Preface:
This paper presents a rhetorical exploration of the deeper (and some might say, striking) implications of the ontological shift from materials to activity in music performance analysis. It is not meant to engage everything that might be said about music performance. For example, I do not discuss the highly influential work of Roger Chaffin (2002) (http://psych.uconn.edu/faculty/chaffin.php). Chaffin’s research can be credited with opening the door for performers to systematically explore their working process. The outcomes of his work have been profound for both the performers who participate and for a broader audience of researchers looking to explore performance. I highly recommend his work as a starting place for those seeking to understand their own working process.

The other set of ideas that are not explored in this paper are the “empirically motivated” studies of music performance that have explanatory aims beyond practice. My aim is to cultivate a “meaningful analytics” for performance, not to discover the neural basis for entrainment, for example. I remain somewhat suspicious of scientific research that “objectifies” the performer, where no attempt has been made to ground the concepts in practice. My aim is to offer a conceptual framework that allows performers to systematically unpack the tacit processes of performance in order to ground musical practice in a deeper exploration of the basic mechanisms of music making. Because music making is deeply social and richly meaningful, I recommend conceptual frameworks in the social and cognitive science of language use, most notably the work of Herbert H. Clark (1996, 1997). This paper borrows Clark’s (1997) rhetorical device, because I have found it very challenging to convey the shift in ontology – which arguably must be done before studies are run, not after. Here too, one might find parallels in the work of ethnomusicologist Benjamin Brinner (1995), though his concepts have not to my knowledge been explored in Western Art Music performance.

The data for this rhetorical exploration comes from a case study of master classes offered by members of the London Symphony Orchestra on YouTube (Kaastra, 2014). The master classes, one or more for each instrument of the orchestra, were captured and analyzed as data. The warrant – what makes this more than just a subjective account – is based in the fact that the master classes are instructional materials, not first person accounts of the mechanisms of performance. The instrumentalists are teaching others how to prepare a taped audition, and ultimately how to play well in a live orchestra. As this paper reveals, teaching music is really about teaching how to attend in performance, not just how to play a passage. The instrumentalists delivering these master classes are professional musicians, most of the players also teach professionally. Using standard qualitative analysis procedures, I systematically explored the entire set of master classes, not just the few that seemed most interesting. The examples that are used to illustrate concepts in this paper are not intended to directly inform performance, rather, to demonstrate layers of awareness in music performance based on the conceptualizations used here.

Finally, I would like to direct the reader to the work of Nicolas Donin and Jacques Therreau taking place at IRCAM: http://apm.ircam.fr/membre/JT/ and http://apm.ircam.fr/membre/nd/. It is exciting to see these ideas develop in the context of musical practice.

I hope the reader finds it entertaining. Comments and questions can be sent to the author at: lkaastra@sfu.ca.
Abstract

Research in Western Art Music (WAM) performance relies on a number of idealizations. However, as with the study of language use, many of these idealizations have turned into “dogmas—convictions that are impervious to evidence.”1 Because of these dogmas, investigators have overlooked the most basic features of performed music such as multimodal coordination, layered meaning, instrumental variation, tacit knowledge, and ad hoc conceptualization. This paper describes many of the dogmas and “analytic fictions”2 that must be set aside for a meaningful analytics on performed music. I propose an account of music making that bridges inner and outer processes of awareness around domains of coordination. In this view, structural and metaphorical conceptualizations are viewed as targets of focal awareness, rather than the basis for cognition in music making. This work paves the way for a “meaningful analytics” of musical practice.

Keywords: joint activity theory; ad hoc conceptualization; instrumental performance; creativity

Introduction

What does it mean to make music? There are many possible answers to this question from such diverse perspectives as music philosophy, music theory, ethnomusicology, music cognition, and performance analysis. The answers from these different fields draw on different ontologies of music. They disagree about the aspects of music that can be conceptualized, experimented with or captured as data, and theorized.

We idealize music performance in order to study it. It is impossible to analyze music making without some idealizations. However, when the idealizations become “dogmas—convictions that are impervious to evidence, they become roadblocks to scientific progress” (H. H. Clark, 1997). These idealizations have hindered the meaningful study of a number of basic features of music making—such as multimodal coordination, layered meaning, instrumental variation, tacit knowledge, and ad hoc conceptualization.

This paper addresses dogmas of understanding in four main areas of music performance: meaning, audience, interaction, and musical thinking. These idealizations are built into our systems of training and advanced education in WAM performance and thus pervade scientific research on cognition in music performance. All of the dogmas presented here are ones that I have held at some point and so this presentation is to be construed as autobiographical. The aim is to bring analytical practice and research on music performance more into line with current theories of representation, concept formation, situated cognition, and tacit knowledge. In doing so, I propose an account of cognition in music performance that bridges inner and outer processes of awareness around domains of coordination (Kaastra, 2008a).

Meaning in Music Making

When musicians make music, it is assumed that they create mental representations of the music—they internalize abstractions of musical materials and propose interpretations through a combination of expressive body motion and sound. While some researchers have been calling for increased acknowledgement of the situated nature of music making (e.g. Cook, 1999; Ritterman, 2002; Brinner 1995), empirical research on music performance remains closely tied with its epistemological roots in music theory (Clarke, 2004; Gritten & King, 2006). For most music theorists the question is not whether, but how strongly an interpretation should inform performance (Berry, 1989; Dunsby, 1995, 2002; Howell, 1992; Lester, 1995; Nolan, 1994; Rink, 2002, 2004; Rothstein, 1995; Sloboda, 1985). As Zbikowsky asserts, “understanding the way music theory instantiates cognitive processes will also help explain its enduring value” (2002, xi). There is a foregone conclusion that the conceptualizations of music theory drive cognition in music performance; that basic cognitive processes arise from the conceptualizations of music theory (Zbikowsky, 2002). This paper argues that the conceptualizations of music theory are, like idealizations in the study of language, “analytic fictions created for the purpose of those who study them” (Barsalou, 1987, 119). The first set of dogmas address these misconceptions about representation in music making.3

Analysis and Performance

In the analysis of performed music4, musical materials (e.g. notes, rhythms, phrases, harmonies, melodies) need to be distinguished from musical utterances (see H.H. Clark, 1997). An utterance can be defined simply as the action of saying something. Musical utterances are the actions of producing musical sounds. Sounding a note is not just about its material qualities; it is about how the note is sounded, and how meaning is associated with that sound. For example, when a bassoonist “plays middle C” she coordinates her embouchure5, air speed and pressure, and fingers to produce a sound that satisfies the conditions for middle C. In practice, rehearsal, and performance an utterance of middle C can also signal a musical concept (e.g. the tonic).6 At the same time, its serves as a musical cue conveying the dynamics (e.g. mezzo piano), tempo (e.g. moderate), character (e.g. dolce, sotto voce), and style. The utterance is also an invitation, “here we go: the piece is starting; please listen; it starts this way”. In addition, the utterance of C can present a meaningful evocation—a novel

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3 For a proper account of why music theory does have explanatory value see the section on musical thinking in this paper.
4 For simplicity, all references to performed music in this paper refer to WAM performance.
5 Embouchure is the combination of jaw, lips, teeth, and tongue on the instrument.
6 The tonic of a key, e.g. C is the tonic of a C major scale.
layer of meaning added for the benefit of members of the ensemble or audience, “this is the way we heard Joe play it last time.” We recognize the utterance as “saying something” at these different levels of action and their corresponding layers of meaning (see H. H. Clark, 1996). The levels of action in music performance must be extended to account for the presence of a signal and a cue, as well as the possibility that a performance is also “speaking to” the musical work and its past performances as well as the physical and social environment in which it is currently being played.

Levels of action in a musical utterance:
1 – the utterance
2 – the signal for self and other
3 – the cue for self and other
4 – this instance of the musical work
5 – this physical and social situation

For the performer, each of these levels of activity is subsumed in one action. A performer does more than play a “middle C”—she presents a signal and cue to self and other, and to the listener, and to the performance space, and the social context. Writing on music performance tends to privilege the score as the source of meaning in music making (Kaasstra, 2008b). However, this focus on musical materials has led to one of the oldest dogmas about meaning in music making.

D1(L): Dogma of Musical Meaning (Listening): For listeners to understand a performance, they must first decode the musical materials.

And its alternate,

D1(P): Dogma of Musical Meaning (Performing): For performers to play a musical work, they must first decode the musical materials.

The problem with these dogmas is that listeners and performers do understand musical utterances quite apart from their ability to analyze or decode the musical materials. We understand what the performer is saying. Members of the London Symphony Orchestra demonstrate awareness and mastery of these levels of activity in their instructional materials for the Youtube Symphony Orchestra project (Kaasstra, 2014):

1. Bassist (level 1): “The sforzando needs to be a lean rather than a heavy accent.” “Pull weight away for diminuendo.”
2. Bass Trombone (level 2 signal): “Exaggerate the dotted rhythm so that the correct rhythm will be heard through the orchestra.”
3. Violin (level 3 cue): “The notes need to be beautiful but it is more important that you are clear about timing.”
4. Bassoon (level 4): “Think of captivating your audience in the same way Scheherazade did in order to avoid being killed.”
5. Tuba (level 5): “You need to sound like overfed first trumpets. We want all the energy and character of a first trumpet player, but on a big instrument.”

These comments suggest that performers manage their awareness of different levels of activity in performance. This leads to a second dogma, the dogma of instrumental invariance.

D2 Dogma of Instrumental Invariance: Performers determine the meaning of musical materials independently from the constraints or affordances of their instrument.

The difference is perhaps greatest between harmonic and melodic instrumental performance. Igor Stravinsky’s Rite of Spring is performed in two versions, an orchestral version and a two piano version (piano 4 hands). Pianists benefit from understanding the polychordal structure 8 of the music because the piano is an harmonic instrument. Understanding the polytonality of the music is a helpful way to chunk finger motion, and so it makes sense that a pianist would find it meaningful both for practical and expressive purposes. But a woodwind player gains nothing by knowing the polychordal structure of a passage of music. Instead, the wind player must know something about what is salient for the purposes of coordinating her performance with that of other members of the ensemble. 9 Performing on melodic instruments is a deeply situated and social activity.

In order to perform in an ensemble, an instrumentalist has to know what is meaningful for the purposes of performance. She must attend from the particulars of her engagement with her instrument to the particulars of her engagement with others (Kaasstra, 2013, 2014). This leads to a concern about audience, or, the purposes for finding meaning in a musical utterance.

Audience
We can think of audience literally, as in those participants who are seated in front of a stage, watching, listening, and clapping on cue. But audience as I discuss it here represents a broader set of ideas regarding the purpose for finding meaning in a social context (H. H. Clark, 1997). The broader concept of audience includes the aspects of the

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8 Polychordal means the sounding of two different chords at the same time. This produces the dissonance that is characteristic of this work.
10 This is not to suggest that the analysis of musical materials won’t deepen our understanding of the music; simply that it is not what a woodwind player needs to know to do her job.
situation that play a role in shaping the interaction. Audience can be explored at different units and levels.

One unit and level of analysis is the ensemble. When two or more individuals play together, they are responding with each other. Research that takes an ecological approach (e.g. Reybrouck, 2012) supports the idea that we “listen for” based on our roles in the experience. The musical utterances become meaningful for someone in a specific musical setting. This challenges the idea that all music is understood in the same way. We can borrow from H. H. Clark’s D4 (1997, p. 574):

D3: Dogma of Undifferentiated Hearsers: Listeners understand musical utterances in the same way regardless of their role.

And its cousin,

D4: Dogma of Autonomous Performance: A musical work means the same thing no matter where it is performed.

With a focus on musical materials, it is difficult to conceptualize how musical meaning is arrived at in different contexts. This is in part because musical materials in the WAM tradition are so theoretically rich and meaningful in an abstract sense. Much more needs to be done, however, in exploring how context shapes the experience of making music.

**Performer Roles**

In live performance, there are explicit and implicit roles for each person performing, and the roles can change based on the content of the music or the process for performance (Kaastra, 2008a, 2014). In orchestral performance, it is possible to both overestimate and underestimate the importance of seating in how musicians understand their work. On the one hand, we encounter the idea that orchestral performance is “ossified, stilted, and predictable” (Sawyer & DeZutter, 2009). There is a common misconception that the conductor plays the orchestra, and individual players bear little personal responsibility for the overall success of a performance. The reality, as most performers know, is far more complex.

D5: Dogma of Orchestral Hierarchies: The conductor plays the orchestra

In this view, the activity of performing in a large ensemble seems, to anyone who has not actually played in an orchestra, largely automated. Of course, performances are never the same from one night to another, and this view seriously overestimates the role of the conductor in getting it right. In reality, seating determines a great deal about how we attend to the activity of making music from within the orchestra. There are explicit roles in the orchestra, for example, the first chair is the leader of the section, and the concertmaster is the leader of the ensemble. These roles are particularly important for organizing the procedures of rehearsal and making larger interpretive decisions. When the music starts, however, the content will often imply alternate hierarchies for listening. For example, the woodwind section may need to “listen down” to the second bassoon to lock in their tuning of a chord. London Symphony Orchestra musicians offer a glimpse of some alternate hierarchies that determine what they are “listening for” in a series of online masterclasses (Kaastra, 2014).

1. Oboe: “Be under the flutes.”
2. Bassoon: “This melody is a memory of the longer oboe melody played earlier in the movement.”
3. Timpani: “Be near the trumpets, because you need to be hand in glove.”; “You need to be locked into the basses and cellos.”
4. Clarinet: “You don't want to stick out; you want to be the icing on the cake.”; “Play in character of the flutes.”

Expert instrumentalists understand that the music implies certain roles for the purposes of attention, and those roles determine what they are listening for in their own playing and in the orchestra. We can call this “situated listening”, after Hutchins (2005). The oboist is positioning his sound below (quieter than) the flute sound. The bassoonist is playing his melody just the way the oboist did earlier in the movement, but a bit softer. The timpanist anchors his performance in that of other sections. The clarinetist is positioning his sound in the first example as “icing” and the second example he is mimicking a flute sound. So far this discussion calls into question the following statement:

D6: Dogma of Determinate Meaning: Performers have an interpretation of a musical work in mind and it is up to the audience to identify that interpretation.

While performers certainly are concerned about how their music reaches the audience, the details of the meaning in performance should be broadened to include the situated listening from within the ensemble.

**Interaction**

Performance in an orchestra is a thoroughly social activity. When one player “says something”, the entire group responds in kind. Responding and coordinating responses happens in real time, in less time than it takes to think through what just happened. A good way to understand this is by drawing out another of H. H. Clark’s “dogmas of understanding” (D7 Clark, p. 581).

D7: Dogma of Autonomous Processes: Playing and listening are autonomous processes

Performers “coordinate at all levels of processing” (Clark, 1996). They monitor their own and others’ contributions for successful completion. This monitoring is a basis for
participating; it is ongoing; it is iterative; it is “responding with”. Successful completion does not refer to flawless interpretation, but to the ability of the performers to draw out meaningful connections with each other. Each utterance is placed meaningfully in a responsive context. Orchestral performance is not as brittle as we are led to believe. As with other kinds of meaningful social interaction (Clark, 1997), players adapt in real time.

D8: Dogma of Musical Perfection: The processes of understanding music are fundamentally designed for flawless utterances.

We strive for perfection; a common misconception is that there is one perfect way to utter a musical phrase. In reality, what is more important about a musical utterance is the sense in which it is connected to what is going on around it. You see this reflected in statements by members of the LSO (Kaastra, 2014):

1. Cello: “Practice it all in one bow, in separate bows, so that you are flexible and can do it all ways.”
2. Oboe: “Work it out intellectually but then play it naturally…. Imagine where the music is flowing to. We could play it very static, just trying not to make a mistake, but this wouldn’t be the essential meaning of playing. …The music should sing, it should relax and it should express itself.”

Flexibility is mentioned over and over again in the LSO’s Youtube Symphony Orchestra masterclasses (Kaastra, 2014). If orchestral performance were as scripted and “mindless” as we are led to believe in the literature on music making (e.g. Sawyer, 2003), musicians would not emphasize this flexibility. In reality, orchestral music performance requires a tremendous presence of mind to continually attend to, pick up, and draw out what is meaningful. Flexibility and the ability to recover after a mistake are two critical components of expert performance. When mistakes are made, the performance does not stop. Rather, the players continue to pick up what is working and move forward. Some members of the LSO discuss this in their lessons.

1. Flute: “Don’t get caught up with the rests. If you play the rests, the piece will come to a stop.”
2. Cello: “Practice the shift, of course, but in performance, think of something else before the shift.”

Both of these instructions focus on the contents of awareness. The flutist is saying that to keep a feeling of movement through a series of melodic fragments in a passage, he has to cover over the rests rather than giving the rests full attention. The cellist is giving instructions about a very challenging and exposed shift. These instructions came to her from another cellist, who has a strong record of success with that shift. “Think of something else” – don’t put all of your attention to the one shift; instead move through that tricky area and you will either hit or miss, but you will recover gracefully. This leads to another misconception that touches on the nature of creativity in music performance.

D9: Dogma of Scriptedness: Performance that relies on a musical score fundamentally lacks creativity.

Music making never just appears out of nowhere. It does not spontaneously erupt in forms we have never experienced. What instrumentalists miss by focusing on the perfect expression of a phrase is the idea that, by practicing and rehearsing, we are learning to attend to the particulars of performance to learn greater awareness and control over those particulars so that when the moment comes and we are performing in context, we can manage the tremendous mental resources required and use our ability to attend in specific ways, to connect what we are doing to what is going on all around us. It is the process of connecting aspects of the music that is creative in the orchestra, as well as in less scripted and improvised music making. When we play without a score, we simply use a different set of coordination keys (Kaastra, 2008a, 2011).

Musical Thinking

This leads to another dogma, deeply buried in our collective misunderstanding of music making:

D10: Dogma of Mindless Performance: The performer can make music but be unaware of any expressive or creative processes.

And its cousin,

D11: Dogma of Musical Expertise: A performer is knowledgeable about music on in so far as she can speak intelligently about it.

Tacit knowledge in music performance

The difficulty here is two-fold. Firstly, critics (including our own inner critics) maintain that a performance that does not move us in some way, often related to an interpretive ideal, lacks expressive or creative purpose. Secondly, theorists, (including our own inner theorists) maintain that the only knowledge that counts is declarative knowledge “about” the music. Sadly, when we believe that performance is only knowledgeable when it is expressed in declarative terms, we lose the ability to conceptualize the more basic cognitive processes of musical engagement. When this

11 For more on this, see the action ladder that is used to conceptualize monitoring in face-to-face conversation (Clark, 1997 p. 582).

understanding is limited, it only makes sense that salient aspects of the performance might be lost with it. Our understanding can only progress when we can ask the right questions.

I propose an account of cognition in music performance that emphasizes processes of awareness around the particulars of music making (Kaastra, 2008a, 2008b, 2011, 2013, 2014). This account applies Polanyi’s structure of tacit knowledge to explain how instrumentalists bridge inner and outer processes of attention and awareness in performance. In essence, I am proposing an account of cognition in music making that would benefit from further exploration in the range of approaches currently used to study ad hoc conceptualization in language (seeBarsalou 1983, 1999, 2003; Barsalou & Prinz, 2002; Glushko et al. 2008; Casasanto & Lupyan, 2015). In this view, the structural and metaphorical conceptualizations of music theory are targets of focal awareness, rather than the basis for cognition in music making.

In the orchestra, performers monitor the particulars of their own and others’ playing (Kaastra, 2013, 2014). The particulars in music performance include any and all aspects of sensory engagement that can be manipulated. The possibilities range from the very obvious — finger and arm motion, to the very subtle — the intake of a breath and embouchure formation.

Polanyi (1966) says that tacit knowing always involves two “terms”, the proximal and the distal. “We attend from something for attending to something else… from the features to the face” (1966, p. 10). Internally, if I have “play as softly as you can” as my target, many aspects of my subsidiary awareness are automatically restructured to meet that target. These can include air speed, air pressure, finger pressure, hand position, posture, embouchure pressure, embouchure size, embouchure shape, and tongue placement. I will not be attending focally to each of those aspects of my performance; rather, I choose a target that will work best for current purposes. Sometimes a target will include structural knowledge of the score (e.g. play it more quietly on the repeat). Other times a target might have more to do with an imaginative portrayal (e.g. play it with all of the filigree of a Viennese ball).

In musical terms, we attend from the technical particulars to the utterance. The technical particulars are proximal; they belong in our subsidiary awareness, literally inside our bodies. The note is distal; it is the situation we are striving to master, the object of our focal awareness. As we progress to increasing levels of musical sophistication, we choose different targets of awareness. Those targets restructure the aspects of subsidiary awareness to meet new goals. This is the functional aspect of tacit knowledge (Polanyi, 1966).

The particulars of performance on the different instruments vary greatly. Stringed instruments do not involve the breath, but the bow. Yet, string and wind players are able to recognize based on their mutual knowledge, beliefs, expectations, and experiences (Clark, 1996) what is meaningful for the purposes of coordinating the performance (Kaastra & Kirsh, 2013). One way to explore this is to say that the particulars of performance expose perceptual objects for us (see Noë, 2012).

For example, performance on a brass instrument requires a very complex coordination of perceptuo-motor processes. It involves tactile sensations in the lips, jaw, mouth, and throat, and tactile and kinesthetic sensations in the airstream, fingers, hands, and arms. Sensory perception in music making involves listening; it also involves other sensory systems such as chronoeception, proprioception, and sometimes nociception. Coordinating performances requires not only a deep familiarity with ones own sensory engagement, but by extension a familiarity with what other musicians are also experiencing as they play. I direct the reader to a wonderful performance by the ensemble, Mnozil Brass called, “Lonely Boy” (see reference list). In order for this performance to be possible, the brass players must have very stable access to shared perceptual objects in performance. They literally share their performance of an instrument with each other.

Performers manipulate the particulars in order to produce musical utterances that are meaningful for current purposes. This is true at a very basic level of music making. Even without an instrument in hand, we can manipulate the particulars of clapping to create meaningful material. Even keeping the same rhythm and tempo, we can use flat or cupped hands; we can alter the distance and pressure to create different qualities of clapped sound. It is also what the great teachers address when they focus doggedly on technique (famous examples include the teaching of Janos Starker, cello, and Stephen Maxym, bassoon and many, many others).

Concluding Thoughts

Orchestral performance is enjoying an increased popularity — yet the gulf between performance and scholarship in WAM is still vast (Kaastra, 2008b). It is time to move beyond the dogmas and misconceptions of the tradition and engage in meaningful analytics on practice. Doing this will formally acquaint instrumentalists with their tacit knowledge and socially situated creativity. Creativity is a fundamental aspect of human cognition (see Barsalou & Prinz, 2002; Johnson, 1987). Yet, many dogmas of understanding have prevented us from conceptualizing creativity in Western Art Music performance. It is time that some of these dogmas are let go in favor of a deeper exploration of the fundamental mechanisms that connect us in our joint activities. Below the surface differences between music and language there is a deep fundamental similarity. It is found in our ability to manage joint awareness, understand roles and goals, enjoy meaningful multimodal interaction, and respond meaningfully with each other.


14 See also Kaastra, 2012.
Acknowledgments

This paper pays sincere and humble homage to Herbert H. Clark, and to one of his brightest papers, “Dogmas of Understanding” (1997). The author would also like to acknowledge Brian Fisher for his constant encouragement and support.

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Mnozil Brass “Lonley Boy” (2012). (http://www.youtube.com/watch?v=m_QRd8SjKKM


