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Creating A Rubato Layer Cake: Performing And Producing Overdubs With Expressive Timing On A Classical Recording For 'Solo' Piano

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Introduction

This paper reports on some of the outcomes from a larger UK Arts and Humanities Research Council funded project on Classical Music 'Hyper-Production' And Practice As Research – a project that sought to create radical reinterpretations of the classical repertoire through record production. In this example, the two authors of this paper, Emilie Capulet and Simon Zagorski-Thomas, were acting as pianist and producer respectively with a third researcher, Andrew Bourbon, working as engineer.

The world of classical music has, in the vast majority of cases, sought to emulate the sound of the concert hall on recordings. In this case study from our project, a pianist and a record producer (both also academics) sought to explore the creative possibilities of transferring techniques from popular music to the production of classical recordings. Through the use of Actor Network Theory (Latour 2005; Law 2007; Callon 1986) as a method of analysis and Practice As Research (see for example Borgdorff 2006) as a mode of experimentation, we examined how both performer and producer explored the conceptualisation and practice of creating recorded music.

The pre-production and recording sessions were either filmed or recorded and excerpts from these were used to examine the development of various performance techniques through this process of experimentation and discussion. For example, on pieces involving rubato, we explored a variety of techniques for synchronising multiple overdubbed performances where individual lines or parts from a piece for solo piano were staged or processed differently to others. This involved experiments working 'by ear', working with a guide track and with click tracks constructed in a variety of ways, and 'by sight', working with a video of the guide performer's hands. The article begins with a description of the theoretical background to the study, examining the creative possibilities of this approach, discusses the ramifications that this has for performers, discusses the practical problems and then draws some conclusions and suggests some possible future work.

Theoretical Background

Recording produces a schematic representation of performance. Its schematic nature flows from the reduction or simplification of the experience. This has both potentially positive and negative implications for our experience. On the one hand, the removal of much of the extraneous 'noise' of the concert experience—the coughing, the distant traffic noise, the visual distractions etc.—produces a more distilled and pure representation of the performance. In addition, mistakes can be edited out and any acoustic imperfections can be addressed. On the other hand, the visceral and multi-modal nature of the performance and the direct connection that an audience can make with a performer are reduced or removed. In either artistic medium it is the responsibility of the creators to engage with all the factors that can influence their audience's perception and interpretation and to turn them to their advantage. In recording, this involves deciding upon an aesthetic approach and using the technology to this end. This project involved moving away from the mainstream classical aesthetic of creating an idealised representation of the concert hall experience and looking at how musical features of the works could be highlighted and exaggerated in ways that suggested particular interpretations of the musical narrative.

The theoretical basis for this approach is drawn from the ecological approach to perception (Gibson 1979; Clarke 2005; Zagorski-Thomas 2014) and the form of embodied cognition found in the neural theory of language (Lakoff & Johnson 2003;

Feldman 2008). These two approaches are used to examine how the perceived invariant properties and affordances of the technology affected the performer and producer's conceptualisation of the piece and the process using the concept of event and image schemata. One crucial example of this would be the various invariant properties and affordances offered by different ways of synchronising an overdubbed performance with other recorded material. The producer and engineer's event schemata for this kind of activity have been formed from experience of music with a relatively steady, if not metronomic, pulse. In the case study examined in this article, Debussy's Prelude *La Cathédrale Engloutie* (The Sunken Cathedral), we separated out the written two-handed performance into a series of separately recorded parts. However the piece has a constantly shifting tempo which makes synchronisation difficult and so we were looking for monitoring and cuing systems that provided affordances such as being able to restart playing exactly on time after a pause.

Another key feature of the project was to explore how the technology of recording impinged upon the performance practice of the participants and to examine where and how the performers could be encouraged into a creative interaction with the technology. Our approach to this is based on Actor Network Theory (ANT) and how technology has to be included in the 'equation'. This involves thinking of the process as the activities of a network of human and non-human actors and the ways in which their properties and context influence each other's operation. The non-human actors in this network include the recording and monitoring technology but also the musical instruments and notation. The traditional model of classical recording tries to keep the experience of the performer the same as the concert hall and to produce a 'perfect' version of it. However the technology always impinges: choosing the sound that is captured through microphone selection and placement; removing noise that would be present in the concert hall; editing together different segments of the performance. In ANT, the study of this process would examine how the performer changes their approach to performance based on the experience of recording. One of the issues with recording is that the performer's experience of the process—playing without an audience and yet trying to recreate the energy and excitement of the concert hall—lies in between two forms of their *habitus* (Bourdieu 1993), their routine way of engaging in and thinking about both music and musical activity.

If we think of affordances as the likely potential outcomes of a particular situation—a set of invariant properties—it is plain that there may be many affordances and that some of them may be mutually exclusive. It is also important to remember that affordances aren't inherent properties of a situation, they are the subjective set of probabilities that our previous experience have suggested. This build up of the probable outcomes in a given situation, along with their desirability in relation to our current goals, are the building blocks of Bourdieu's *habitus* or an event schema in Lakoff and Johnson's parlance (2003). However, we don't have a single *habitus*, we have a range of them. One of them relates to our tendency to focus our attention on a particular range of affordances at particular junctures and to explore the alternatives i.e. we have a *habitus* that relates to lateral thinking or creativity and how often and in which circumstances we are likely to do it. Thus, our ability to attend or to make ourselves conscious of the range of alternative affordances at particular moments and in particular circumstances is the mechanism of creativity. Of course, this has to coincide with the ability to see how these expected outcomes align with our goals – or to realign our goals to these expected outcomes if necessary. And there are additional levels of this. We will have a *habitus* that means that we are either more conformist or more creative in different circumstances but we also have a *habitus* – a usual way – of looking for opportune situations or moments in which to look for opportunities. However, this process of creativity – of interrupting the 'usual' flow that experience has led us to expect to explore the alternative affordances – is disruptive. Our lives are a balance of the smooth progression of getting something done (using the usual pathways of the *habitus*) with the disruptive but useful process of examining the possible affordances to assess the desirability of the less usual affordances.

Returning to our recording example, on the one hand, the desired outcome is closely aligned with the experience of the concert hall: a technically perfect and yet expressive single performance. On the other hand, the process is more like a rehearsal experience: playing the same piece many times without an audience and often performing the piece in sections to get a particular passage 'right'. That form of sectional performance in rehearsal is also frequently focused on getting purely technical matters right and players are sometimes more used to focusing on the expressive arc of a piece in a complete performance. It takes a conscious effort and extended experience to develop a *habitus* that combines the fragmented critical reflection of the rehearsal process with the expressive energy of the concert hall. The performer would also be seeking to arrange the technology so that their 'normal' experience was maintained as much as possible. For example, there is the question of the audible feedback that the performer hears and how that affects their performance. The sound that they want to hear is more like the concert hall than a typical rehearsal room which will have short reverb but if they are synchronising a performance to a previously recorded one then they will need to work in headphones and that has an impact on performance (see, for example, Williams 2012). Of course, the network includes additional human actors other than the performer. The sound engineer and/or producer will be concerned with getting an appropriate sound or an appropriate set of signals that can be mixed together later to create the right balance of clarity and reverberation. They will also be concerned to create a series of segments that can easily be edited together to create a fluid sounding performance. In addition, they must also decide upon the appropriate balance of musical expressivity and technical perfection. Blier-Caruthers (2011; 2010; 2013) has engaged in some academic study of the more widely debated idea that the quest for technical perfection in recorded classical performance has eclipsed expression (see for example McLennan 2009). In short, the actors in the network have to negotiate a *habitus* based on the physical properties (and affordances) of the non-human actors and the goals and properties of the human actors.

In this project, the performer, the engineer and the producer were concerned with considering the pieces from a musicological / analytical perspective: could a piece be fragmented into parts that performed some specific musical function? In some ways this is analogous to the notion of orchestrating piano works. Various lines or segments of the piano pieces could be recorded in ways that give them a different tone. In this process, however, the treatment of the musical lines is more likely to be a variation based on the perceived distance of the performance, the type of space in which it is occurring or the number of pianists. The analytical process was aimed at establishing the kind of sound or processing—or spatialisation—that would help to suggest or reinforce the musical interpretation. Once this musical strategy was in place it was developed into a performance strategy that allowed Emilie, the pianist, to play these fragmented segments in a way that could be put together to create a fluid sounding performance. The two initial methods chosen were 1), to create click tracks based on a tempo map that followed the way Emilie played the pieces or 2), to record a guide track which could include vocal cues such as verbally counting in after a pause or speaking subdivisions of the beat out loud. In parallel with the recording project there was also a live surround sound project, with four pianists playing interlocking parts that could be processed differently to create a similar effect. It became apparent that the four players were better at synchronising by watching each other's hands rather than by using headphones and a click track. In the studio we therefore tried filming a guide track so that Emilie could take her cues from watching a video of her hands on the piano keys. Another possibility was to record the overdubs in short sections and just learn the timing through multiple takes until it was right.

Despite all of this, and also because we didn't have sufficient studio time to use these techniques extensively enough to get 'perfect' takes, we also used audio editing software to quantise the timing of the overdubs to the timing of the guide or main performance. Indeed, there was a tension in the research project that became more apparent as it progressed. The primary aim of the project was to conduct a series of experiments to explore the possibilities of 'hyper-production' in classical music. Depending on who is going to be judging the success of the project, there are two very different sets of data by which the assessment of those possibilities might be achieved. If the judgement is by 'consumers' then the quality and musical interest of the completed pieces should be the object of study. If, however, the question is aimed at 'producers' (in the general sense, including performers) then the assessment might be more based on the creative engagement of the participants: their sense of control or collaboration. The latter would be more concerned with exploring how it could work rather than how it did work in this instance.

The research strategies in these two cases would be very different. In the first instance, the focus would be on completing a small number of recordings to the highest possible standard and, in the second, the strategy would be to explore as many of the techniques as possible and be less concerned with creating excellent finished articles. With this project, the intention has been to attempt a balance between these approaches so that, while the majority of the experimentation has not resulted in outputs that have received the attention to detail that would be required for a professional project, there are a few recordings that have (or, at the time of writing, will have).

The participants in this research project have mainly engaged in Practice As Research (PAR)—undertaking the process of creation in order to take a reflexive look at that process. The two authors of this paper were practitioner researchers, as was a third researcher, Andrew Bourbon. The fourth researcher, Amy Blier-Caruthers, participated as an observer and undertook an ethnographic study through observation, filming and interviews using stimulated recall. This publication, therefore, is one of a range of outputs that not only look at different aspects of the project but also utilise differing methodologies. This publication, though, is based on PAR for the process of data collection. This involved the participants taking notes, marking scores, recording the pre-production conversations and video recording the session. This data was then subjected to a stimulated recall analysis to help to reconstruct and understand the development of the creative process. Of course, much of this data is subjective and subject to interpretation and a good deal of the research element in this case involved triangulating this subjective memory and 'feel' about what happened – the story that we told ourselves – with the more objective data – the video and the recorded music.

There are four main areas of understanding about which this study generated new insights:

1. Performance: From the perspective of both the performer and the producer, this project has raised questions about the nature of performance and the ways in which it can and should be different in the recording studio.
2. Interaction: By using ANT the study focused strongly on the process of interaction between both human actors and between human and non-human actors. The parallel experiences of both producer and performer have provided insights for each into the working practices of the other.
3. The Pieces: It has been illuminating to engage in the parallel processes of analysis and 're-orchestration'. In addition to building on both the performer's and producer's understanding of the pieces, this process has also provided further insights into how de-construction and re-construction have significant pedagogical potentialities for situated learning (Lave & Wenger 1990; Ingold 2013).
4. Recording: By applying a hybrid approach to creative recording this project has put the engineer, performer and producer into a working environment that is different from all their previous experience.

Why Do This?

In our project, we explored alternative ways of recording classical music, drawing on techniques used in popular music. The aim was to challenge the 'best seat in the house' experience associated with classical music recording in order to give the recording an alternative aesthetic value. This approach is based on the idea that recorded music is a separate art form from concert performance in the same way that cinema is different to the theatre. Both cinema and recorded music are experienced and judged as schematic representations of performance rather as the direct and real-time experience of a single unique performance. The cinema and recorded music have to bear the scrutiny of repeated listening but they also offer creative possibilities that a non-linear production process—as opposed to a linear performance—can offer. By giving the performer and engineer the chance to explore the extensive sonic possibilities afforded by technology, these recordings have pushed the traditional boundaries of classical music interpretation. This has meant forging a close partnership between performer, producer and engineer as all were equally creatively invested in the production of the sound track. Throughout the process, we based our creative decisions on close-readings of the score itself, and on a holistic contextual approach to the work. The aim was to create a recording that started from within the music, rather than from without, that entered into the spirit of the music, rather than just capturing it. To shape our approach, we took into consideration historical performance practices and aesthetic contexts, as well as relevant extra-musical elements. In the words of Adorno, we hoped that in each recording our interpretation would be like "an x-ray of the work; its task is to illuminate in the sensuous phenomenon the totality of all the characteristics and interrelations which have been recognized through intensive study of the score" (Adorno 1981, p.144).

We can, therefore, identify three specific streams of motivation when it comes to the question of 'why do this?' On the more general level of the research project, we are concerned with initiatives that help to maintain the relevance and vitality of western art music in the twenty first century. Recently in the UK, there have been many exciting developments in performance practice in this regard—staging concerts in pubs, breaking down the formal barriers in the concert hall through talks and discussion with audience members, programming concerts that combine the classical and the popular in innovative ways etc. On the other hand, with sales and, therefore, recording budgets decreasing, classical recordings are, if anything, becoming more conservative, with many recordings done at rehearsals in performance venues or as quickly and simply as possible. Although that doesn't entirely preclude the possibility of experimentation, it hasn't encouraged it. We're hoping that by adding to the small number of recordings that do include experimentation and by discussing the ways in which it can contribute to expressive exploration of the repertoire, we will be contributing in some small way to the maintenance of relevance and vitality in this cultural domain.

Amy Blier-Caruthers, one of the other researchers on the project, has also written about the negative perceptions that many classical performers have in regard to recording (Blier-Caruthers 2013). One of the aims of the project is to 'spread the word' about the creative possibilities that this kind of approach offers to performers. This has, hopefully, been happening through the dissemination of the musical outputs of the project via the Internet and concert presentations but also through talks given at conservatoires, universities and conferences.

The third stream of motivation is the personal. For all of us involved, not just the two authors of this article, this has been a project that has opened up a range of creative possibilities and allowed us to develop the techniques of PAR to explore new ideas. It's a truism to suggest that the further you investigate a subject the more questions become apparent and with PAR a similar phenomenon has occurred: more possibilities for exploring new avenues of practice have become apparent.

On the more specific question of why to utilise overdubs in the recording of pieces of the classical repertoire that involve expressive timing, the rationale is slightly different for each piece. It may relate to exploring spatial possibilities, performance intensity, timbre or other factors but the unifying question is whether there is something musical to be 'said' by creating some form of perceptual separation for one or more of the musical components of a piece and staging it in a way that marks it out from the rest of the performance. In the piano examples that we have recorded for the project, the main aim has been to produce a recording which explores the spatial potential of the piece and which reflects more diverse spatial sounds. Normally a recording is done from one acoustic or spatial perspective, as in a concert where the audience sits in one place. But this technique allows for a more dynamic spatial approach to the music. Indeed, much of the 'leg work' in arriving at an appropriate communal *habitus* within the network was in the discussion and experimentation that led us to our *habitus* of creativity – establishing the types of invariant properties and affordances that characterized the moments where we should break the flow and explore the possibilities of 'the unusual'. This is why the Debussy example (see later discussion) was such a success using this method, because we drew out the concept of distance by using the multiple microphones and overdubbing.

What Are The Ramifications For Performers?

For the performers, working in this way means taking into account a new dimension which is normally not available (or required) and which therefore hasn't necessarily been considered during the learning and rehearsing of the piece. In the popular music world it is quite common for a producer to take a band into a rehearsal or small, cheaper studio space in pre-production to work through these kinds of ideas. The specific details of performance as they relate to the recording project can be addressed. For many classical musicians, this involves bringing to bear a disruptive *habitus* of examining the affordances for different ways of performing that are not usually considered. This can be both frustrating and exciting but also, as we've mentioned, this does

require more time and, potentially, money for a project, which can be problematic in the current world of recorded classical music where performers are often required to take on the responsibility of recording costs and to approach a record company with a completed product.

It does, however, mean that one can interpret the piece in a new way, and so can be an innovative and positive process. However, that process of interpretation needs to be done for sound musical reasons and that can be very time consuming. It requires a lot of trouble and effort to think carefully about where particular aspects of a piece such as its rhythmic momentum, an emotional impression or a relationship between different perceived agencies might be situated. For the performer, this can require a shift of perspective away from a performative approach and towards a more analytical interpretive approach. The search for interpretive potential is not confined to what is possible with a given individual's 'usual' technique, their concert hall *habitus,* but can extend to ideas outside of that range and then the members of the network can consider how it might be possible given the affordances of non-linear editing and processing techniques. The participants in the network negotiate acceptable criteria for collaborative creativity that allows each of them to feel an appropriate level of ownership. However, there are pragmatic considerations as well. For example, one has to explore not only whether separating out a component or doubling it might have an impact on the rest of the parts but also whether processing it separately is, at all, a positive way to enhance that particular aspect. We mentioned before that this process is analogous to orchestrating an existing piece but it also brings out one of the interesting questions that relates to arranging popular music performance. When a particular musical gesture is reliant on the particular shape of an individual action, what can be done to maintain the integrity of that gesture when it is subdivided and allocated to more than one performer? Even in this example, when the allocation is being made to a single performer in a range of overdubs, the change in the gestural activity that is required to make the sound (e.g. playing only a left hand part) can create subtle alterations in phrasing and accent that disrupt the musical flow.

Other than the time consuming process of deciding why, whether and how to separate out the parts, the difficulties are primarily technical. Overdubbing means fragmenting the score into voices or parts and then putting it back together again. The difficulty is in achieving the same simultaneity and flow as in a traditional two-hand performance. Another of the 'experiments' that we conducted was a recording of the second (in E flat major) of Schubert's Four Impromptus (D899). The musical aim was to differentiate the more refined and aristocratic dance of the A section from the more raucous and rustic ländler of the B section. One of the approaches was to accentuate the rhythmic momentum of the accompaniment in the B section by recording it separately from the bass root notes and the melody: to split the performance into three parts. This was done by playing them along with a guide version and then using timing alteration software in ProTools to synchronise them more precisely. Even once the timing was altered, the accents were subtly different in the overdubbed version and the momentum wasn't quite right. Unfortunately we haven't yet had the time to revisit this recording and to try and create a set of parts that work together. The subtleties of rubato are particularly difficult to render when one has separated the voices and hands as the physical gesture no longer helps to achieve the effect. Simply put, we did not have sufficient time to develop an appropriate *habitus* to get the rhythmic feel as we wanted it.

The ramifications for performers, and for the producers who are working with them, who want to create classical recordings using these types of technique are that there is a great deal of time and effort that needs to be invested in order to create musical works of outstanding merit. Within popular music there is an entire sub-class of session musicians who have developed versions of these types of skills that are pertinent to their musical styles. Within the classical world, there are many players who have developed some of these skills—especially for the recording of film and television soundtracks. The types of alterations to practice that we have been working on, however, do require a lot of time and effort to develop (not to mention a desire). Session players in the popular music world are used to being asked to deconstruct a performance – not only with the horizontal or linear edits that recording classical musicians are used to, but also extracting and isolating lines out of a more complex part in a vertical manner so that they can be processed separately. One final point in relation to the kind of solo piano work that we have been discussing is related to the collaborative nature of this activity. If the aim is to create musical meaning through means in addition to the original composition and subsequent performance, perhaps there will also be a need for a slightly more understated performance to 'make room' for the types of meaning that processing can contribute. To go back to the comparison with cinema, theatre actors had to develop a more subtle and nuanced approach to some aspects of performance when they worked on film because the intimacy of the close-up made their usual craft look over-blown. This is certainly true of the ways in which some popular music performers have explored timbre and low energy levels of performance facilitated by the microphone. We have only begun to scratch the surface of this in relation to classical performance despite the fact that there have been some interesting developments in this direction from Gould to Gavrilov. This can be seen as analogous to including a virtual listener into the actor network – the creative participants are using the affordances of the medium to re-configure the subject-position of the virtual listener in relation to the constructed performance.

What Are The Practicalities?

As has been intimated, the biggest problem that we faced in the creation of our 'rubato layer cakes' was that of synchronizing the various performances and overdubs. We tried different ways of overcoming this but they all boil down to essentially the same

problem of playing ‘to’ rather than playing ‘with’ another performance. Whenever a performance is recorded (or constructed), it becomes a non-human actor in the network process. Whether it’s a mechanical click-track or a guide track recorded by the same or another musician, it has to be played ‘to’. It doesn’t respond and vary like another performer and, despite the fact that it won’t be heard on the final recording, it is a crucial determinant of the character of all the subsequent recorded performances. Playing to a regular click-track means the performance is potentially very mechanical and stilted though this did work with the Haydn piano sonata no.50 in C as the classical structure and aesthetics of the piece allowed for a very regular pulse. Indeed, for the Haydn recording, all of the pauses in the performance worked best by simply adding a beat or two at the metronome speed i.e. if there was a pause on the last beat of a 4/4 bar we turned it into a 5/4 or 6/4 bar and started again on the first beat of the next bar. However, in compositions that demand more rubato, breathing, phrasing, etc. a regular click-track doesn’t work. This was particularly true, for example, in the fast sections of the Chopin 2nd Ballade. We therefore created a varispeed click-track mapped onto a traditional performance. This was done initially by recording the pianist in a rehearsal room and going through the recordings with a metronome to create a tempo map. This was, however, quite difficult to follow as there was no way to anticipate precisely how the clicks may slow down or accelerate. Even breaking down the pulse (i.e. doubling the speed of the metronome to 1/8th notes instead of ¼ notes) still didn’t quite achieve the precision of a traditional two-hand version. We also tried to record guide versions that would be used as the framework to double certain parts. This was better in some ways but a performance doesn’t provide the same clarity of timing as a click track. We also tried getting the performer to count or provide verbal cues on the guide track which is something that could work but which we didn’t pursue. We eventually tried a video recording of a guide-track, so that the actual physical movements could be followed visually, rather like having a conductor. This also was not ideal, as it was difficult to play and watch the video at the same time, as the performer couldn’t look at their hands or the keyboard. Once again, there is potential for exploration with this technique: perhaps working with peripheral vision.

Another issue has been that of monitoring. As mentioned, one of the things that we have begun to explore is to tailor performance technique to the sound that the microphone is picking up. In several of the recordings we have attempted to situate our virtual listener ‘inside’ the moving sound-world of the music. To do this, we used an array of microphones to capture space through distance and varying degrees of reverberation and proximity. In some instances the microphones were right up close to the hammers and in others distant microphones were placed in the resonant corners of the recording hall. Within this framework, the player was able to experiment with touch, attack and dynamics, and the engineer manipulated the sound to give it varying depth and resonance. From a pragmatic perspective the performer had to use headphones where appropriate (Williams 2012) in order to hear what the microphone was ‘hearing’ and adjust her touch appropriately. In this we can see the negotiation that has to occur between the human actors, their goals and the physical characteristics and affordances of the non-human actors (the piano, the microphones and the headphones).

Example: Debussy’s Prelude, *La Cathédrale Engloutie* (The Sunken Cathedral)

One of the key recordings in the development of our approach was a piece which itself is based on the idea of depth and space, Debussy’s Prelude, *La Cathédrale Engloutie* (The Sunken Cathedral). Based on the story of the submerged cathedral of the Breton town of Ys, the extra-musical indications and inter-textual allusions, suggest the slow rising of a cathedral from the depths of the ocean, complete with ringing peals of bells, sonorous organ chords and mournful plainchant. The structure of the piece is problematical. Roy Howat has (aptly) described this as an ‘arch-form’, ABCBA (Howat 1986, p.160). However, for our purposes we have structured the piece slightly differently based on the different soundscapes of the piece. Quite a few of the indications in the score are not only of a narrative nature but also give us an idea of motion in space and it is with a quasi-cinematographic ear that we approached the structure:

1. bars 1-15: the cathedral under the water, in the depths but heard from above the water, in the mist; dynamics *pp*
2. bars 16-27: the cathedral breaking the surface of the water to be gently bathed in the mist; dynamics *pp* to *f*
3. bars 28-46: above the surface of the water, we now move inside the cathedral as the organ sounds; dynamics *ff* then down to *pp* at the very end of the section for transition.
4. bars 47-72 still inside the cathedral, plain-chant with a ‘focussed’ (‘concentré’) sound; brighter, mist has dissolved; dynamics *pp* to *ff*

C/B) bars 73-83: echo of the organ as the cathedral sinks back under the water

1. A) bars 83-end: in the depths; dynamics *pp*

Debussy indicates that the opening and closing sections should be bathed in ‘a gently sonorous mist’, with the distant bells heard calmly ringing in the depths. Debussy is playing on the word ‘profondément’ referring both to the depth of the water and the profound stillness of the passage (‘profondément calme’). Debussy only rarely indicated actual pedalling in his scores, and there are no such indications in the Sunken Cathedral. However, the opening image of the ‘sonorous mist’ suggests that he expected the pianist to use the sustaining pedal to achieve this watery effect through sustained resonance. In a traditional performance, it is quite hard to achieve the impression of loud bells, but heard from a distance. To a certain degree, a shallow, quick attack of the uppermost voice of the chords can start to convey this sort of sound, but with overdubbing techniques, we can enhance this effect. For the opening and closing sections, we combined both distant microphones, capturing space, with close

microphones, capturing the clear attack of the peals of bells. The peal of bells itself was recorded in layers, first the peal *pp* as a guide, then the top open fourths played *ff*. The sound of this element was then mixed down to *pp* levels, but the attack still had the incisiveness of a loud bell being rung. There is a big perceptual difference between performance intensity and volume and something played energetically in the distance might reach our ears at the same volume as something very near played gently.

The impression of depth is not only achieved by giving more emphasis to the sound of the space of the hall, but also in the music itself – in the low/high 'pedal' chords (on the first beat of bars 1, 3 and 5). We subtly enhanced this by overdubbing the chord with a *pianissimo* phantom low and high frequency construction of the chords. The chords themselves were artificially sustained so that there was not the natural decay of the piano's sound, and the resonance was maintained from bar to bar. This was achieved by playing the chords several times with the sustain pedal down and then editing away the attack portion of the sound and positioning them in the ProTools session so that they overlapped and created the impression of a shimmering and yet harmonically 'correct' mist.

The emerging plainchant (bars 7-13) is indicated 'soft and flowing' ('doux et fluide'), with a play on the word 'fluid', referring both to the narrative itself (the water), the tempo (this is where Debussy plays the section double-speed in his 1913 Welte Mignon recording), the attack (soft and blended) and the legato pedaling. In addition, we aimed to blend the notes of the plain-chant so that they merge together in a 'fluid' motion. In a traditional performance, it is difficult to blend these notes together. In our recording, we played these with as little attack as possible, but sustained the resonance later with the use of automation, so that there was very little decay. The attack was then minimized and the effect was of a continuous singing tone, with the softest of attacks.

Conclusions And Next Steps

This article has used ideas drawn from the ecological approach to perception and embodied cognition to explore Bourdieu's notion of *habitus* and how it can help to understand the mechanisms of creativity and agency. It also explores how this process can be used in actor network theory to explain the negotiation of communal working practices. These were discussed in the context of a series of piano recordings made by the authors and other researchers and with particular reference to the case study of a Debussy prelude.

The main ways in which the pianist engaged with the non-human actors in the network relate to the synchronization of the overdubbed performances to some established template or framework (itself created by the non-human actor of the click-track or guide performance) and to the idea of altering performance practice to suit a particular microphone placement. In addition, the producer and the engineer, while initially considering that the working practices of their 'normal' recording event schemata wouldn't have to be adjusted as much as the performer's, realized that the various implications of rubato and expressive tempo also had a strong impact on their interaction with the non-human actors.

The most successful pieces were the ones we talked most about in terms of the performer's current (usual?) interpretation, where there was a dialogue between the producer and the performer so that both could learn more about each other's craft. It's about finding a balance of responsibilities between the performer and the producer so that the performer still feels like they are getting their own message across and the producer is enhancing this message in a creative way.

Our next steps rely on us getting some time to work together. The funded research project has now ended and, with the exception of the Debussy, the majority of the pieces have been experiments in developing the techniques we would now like to use in earnest. The mutual learning curve we have all been on has provided us with a set of strategies and techniques for working on future pieces.

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