Art Worlds, Voice and Knowledge: thoughts on quality assessment of artistic research outcomes

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Abstract: This paper discusses the nature of artistic knowledge, and proposes that knowledge production through artistic research takes material and embodied forms. Further, the author proposes that artistic researchers must be clearly situated in an art world, as well as in academia. The assessment of artistic quality must be carried out to a great extent outside academia, by agents identified in the art world within which the project is situated. In the paper, four recent PhD theses produced in three institutions in Sweden are presented and analysed from the socio-cultural perspective of their art worlds. Further, the paper proposes that artistic knowledge can be further accessed through a systematic inquiry into the material and performative forms in which it is manifested. A brief analysis of the emergence of a shared voice between a composer and a performer - through a study of the use of transcription in the working process - aims to further unpack the possibilities of accessing artistic knowledge through multiple methods for documentation and analysis. In the final analysis, the author proposes that artistic research must develop more considered approaches to artistic knowledge, and thereby, also to aim for artistic results that allow artistic researchers to make a difference in their respective art worlds.

Keywords: artistic knowledge; assessment; voice; art worlds

1. Introduction

Although artistic research indeed has become an established discipline in many countries across Europe over the past twenty years, the approaches to several fundamental perspectives, such as publication formats, epistemology and methods remain diverse, as does the question of assessment of artistic quality. As summarized by Henk Borgdorff in an interview in an Australian journal:

I don't think there is an overall European consensus in that regard. Maybe there shouldn't be one either because the idea that something is fixed in assessment criteria doesn't do justice to a field which is always changing (as science is). As Bruno Latour says it is 'in action'. Maybe it is good that there is no fixed set of criteria for the assessment of artistic research because then we can keep the discussion open. The discursivity or inter-subjective judgement framework should be in place. So, you should endorse or strengthen the debate but I don't think there are any definitive criteria to assess whether this is good or not. (Wilson, 2016, n.p.)

Along similar lines, the aim of the present paper is not to propose a "fixed set of criteria" for the assessment of artistic quality, but rather to contribute to a discussion which will not have a final endpoint. The argument builds on a consideration of epistemological and methodological perspectives, in order to approach the formulation of a framework through which a more considered understanding of knowledge production through artistic research can be created.

2. The art worlds of artistic research

In this paper I will develop an understanding of artistic quality as the result of the negotiation between many actors in a network of human and non-human agents, in a specific sociocultural context. Howard Becker (1982) refers to such contexts as "art worlds", which are inherently dependent on cooperation, but also and importantly, do not have boundaries

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dividing them from other art worlds. Some agents may only be active within one specific art world while others, say a symphony orchestra, may play substantial roles in many different art worlds. The activities inside an art world are defined by conventions, some of which rest on aesthetic judgement and some of which are conventions guiding activities of a practical nature. Conventions are maintained, carried on, challenged and replaced within art worlds. As such, conventions are important for creating an understanding of how artistic quality is understood in a specific art world. Perhaps to an even greater extent than with individuals and institutions, conventions spread across art worlds, a process through which, their nature also continues to modify.

Art worlds consist of all the people who are necessary to the production of the characteristic works which that world, and perhaps others as well, define as art. Members of art worlds coordinate the activities by which work is produced by referring to a body of conventional understandings embodied in common practice and in frequently used artifacts. The same people often collaborate repeatedly, even routinely, in similar ways to produce similar works, so that we can think of an art world as an established network of cooperative links between participants. If the same people do not actually act together in every instance, their replacements are also familiar with and proficient in the use of those conventions, so that cooperation can proceed without difficulty. Conventions make collective activity simpler and less costly in time, energy and other resources; but they do not make unconventional work impossible, only more costly or difficult. Change can and does occur whenever someone devises a way to gather the greater resources required or reconceptualizes the work so it does not require what is not available. (Becker, 1982, pp. 34-35)

However, when institutions grow strong in an art world, change can become less and less likely. In 1995, Becker returned to the question of stability and change, looking specifically at western classical music. He notes how "one of the remarkable things about that world is how stable it is. Things change, but not much. Orchestras of the same size have been playing the same repertoire, with occasional additions, for almost a hundred years, on instruments not very different to those used almost a hundred years ago" (Becker, 1995, p. 301). The theoretical problem he wishes to address here is "how to understand the narrowness of our choices of how to make music when there are so many possibilities" (Becker, 1995, p. 302). In Becker's return to the role of conventions, he identifies the source for the inertia in "classical" music in the hegemony of this "package", and if you choose one piece, all the rest in the package follows automatically. This analysis is helpful when considering the structure of an art world, and it may be decisive for the appropriate qualities of artistic action within this context. While the art world within which a PhD project is situated should, or indeed could, be independent of academic institutions, particular attention must also be payed to the relation between the institution within which the research is hosted, and the possible risk of inertia rather than change through this institutional package.

In sections 2.1 to 2.4 I will consider four recent PhD theses in artistic research carried out in three different institutions in Sweden, Kent Olofsson's "*Composing The Performance*" (2018), Peter Spissky's "*Ups and Downs*" (2017), Sten Sandell's "*Music On the Inside of Silence*" (2013), and finally, Marina Cyrino's *An Inexplicable Hunger: flutist*)body(flute (dis)encounters (2019).

My aim is to analyze how these artists situate themselves in a particular art world, and how

their PhD project eventually impact practice within these contexts. The selection of PhD projects followed a few simple criteria. I wanted to explore projects in which the candidates were from distinctly different art worlds. I selected projects that I already was more or less closely acquainted with, in order to obtain as high a resolution of the observations as possible.²

2.1 Kent Olofsson: Composing the Performance

Kent Olofsson is a Swedish composer, whose music has been characterized by great attention to detail in an extensive output of highly demanding works for solo instruments, chamber ensembles and also a number of large scale works for orchestra and choir. When he started doing a PhD at the Royal College of Music in Stockholm in 2012 he had already been teaching electro-acoustic music composition at the Malmö Academy of Music since 1995. He was a well-established figure in the art world of contemporary classical music, wherein the leading institutions had been the Swedish National Radio and Rikskonserter (Concerts Sweden), two important sources for commissions, but also for concert production (Svenson 2007, Österling 2006). Artistic quality is assessed in such institutions by a board, consisting of some representatives from the organization, and some established artists from the field. Similar procedures are employed in the two channels for state funded commissions, through Konstnärsnämnden (The Swedish Arts Grants Committee₃) and Kulturrådet (The Swedish Arts Council₄).

Olofsson describes in his thesis, "Composing the Performance: An exploration of musical composition as a dramaturgical strategy in contemporary intermedial theatre" (2018), how the driving force was to explore what we may describe as a different art world, situated in a practice developed by the Swedish independent theatre Teatr Weimar, in collaboration with the Swedish Ensemble Ars Nova, a contemporary music ensemble. In 2008 these two groups produced a first collaborative production which wanted to explore the compositional means of the *hörspiel*, but transformed into staged experimental music theatre. Olofsson saw the premiere of this production, including a Swedish version of Olga Neuwirth's and Elfride Jelinek's Todesraten (Dödssiffrors) and a new piece, 0308, composed by the playwright Annika Nyman and the composer Erik Enström. Olofsson describes how he found that "the way the amalgamation of the text, partly performed on stage and partly pre-recorded, and contemporary music worked in *Todesraten* had a very special quality, an expression and a form I wanted to explore myself. My experience from that evening with the two staged radio plays, was the ignition spark that would start my artistic work in this specific field of contemporary music theatre, which in turn initiated ideas for an artistic research project. However, both the radiophonic format as well as composing music for theatre with spoken

2 My relation to the four projects is very different in nature. I was the first supervisor of Peter Spissky's PhD, but incidentally also know Peter since the late 1990's, at a time when he still played the modern violin and was the first violinist of Ensemble Ars Nova, a group for which I was the artistic director between 1995 and 2012. I was the faculty opponent when Sten Sandell defended his thesis in 2013, and I was also asked to review it the year after, a review which I occasionally cite in the present paper. With Marina Pereira Cyrino I was external examiner in her 25% seminar, but did not follow her work too closely in the later stages. In the case of Kent Olofsson's thesis, I had no formal, academic relation to his PhD, but we initiated a long-term artistic collaboration in the early 1990's which has continued to be fruitful, and I was involved in the early stages when he began to articulate ideas for a PhD looking at new approaches to experimental music theatre. Hence, I know the artistic practice from the inside, but have followed his academic work only at a distance.

3 https://www.konstnarsnamnden.se/default.aspx?id=11309

4 https://www.kulturradet.se/en/

5 The translation was made by Jelinek's official Swedish translator, Magnus Lindman

words in any kind of context was rather unknown territories for me" (Olofsson, 2018, p. 36). Although Olofsson refers to the performance he had seen as a "specific field of contemporary music theatre", as the thesis unfolds, the specificity of the field is challenged. While the author attempts to define the field, its aesthetic aims and its compositional and dramaturgical means, what emerges is perhaps better described as a map of many different art worlds, with many points of intersection:

The radiophonic art as a method and model for a form of new music theatre was a crucial starting point for my research project. However, the performances I have created together with Jörgen Dahlqvist and Teatr Weimar stretch beyond this concept and encompass many artistic directions in performing arts. The works are positioned at the intersections of numerous fields within music and theatre: classical and contemporary art music, popular music, sound art, post dramatic and traditional theatre, new music theatre, Composed Theatre, radiophonic art and video art. Due to the interdisciplinary and shifting nature of the projects as well as the fluidity in the inter play between art forms and expressions, it has been difficult to find a precise definition and a label for the art form we have been working with. The works could be termed Sonic Art Theatre considering the role of sound and music, particularly electroacoustic music. However, while this is an important concept in the works, they also embrace many other directions. (Olofsson, 2018, p. 49)

Olofsson's project is deeply collaborative, first and foremost in interaction with the playwright and director Jörgen Dahlqvist, with whom all productions discussed in the thesis were produced. Teatr Weimar constituted the organizational platform for all this work, which entails the technological development, staging, light design, providing actors, organizing rehearsals and performances, and so on. While in the above citation, the art world seems to have almost no boundaries, seen from a more hands-on-perspective, the art world of the PhD project is very much defined by Teatr Weimar and its relation to institutions and audiences in Sweden and abroad, when productions were brought on tour in Europe. Olofsson notes how it has been "difficult to find a precise definition and a label for the art form we have been working with" (ibid), but here, we are less concerned with the labelling, and rather more interested in who the cooperating agents are. At the same time, references to the practices of Goebbels, the movement of post dramatic theatre, and so on, are also relevant when assessing the artistic outcomes of their work. I propose that in addition to defining and relating to the art world, the assessment of an artistic PhD thesis may need to consult more distant references, as well as examining the interactions within the art world itself.6 But how can we then identify the key players in the art world around Teatr Weimar and Olofsson's compositional project?

Theatre critics play an articulated role in the first chapter, where Olofsson cites several reviews, articulating the reception of the work of Teatr Weimar and of the new series of "Sonic Art Theatre" launched in 2008. Theatre critics, and the newspapers and other media that they represent, are integral to the art world, and are part of defining artistic quality within it. In fact, Olofsson cites a critic explicitly discussing the artistic quality of Teatr Weimar's overall contribution to contemporary Swedish theatre, who eventually concludes that "in this small theatre company there is a solid core of quality, as noticeable in the visual and psychological details of the individual play as in the awareness about the political and

⁶ Just as in any other academic practice, the research needs to be situated in a wider field, and there should be a contribution to this wider field of research. However, the role of the art world in the assessment of artistic quality in a piece of artistic research is a perspective which is particular to artistic research.

philosophical whole" (Karlsson, n.d.).7 But what is the role of theatre critics in the assessment of quality? Historically, theatre and music critics emerged with the new forms of public performance in the 18th Century. The musical Salon, and the public performances in theatres and operas created a "persistent fear on the part of the Academie that the criticisms of a parterre-like public, that is one dominated by the rowdy and unreflective, would come to control the content of the exhibitions. Contemporary characterizations of the public contained both negative elements, describing the mass-like features of the crowds in the Salons, as well as positive elements describing the surprisingly refined judgments emerging from varied perspectives [from the sensitive fishmonger, or the keen-eyed baker]. A key to stabilizing the judgment of the public, and to preserving the practice of producing artworks, was a core of reasonable attention to the work itself [the autonomous work of art] represented by wellfounded critical interpretations" (Neufeld, 2012, p 96). The professional art critic emerged out of such attention to the preservation of the musical work, and involved both an educational perspective and the role of representing the public. However, Neufeld observes how "after the "great divide" of modernity, the role of critics became one granted and played by the public – criticism was and continues to be fallible and taken to be "good till countermanded" by further, better reasons. Though critical practice has, of course, become organized and institutionalized, it is all merely well-informed lay judgment and so has the character of one voice among others in public while at the same time guiding discourse" (Neufeld, 2012, p. 98). In the field of music, the relation between what Levinson (1993) calls "critical" and "performative" interpretations of music has been central to the discussion of the interpretation of musical works. The distinction between the two rests on the relation between verbal interpretation as an act of translation, which characterizes "critical" interpretation, while a "performative" interpretation takes shape within the artistic domain and therefore evades translation. Neufeld argues that an essential difference, which has been understated, is the degree of authority which critical and performative interpretations have. He observes how, even though critics "historically have had enormous influence on how artworks are viewed and understood" there is a difference in kind between the authority of a critic and of a performer: "having influence or offering advice is not the same as issuing an authoritative decision concerning how the laws are to be preserved and developed. The distinction is analogous to that between a legal commentator and a judge. As influential as the former may be, only decisions of the latter are authoritative and give expression to the law. Only judges make law and obligate the audience in the very act of interpretation" (Neufeld, 2012, p. 98).

We will return to the agency of performers below, for now, it suffices to first note that critics play an important role in art worlds of theatre and music, and certainly do so in the art world in which Olofsson's thesis is set. The exact nature of their agency will be further unpacked below, but we first need to consider the structural foundation for art criticism. The cultural capital₈ in art criticism lies not only in the word on the page, but just as much in

⁷ Cited in Olofsson (2018, pp. 27-28), in the author's translation from the Swedish.

⁸ These art worlds can, drawing on Bourdieu's analytical framework, be seen as containing their own evaluations of cultural and symbolic capital. Bourdieu (1979) describes how a cultural world consists of different fields, each containing their own forms of power and status. These forms of power produce capital that can be used as material and/or ideal value or status symbols. He considers different kinds of capital: economic, social, cultural, and symbolic capital. Cultural capital and symbolic capital are of ultimate worth for the field of art. Cultural capital concerns explicit and tacit elements of knowledge, educational levels, and aesthetic understanding. Symbolic capital refers to the symbolic recognition, articulation, and legitimisation of other forms of capital, offering power, respect, and status. Utterly defined by taste and mentality, but also by education and skill, participants in the field of music, by way of particular lifestyles and habits and aesthetic appreciation and artistic embodied knowledge,

the authority of the publisher. This authority is defined by the art world, as noted by Brennan (2006) in a paper based on interviews with professional performers in popular music. The cultural capital of daily newspapers and specialized magazines is completely reversed in a comparison between independent rock and jazz, hence the "press hierarchy for the independent rock field finds glossy music magazines at the top and broadsheets roughly at the bottom of the list. But this hierarchy is reversed in the jazz sector: quality dailies become the most desirable form of coverage, while jazz magazines are relegated to the bottom" (2006, p. 225). In contemporary theatre, the leading daily papers (Dagens Nyheter and Svenska Dagbladet in Stockholm, in Malmö where Teatr Weimar is located, Sydsvenska Dagbladet) are important players. It should be noted then that, while Teatr Weimar indeed has attracted strong attention from the leading dailies, the review cited by Olofsson is from a small local newspaper, Hallandsposten. In other words, the cultural capital to be drawn from this otherwise very positive review is less than is immediately communicated. The next review which Olofsson cites refers to the first production in the Sonic Arts Theatre-series, by Martin Nyström, a central music reviewer at Dagens Nyheter in Stockholm:

The radio play (Hörspiel) is a genre that is associated with the radio, electroacoustic music and experiments of the 60's. The Malmöbased groups Ensemble Ars Nova and Teatr Weimar now take this form of music drama into the 00's and onto the stage. In the staged premiere of *Todesraten* we meet both the voice of a young deceased athlete who worshipped Arnold Schwarzenegger and the voice of Death who claims to be 'the widow of itself.' She exercises her favourite sports amidst the bodies of others – which Death makes more efficient than the most perfect housewife. A twisting dialogue between two narcissistic poles in the battle for supremacy over the body that the music by Olga Neuwirths gives jagged resonance to. The idea by Ars Nova and Teatr Weimar – to provide space on stage for the hörspiel's concentration on the word and sounds – is both exciting and promising. (Nyström, 2008, n. p.)9

This review contributes to setting the ground for the artistic research project that Olofsson is about to discover. In the new series, the next commission is a piece composed by Olofsson to a libretto by Dahlqvist, Indy 500, and the creation of this piece becomes the very starting point for this new direction in Olofsson's compositional practice, and thereby to the research project which became his PhD.

Again, critics do play a role in this art world, but, just as argued by Neufeld above, they do not have the authority to define where the art world will go, but can only voice their opinion of how they find a particular performance or composition. Still, they have agency when it comes to attracting audiences and funding. Hence, while their role appears to be that of judging guality, their impact in the art world has a structural function more related to the foundations

obtain consideration, privileges, mythical appreciation, and marks of distinction. Cultural capital can be subdivided into three forms: an interiorised or embodied form, relating to practices of the body and aesthetic knowledge; the art objects themselves as an objective form of cultural capital; and, finally, the diplomas, educational degrees, prizes, and critiques of the artistic field as an institutionalised form. The embodied cultural capital, reflected in the difficult and demanding acquisition of the skills and techniques of performing, is the primary tool for acceptance in the field of performers. However, there is a need for broader acceptance in society and redefinition of the legitimacy of the field—the institutionalised and objective aspects of cultural capital. This happens through participation in the culturally defined trajectories of artistic education and artistic output and the necessary appreciation by critics and public. Artists therefore reproduce cultural structures in the form of durable and adapted dispositions, doing so within the limits of socio-historical conditions (Bourdieu, 1980, p. 96).

9 Cited in Olofsson (2018, pp. 35-36) in the author's own translation from the Swedish.

for the funding structure. I would argue that, in order to incorporate the aesthetic judgement in media when assessing the artistic quality of an artistic PhD thesis, such texts cannot be taken at face value but must be understood from a contextual analysis of the art world. Other important factors in the art world of theatre are actors, light and set designers and technicians. In a group like Teatr Weimar, technicians and light designers are all part of the artistic collective, an environment which also invites interdisciplinary collaboration and experimentation.10 The central group of actors, like Linda Ritzén, a founding member, have a very strong say on artistic quality. This Any script will be negotiated with the actors until there is agreement on its gualities. Dahlqvist's style of directing is also highly inclusive, and aims to bring the most out of each individual. This also was the outcome of his experimentation with dramatic texts, which meant that "the actors that performed in these plays, Linda Ritzén and Rafael Pettersson, were forced to find new methods in order to perform them. Traditional training in acting needed to be supplemented with new methods" (Olofsson, 2018, p. 29). This development of new methods have been developed by Ritzén throughout the years in the context of Teatr Weimar, but also tested in her teaching at the Malmö Theatre Academy. Her writings on the subject are also discussed in Olofsson's thesis. Hence, the artistic development in the collective of Teatr Weimar is defined in a rather flat structure in which the playwright, director, or for that matter the composer, does not have the only say. As described by Olofsson in his thesis, the collaboration within the group intensified over the years, and the forms of collaboration became increasingly integrative:

The creative process revealed an interesting pattern: there was a continuous movement between working all together to working in pairs to individual work; this was a cycle that went on throughout the work. For example, when I worked with Linda Ritzén recording all the prerecorded voices for the performance we were both directing. In some sections where there were a strong interplay between her and the music, she often 'directed' me in the compositional process. In similar ways Ritzén and Dahlqvist worked with the video material and I composed the songs together with Zofia Åsenlöf. Each participating artist transgressed his/her area of practice and expertise and became an integral part of the dramaturgical work. Consequently, the expected and traditional roles of the artists involved in a production change and expand. This calls for new artistic methods and deepened, mutual understandings for each other's practices and art forms. (Olofsson, 2018, p 248)

To summarize, the art world with which Olofsson's thesis engages is defined by the cooperation of a rather limited number of agents, where the central actants are found in the collective of Teatr Weimar, but also in other institutions in Sweden, and some abroad, and as discussed at length above, also among theatre and music critics and their institutions. Artistic quality then is first defined within this collective, by the decision of the artists involved to produce one piece after the other, but also of their reception in the institutions that define the art world.

2.2 Peter Spissky: Ups and Downs

Peter Spissky's thesis Ups and Downs: violin bowing as gesture (2017)11 represents a rather

¹⁰ This cross-disciplinary approach appears to be a strong reason why Olofsson's practice as composer and improviser with electronics was so smoothly incorporated in the group.

¹¹ Spissky's thesis draws extensively on analysis of gesture in video documentation of performances and rehearsals. The central results are discussed in video essays, and the entire thesis is contained in a website, and therefore there are no page references. The thesis is found at www.upsanddown.se

different perspective. Here, a violinist who identifies as a baroque specialist seeks novel approaches to musical interpretation, by adopting a perspective based on embodied music cognition (Leman 2008). Hence, we are not looking at the creation of new artworks in a contemporary subculture, rather, it is a matter of the preservation and renewal of the performance of central works in the canon of western art music. Another difference is how Spissky's research is not only related to his practice as concert master of several professional baroque orchestras, but also to his practice as a teacher in several Scandinavian academies of music. Hence, the findings in his research are developed and tested in professional ensembles as well as in educational contexts. In his thesis he describes his situatedness in the early music movement as follows:

Historical performance practice went through a major 'ideological' shift towards the end of the 20th century. This new spirit was manifested as a decisive turn towards 'musicking', performativity, and an embodied approach to historical information (Small, 1998; Butt, 2002). Such tendencies are also reflected in my performing and teaching activities. My artistic practice generates invaluable material for my research. [...] The research project brings my artistic and pedagogical practices together, and comprises my work with some of the leading Scandinavian baroque orchestras (Concerto Copenhagen, Camerata Øresund, Finnish Baroque Orchestra etc.) as well as workshops and concerts with my students at the Malmö Academy of Music and the Royal Danish Academy of Music. I am also regularly invited as a so-called 'baroque expert' to direct modern orchestras when they perform baroque programs (Tallin Chamber Orchestra, Ostrobothnian Chamber Orchestra), and thus my artistic practice is not strictly limited to the early music environment. (Spissky, 2017, n. p.)

The art world of Spissky's thesis is centered around Concerto Copenhagen, although they are indeed not the only ensemble to appear in the documentation of the project. The assessment of the activities of this ensemble is mainly carried out by the festivals that program their performances, as well as the critics that review their concerts. But, while much of the music they perform are canonical works in the western art music tradition, their art world is only partly linked to the largest concert halls and festivals. Again, historically informed performance started out as an underground movement, which very soon was strongly supported by historical musicology, and eventually developed into a movement also supported more largely by the music industry in the last decades. As described by Spissky in his thesis:

A very particular cultural agreement, and one that has resulted in a number of specific styles of musical interpretation over time, is known today as Historically Informed Performance (HIP). It is a movement which started in musicology in the middle of 20th century, and that has had as its 'holy grail' the unattainable goal of the realization of 'historical authenticity'. The ambition to play historical music in the same way that it was played when first created produced the concept of 'authentic performance practice'. I myself am very much a part of this cultural agreement, but, as can be noticed in this thesis, the word 'authentic' does not occupy my thoughts very much. It is however, and most certainly was, such an important concept in Historically Informed Performance, that I feel the need to address it, albeit briefly. (Spissky, 2017, n. p.)

Also non-human agents have impact in art worlds, and musical instruments have strong agency in any musical community. Alperson (2007) argues that, although acoustic instruments indeed immediately appear to be material objects, musical instruments are indeed "objects whose creation and whose musical capabilities are infused with information

and conceptual structures that reflect the history and styles of musical sounds" (p. 41). What is understood as a musical instrument is thus dependent not merely on its physical features but also on the specific cultural definitions of music and with what means music is made. In a recent review chapter, Sarah-Indriyati Hardjowirogo (2017) suggests a number of parameters of the "instrumentality" of an object, which contribute to defining it as a musical instrument. The first parameter is an ability for sound production. She continues by noting, second, how the emergence of digital instruments has increased the complexity in this understanding, since the sound-producing device may then typically be distinct from the physical interface.

This second point identifies both the maker's and the performer's intentions as necessary for defining instrumentality, a perspective which also can be referred to McCaleb's (2014) discussion of performer intention as essentially decisive for when a turntable, or similar borderline object, is deemed to be instrumental or non-instrumental. Third, the object's learnability and possibilities for virtuosity (Jordà, 2004) defines instrumentality through the relative impact of practicing, which Jordà refers to as its efficiency. At this point, Hardjowirogo arrives at more complex and interwoven perspectives, where effort, corporeality, and interaction come into play. Here, effort and resistance (Evens, 2005; Östersjö 2008 and 2013) are of particular importance, and the relation between the poles of efficiency and effort will be explored below through the notions of resonance and resistance (Östersjö, 2013). These perspectives entail the relation between expressivity in musical performance and the degree of perceived effort that is projected to an audience. Spissky (2017) discusses the role of the instrument in his artistic practice, by observing how, as a baroque violinist, he employs playing techniques based on historical performance practice on a historical instrument. Here, the relation between the performer's body and the instrument are again highlighted, now through the application of historical knowledge to the interaction with the instrument:

Apart from the obvious difference in sound between the modern and barogue violin, there is another distinction that is more relevant to the present study: the specific kinaesthetic affordances of the baroque instrument (Boyden, 1990; Gibson, 1986). The baroque violin is held without a shoulder rest and chinrest, which makes the violin grip freer and more flexible in comparison to that of the modern instrument (Tarling, 2000). This allows for greater freedom in body movement, and it might have some implications on the role of the body in the interpretation and performance of baroque music. When I started to play baroque violin back in Bratislava in the late 1980s, I accepted the awkwardness of the playing technique as relevant information in itself. The instrument, being authentic, was to dictate all aspects of phrasing, articulation, dynamics, and, most importantly, the sound. The way the instrument 'decided to sound' was accepted as historical information. [...] In this respect, my baroque beginnings were all about finding a sound which is different from the traditional aesthetics that I had grown up with. The instrument was the main source, and the awkward 'chin-off' technique (i.e. without fixing the instrument under the chin) became the crucial means of achieving this sought-for difference. Looking back from the perspective of today, the kinaesthetic advantage of freeing the body from a fixed grip that is afforded in the baroque violin, was simply neglected. Only later, like my childhood beginnings with the modern violin, did my finding of the sound trigger the curiosity of what is behind the sound, leading to a discovery of movement, dance, and poetry. (Spissky, 2017, n. p.)

These are strong examples of how instruments can be highly resistant objects, and that this

resistance can either be material or cultural.¹² The agency of the instrument was indeed central in the early days of historically informed performance, as in the practice of Arnold Dolmetsch. Through the use of original instruments, or copies that aimed to reconstruct the affordances of the original instruments, Spissky notes how "it was assumed that, for instance, an authentic baroque sound could be reconstructed. But such assertions are obviously problematic. The final sonic product – built on descriptions of playing techniques and the reconstruction of the historical instruments in the sources – can never be compared with the actual original sound of the past. Thus the assessment of the result must allow criteria such as possible, logical, and plausible" (Spissky, 2017, n. p.). In the art world of Spissky's thesis, the agency of the historical instruments is indeed strong. Further, it is important to stress the impact of historical musicology on the field still today. In the case of Spissky's art world, the agency of this research field is lessened by his particular approach to historical repertoire, and the historical instruments, through what he calls

"embodied interpretation" (Spissky, 2017), a concept which constitutes the central outcome of his PhD. To summarize, music institutions and media have strong agency in the assessment of artistic quality, but the quality of Spissky's findings, and the entire research output, is also assessed through his extensive pedagogical activities.

2.3 Sten Sandell: Music On the Inside of Silence13

Sten Sandell is one of Sweden's foremost improvisers with an extensive international career. His thesis is titled *Music on the Inside of silence – a study* (2013).14 It is a complex product comprising a box containing a triple cd, a book and further material on Sandell's website. On the three cd's are three major works by Sandell, all with clear conceptual links to the aims of his PhD. The book is a mottled affair that takes in many different linguistic levels, ranging from poetry, via discussions of a more theoretical nature, to transcriptions of dialogues between musicians at work. The thesis is an artistic exploration of the relationship between sound, text and images, and specifically what happens in the interplay between these different forms and practices. Hence, the project takes off from a context of free improvisation in which Sandell is deeply rooted. The book itself also starts out in that end, perhaps as a method for situating the project. On page 19-29, the reader is presented with two verbatim transcriptions of a dialogue between Sandell and the guitarist David Stackenäs. with reflections on their long-term artistic collaboration, and other little comments and reflections, in between the playing. This dialogue holds some moments outspoken positioning, wherein free improvisation is contrasted with performative interpretation of scores, and Sandell observes in his first comment on page 19 how the improviser can be free to respond to everything that happens in the room, in the here and now, in contradistinction to when performing a pre-prepared interpretation of a composed score, in which it is assumed that the aim is always to stay as near to this pre-conceived interpretation as possible.

One can trace the artistic roots of Sandell's project to the early Modernism of Marinetti and Kurt Schwitters, or Öyvind Fahlström in terms of a Swedish tradition, and the latter is

¹² For a further discussion of cultural resistance in musical creativity, see Coessens and Östersjö (2014). 13 Parts of this section are built on an earlier review of Sandell's thesis, commissioned by the Swedish Research council, see further Östersjö (2014).

¹⁴ It should be noted that while the other three theses are in English, Sandell's is in Swedish, and the original title is "På insidan av tystnaden – en studie" (Sandell, 2013).

significant. Sandell's text is peppered with quotations from the poetry of Bengt-Emil Johnson and the artistic aims of the project are closely aligned with the development of text-sound composition, bringing together concrete poetry and sound art, a direction of which Johnson was one of the leading proponents. It is hard to believe that Sandell's study would have taken on the same form without these precursors. This connection is not discussed in the thesis, but just as with the ways in which the work of composers like Heiner Goebbels or Georges Aperghis certainly are reference points in Olofsson's thesis discussed above, the art world of Sandell's thesis is indeed informed by these precursors.

But also Sandell's art world is strongly shaped by the agency of his instrument, in this case the piano, and the parts of his writing that approach the phenomenology of piano playing strike a note which is indeed not so remote from the approaches to an embodied interpretation, suggested by Spissky above:

When I strike a key on my piano, I hear the hammer hitting a string that starts to vibrate. From my actions, I register that the mechanics of my piano work. But when I listen to the note I've just played, I hear a fundamental and a series of over-tones that already tell me something sonorously. Now I become interested in where this is going. Will this note immediately be followed by another or will there be a pause, will it be followed by a rapid succession of notes that might also form a chord, polyphony? Composer Morton Feldman describes this by saying: "All activity in music reflects its process."¹⁵ I look at the piano, turn to the audience and say: I exist in a space. My body is part of that space. Inhabits the space. Experiences the space as I move and play in that space. 'As such we cannot say that the body is in the space, nor is it in the time. It inhabits the space and the time'.¹⁶ (Sandell, 2013, p. 50)

There are indeed many attempts to explore the space between sound and words, between music and text in concrete poetry and in other fortspinnung of established forms within textsound composition The poetry by Sandell, together with Fredrik Nyberg and Bengt-Emil Johnson, is woven like a fabric through the book, with many of these texts also forming a springboard for works that combine recitation and instrumental music These encounters are perhaps Sandell's greatest contribution to the field of text-sound composition. Acoustic instruments and instrumental music were never at a premium among forerunners such as Sten Hansson, Åke Hodell and their ilk. When Sandell approaches text-sound composition from a pianist's perspective, this brings many new qualities to an old Modernist tradition. The variety of textual levels is one of the assets of the thesis, with one reservation. In her thesis, journalist Kristina Widestedt (2001) points to a tendency towards increased use of metaphors in contemporary music criticism, which she reads as a paradigm shift away from a more initiated target group towards a broader audience. In Sandell's thesis there are several examples of how his texts about his own music verge on evaluative statements of the same character as review prose, a linguistic level that comes across as particularly problematic when such statements are written by the performer himself.17

There are several similarities in how Sandell's project is designed as compared to Olofsson's

¹⁵ Morton Feldman, Give My Regards to Eighth Street (Exact Change 200), p 65, quoted in Sandell 2013 16 Maurice Merleau-Ponty, Phenomenology of Perception, Swedish translation by William Fovet (Daidalos 1997), p 102, quoted in Sandell (2013).

¹⁷ See e. g. this sentence: "Together with my vocal comments in the form of breathing sounds, overtone singing and exclamations, this forms an apparently obvious organic unit, where the confinement is clear" (Sandell 2013, pp 139–140) ["Tillsammans med mina röstkommentarer i form av andningsljud, övertonssång och utrop, bildar detta en tillsynes självklar organisk enhet, där instängdheten är uppenbar"]

thesis discussed above. Also here, a well-established artist embarks on a project that wishes to explore new territory. There are differences too. While Olofsson struggles to define this new field he is exploring, Sandell pays very little attention to predecessors and earlier modernist traditions with which he appears to have strong sympathies. Further, while collaboration is the central method, and the practice which is explored in Olofsson's project, such interaction play a much more limited role in Sandell's project. Hence, while the art world was rather small, and clearly defined, in Olofsson's project, in Sandell's thesis, the art world is not so clearly described.

However, within the book's constant shifts between different linguistic levels and material, the analytical sections come across as strong statements: the parts of the text where Sandell draws on models for understanding from Nancy and Foucault, for example, are intimately bound up with the music at the heart of the thesis, in the box of three cds. The ability to move between different forms of knowledge is a factor in artistic research that remains in its infancy, but it is clear that there need be no contradiction in this movement. Perhaps one can understand Sandell's book as a series of experiments, a collection of études that in various ways occasionally succeed and sometimes fail in achieving this meeting of parallel worlds.

By this, I mean that all these different approaches have a function in a cohesive whole. But without a convincing artistic statement, such an endeavor would be doomed to failure. It is indeed also a strength with the thesis, how it makes itself dependent on the artistic outcomes, such as represented by the cd recordings.

Sandell quotes Nancy in his thesis, and in his words captures the core of his own project: "to be listening is always to be on the edge of meaning" (Nancy, 2007, p 7). This listening is also a fundamental precondition for artistic research. The generation and communication of knowledge often takes place in the space between academia and art, where the artist can move freely between discursive thought and the way of the hand, applying the art of listening to the creation of knowledge in this borderland. In my reading of the project, "Music Inside the Language – the trio" stands as the key outcome, a piece of music for three musicians that moves seamlessly from text to voice to music, inhabiting the spaces in between that the thesis evokes. In collaboration with singer Sofia Jernberg and double bass player Nina de Heney, Sandell has created music that gives perfect form to a movement between text and language, sound and silence. A blazing review was published in "All About Jazz", an online journal clearly situated more in the art world wherein the project took off, rather than in the novel domain which Sandell set out to explore. The reviewer, Eyal Hareuveni, appreciates how Sandell "investigates his musical language and attempts to formulate it anew, from a fresh perspective, without any attachment to conventions, routines or approaches" (Hareuveni, 2013, n.p.). Further, he finds the trio CD to be the most accessible expression of these aims, a project in which

[a]II three deconstruct and reconstruct their shared language—the musical and the verbal—into a series of mutated alphabetical, phonetic syllables, interrupted poetic lines and emotionally charged song-like sonic articulations, within a loose grammatical framework, creating a sensual and emphatic interplay that introduces more and more surprising and inventive dynamics and sounds. The sensitivity of all three musicians, their immediate responses and instincts, the telepathic understanding and endless flow of ideas, is exemplary. This chapter [of the cd-box] and this resourceful trio offers the most intriguing realization of Sandell's musical language (Hareuveni, 2013, n.p.)

Again, it is worth noting that the project with this group is one of the artistic outputs that is most clearly grounded in the art world wherein Sandell initiated the research. Sandell's experimental approach is important for the inquiry, but perhaps the assessment of artistic quality can still best be carried out in the art world in which the project took off. This, I believe, is not the case in the fourth PhD project we will study.

2.4 Marina Cyrino: An Inexplicable Hunger: flutist)body(flute (dis)encounters

Marina Pereira Cyrino is a Brazilian, classically trained, flutist. Already in her master thesis (which she obtained in Piteå School of Music, at Luleå University of Technology), she explored a space outside of the classical flute techniques. Her master thesis, titled The Vocal Flute: Creative Uses of the Flutist's Voice in a Collaborative Context (2013) was concerned with how she could develop techniques for a singing flutist in a series of collaborative compositional projects. Here, she describes how collaborations with composers had been a part of her practice as a performer already for many years. She describes how, in 2004, she "participated in the creation of a student experimental chamber group in the town of Belo Horizonte, Brazil. During four years we worked with improvisation and collaboration with composers, focusing on classical contemporary music. These years reinforced my passion for new music and showed me the importance and benefits of working directly with composers" (Cyrino 2013, p. 4). It appears that this experience signals a movement outside the art world of western classical music, and the search for an identity in a different space. Her PhD thesis, titled An Inexplicable Hunger: flutist)body(flute (dis)encounters (2019) starts out by articulating a critique of the culture of western art music, and its institutions. She cites the French composer Jean-Charles Francois, suggesting that "the matter of expertise lies at the centre of the questions musicians have to face today: if the twentieth century called into question the notion of virtuosity, either by denying, violently, the craft of the artist, or even by denying art itself, or by multiplying virtuosities and adapting them to increasingly specialised contexts, still the division of roles perpetuates a norm inside music institutions - even if some eccentrics have permission to mix music with other art modalities. Meanwhile, in other artistic fields, mixture has become a fundamental practice" (Cyrino, 2019, p 24). The notion of creating a mixture of the roles of interpretation, improvisation and composition, constitutes the initial response to the institutional demands for specialization and fragmentation, in the name of efficiency or excellence. She turns to Becker's analysis of system inertia through the institutional packages of conventions as a model for understanding also the role of teaching institutions in this development:

This form of globalised standardisation is not a new phenomenon but lies at the heart of modern utopia, of the imperialist enterprise. The almost absolute exclusivity that is evident in the standardisation of the musical practices performed inside institutions of higher education belongs to the European model of the conservatory, on a global scale. François points to the way in which the phantasmagorical threat of the disappearance of the European "classical" music heritage and an ensuing generalised amateurism is destabilising the conservatoires and institutions of higher education at present. The ensuing fear, though, simply reinforces the slogan of "maintaining excellence", of a disciplinary practice, of a certain accordance with a systematic, intensive and unquestionable practice, imposed as "tradition", which hinders the opening toward a diversity of marginal and experimental practices.

Musicians who for one reason or another do not work inside what sociologists have named the "system of *package*" – and there are many – have difficulties accessing institutions of higher education in music. François traverses a dilemma: either they can

accept rules that will deeply modify the conditions of their own practices, or they can prefer to remain outside institutions, or to create their own institutions, separated, in the margins of the official circuits. (Cyrino, 2019, p 25)

Hereby, she turns the critique not only toward the institution hosting her PhD studies, but also toward the discipline of artistic research: "what does artistic research, made inside the same institutions that standardize, have to say? After all, here am I, inside the music academy, proposing a form of mix-me-other-arts as a method of artistic research" (Cyrino 2019, p 25). Her method of creating a mixture of practices is fundamentally an act of resistance to the system of package, an attempt to destabilize the value system and breaking out of its standardizing procedures. Instead of the efficiency of specialization, her method evokes questions like: "How to practice un-goals? How can the relation between the body of a musician and the body of a musical instrument be understood as a space for the practice of un-goals?" (Cyrino, 2019, p 25). The art world that unfolds through this collaborative practice is fragile and local, seeking different institutional connections, beyond the conventions of concert hall culture. Cyrino describes how "mixture-as-investigation began, timidly, as an opening towards musicians and artists nearby; it was essential for my research to begin with artist-neighbours and their practices" (ibid). But it is through the unfolding of this novel practice, and the encounter with audiences, that the ethical nature of this artistic research project, which enacts a certain resistance, not only against the institutional package, but also against gendered stereotypes in contemporary concert cultures. Through a collaboration with the composer Mansoor Hosseini on a solo work for flute titled Cass...andra (2015), several political dimensions of Cyrino's practice emerged. First, in the engagement with Ellen Waterman's gender analysis of Ferneyhough's classical flute solo Cassandra's Dream Song (1970), but also through a reading of Adriana Cavarero's philosophy of voice. However, the political nature of the piece is most of all drawn from Hosseini's approach to composition through bodily gesture, and the composition becomes an articulation of a body politics, which can only be experienced through performance. As argued by Cobussen and Nielsen, "a musical ethics can only come into existence on the basis of a contact with a perceiver—that is, through the act of listening. Thus, ethical moments can only be understood as strategies of engagement, through receptive interpretation, affected and formed by both doubt and astonishment" (Cobussen & Nielsen, 2012, p. 166).

When does the audience start listening? When I ululate a nonsensical breathing language or, finally, when I show my face and my skills as a flutist, an acceptable knowledge, an expected knowledge? Where is the truth, the knowledge, the prophecy? Is someone going to believe that I am a flutist, a musician? During most of the piece I am estranged from my knowledge as a flutist, from the usual relation flute-body- flutist, from the usual relation flute-body- flutist, from the usual relation flutist-body-audience. I estrange the flute from myself by playing a disassembled instrument assembled through my body-breathing. The assembled flute, as a "complete" musical instrument, appears at the end, as a revelation, tying up *Casss…andra*'s story: Does anyone believe? The audience? The 'I' performing? Why did we not listen in the same way in the beginning, if we did not?

Cassandra-in-me takes the form of a double question, a double contamination. What can Cassandra do to my body- flutist? Through *Casss...andra*, I encounter ways of working around standardised forms of flute playing, standardised forms of hearing a flutist on stage, and new forms of artistic presence. What can my body-flutist do to Cassandra? If *Casss...andra* retained aspects of the exotification of a tragic silencing of the female, I tangle and twist depictions of Cassandra, stealing her out of her context. By speaking and playing at the same time, I mix Cassandra with *Casss...andra*, with the song of the flute, with the doing of academic research, in order to question the nature of her curse. In order

to contaminate her tragic voice with breath, movement, suspension. In order to reclaim the auditory dimension of her gift. Cassandra-in-me continues: *Listen, sound touches in between!* (Cyrino, 2019, 85-86)

This ethical engagement with the constraints of the body-politics of the institutional package of western art music is an important quality articulated in the art world formed through Cyrino's PhD project. I will in the next section argue that the artistic knowledge articulated through artistic research, in performative or material forms, can only be fully understood through an analysis that combines perspectives of embodied cognition and a socio-cultural perspective.

3 Artistic knowledge and the performer's voice

The central argument in this paper is that artistic knowledge takes shape both in the materiality of an artwork and as performative knowledge embodied by the artist. Further, this knowledge is situated in a particular art world, and can only be analyzed and evaluated through an understanding that builds on a combination of these perspectives. This entails several forms of "thinking-in-art" (Merleau-Ponty 1964) and "thinking-through-art," where the latter suggests a further communication across artistic, embodied, and discursive domains (Östersjö 2017).18 The analytical model of a musician's voice presented below has been developed and tested within a research cluster at the Orpheus Institute, primarily in a subproject with the composer David Gorton and two musicologists at IPEM, the centre for systematic musicology at the University of Ghent, Esther Coorevits and Dirk Moolents.19 Art worlds produce performance practices, constituted by the repetition "with difference" characteristic of the citational practice of performance (Bolt 2016). Building on theories of material thinking, Mikkel Tin observes how "this forming process involves my body and is performed as a bodily practice. But even as a bodily practice it requires training, and certain kinds of professional making require a long and comprehensive training. Still, the practical skill that results from such training is bodily rather than conceptual. The training and transmission of making skills take the form of practical experimentation rather than theoretical explanation" (Tin, 2009, p. 1). Artistic research holds the possibility of gaining access to the knowledge forms specific to the practice, within any given art world. Art worlds develop their specific interpretative models for evaluating artistic quality across the domains of material artworks, as well as of performance. An epistemology of artistic research must embrace, and seek to further deepen, these forms of interpretation within the art world, which entails knowledge claims related to the performative (Haseman, 2006) and the material domains of artistic production. Gorton and Östersjö (2019) argue that

The truth claims within the performative paradigm are not related to repeatable testing, as with the other two forms of knowledge, but are instead situated within a specific context

18 When thinking-in-art, experimentation with materials forms the process, rather than the conceptual explanation. A further possibility is suggested by Sarat Maharaj (2005) who introduced the notion of thinking "through" the arts. Such "thinking-through-music" (see Östersjö 2008 and 2017) necessarily presupposes thinking-in-music but additionally introduces the possibility of a translation from the artistic, "through" an understanding of art also as process, towards a translation into a verbalisable articulation of knowledge.
19 The cluster is headed by Catherine Laws, and within the cluster I have also carried out one project with the composer Bill Brooks and audio engineer Jeremy J. Wells, and another looking at the work of my Vietnamese/Swedish group The Six Tones in collaboration with Nguyễn Thanh Thủy. This research cluster has used processes of artistic research to explore how subjectivity is instantiated and embodied in performance, and has explored various forms of documentation and analysis in order to approach a more robust understanding of how subjectivity is indeed an embodied and socio-culturally defined phenomenon (See further Laws et al., 2019).

and validated through measures of force and effect (Bolt 2016). Performative knowledge belongs to the sphere of tacit knowledge (Polanyi 1967), taking shape within the context of a specific artistic event and remaining as embodied knowledge, sedimented in the artist's body. This raises the fundamental question of how such knowledge can be accessed intellectually and communicated, beyond the recognised performative and demonstrative situations of rehearsal, concert performance, and instrumental teaching, and to what extent, and with what methods, this tacit knowing can be translated into discursive knowledge. (Gorton & Östersjö, 2019, p. 38)

The "long and comprehensive training" that Tin refers to above is essential in the formation of a musician's embodied knowledge.20 As discussed above in section 4.2, with reference to the agency of historical instruments in the art world of HIP, in order to fully embrace the character of these learning processes, the agency of technological tools, like instruments and scores, must be considered. Naomi Cumming describes such an experience of agency in her encounter with a new violin as a teenager: "When I began to play it, the sound of this new violin seemed to draw from me something I did not know I possessed. It was as if the violin had the potential to become the voice I lacked. This was guite a discovery, not made fully in a moment of time but over a couple of years" (Cumming, 2000, p 3). What is essential to our discussion here is how these interactions with the instrument give rise to what she calls a subjective voice. Further, she describes how she begins to make sense of what this "voice" is, and how it relates to her instrument through lessons with the leader of the second violins in the Melbourne Symphony Orchestra: "What he sought, somehow, was an identification of his students with the sound of the violin as a voice that could be expressive of their own passion, and yet a cultivated distance that would allow them also to draw out the best in the violin's tone, in a critical stance that recognised it as more than a projection of their subjective states" (Cumming, 2000, p. 4). Gorton & Östersjö conclude that "for Cumming, her subjective "voice" is therefore a result of both a bodily and emotional relationship with her instrument, but also something separate, that can be listened to with critical detachment" (Gorton & Östersjö 2019, p. 39). Importantly, as can be seen in Spissky's discussion above of the learning process of embracing a historically informed playing technique, finding voice is not merely about producing the intended sound, but just as much to do with "what is behind the sound, leading to a discovery of movement, dance, and poetry" (Spissky, 2017, n.p.).

Similarly, the formation of a composer's voice is shaped through the interaction with the technology of musical notation, as well as through the interaction with musicians and their instruments. In chamber music performance, the negotiation of a shared voice constitutes a fundamental aspect of artistic quality.₂₁ Gorton & Östersjö (2016) observe how, through

20 The philosopher Helena De Preester notes how "in performance, the body abruptly and explicitly comes into visibility and resists forms of objectification that may put it to rest, to clarity and obviousness" (De Preester 2007, 352). Any analytical engagement with performative knowledge must therefore develop methods to overcome this resistance. The distinction between body image and body schema is helpful in understanding the multi-layered human body. The body image may be thought of as the explicit understanding that we have of our own bodies. It is an intentional state made up of several modalities: perceptual experiences of one's own body; conceptual understandings of the body image, performative knowledge may be accessible through introspection and reflexive research methods, such as is common in autobiographical forms of artistic research. The body schema, on the other hand, involves "a system of motor capacities, abilities and habits" (Gallagher & Cole, 1995, 370) and is thus often unintentional or subconscious in character.

21 I am currently part of a research cluster with David Gorton, Mieko Kanno, Deniz Peters, Åsa Unander-Scharin, Jessica Kaiser (artistic PhD student in Graz) and Kerstin Frödin (artistic PhD student in Piteå School of Music), within which a series of studies of the formation of voice in duo performance is being carried out, and the first

composer-performer collaboration, a "discursive" voice, can be an identifiable outcome of such interactions. Further, in a forthcoming book chapter drawing on a more extensive analysis of qualitative and quantitative data, they argue that in this study, the composition discussed - Austerity Measures I for 10-string guitar - points to how the identity of a score-based composition can also be performative, and not merely situated in the materiality of the artwork, an observation which is true of all such works, but is underlined by the malleable structure which characterizes Gorton's composition:

The performative identity of *Austerity Measures I*, which appears to be primordially linked to the sessions in which its initial materials were developed, suggests that the function of the score is not to define the identity of the 'work,' but rather to instigate a negotiation of 'discursive voices.' In the creative process leading up to the first performances, such a 'discursive voice' emerges from the collaborative process. Here, the composer has direct access to the performer's instrument, and the performer has direct access to the composer's notation (at various stages of development), with the guiding and moderating performance and compositional practices shared by both. (Gorton & Östersjö, 2019, forthcoming)

The emergence of voice is situated in a musician's embodied interaction with technological and psychological tools, but also in a socio-cultural context. Importantly, an analysis of such processes will bring greater focus to the material and embodied interaction, and provides further insight into perspectives such as suggested by Sandell above, in his phenomenological observations of piano playing. For the assessment of artistic quality in the longitudinal and transformative format of an artistic PhD, the negotiation of voice, either in direct interaction with other human agents resulting in a discursive voice, or as a transformative development of a singular voice, constitutes a fundamental analytical perspective. In the next section we will look at an example of how such a negotiation of voice, wherein musical transcription plays the role of a methodological tool, which serves to unveil some of these processes in which performative and material artistic knowledge is articulated.

4. Musical Transcription as negotiation of voice

Musical transcription has historically been a practice with the dual possibilities of exploring the affordances of instruments, as well as the technology of musical notation itself.²² Luciano Berio embodied this practice, and transformed it into a central tool in his compositional methods. His approach to transcription is also a beautiful example of how the preservation of tradition always holds an element of transformation, and he observes how "musical transcription, seen from a historical perspective, implies not only interpretation but also evolutionary and transformational processes. The practice, the possibilities, and the needs of transcription were an organic part of musical invention" (Berio, 2006, p. 35). The move from transcription to composition can be observed in the cycle of transcriptions of his cycle of solo works (Sequenza) into compositions for soloist and ensemble (Chemins). He further argues that there is an immediate connection between interpretation and analysis in the act of

written outcome is a chapter in a book publication at the Orpheus Institute, to be published in winter 2020. 22 A historical example could be Bach's transcription of Vivaldi's concerto for four violins, and its transformation into a concerto for four harpsichords. Here, it can be observed how he improves the counterpoint, increases the number of parts where this seems to be called for, extends slow movements by extending the existing contrapuntal structure. By also making further notation of the ornamentation, Bach's transcription has also given us further knowledge of the performance practice of the time (Aldrich, 1949).

transcription, and points to how the third movement in his Sinfonia 'is the best and deepest analysis that I could ever have hoped to make of the Scherzo from Mahler's second Symphony' (Berio, 2006, p. 40).₂₃ Feruccio Busoni makes some even more far-ranging and illuminating observations regarding notation in his essay "Sketch of a New Esthetic of Music" (Busoni, 2010), as a precursor of Ricoeur's hermeneutic philosophy of the act of writing:

'Notation' ("writing down") brings up the subject of Transcription, nowadays a term much misunderstood, almost discreditable. The frequent antagonism which I have excited with 'transcriptions,' and the opposition to which an ofttimes irrational criticism has provoked me, caused me to seek a clear understanding of this point. My final conclusion concerning it is this: Every notation is, in itself, the transcription of an abstract idea. The instant the pen seizes it, the idea loses its original form. The very intention to write down the idea, compels a choice of measure and key. The form, and the musical agency, which the composer must decide upon, still more closely define the way and the limits. (Busoni, 2010, p. 18)

Historically speaking, a musical transcription can either expand the instrumentation of a composition, as in an orchestration of a piece for a solo instrument, or reduce the number of parts, as is found in versions of Schönberg's Chamber Symphony op 9 by the composer himself for two pianos, or, perhaps more importantly in Anton Webern's two differently scored versions for quintet, created with an articulate conviction that the true identity of the work was more intimate than the original version suggested, and must have the "character of a chamber music composition".²⁴ But the original could also constitute the material for a rather independent new composition, like in Liszt's paraphrases of Chopin's songs.²⁵ As part of the musicological study of folk music and extra-European music, a different form of transcription emerged in the 19th Century, which entailed the translation of orally transmitted music to western notation. In the 20th Century these methods were further developed in ethnomusicology, first with the use of audio recordings, and after 1950, also with the use of new technologies and computing to create analysis and representations of these data in other forms than in standard western notation (Nettl, 2005).²⁶

I will in the following turn to a brief analysis of how different forms of transcription can be a source for identifying the negotiation of voice between a composer, a performer, a specific instrument and several compositional systems, using documentation of a collaboration between myself and the British composer David Gorton as material. The piece we eventually created through these collaborative processes is titled *Forlorn Hope*₂₇. It is a composition for

23 In Bach's time, the practice of transcription was an essential component in the study of composition. But it also had a very pragmatic function, as a means to efficiently respond to the demands for new works and performances.

27 The title refers to one of John Dowland's most complex solo works for the lute, the Forlorn Hope Fancy. I will discuss below how transcription played a series of roles in the compositional process, and Dowland's fancy constituted one of the sources here (discussed further below). Forlorn Hope is recorded on CD, together with my transcription of John Dowland's Forlorn Hope Fancy, in a portrait CD with David Gorton's music on Toccata Records, London (Gorton, 2017).

²⁴ Cited in Muxeneder (2018, n.p.). Obviously, Schönberg's Chamber Symphony is indeed a rich example when it comes to arrangements and questions of instrumentation, since the composer's own intuition obviously was contrary to Webern's and, following the premiere in 1907, he created a series of versions that expanded the instrumentation, until the premiere 1936 of op 9b, scored for full orchestra.

²⁵ For a discussion of these transcriptions, see Charles Rosen's book The Romantic Generation (1995) where he points to how even the more extensive reworking of materials, as in the intertextual coupling between Chopins Nocturne in Db major Op 27, no. 2 and the mazurka, Meine Freuden (Op 74 nr. 5).

²⁶ For a literature review of the development of methods and software for such analysis, see "Automatic music transcription: challenges and future directions" (Benetos, et al., 2013).

11-string alto guitar, an instrument which was originally developed to allow the performance of renaissance lute music on a guitar, without compromising the composed structures. Hence, the instrument is tuned a minor third higher than the guitar, as a renaissance lute, and it has a theorbo-like construction, although it differs from such lutes by also having frets for the extended bass strings, a difference in the affordance structure of the instrument which has urged the development of different right hand techniques in order to master the extended possibilities of this particular instrument. I have indeed used this instrument to record the lute music of J.S Bach,28 but, for me, it has primarily functioned as one of many experimental guitars on which to create new music.29 The alto guitar was a central instrument in the first working sessions with David Gorton at the Inter Arts Center (IAC) in Malmö in 2010. Over a period of three days we tested a series of tuning systems that David had prepared. They are reflective of a core feature of his compositional practice, which entails the creation of harmonic structures, specifically designed for compositions for string instruments, by retuning each instrument using procedures built on the affordances of the seventh harmonic. By using this natural harmonic, which is 31 cent lower than the seventh step in an equally tempered scale, as a building block in the tuning procedure, a particular alteration of the internal pitch structure of the instrument(s) is generated. Hence, the harmonic structures in Gorton's music is not built on a microtonal system which is imposed on the instrument, but instead, the microtonal harmony is immediately drawn from the affordances of the instrument(s) when tuned to such a scordatura. Gorton had prepared three tuning systems and we worked on each of them, going in between, comparing their individual characteristics, and considering whether they would be more suited for one particular instrument rather than another. Figure 1 shows the first of the three tuning systems, eventually selected for the piece for 11-string alto guitar. This scordatura illustrates the general principle: here strings 2 and 4 are tuned one-sixth of a tone flat so as to bring them in tune with the seventh harmonic of strings 7 and 11 respectively; and strings 6, 8 and 10 are tuned one-sixth of a tone sharp by bringing their seventh harmonics in tune with string 1, which is at "normal" pitch.



Figure 1. Scordatura for the 11-string alto guitar in David Gorton's Forlorn Hope.

For the purposes of this paper, it is important to consider how this collaboration was documented and analyzed. The first working sessions at the Inter Arts Center were recorded on video, and initially analyzed by Gorton and Östersjö, in stimulated recall sessions, set up

²⁸ Also in the performance of Bach's lute music, the extended fretboard, and a right hand technique which allows for fingering parts of the counterpoint on the lower bass-strings, is essential in order to avoid compromising the structure of the more intricate movements. See further Östersjö (2003).

²⁹ Among early recording projects, André Chini's solo work "Skål Khayyam!" (recorded on Östersjö, 2001) and Kent Olofsson's concerto for guitar and chamber ensemble, "The Garden of Earthly Delights" (recorded on Östersjö, 1997) were of particular importance.

in immediate sequence after the recordings. This provided a first analytical overview of material produced, and of some important interactions between the two protagonists. However, we then contacted Eric Clarke, Heather professor of Music at Oxford, and agreed to include this project as a study carried out with him and his assistant Mark Doffman, as a part of the then unfolding CMPCP-project. All documentation that we produced, videos of rehearsals, compositional sketches, as well as email conversations, was handed over to Clarke and Doffman, and analyzed in a second round, independently of the first. Eventually, the four researchers then again met for a final round of joint analysis which led to the publication of a jointly authored book chapter (Clarke et al., 2017).

Here, the project is discussed as situated in an art world of contemporary classical music, in which a division of labour between composer and performer remains the rule. While they find that the project provides clear evidence of artistic practice in which the traditional roles of "composer" and "performer" become fluid, they also suggest that these examples "may do little to shift or break those boundaries in any dramatic manner; but in more implicit and procedural ways they help to carry forward the long process of dismantling the still persistent myth of the autonomous-genius composer and his or her helpful and accommodating interpreter–performer" (Clarke et al., 2017, p 134). I will return to this problem of inertia below. In the final analysis, the four authors make a series observation regarding the initial working sessions, in which they find

Östersjö and Gorton behaving almost as a single agent distributed between two individuals, in which Östersjö generates the material while Gorton sits alongside as an interactive listener, asking, suggesting, commenting, responding—with frequent, quite lengthy periods of quiet attentiveness. The process starts with a diagnostic phase, in which Gorton and Östersjö investigate ways to get to grips with the tuning systems: what they sound like, what sort of resonant qualities they have, how the pitches of the strings relate to one another across the frets, and the sonic outcomes of typical fingering patterns that are now transformed by the new tunings. By extension, this diagnostic phase then becomes manipulative, driven by the tacit question: If the strings sound like that, what happens if we try this? And a third phase is more directly performative: once Östersiö has gained sufficient familiarity with the tuning system, he is able to improvise with it for extended periods. These improvisations confirmed the sense that the first tuning in particular brought out specific dynamic and dramatic gualities in the eleven-string guitar, with the resulting decision that this system would be used for that instrument in the first piece of the project, and that the other systems would be used in later pieces on the tenstring and six-string guitars. (Clarke et al., 2017, p.122)

The chapter provides several detailed examples of how material which was created in these sessions were incorporated into the final composition. I will not discuss the detail of how these can be identified, but rather the significance of the process of transcribing parts of these video recordings, with the intention of either literally citing them, or for recomposing them.

But first we need to look at the next impulse towards transcription: the idea of using John Dowland's Forlorn Hope as a reference, and as a material to cite, in the piece. The first impulse was related to an earlier project of mine, a duo collaboration with the composer and improviser Natasha Barrett. Culminating in a CD released in 2009 (Barrett & Östersjö, 2009), we had developed a shared voice as a duo, aiming at the exploration of materials from John Dowland's lute songs – or in fact, only one song, "Can She Excuse My Wrongs" – through two compositions for guitar and electronics by Barrett and a series of improvisations for

guitar and electronics with the duo. Gorton was familiar with the CD and was interested in connecting to the project. We decided to use a different piece from Dowland as a source material. Since I had just been making a transcription for 11-string alto guitar of Dowland's Forlorn Hope Fancy, we quickly agreed to work from this composition. We decided that the first step must be to transcribe the piece for the scordatura we had agreed on for the new composition.

We met at the Royal Academy of Music (RAM) in London for this second stage of the work. We agreed to use my existing transcription as a point of departure, and make annotations with new fingerings in my score. We additionally agreed on a set of "rules" for how to go about making the new transcription: (1) the tonal structures of the original fancy should always remain recognizable, even while sounding "out of tune"; (2) the tonal structures should sound as if coming "in and out of focus"; (3) "out of focus" moments should predominate, so that the "in focus" moments are rare; and (4) technically idiomatic solutions on the instrument should be prioritized. This entailed on the one hand a pragmatic approach. but also a focus on attentive listening to the minute detail of the many different options in the "retuning" of the Dowland, through Gorton's scordatura. By using my transcription as point of departure, and exploring the affordances of Gorton's tuning system as applied on the alto guitar, the process of creating the transcription put the voices of both performer and composer in interaction also with the voice of John Dowland, as a lutenist and as a composer. In the liner notes to the portrait CD comprising Forlorn Hope and other works engaging with historical voices in similar ways, Gorton observes how there are several reasons for his interest in "working on the edges of transcription, arrangement and composition" (Gorton, 2017, p 4). He finds that there are micro-levels of signification that come to the fore, specifically through such negotiations of voice:

It is a common practice to classify a composer's style in relation to his or her harmonic, rhythmic or aesthetic concerns and, where these considerations might change over a lifetime, to divide someone's output into distinct stylistic periods. Yet questions of style run much deeper than that and are influenced by the kinds of choices made by a composer on a note-by-note basis: the voicing of a chord, the pacing of materials, the dovetailing of a line between instruments, the idiosyncrasies of instrumental writing. Usually these small-scale choices become subsumed or obscured by the more obvious stylistic considerations, but when working with borrowed materials they come to the fore. The compositions on this album therefore represent a process of discovery for me, in which I have found new facets of my compositional "voice" through that of another (Gorton, 2017, p. 4).

Interestingly, in the initial stage, in the working sessions at RAM, a parallel negotiation of voice - between the two protagonists in the room and the voice of John Dowland, through the score - took place. Once this annotated score was completed, Östersjö recorded the transcription, as a reference for Gorton. Gorton then took the annotated transcription and created a new score which properly represented the sounding pitch with all its microtonal fluctuations. This second score served as a basic working material when Gorton hereafter gathered the entire material created so far - the improvisations in the working sessions at IAC, the qualitative analysis of the working process, the transcription in its different versions – and returned to the traditional role of the composer, working out a score for the composition.₃₀ As mentioned above, Clarke et al (2017) develops a comprehensive analysis

30 This was by far the longest single working period, and took place between March and September 2011.

of the relation between materials found in the sessions at IAC and the finished score. However, for the purposes of the present paper, we are more looking for the type of observations made by Gorton and Östersjö (2016):

In the case of Forlorn Hope the notation of the existing Dowland material afforded many possibilities once transferred into the microtonal tuning system. But at the same time notational conventions provided resistance when it came to writing out the fluid glissing/tapping/trilling material that had been developed in the Malmö sessions. The opening bars of the Almain section shows the meeting point of these two types of notational engagement; the undulating scalic shapes of the Dowland can be seen in the contours of the material, combined with a kind of tablature notation that indicates separate right and left hand movements. It is through this conception of notation that the voice of the composer emerges from the complex entanglement of Östersjö's improvisations with Renaissance counterpoint (Gorton & Östersjö, 2016, p. 590)

Forlorn Hope contains seven movements, titled in a Dowlandesque manner, with references made to dignitaries, in this case not all too popular British politicians. There are three longer movements, whose titles make reference to Renaissance dances. They use material from one third each of the Dowland transcription, divided in the following order: *The Right Honourable David, Minister of State for Universities and Science (attending Cabinet), his Galliard; Dr Cable's Pavan; Mr Hunt's Thing, Almain.*³¹ Hence, the Almain uses material from the third part of the transcription, which is characterized by quickly undulating figurations. With the material which was transcribed from my improvisations at IAC, a complex web was created of often independent figurations in the left and the right hand, generating a diffuse after-image of Dowland's composition, but at the same time capturing characteristic elements of the voices of both Gorton and Östersjö (see figure 2).



Figure 2. Bars 54-59 of Mr Hunt's Thing, Almain

A bit further into the Almain, the connections with the Dowland Fancy become even more obvious, as can be seen by comparing bars 56-59 of Forlorn Hope (Fig. 2) with bars 28-29 of the transcription of the Dowland (Fig. 3).

³¹ The title of the Almain refers to Jeremy Hunt who was Secretary of State for Culture, Media and Sport 2010-12 and thoroughly unpopular in this role. The other two partes are dedicated to David Willettts, who introduced the new higher fees structure within UK universities, and Dr Vince Cable, who at the time was Secretary of State for Business, Innovation, and Skills (which housed higher education). Hence, these three between them were responsible for UK art worlds and academia, unpopular as they may have been, they were indeed popular enough to have been elected!



Figure 3. Bars 28-29 of Gorton's and Östersjö's transcription of Dowland's Forlorn Hope Fancy. Note the structural correspondence between bars 56-59 of Forlorn Hope and bars 29-29 of the transcription.

The practice of musical transcription may be understood as situated in between the material identity of a finished score and the performative identity of and improvisation or a performance. As a practice, it also destabilizes the notion of a single and definite musical work, and instead emphasizes the performativity of the act of writing, as well as of the strong agency that musical instruments have on the identity of any piece of music. Given the role transcription had in the genesis of Forlorn Hope, it may serve as an illustration of how artistic outcomes and materials, whether of a largely performative or material nature, are constitutive of musical voice. All of these manifestations of artistic knowledge can be studied and analyzed through multiple perspectives, and taken together, should serve as the grounds for the assessment of the knowledge production in any piece of artistic research. But in order to allow for such in-depth assessment of artistic knowledge, in its material and performative forms, the field must engage in further development of multi-method design and forms of analysis.

5 Discussion

In my understanding, there are two central perspectives that should guide quality assessment of artistic research output. First, that artistic quality in any artistic research project must be understood from within its art world, and further, that a substantial part of the assessment must be carried out within this art world, and not in academic institutions. Following Barbara Bolt, quality in artistic research can be identified through its performative force, "that is, its capacity to effect 'movement' in thought, word and deed in the individual and social sensorium. These movements enable a reconfiguration of conventions from within rather than outside of convention" (Bolt, 2016, p. 130). But again, as I have argued above with reference to the role of critics in the art world of theatre (with reference to Kent Olofsson's PhD thesis), an assessment of the quality of artistic research outcomes through an art world must also be based on a contextualizing analysis. It remains a challenge for the community of artistic researchers and institutions hosting research programs and projects to

develop formats for how such assessment can be best carried out.

Second, while any music institution is built on practices of internally assessing artistic quality, starting in the admission process and continuing throughout the curriculum, the method development within artistic research—and, in particular, the possibilities inherent to the notion of artistic research carried out using multi-method design—allow for an even more thorough assessment of the knowledge production. The development of methods within artistic research, entails an articulated understanding of the possibilities and limitations of documentation, as well as a critique and development of the use of introspection and reflection (see further Wong 2008, Östersjö, 2017). As suggested in section four, artistic research can engage with many different traces of artistic process, and hereby construct a more complete picture of the emergence of voice through research processes in which we are engaged. The four theses discussed in the present paper provide such data to a greater or lesser degree, and I believe that we may do well in considering in further detail what forms of documentation and representation, as well as what forms of analysis, are best suited for providing a reviewer the necessary materials for a review of artistic quality in an artistic PhD.

Further, I would argue that this demands a holistic understanding of how artistic knowledge is embodied and situated in an art world, and a keen awareness on the side of both researcher and reviewer of the difficulties embedded in the task of accessing the tacit domains of artistic and embodied knowledge.

However, the power of inertia (Becker, 1995) is also a factor to consider, when the force and effect of artistic practice within an art world is to be assessed. As concluded by Clarke et al., (2017), looking at the evidence of the fluid practices of Gorton and Östersjö (2019), also in the more radical field of classical contemporary music

these socially constructed designations are not given up or laid aside lightly—and it is easy to see why. Quite apart from their psychological function as markers (and more than just markers) of people's sense of identity, from a wider perspective these identities acquire specific meanings as cultural capital in the social field of the art world. In all too tangible terms (reputation, employment, remuneration) it means something to be either a composer or a performer, and while in popular music these distinctions have been changed and challenged quite significantly by singer–songwriters, re- mixers, producers and DJs, in classical music there is less evidence of change of an equivalent kind. (Clarke et al., 2017, p. 133)

The challenge then is to define methods for the assessment of artistic quality which is situated both in the art world (where the force and effect of an experimental and developmental project may, or may not, be immediately apparent), as well as through the scientific study of the artistic practice. Frisk & Östersjö (2013) identify four fields of gravitation₃₂, arguing that the political potential in artistic research lies in the creation of an awareness of the socio-political situatedness of the artistic researcher: "The contextualization of art as artistic research is in itself a politicization, but it is also the placing of the artistic work in the light of a particular social, theoretical, cultural, or philosophical framework that makes the political dimension surface. Such awareness may constitute a foundation for artistic production and research that is responsive to the four gravitational fields discussed above – the subjective, the experimental, the academic, and the field of the art world" (Frisk & Östersjö, 2013, pp. 59-60). If we adopt a sociological perspective on the

32 Further discussed in Östersjö (2017).

academic field, along the lines of Latour's classic analysis of the Salk Laboratory in Laboratory Life (1986), perhaps we could think of the two central poles as an art world and a "science world", wherein the latter is similarly constituted of many agents, then the space for embodied and material interactions can be represented by the subjective and the experimental (see figure 4).₃₃ Art worlds and science worlds interact also outside of the context of artistic research, as discussed above with regard to the role of research on historically informed performance in Spissky's project. If the science world can actively engage with the analysis of the subjective and experimental dimensions of artistic research,³⁴ new tools can be created for the assessment of central artistic outcomes.



Figure 4. Four Fields of Gravitation. Adapted from Östersjö (2017).

In section two, I made an attempt to define the art worlds within which each of these PhD projects are situated. One of my aims was to show how several successful PhD projects have started out, firmly situated in one art world, but intentionally challenged the boundaries of the PhD student's individual practice. Hereby, we can see how artistic research has the possibility of creating change inside art worlds, but experimental projects can also cause individual transformations that instead bring the artist into new contexts, outside of the art world in which the project was initiated. While this appears to be a possible outcome of a successfully experimental project design, it also poses particular problems in the assessment

³³ The nature of the "science worlds" of artistic research is beyond the scope of the present paper, but a further analysis of how such science worlds are constituted in academia in Europe is indeed a pertinent research topic. ³⁴ As suggested above, a scientific engagement with subjectivity in musical creativity, entails a multimodal approach to the embodied and material forms in which artistic practice takes shape. of artistic quality. Again, the outcomes of Olofsson's and Spissky's projects are assessed by key players within the art world, ensembles and individual artists, concert halls, theatres, festivals, as well as by critics. I suggested above that the assessment of Sandell's thesis may similarly be best carried out in the art world where the project was initiated. But through Cyrino's experimental approach to her practice as a classical flautist, a more radical movement away from the art world of classical music is instigated, and therefore, it may be necessary to assess such a project from a wider perspective, not through its immediate effect in an art world, but instead as a piece of artistic experimentation wherein the quality is assessed to a greater extent in the science world, and specifically through a thorough examination of artistic process.³⁵ But, at the same time, this assessment must necessarily build on a robust understanding of the art world which the project wishes to challenge. Additionally, it may be concluded from the above that an artistic PhD thesis should provide the reader with a substantial presentation of the art world in which the project is situated, in order to facilitate the assessment of the artistic knowledge production.

Artistic research, and indeed each artistic researcher, must be situated in a liminal space between the academic institution where research is carried out, and the art world within which their practice is situated. Therefore I think of artistic researchers as nomads, seeking new knowledge and new forms of expression by oscillating between different "modes of existence" (Latour 2013). Hereby, the promise of artistic research is to, on the one hand, create formats through which artists can be allowed to experiment with and challenge the practice within their art worlds, and on the other hand, to constitute a critical voice, and a factor for change and innovation, within academia. Marina Cyrino's project is clearly driven by such aims, and she notes how

Academic research is beginning to incorporate research that is not only thought on music, but is lived and thought through music. But there are still ways to go in order to decentralise the logic of the finished artwork (as well as the hegemony of the big Surnames) and give space to the mediations that precede or follow the work, or all the different forms of practices that do not claim the status of an artwork in the modern sense of the term, names without dazzling brilliance, bodies-musicians who neither claim nor succumb to the position of stars. There are still ways to go in order for the musician's voice to bring academic writing out of tune, contaminating it, in fierce joy, with chant, breath, drool and grunt. (Cyrino, 2019, p. 26)

But such a vision is unlikely to be realized unless the artistic research community delivers artwork which has impact in the art worlds where they are situated. Certainly, such impact may be gradual rather than immediate, and artistic innovation is not always greeted with immediate success, however, the growing community of artistic research practitioners and institutions must develop a more grounded practice of assessing such qualities, and indeed, also become more devoted to the production of artistic outcomes that make a difference.

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This paper builds on long-term experience of artistic collaboration, and on joint artistic

³⁵ The history of experimental music in Europe does suggest that some forms of artistic experimentation have been strongly supported by an engagement with science worlds, and this is a factor which should be further explored, but goes beyond the scope of the present paper. Through such an analysis, it might also be suggested that the experimental potential in Sandell's project could have been expanded through various forms of expanded engagement with a science world.

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