation parameters is certainly one of the most documented categories in the literature. The reason for this may be found in the discrepancies between this repertoire and instrumental (acoustic) music, which is best explained by Hoffmann (2013): "[…] the most receptive sites for performance intervention in acoustic music (timing, pitch intonations and amplitude balance) are those that are immutable or relatively hard to control in electroacoustic music. And, conversely, the sites that are maximally receptive to performance intervention in electroacoustic music (spatialisation and timbre) are completely or marginally mutable in acoustic music performance." (p. 69). Schaeffer (1967, p. 50) posited two dimensions of interpretation, namely static and dynamic in reference to the early spatialisation experiments. While the literature reflects largely on these spatial parameters, authors have gone in describing more extensive frameworks, which relate also to the development of the acousmonium (the question of timbre is paradigmatic in this regard). Prager (2012), for example, defines six parameters: 1) nuance, which relates to contrasts in dynamics; 2) color, which relates to frequency profiles and is dependent on the specification of the acousmonium; 3) geography, which relates to the spatialisation of sound according to the localization of loudspeakers, as previously mentioned; 4) distance, emphasizing motions toward and motions away from a point; 5) spatial density, bringing into light tutti and soli; and finally, 6) the speed of parameter variation. Unsurprisingly, our analysis brings out a more general framework with three main dimensions, namely, space, timbre, and energy. The reason for this is rooted in the methodology, where the stated goal is to bring to light concepts at various levels of abstraction, subsuming all participants' perspectives, rather than the detailed perspective of one expert. Prager's (2012) concepts can indeed be related to the more abstract threefold division that we portray.

D2.2 *Playing praxis*, specifically relates to the control and use of these parameters. This category emphasizes several complementary concepts. First, the personal style of the performers (or the style of a school of interpretation), which relates to preferred playing techniques independently of the work but

in relation to the acousmonium: "[…] I would relate my strategy to the Montreal school, which often relies on front-rear movements, with focal points […]" (P-08). P-05 emphasizes his habit to work with diagonals rather than strict loudspeaker pairs like P-03. Gestures also vary according to the performer, as P-11 discusses in relation to different types of gestures (see Jensenius, Wanderley, Godøy, & Leman, 2010 for a definition of communicative gestures, sound-producing gestures, sound-facilitating gestures, and sound-accompanying gestures). Second, the systematization inherent to the repertoire. The method of working in loudspeaker pairs, which reflects the stereophony of the original medium, exemplifies this notion. P-10 states: "there are multiple spatialisation or interpretation techniques […] which are used according to the works". P-09 argues that, "[…] there are several playing aesthetics depending on schools of interpretation". These two perspectives – personal and general methods to achieve a goal – represent the interplay between style and genre (as defined by Clot, 2008, p. 149-158, in relation to any work activity). A third notion is the relation between determination and improvisation: "[…] once we assimilated all this [technological environment and room acoustics] we make decisions, […] but we keep—I think we all do—a part of improvisation" (P-03). Here, the idea of spontaneity and improvisation is oriented towards the practice. We may put this in perspective with D1.3 *a reading of the work*, which is oriented toward the work. As Dow (2004) states: "performance, including acousmatic performance, of course has to be analytical in the sense of divining and reacting to these intentions and structures, but importantly must also be intuitive, and to an extent, spontaneous: a creative force in its own right" (p. 2).

The D3. anthropological dimension

The anthropological dimension of interpretation relates to the situated activity of interpretation in a concert environment. It refers to the internal milieu (intellectual capital of the performer) and external milieu (resources available to the performer) that Leroi-Gourhan (1945) famously described in his anthropology of technique.

D3.1 *a priori knowledge* describes the internal milieu and includes knowledge of the work as well as technical expertise. This category reflects both the *know-that* and *know-how* pertaining to any interpretation practice. For example, P-03 reflects on the impact of this milieu as conditions of possibility: "[…] a few years ago, they [Groupe de Musique Expérimentale de Bourges] gave up setting up their system, the GMEBaphone, […] because composers did not know how to use it anyway […]".

From an information science perspective, Bates (2006) argues that, "[…] within the humanities we can see the performing arts (dance, theater, music) as the disciplines of expressed and enacted information" (p. 1043), a reference to the work of Varela, Rosch, and Thompson (1992). The category D3.2 *cognitive ecologies* depicts this embodied, situated and distributed knowledge for interpretation practice. P-10, for example, describes a process pertaining to room acoustics: "I do not leave the room, […]—even though people are working around—trying to get the venue into my body, to listen—because our ears get used to a new place". D3.2 discusses the extension of the cognitive system, especially in relation to memory, to external information systems. This includes elements such as performance scores, produced (notably and potentially) during rehearsal time, as well as computer screens displaying information such as the waveform of the audio track complemented with markers. As a continuation of this point, D3.2 also includes ergonomics considerations in reference to human-machine interactions, for example, the position of the body in relation to the tools in such ways that the performer's ears are best positioned for listening to the outcome of the musical gesture. As such, this

category provides the link to the idea of gestural accompaniment in D2 *technical dimension*. Another example of distributed cognition and situated action is provided by P-01 who focuses on the score rather than the waveform displayed on the computer screen: "[…] I put it [the score] where my eyes are. […] Often […] the computer screen is further away, I don't have the time to look at it".

Following on the perspective of expressed and enacted information but looking at it from the technology's perspective, D3.3 *affordances* emphasizes one aspect of the external milieu, which is the characterization of technological affordances (see Gibson, 1979). In this context, affordances are possible actions of interpretation provided by the technical work environment, including the console, as a direct extension of the body, the loudspeaker system, as well as the room and its acoustics. D3.3 includes statements ranging from the quality of the faders at the mixing console to the ability to produce the feeling of sound proximity in a large concert hall. P-07 emphasizes the historical influence on performance practice by the addition of subwoofers to acousmoniums. P-09, after discussing interpretation schools in relation to D2 *technical dimension*, further links this scholastic argument to affordances, explaining that different kinds of acousmoniums (for example those at GRM as compared to those at the Motus organization) do not allow for the interpretation of the same kind of works. P-11, provides a quantitative analysis, stating, tendentiously, that the minimum number of loudspeakers necessary for interpretation is two, that is a stereophonic environment, while others argue over four (P-03) or even sixteen (P-06).

The D4. psychological dimension

The *psychological dimension* has not received much research attention nor theorization in relation to acousmatic music. This category, which emerged late in our analysis, deals with the performer's psychological states during the performance and includes questions of D4.1 *disposition* and D4.2 *affect*.

The correlate to the psychological consequences are the personal commitments to the activity: "I don't feel involved [when I rehearse too much]. On the contrary, when I play for the first time, […] I give my best" (P-06). This involvement may require a specific state of mind conducive to interpretation, according to P-10.

Interpreting can also affect the performer's psyche. For example, P-03 explains that "when you have no control it [the concert] seems long, but when you are in control, it's really thrilling […]". With this sub-category, exemplified in this simple statement, the performer articulates the relevance of emotion in performance that authors, such as DeNora (2003), have emphasized in the general context of music. The question of listening provides the link between the psychological and the technical dimensions and involves both the musician and the public. As Barrière (1997) states: "it seems to me that between the composer-diffuser and its listeners, there is a spiritual flow, a complicity that is almost imperceptible but nevertheless very real. […] reactions from the audience as well as what the composer-diffuser feels during the concert will modify the interpretation." (p. 207).

The D5. social dimension

As any activity, acousmatic interpretation has a social background. This social background brings the analytical process to a critical point which relates to the extension of this category. Categories emerging from the analysis provide us with a separation between the social as pertaining directly to the interpretation and the social as pertaining to the organization of the activity of interpretation. The latter,

described within *Organization of interpretation practice*, includes the complex production environment, which will present performers with possibilities and constraints in terms of staff, hardware, rehearsal time, institutional implication, and so on and so forth. All these elements are critical to understanding the social, organizational and political context of acousmatic interpretation. This analysis, by distinguishing between the inherently social within the act of interpretation and the social as a context of production, focuses on a few concepts.

D5.1 *social gathering* refers to sharing the experience provided by the event of acousmatic interpretation. As P-03 states, "[the work] is meaningful when it leaves the studio, when it is part of a collective sharing, which is the goal of the concert". This statement also links the social and the cultural, it depicts practice as a social event, whose audience makes the activity purposeful. This link was also debated in 1977 during a round table with GRM members (Bayle *et al.*, 1977).

The second subcategory, D5.2 *professionalization*, relates to the activity of interpretation in terms of social status, that is to say the activity of interpretation of acousmatic music as a potential profession. In 1989, Menger and Cullinane discussed the institutionalization of electroacoustic music—in relation to public broadcasting companies in France, Germany and Italy—and the need to create an 'art world', following Becker's (1982) famous concept. The social dimension relates to this discussion about the social space that interpretation occupies in the electroacoustic art world. P-05 reflects on this topic: "to my knowledge, there are not enough ensembles which have a year-round program, for […] electroacoustic music interpretation to be a profession. An activity, a work, but a […] For me, it is not a profession". P-06 emphasizes the recognition of the activity already at the level of the concert program (which is reminiscent of the struggle of computer music designers for their inclusion in concert programs of mixed music, as discussed by Zattra, 2013). P-06 also discusses the need for education in acousmatic interpretation at the institutional level. P-02 emphasizes conditions required for a performer to be considered as an interpreter, namely, the act of performing the work of other composers as opposed to her or his own. P-09, who asserts the relevance of the term profession, relates it to D2 *technical dimension*, that is, specifically, to a structure within the activity of interpretation which is repeated and shared between interpreters.

The D6. cultural dimension

D6 *Cultural dimension* refers to the relevance of acousmatic interpretation in relation to cultural heritage and includes the question of transmission to a public during a unique performance, historically situated.

D6.1 *transmission of the work* reflects on the aspect of interpretation pertaining to the transmission of a repertoire, a notion which is emphasized, for example, by P-09: "[to interpret] is to allow for the transmission of the work through time, so that the works do not stay on CDs in a cupboard". P-10 comments on the experience provided by the concert and specifically on the benefits and the need to have access to this experience for a larger audience. Similarly to P-09's emphasis on the distinction between the physical support for dissemination and the live event, P-03 remarks that recordings, either as physical media or as audio streaming, are just, for this repertoire, prevailing channels for transmission. According to P-03 these channels do not allow for the control of the rendition's quality and the concert still is the most convincing audio experience. The relation between the cultural dimension and the musical dimension is best put into light by P-08 and P-01. Building on her/his own experience as a listener, P-08 emphasizes the ability for the listener to reach for a better understanding

of the piece in concert. conversely, P-01 brings up the perspective from the interpret, who uses interpretation as a magnifying glass on important aspect of the work.

D6.2 *spectacularity* (i.e. relating to the notion of spectacle) encompasses the idea of providing an experience to the audience with a controlled quality motivated by the desire to entertain. As P-07 argues, interpretation requires the ability to keep the public interested: "if I constantly bring powerful sounds, […], the public could think: 'he is annoying, where are we going? I am fed up'.". As P-10 states, "we have the public at the tip of our fingers". P-08 discusses audio comfort in terms of general sound level and of sweet spot (i.e. the area in the concert hall where the sound output is the closest to the intention of the performer).

D6.3 *historicity* relates also to the notion of the unique event, that is to say interpretation as situated in time, pertaining to the *hic et nunc* of the performance, never to be equivalent to another instantiation of the work. "The idea is that something happens here and now, which will not happen the same way if ever we perform again the day after", underlines P-03. As Prager (2012) argues, the acousmatic concert is a real artistic event whose goals include attracting a public to a sonic performance, a statement which connects both the *spectacularity* and the *historicity*, as defined above.

The D7. linguistic dimension

The D7 *linguistic dimension* represents the discursive modalities of participants when characterizing acousmatic interpretation. This category includes D7.1 *terminology* and D7.2 *rhetoric*.

The acousmatic music literature makes use of multiple words for describing performances with a focus either on practitioners, practice or technology. Smalley, interviewed by Austin (2000), states: "sound diffusion is the projection and the spreading of sound in an acoustic space for a group of listeners—as opposed to listening in a personal space (living room, office, or studio)" (p. 10). The words 'diffusion', 'projection' and 'spatialisation' are often used by participants and some of them explicitly dismiss the word 'interpretation', while other participants avoid using it during the course of the interview. For example, P-07 argues that the word 'diffusion' is the right term for describing it. P-03, controversially, argues that the term 'interpretation' is poorly used". On the contrary, P-06 states: "some sad acousmatic composers do not like to say interpreted music, like for instrumental music, […] I think this is a pity".

The comparison to other artistic practices, literally or metaphorically, is another recurrent aspect of the interviews represented by D7.2 rhetoric. Most participants compare acousmatic music to instrumental music, but multiple genres are forced into the discourse, including jazz and rock, and multiple roles, including conductors. This last comparison parallels the use of the term 'loudspeaker orchestra', combining the instrument with the profession. Complementarily, the mixing console is sometimes compared to a classical musical instrument with an emphasis on the specificity of each instrument as well as the ergonomics of each setting. Some participants make comparisons to theatre, dance as well as cinema, a discipline famously used as a comparison by Chion (e.g. in Chion & Reibel, 1976).

D7 *linguistic dimension* tackles the limits of grounded theory analysis, which is not a discourse analysis. The emergence of discursive elements stems from the occurrence of explicit terminological reflections and recurring systematic comparisons by participants. The justification for including this emerging category derives thus from the conceptual analysis of a discursive perspective on interpretation emerging from the data rather than a discourse analysis within a conceptual perspective.

The D8. ontological dimension

The D8 *ontological dimension* of interpretation relates to the properties of a musical work fixed on a support which pertains to its acousmatic interpretability. It questions the link between the work as a fixed entity pertaining to the electroacoustic music world and the possibility of an acousmatic interpretation.

D8.1 *acousmatic aesthetics* refers to the idea of an acousmatic repertoire (Bayle, Mâche, & Vande Gorde, 1980) and its characteristics. Several statements from participants exemplify this idea. According to P-02, "[…] an acousmatic work, in the sense of Bayle, requires a few relations to perception that are not shared among all fixed media works". On the contrary, P-09 claims that every fixed media work can be interpreted on an acousmonium, but emphasizes the relevance of interpretation schools and acousmonium types, previously discussed in both D2 *technical dimension* and D3 *anthropological dimension*. P-02 rejects this notion and argues that there are no styles of interpretation, there are only styles of works. Later in the interview, P-02 softens this statement, positing the idea that the style of work always has primacy over the style of interpretation, an argument that connects with D1 *musical dimension*. Several participants describe the properties of fixed media works influencing the possibilities for acousmatic interpretation. For example, P-03 highlights the difference between polyphonic works (i.e. containing several categories of content separated in terms of frequency spectrum) and sound mass-oriented works. P-10 generalizes the inability to interpret a specific work to the entire repertoire of a specific composer, whose aesthetics unhinge or restrain interpretation.

The second element, D8.2 *medium*, is the question of the physical support, especially in relation to the number of channels. P-09 argues that stereo recordings are relevant for interpretation but multitrack recordings limit the activity to mapping decisions between tracks and loudspeakers. P-03 argues that in the latter case, the interpretation is fixed, whereas P-01 acknowledges the benefits of multi-channel as well as the digitization of analog works for their integration within a digital performance environment. Similarly, P-04 acknowledges the potential of a different sound rendering for the extension of interpretation parameters such as elevation. Already in 1991, for example, Favre was arguing for multitrack recordings in acousmatic music as an evolution but also acknowledging the relation between stereophony and the nature of acousmatic interpretation.

Discussion

Theory development

According to Harrison (1999), "questions about diffusion can be reduced to three main issues: 'what', 'how' and 'why'? Whilst it is relatively easy to deal with 'what' and 'how' because they are primarily technical in nature, there is little point in doing so without also considering the much more involved and difficult question of 'why'. For it is here that we find the reason for sound diffusion […]". The first outcome of the analysis is evidence that the 'what', 'how' and 'why' are critically intertwined, making such a formal reduction hardly possible.

Discussing acousmatic interpretation in terms of activity provides us with a first angle to show this entanglement and think critically about it in relation to documentation. From the point of view of activity theory (Leontiev, 1978), activity is composed of actions. While "activity in the narrow sense is a unit of subject-object interaction defined by the subject's motive" (Kaptelinin & Nardi, 2009, p. 60),

actions are consciously goal-oriented processes which may not be directly related to the motive of the general activity. Actions then comprise operations, which are "[…] routine processes providing an adjustment of an action to the ongoing situation" (Kaptelinin & Nardi, 2009, p. 62). They are typically performed unconsciously. 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. On the one hand, the intimate relation between activity and actions, that is to say between D1 and D2, is discussed by Vande Gorne (2002) independently from this theoretical framework. Vande Gorne describes fifteen interpretation techniques in relation to their musical function, notably in terms of syntax (e.g. movement, phrasing) as well semantics (e.g. iconicity, subjectivity). On the other hand, relations between actions and operations encapsulate the idea of virtuosity discussed notably by Clozier (1997, p. 262). The traces of these relations are to be found within D3 *anthropological dimension* as well as D4 *psychological dimension*. The relation to D3 exemplifies the question of the unit of analysis. As Bateson (1987) famously put it, "the individual mind is immanent but not only in the body. It is immanent also in pathways and messages outside the body; […]" (p. 467). The tool for Leroi-Gourhan (1993) is an "exteriorization of the organs involved in the carrying out of technics" (p. 257). Stiegler (1998), building on Leroi-Gourhan, defines technologies inherently as mnemonics (mnemo-techniques). Stiegler's perspective transforms the post-cognitivist question of the unit of analysis to the question of unit of documentation that is relevant to our paper, in relation to Bates' (2006) conceptualization of information. The relation to D4 exemplifies the transformative properties of the activity. Barbier (2017) reminds us that affects (distinct from emotion) are not states but transformations of the subject's activity trend, they are reciprocal transformation of the subject and the activity. D1, D2, D3 and D4, together, call for empirical investigations in the notion of expertise, of which the outcomes may provide us with relevant documentation methodologies for acousmatic interpretation.

A second angle, relevant to the documentation, emerged from our analysis and relates firstly to D6. *cultural dimension*. The interpretation of acousmatic music is presented as the paradigmatic way to experience these works which belong to the performing art. This perspective is moderated by the D8. *ontological dimension* of the acousmatic work – primarily in relation to the number of channels – as well as the instrument in relation to the new technological affordances for spatialisation. To a certain degree, acousmatic interpretation may be related to the second domain of intangible cultural heritage (i.e. performing arts) of the United Nations Educational, Scientific and Cultural Organization's 2003 convention's text. This statement follows our introductory quote about death by lack of interpretation by Boesch (1997), as well as the argument of Favre (1996, p. 15), stating that there is a need to maintain a tradition of diffusion for this repertoire which started in 1948 and needs to live through the act of interpretation. Clozier (1997) argued that: "there are media for diffusing information and knowledge […]. And there is the concert, the show: diffusion in a given place, […]" (p. 233). From this perspective, the polysemy of the word diffusion acts as a reminder of the relation between interpretation and cultural heritage. Beyond or beneath the notion of expertise, the question of transmission converges with the notion of professionalization in D5. *social dimension* and its manifestation in D7. *rhetorical dimension*. D5 and D7 support the idea of a professional activity independent from the activity of composition, and without regard to whether the performer is also the/a composer or not, and how entangled these two activities may be in acousmatic music. The terminological and rhetorical perspective epitomizes the tension in the definition of the social status of the performance activity. D5, D6, D7 and D8 together call for an investigation of the space and the

form which documentation of acousmatic performance can cover within an institutional and political environment, in relation to our second main category *Organization of interpretation practice*.

Discourse profiles and documentation model

As we argued, thinking about documentation of interpretation as an expertise or documentation of interpretation as a profession may lead to different methodological propositions. The dimensions they convene however are present in all participants' discourses, but the emphasis is different for each one of them. Focusing on the first level – that is to say, the eight categories: D1 *musical dimension*; D2 *technical dimension*; D3 *anthropological dimension*; D4 *psychological dimension*; D5 *social dimension*; D6 *cultural dimension*; D7 *rhetorical dimension*; and D8 *ontological dimension* – we are provided with a quantitative comparison of each participant's discourse. The goal of such an analytical perspective is not to present profiles of the participants or to produce a conceptual categorization of interpreters. Indeed, this goal would not be methodologically sound at several levels. First, the potential view of participants on acousmatic interpretation cannot be reduced to this data collection, which is constrained, notably, by the process of semi-structured interviews and which was conducted at a specific moment in their career. Second, while the segmentation process tends to be homogenous for one participant, it evolves along the analysis of multiple interviews following the emergence of the model (still, previous interviews were continuously reprocessed according to the evolution of the model and confronted to new emerging categories, leading sometimes to re-segmentation). Third, the constant comparison method of grounded theory is a broad method for the generation of a conceptual framework. As such, it does not focus on participants' unique perspective (or data source in a broader context of grounded theory analysis), as opposed to some phenomenology-driven methods such as Interpretative Phenomenological Analysis (IPA) – a method used in information science (VanScoy & Evenstad, 2015) – or *explicitation interviews* (Vermersch, 2009) – previously used in relation to the study of instrumental composition. The choice for grounded theory, came from the research focus, which relates to the definition of acousmatic interpretation on a general level for the purpose of both disciplines involved – information science and musicology – rather than a portrayal of specific individuals with recognized expertise. The goal of the analysis presented in this section is thus to compare the conceptual content of discourses in the context of this study and to discuss how discourses about acousmatic interpretation may develop in multiple ways, which include or exclude certain dimensions or at least focus on some of them, and its impact on documentation.

The variety of discourses is well represented in figure 4 by the difference between P-01 and P-03, or P-11 and P-10. Some dimensions deserve particular attention. The D4. *psychological dimension*, poorly discussed in the literature, is present in a few profiles (e.g., P-01, P-03, P-10). Its absence within other participants' discourses emphasizes the relevance of such a framework for the identification of dimensions to be stressed during documentation processes, at the risk of losing a relevant perspective on an interpretation. The D6. *cultural dimension* is also a paradigmatic example of a broad variety of presence levels within a discourse, from almost inexistent for P-01 and P-02 to a quantitatively important part of the discourse for P-08 and P-11. The D3. *anthropological dimension*, is given the specific status of being the predominant dimension for most participants, except for P-01 and P-10. Discourse profiles also provide a perspective on documentation of interpretation as an expertise or as a profession. While most discourses predominantly favor dimensions that we related to the former, some profiles have a more harmonious balance, e.g. P-11 and P-03 (P-08 is the opposite example).

Figure 4. Percentage of total occurrences for each category per participant, independently normalized to a scale of 0 to 1 for each participant: a) on the left, P-01 to P-06; b) on the right P-07 to P-12.

In the context of documentation of interpretation as an expertise, modelling these dimensions in relation to the collection of relevant documents acting as traces of the activity (e.g.: audio/video recordings; data from the mixing console; performance scores; the fixed media work itself; etc.) provides us with opportunities as well as limitations. Discourses concerning the musical dimension of interpretation connect different levels of abstraction pertaining to the notion of work and are best described by the Functional Requirements for Bibliographic Records (FRBR). FRBR (2009) famously distinguishes between the work, the expression, the manifestation and the item. The interpretation of a work in FRBR terms starts at the expression level: "we can use the entity called expression to identify, for example, [...] the specific score used for the performance of a musical composition" (p. 20). Generally speaking, "an expression is the specific intellectual or artistic form that a work takes each time it is 'realized'" (p. 19). The D1. *musical dimension* thus questions the relationship between the level of the work and the level of the expression. The FRBR and CIDOC CRM Harmonisation model (IFLA, 2016), a linked data model named FRBRoo helps us in proposing a more precise way to identify this relationship (see figure 5), using the specific relation *R19 created a realisation of* between on one hand the entity *F20 Performance Work* and on the other hand the entity *F28 Expression Creation*. The link between the *F20 Performance Work* and the *F1 Work*, which accounts for the recording of the piece that is used as the material for the performance, must be modeled by considering the recording of the work as being incorporated, *P165 is incorporated in* – at the expression level (*F22 Self-Contained Expression*) – in the *F25 Performance Plan*: "[...] the incorporated expressions (such as [...] the recorded music to be used for the ballet, or the content of the musical score to be used for a concert, etc.) are not by themselves a part of the expression of this F1 Work. Rather, an expression (*F25 Performance Plan*) of the instructions, the stage production, choreography or musical performance consists of *incorporates* (P165) that textual or musical content" (IFLA, 2016, p. 67). This statement directly connects with Prager's (2012) conceptualization of the medium as a score, which must be integrated prior to any technical actions in relation to D2. This proposition is the main difference between acousmatic and instrumental music modelling in relation to recordings, as instrumental performance modelling usually advocates for a reverse P165 link between *F22 Self-*

Contained Expression and *F26 Recording* (see IFLA, 2016, p. 10). The fact that *F25 Performance Plan* is a E73 Information object and thus also a E90 Symbolic object allows for this bidirectionality. While modelling the acousmatic fixed media work as a F21 Recording work instead of F1 Work would not modify the general model proposed in Figure 5, the description of F21 Recording work – e.g. "The characteristics of the manifestation of a recording work are those of the product of the capture process" (IFLA, 2016, p. 67) – is poorly suited to the context of acousmatic work. Building on the question of modeling initiated in relation to D1, we may relate D2 to the relation *R17 created* between the entities *F28 Expression Creation* and *F31 Performance*, both subclasses of *E7 Activity*, mediated by the *F25 Performance Plan*. In this context, the notion of performance plan is very broad and relates to the fixed media work (El Raheb and Santucci, 2013, discuss the challenge of modelling descriptive rather than prescriptive scores in FRBRoo in the context of dance by comparing the score to a recording), a *F1 Work* and its expression (i.e. a *F22 Self-Contained Expression*), as well as information systems (e.g. performance notes, diagrams, etc.), as depicted in D3.2.

FRBRoo is not sufficient for providing a framework for the dimensions of interpretation relevant to the expertise perspective. We can relate the difficulty of modeling the relation to D4 to the limitations expressed by Jett, Sacchi, Lee, and Clarke (2017) in what they call the 'cognitive perspective' in video games modeling. FRBRoo provides us with a way to go further than FRBR, but the post-cognitivist perspective of expressed and enacted information supported by D3 is also ill-fitted for a formal model outside of the generic relation *P67 refers to*, or *P129 is about*. Future design of documentation methodologies in these domains may also require an investigation into modelling to support the type of content that is captured and mediated in a post-cognitivist approach beyond methodological individualism and collectivism.

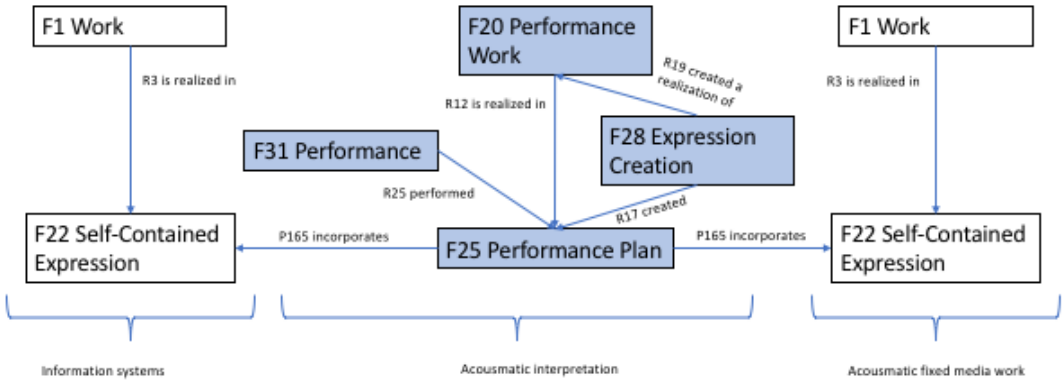

Figure 5. proposition of FRBRoo modeling for acousmatic interpretation

From the perspective of Weissenberger's (2015) MIO representation meta-classes, while the framework is based on non-mutually exclusive classes, the inclusion of a studio recording (conceptualized in the model only within *interpretive*'s sub-class *human-generated manifestations*) as a score, that is to say, the conceptualization of sound as symbolic (this point relates to the reversed creative process in this tradition, as compared to instrumental music, going from concrete material to the abstraction of the work, see Chion, 2017, p. 8), is problematic. A potential solution would be to add a *sound-based* sub-class to the *symbolic* class, which comprises already the *character-based* and

image-based sub-classes. Weissenberger's model may provides us with a broad container encompassing formal representations such as the one proposed previously with FRBRoo. We may also start including, at that broad level, dimensions relating to what we labelled as documentation as profession – with a non bi-directional mapping. Still, a couple dimensions which emerged from the analysis – namely D7. *Rhetorical* and D8. *Ontological* – seem to fall outside the scope of the framework. Further research should look into the potential for using multiple formal schemes to address all dimensions from the second group.

Conclusion

"Music for tape is not dead, it also needs to be 'performed'", argues Risset (1998). The holistic framework we propose aims at facilitating the documentation and the study of acousmatic interpretation. We have defined and discussed the relevance of eight dimensions pertaining to the conceptualization of this activity, including the discussion about the ambiguities it builds upon: ontological, linguistic, anthropological. These eight dimensions provide us with a theoretical and practical tool for the validation of documentation methodologies as well as the development of more specific frameworks targeted at some of them. We also propose to distinguish between two perspectives on the conceptualization of documentation for acousmatic interpretation.

On the one hand, documentation of interpretation as an expertise examines the relation between enacted/expressed information and the duality performer/composer. It questions the impact of technological developments on expertise in regard to the externalization of memory within the tool. Future research from this perspective may include performance studies in relation to documentation with an activity theory perspective (see Jacob & Shaw, 1998, Wilson, 2006, for a discussion about activity theory in the context of information science). The goal would thus be the convergence of formal models, such as FRBRoo, and a postcognitivist perspective, within an encompassing mixed methods framework. Another direction is the study of information systems targeted either towards the impact of digital interfaces, or towards diagrams, scores and notes generated by performers, in the continuation of the study of instrumental scores annotations from an information science perspective (e.g. Winget, 2008). This perspective call for an inquiry in the kind of services (e.g. Gottlieb, 1994) that may be developed for performing musicians in acousmatic music and the relation with music information modes during a creative process (Pohjannaro & Roussi, 2018) from an interpretation point of view.

On the other hand, documentation of interpretation as a profession discusses the dimensions along which the idea of profession acts, rather than asserting the relevance of acousmatic interpretation as a profession. It provides us with a view on an activity, historically and culturally situated, which may be complemented by the study of the more general context of the production of performances but is not reducible to it. Future research, from this perspective, may go back to Weissenberger's MIO's representation framework with the aim of studying at the intersection of the three meta-classes, namely *symbolic*, *interpretive*, and *derivative*, which formalization may support the dimensions involved in this group.

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