The polyphonic touch : coarticulation and polyphonic expression in the performance of piano and organ music
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Introduction

Polyphony is one of music's most exported concepts, having been appropriated as a metaphor in a wide spectrum of disciplines. Because of its wide web of metaphorical connections, many find polyphony to be a nexus of meaning in music. While polyphony exists in the musics of cultures in many parts of the world, it is a deeply-rooted feature of Western art music, where its development was enabled by the advent of mensural notation (Weber 1958). The history of polyphony, then, is connected to the score-based artistic practices of composition, and the handling of polyphony in musicology, music theory and even music pedagogy has been predominantly score-based.[4] With this research I aim to draw attention to performance aspects of polyphony such as expression, agency and embodiment, showing that polyphony can be employed as an *expressive feature of performance* in a wide range of keyboard music. I will focus on the embodied aspects of single-player experience of polyphony in piano and organ music while also considering the larger context of how polyphony is used as a metaphor, a context which not only motivates and influences the study but also gives it meaning.

The relationship of voices in a polyphonic texture has been described by Pierre Boulez as a relationship of responsibility whereby voices are responsive or respond to each other in creating contrapuntal linear relations and in forming vertical sonorities or

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[4] These disciplines tend to focus on what is written by composers more than the various performance options for any given passage. As such, they are more score-based than performer- or performance-based. (For a discussion of the predominantly text-based orientation of musicology in the 20th century, see Cook 2001; Cook 2014; Doğantan-Dack 2015: 173)

harmonies (Boulez 1971). These vertical sonorities can be described as consonant or dissonant, and the mutual attuning of voices assures a balance of consonance and dissonance (de Groot 2010; Taruskin 2005). Often this responsibility is thought of in terms of compositional practices - contrapuntal considerations of parallel, oblique or contrary motion, consonance and dissonance, and rhythmic convergence or divergence - in other words practices that show up in musical scores and which are taught as part of a general musical education[5]. In performance, voices may just as well diverge in expressive features such as dynamic contour, timing and articulation - features that show up to a limited extent in scores but which form the centre of the art of musical performance. Voices in a performed polyphonic texture, then, are responsible to each other in expression. Just as the compositional practice of counterpoint favours contrary motion over parallel motion, musical performance can favour divergent expression in order to intensify or highlight the polyphonic or contrapuntal affordances[6] of the music.

In the famous species counterpoint method of Johann Joseph Fux (1971[1725]), a balance of consonance and dissonance is enforced by strict rules and it is the responsibility of voices added to the given cantus firmus to coordinate this balance. In the free counterpoint found in tonal music without a given cantus firmus, voices are responsible to each other in creating such a balance. In performing practice, a balance of divergence and convergence of expression in the context of each individual work is likewise desirable and entails a negotiation between the expressive possibilities of individual voices (as seen by

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[5] *Gradus ad Parnassum* (1725), the method of species counterpoint devised by late-Baroque composer and theorist Johann Joseph Fux, has been widely used for teaching counterpoint since it was written. Through study of species counterpoint in this method, the student becomes familiar with the ideas of vertical consonance and dissonance, and the horizontal considerations of voice leading, and parallel oblique and contrary motion. Certain rules and principles balance these elements in the practice of writing counterpoint, and this balance can be analysed directly from the score.
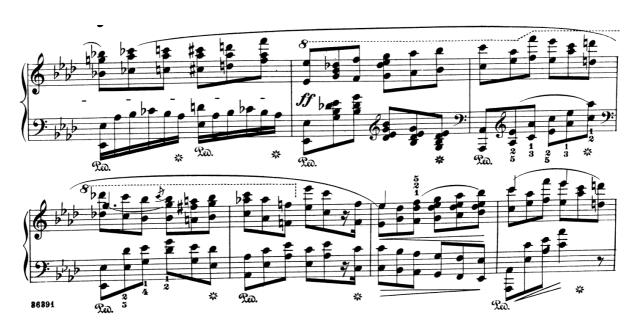
[6] I use the word "affordance" in the Gibsonian sense of a possibility of some action existing between an organism and its environment (Gibson 1979). The use of the word affordance has gained currency in describing musical structure, particularly in performance studies. Musicologist Nicholas Cook (2014), for example, writes of the structural affordance of scores to highlight the fact that scores do not have one fixed structure, but afford several structural possibilities. See Part IV for a more detailed discussion of how scores afford polyphonic performances.

the performer in their contours and rhythms) and the resulting texture and shape as they combine. The aesthetic preferences underlying this sense of balance are neither universal nor fixed, and a taste for expressive divergence can develop with practice (as I will show in Part IV).

In keyboard playing a single player must create this divergence in expression if it indeed is to be made audible. This has a horizontal component, that is, it is extended over simultaneously occurring groups of notes rather than in one vertical moment. The practice of creating this kind of expressive divergence is the subject of this dissertation. As I will argue later, both imagination and body movement are involved in creating simultaneous divergence since musical expression emanates from gesture, which itself bridges the divide between mind and body. Teaching expressive divergence is to a certain degree a normal part of pedagogy, insofar as it is easy point out at a *conceptual* level when it is actually written in scores, but it remains difficult for students to actually *use* it as a normal part of their pre-reflective understanding of music, since its embodiment must be habituated before it overcomes the unifying tendency of a single body and single mind. With the many things a teacher must accomplish in a lesson (correcting notes, rhythms and dynamics, suggesting fingerings, discussing history and style) it would be no surprise if divergent expression were to be mentioned but not followed up with the persistence that it demands. It is my hope that this dissertation will not only provide a rigorous presentation of one specific aspect of embodied divergent expression (defined precisely in Part IV), but also that it will be useful to students at various phases of development.

The relative difficulty of achieving audible divergence is apparent in recordings of passages where the composer actually wrote such divergence. For example, in Frédéric Chopin's third *Ballade*, the clearly-notated simultaneous divergence between the left and right hand is not clearly audible in most recordings (look to the third measure of the

second line of Example I.1). Of eleven that I examined (picked randomly from famous

pianists) only three clearly achieved this divergence of expression to the degree that I was

sure I could actually hear it. Several were unclear, often with one voice creating a shape

(either the crescendo in the right hand or the diminuendo in the left hand) while the other

hand remained passive, the expressive parallel of oblique motion instead of contrary

motion. Keep in mind that these are some of the most famous, artistically successful

pianists of recent times, and imagine how much lower the success rate is among

conservatory students! It should be noted that divergence between two hands - like that in

this example - is also much easier to execute than divergence within one hand.

Example I.1: Chopin Ballade no. 3, op. 47 in A-flat (Schirmer, Mikuli, 1894)

No divergence	Unclear	Clear divergence
Rachmaninoff[7]	Horowitz[8]	Rubinstein[9]
Zimmerman[10] (video recording)	Zimmerman (audio recording)[11]	Kissin[12]
Lang-Lang[13]	Richter[14]	Arrau[15]
	Cortot[16]	
	Ashkenazy[17]	

Table I.1: My perceptions of recordings of Example I.1

In broader terms, one can postulate that pianists may not execute this sort of divergence because they: a) failed to notice it in the score; b) did not want to; c) imagined it but could not manage to make it audible, whether or not they were aware of this failure. With this research, it is my hope to address all three scenarios - to: a) raise the level of awareness of possibilities of polyphonic expression; b) to argue for the value and importance of polyphonic expression by situating it in the broader context of social and cultural metaphoric relevance; c) to provide tools and observations which can help pianists to develop the embodied knowledge that will make such expressive divergence an easy and natural part of their musicality.

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[7] Reissued by Naxos. Recorded April 13, 1925 for Matrices. CVE-352510-1.

[8] From CD *Scarlatti, Beethoven, Chopin.* RCA Red Seal, 1993.

[9] From CD *Rubinstein Plays Chopin Ballades and Scherzi.* BMG Entertainment, 1999.

[10] DVD Recorded for Deutsche Grammaphon. Released July 1, 2008.

[11] CD Recorded for Duetsche Grammaphon. Released 1988.

[12] Recorded for RCA Victor Red Seal, 1999.

[13] From DVD *Lang-Lang at Royal Albert Hall.* Sony Classical, 2014.

[14] From CD *Sviatoslav Richter: In Memoriam.* Deutsche Grammaphon, 1998.

[15] Re-released by Decca, 2013.

[16] Recorded 1928, re-released by Naxos in series *Cortot: 78 RPM Recordings* vol. 5.

[17] Decca, 1997.

In the example above, the expressive divergence was actually written by the composer, but there are many possibilities to use such expressive divergence in any keyboard music, even where it is not explicitly notated. Since expressive details are relatively sparsely notated (compared to actual notes) they are filled in by performers to make the music come alive. Without the written imperative of expressive divergence, performers are less likely to practice it or use it in performance. One way to bring expressive divergence into centre of the technique of performers is to first bring it into conscious awareness and then to provide a series of exercises whereby performers can acquire a specific embodied feeling and integrate it into their practice. It is my experience that once this awareness and embodied knowledge has been well practiced, possibilities for its employment are readily seen in scores of music from all time periods. Rather than an exception, it becomes a standard part of playing.

Overview of dissertation

The relation between the inner world of the musician, how he embodies or feels the music, the musical score and the structure, habits and tendencies of the performing body represent a complex web of interacting artistic impulses which must be approached together. No less complicated is the web of research both from other disciplines and from within music-related disciplines and institutions, ranging from performers to teachers, theorists, musicologists, critics and many more each with their own language and well-established research paradigm. In this introduction, I will present a discussion of the methods used in this research and the audience to which it is addressed.

In Part I I will give a preliminary look at polyphony, starting from the wider context of how it resonates in the world through its use as metaphor and then defining as a compositional texture and as an expressive texture. I will briefly discuss how single-player

polyphony is different from multi-player polyphony and characterise embodiment as a central feature in single-player polyphonic expression. Next, I will discuss how polyphonic expression is a sort of artistic turn that represents a certain ethical viewpoint towards music that is different from (though not incompatible with) historically informed performance and more mainstream ideas of "following the composers intentions" or "being faithful to the work," all of which have their adherents among performers. (Though it is suggested in this chapter, I will save an ethical justification for this artistic turn for the conclusions of this dissertation).

In Part II, I will begin a discussion of embodiment by answering some valid objections against conscious interventions in movement at the instrument (brought to me by performers), and I will discuss how I intend to overcome the problems to which these objections refer. Then I will present an introduction to musical gesture, beginning with the wider context of embodied cognition, connecting body movement and sound, discussing how gesture is a concept that adds meaning to body movement, and then presenting several perspectives or concepts with which to analyse gesture. I will discuss gesture and musically expressive details and show that notation is read not only with the eyes and with the ear but also with the body, and how this embodied understanding is foundational to a performer's experience.

In Part III, I will present the term "coarticulation" and describe how hierarchically nested gestures allow the whole body to take part in the shaping of music, active at several hierarchically nested levels in the musical structure. In order to describe coarticulation and its relation to expression and structure, I will use examples from the Chopin Etudes. While a direct one-to-one mapping between musical structure and the body is impossible and unnecessary, I will show how the movement possibilities of the lived performing body

present a structure of their own which provides an embodied understanding of structure that occurs before conscious analysis.

Having argued that musical gesture is foundational to expression and musical cognition (Part II) and that such musical gesture is structured by coarticulation (Part III), I build Part IV on the hypothesis that developing embodied knowledge of divergent expression is the foundation for a pre-reflective understanding of the structural affordances of polyphony in musical scores. I will use the concept of coarticulation to show how musical gestures combine during the performance of expressive divergence and in order to examine the topic, I will present a series of artistic experiments as well as some exercises. Finally, I will turn to musical examples and show how expressive divergence can be used in the actual case of playing a recital. In the conclusions, I will return to polyphony as a metaphor to discuss the meaning of this research and, based on this meaning, to advocate for an increased awareness of the embodied expression of polyphony and to situate such awareness in a wider cultural context.

Research context and audience

Some artistic research aims to open up already existing artistic practice through conceptualisation, verbalisation, and theorisation, while other artistic research aims to found new practices. Of course this division is somewhat arbitrary, since research that aims to explain tacit practices will inevitably result in the modification, stabilisation or development of those practices. In any case, this dissertation spans both categories by first explaining a central part of technique and expression (coarticulation and divergent expression) and then by showing through examples and exercises how to develop this technique in a specialised direction through its application to *all keyboard music*, not just the most obviously contrapuntal. Admittedly the artistic end result has less shock value than

many other artistic research outcomes which depart radically and creatively from the traditional concert-hall performance practice[18], but the subtle, audible changes in the musical examples presented in this dissertation are at once loaded with metaphorical meaning and at the same time fit in normal concert settings.

Since I am both a pianist and an organist, I will use examples from both instruments. In fact they provide a useful comparison to each other, since each instrument has its own unique possibilities for creating polyphonic expression. The idea of coarticulation will be more familiar to pianists, since the nature of touch-sensitivity on the piano leads inevitably to an awareness of the use of the body in creating sound. Organists on the other hand have more contact points with which to play notes - instead of only ten fingers, they have fourteen contact points including the toes and heels of both feet - and mobilising the whole body to navigate the pedal keys, the swell pedal(s), different manuals, and the various tools for changing registration lends a unique and complicated physicality to the experience of playing. Because of the difference in how the body is used, and the (arguably) more sensitive gradations in how the body is heard at the piano, I will focus the discussion of coarticulation on the piano and use the organ examples as a kind of counterpoint. Through my personal experience with both instruments, I am convinced that playing the organ helps pianists to expand their polyphonic imagination and that playing the piano helps organists to develop their technique and expression, a point which I will briefly discuss in Part IV.

Writing research about piano playing is similar to teaching piano in this respect: the level of playing and musical understanding of the audience determines how basic or advanced the explanations can be. Certainly the embodied experience underlying the ideas about gesture and coarticulation in Part II and Part III are not new, but the fact remains

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[18] One prominent example is the Music Experiment 21 project   led by Paolo de Assis at the Orpheus Institute. For more information see <musicexperiment21.eu>.

that many talented pianists lack the conscious awareness - by which I mean also the framework of language - from which to consciously develop such techniques in their own performing and teaching practices. I expect that many of my pianist colleagues will recognise the phenomena that I try to explain, whether they agree or disagree with the appropriateness of their employment. Divergent expression, the central topic of Part IV, is also not a new idea for professional pianists, but it is an idea that has potential for far-reaching development. I hope that reading the chapter, playing the examples and doing the exercises will open up new sorts of awareness for pianists of all levels, leading to a more frequent employment of divergent expression in performing and teaching practices.

Teaching the practice of music is largely a one-to-one affair, since the teacher continuously adjusts his comments to the reaction of the student. For one student, a mere gesture might suffice, while another student might miss the point of an extended explanation completely and the teacher must rephrase or re-show what he wants to communicate in several different ways. What is obvious to one can be incomprehensible to another. Such is the problem with writing about musical practice - too many words for some and not enough for others. I have tried to write to an audience of both pianists and researchers, aiming for the average in both groups. The fact that some points will be self-evident to most pianists does not mean they are superfluous, since the language used to communicate these points enables a dialogue about the underlying issues. Opening such issues from the practice to dialogue - to refinement or refutation - is an important goal of artistic research.

It is my view that due to the focus on pianistic embodiment, understanding this research is dependent on *actually trying out the ideas at the instrument*! I have made the effort to write in such a way as to be understandable (at a conceptual level at least) to non-pianists, but the very core of this research lies in the actual exploration at the instrument

that I hope to encourage. Only by actually playing the examples and trying the exercises will the research be fully understood.

Language and structure

The conflicting of jargons resulting from an interdisciplinary source-set can be confusing, and this has motivated me to prune away expensive words in favour of, where possible, the kind of language one might encounter in a piano lesson or at a university class. In order to do so, I need to give some commonly-used words a more precise meaning. This will take place in the course of the text, but I have also assembled a glossary, which is presented in an additive manner at the end of each part. Each gloss summarises my usage of the word, while referencing the section where the usage was introduced. The sections and subsections have therefore been numbered for easy reference. Because of these divisions, the part/section/subsection hierarchy has many layers, and while it was not my intention at the outset to create such a byzantine structure, the benefit is clarity for the purpose of self-references in what is often a complicated field of thought. In the PDF version of this dissertation, the part/section/subsection hierarchy is coded into the document structure and can be accessed by the bookmarks tab to the left of the screen. I highly recommend that the reader review the glossary preceding each chapter before proceeding to read the chapter, without which step untold misunderstandings might occur. I also recommend that the reader remain aware of the part/section/subsection structure (by collapsing and expanding it in the bookmarks tab) in order to take each section in its appropriate context in the dissertation. If at any moment the reader wonders how any particular section relates to the whole dissertation, a traversal of the first paragraphs of each part should supplement the overview given above in providing reorientation.

Self-references are made with the section symbol (§). Musical editions are referenced in-line with the system (publisher, editor, year). My own markings in musical examples are shown in green. The issue of gender parity in the use of pronouns was carefully considered, and the inclusive use of "she or he" or "his or her" is intended throughout. Because of the frequency of their use, such inclusive constructions would make the text difficult to read. In order to avoid confusion, the choice between "he" or "she" was settled by the gender of the author. In the conclusion, both pronouns are used to reaffirm the spirit of inclusiveness hereby expressed.

Methods

Certain aspects of this dissertation - such as inclusion of sources from empirical musicology and the fact that I use the word "experiment" in Part IV - might suggest that this dissertation aims to be build scientific, objective or empirical knowledge of some kind. Without rehearsing the problems inherent in any such claim, let me hurry to explain that this dissertation can best be read as an essay that is partly descriptive, partly instructive and partly speculative. In choosing methods for this research, I found it is useful to weigh the benefits of empirical research - the kind found for example in the discipline of empirical musicology - with practitioner literature - the books or essays written by musicians themselves outside of academia. Empirical research benefits from defined research methods and objective results, but its focus is limited to the short span of time during which the subject(s) are connected to motion sensors or otherwise part of the experiment. Practitioner literature, on the other hand, builds conclusions from a whole lifetime of experience, but the methods are not always defined. Both kinds of research have their advantages, and I will use both types of sources.

One problem with artistic research that relies only on the experiences of the researcher can be described as the anti-intellectualist problem. This philosophical position of anti-intellectualism argues that knowledge-how and knowledge-that are not reducible to each other. A person with know-how of a certain skill cannot necessarily describe how they do that skill, or might describe it incorrectly. Knowing how surfing is done from having carefully observed surfers or from reading books about surfing is different from having the ability to surf. Additionally, the experienced surfer, asked how to surf, might give inaccurate descriptions or advice (Fantl 2014; Bengson & Moffett 2011). In order to increase the credibility of artistic research, then, it is my opinion that insights delved from the experience of the practitioner should be connected outward to insights from other kinds of research. The resulting web of interconnectedness prevents solipsism and allows conclusions to be drawn which are more meaningful than those limited by a single method. In the centre of this web is the experience and awareness of my artistic practice, and I use sources external to my practice that resonate with my experience. This resonance can be the resonance of familiarity or recognition, but it also results in changing my experience by offering language, concepts and insights that can subsequently feature in my conscious awareness. The circularity of the artistic research process, like artistry itself, is thus opened to outside influence. It is true that by using sources from outside of the field of music I run the risk of misunderstanding those sources. Though I have done my best to understand each source in the context of its discipline, no one can be an expert in as many fields as are represented in this dissertation, so it is possible that coming from my viewpoint as an artistic researcher I have created my own take on the issues at hand.

The possibility of interdisciplinary interaction has been described as "multi-directionality." Following a long philosophical tradition critiquing scientific knowledge, some artistic researchers have described multi-directionality by showing that every

discipline of research has its own vantage point and thus cannot be complete in itself. "Multi-directionality gives artistic research not only the opportunity to emphatically question the practices of art and research but also the obligation to follow and hear the substantiated critiques of other scientific fields and life forms. This implies that introversion becomes impossible" (Hannula 2005). Thus, they argue for a plurality of research methods within each artistic research project, even going so far as to call for an "anarchy" of methods.

My research is characterised by many methods. At some moments, my gaze will turn inward and I will try to describe the contents of my awareness - at such moments my research method is a kind of phenomenological method. At other moments I will tell a story to describe an experience, at which moments my method is auto-ethnographic. I will connect insights from my own awareness and experiences to empirical evidence found in other disciplines such as empirical musicology and cognitive science. I will sometimes describe musical phenomena and interpret them in relation to meaning, metaphor and cultural context, which is an approach more akin to musicology. In formulating experiments, I will use an action method of research appropriated from sociology.

With this polyphony of research methods, the common thread is the focus, at least in peripheral vision, on the practice of playing and the aesthetic qualities and meaning of the artistic result. For the practicing musician, successful artistic research should be useful. Parallel to the practitioner literature on piano playing such as the famous books written by, for example, Gyorgy Sandor, Boris Berman and Heinrich Neuhaus and the books of exercises from, for example, Liszt and Brahms, all of which stand on my bookshelf, useful research creates as a pathway towards a particular kind of musical development the success of which cannot be measured, since it depends on the user. Standing behind the usefulness of the dissertation is my own practice both in teaching and in performing,

where I have extensively tried out the ideas I present here. In the focus on aesthetic

qualities of the artistic result, the currency is inspiration and the creation of meaning. I

have found the issues central to this research to be inspiring and motivational, both for me

and my students, and I hope readers will share my enthusiasm.