Chapter 2

Phenomenology and the 'hard problem' of consciousness and music

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Introduction

In this chapter I compare what is termed 'the hard problem' in the study of consciousness with a similar issue in music scholarship. The grounds for this comparison are difficulties common to both disciplines, to do with the incorporation of subjective experience within an objective explanatory framework. In highlighting these common difficulties I suggest that they may be open to similar solutions. In particular, I argue that musicology would do well to revisit theoretical perspectives that reject a fundamental opposition between objective and subjective, such as the (European) Continental tradition of phenomenology, since such perspectives have proved useful in meeting challenges posed in the study of consciousness. In this vein, I undertake a fresh look at Edmund Husserl's well-known analysis of time consciousness, using this analysis to provide a theoretical framework within which to understand the objectivity of a musical piece through the subjective experience of the performing body. Such an understanding can, I believe, provide a resolution to the difficulties that underlie the hard problem of music, and, in conclusion, I demonstrate this through a brief analytical engagement with a Chopin étude.

Hard problems in consciousness and music

In 1996 David Chalmers' book *The Conscious Mind* created a stir in the interdisciplinary nexus surrounding cognitive science, neurology, and philosophy of mind. Chalmers argued that the model of mind prevalent in most scientific research was incapable of explaining the human experience of consciousness in any satisfactory way. For Chalmers, this model was predicated on an empirical functionalism that understands the mind solely as the psychological cause of human behaviour. Although he admitted that such a functionalist view of the human mind had underpinned many advances in cognitive science over the preceding decades, Chalmers maintained that the functionalist model's disregard of phenomenal experience was a mistake. In particular, this left the 'biggest mystery' intractable: the question, 'Why are we conscious?' (Chalmers 1996: 7–22). Chalmers called for new directions in cognitive science and

neurobiology in order to deal with what he famously dubbed the 'hard problem' of consciousness (xii–xiii).

This was far from a new argument, as Chalmers readily admitted. The problem of the relation between internal experiences and the external world has roots in Western philosophy that go back at least as far as Plato. Chalmers' argument also echoed questions raised by more recent philosophers, such as Thomas Nagel in his seminal essay 'What is it like to be a bat?' (1974). Nagel was the first of a series of Anglo-American philosophers to express dissatisfaction with the materialist account of mind that underpinned cognitive science, of whom John Searle has been perhaps the most prominent (Searle 1984, 2002, 2004; Searle *et al.* 1997). Nonetheless, if Chalmers' book was not entirely novel, it attracted considerable attention due to its considered and sympathetic treatment of the achievements of cognitive science, and to its vivid characterization of the central problem. *The Conscious Mind* both encouraged and benefited from a growing interest among neuroscientists in developing a secure experiential basis for their observations, which in turn generated a fresh assessment of the question of consciousness among analytic philosophers. A scholarly journal came into being, international conferences on consciousness were held and an association founded, and books by distinguished scientists such as Alain Berthoz and Antonio Damasio put a recognizable face on the quest of neuroscience to include subjective experience (Berthoz 2000; Damasio 1999).[1] Chalmers' book contributed in no small way to this outburst of enthusiasm, and his pithy phrase, 'the hard problem of consciousness', became a touchstone for the new academic discipline.[2]

Given the centrality of consciousness to all human experience, it is unsurprising that an issue that arises within this discipline can be related to other fields of academic inquiry. The hard problem of the relationship between subjective experience and objective, functional analysis has particular resonance for the study of music in two ways. First, there is a trope—familiar to both consciousness and music studies—concerning the resistance of experience to verbal explanation: How can an apparently ineffable experience be rendered in words without losing that which makes it particular? Secondly, there is in the fields of consciousness and music a shared engagement with the problems of temporal experience and, therefore, a common difficulty in using atemporal categories and terms to illuminate experience that is in its essence defined in time. As a rough example of this difficulty, if my seeing red now is functionally indistinguishable from my seeing red yesterday (i.e. the same neurons are firing), then how can the undeniable differences between the experiences be understood? Running through both of these questions is a difficulty in harmonizing the demands of objectivity with the recognition of subjective experience.

Such a difficulty may sometimes seem to strengthen the power of both consciousness and music, even while frustrating researchers. Of consciousness, Chalmers writes admiringly that it is 'startlingly intense . . . [and] frustratingly diaphanous . . . so intangible that even [a] limited attempt at a definition could be disputed' (1996: 3). A similar sentiment is present in many sayings that celebrate the opacity of music and its resistance to words, such as the oft-cited aphorism, 'Writing about music is like dancing about architecture',[3] and the statement by novelist Aldous Huxley: 'After silence, that which comes nearest to expressing the inexpressible is music' (1931: 17).

For both consciousness and music, then, common modes of explanation and analysis do not seem to capture what is central to the experience of the subject. As Chalmers has it: 'for every functional explanation, there remains a further question, "why is the performance of the function associated with conscious experience?"' (1997: 5). Thus, an explanation of the experience of 'seeing red' that limits itself to a description of the firing of certain neurons in the brain does not begin to address the *experience* of seeing red: there seems to be a fundamental mismatch between the terms of explanation and what it is like to have the experience. Such a criticism might be levelled with equal justice at purely functional accounts of musical structure. For example, the closing 29 bars of the last movement of Beethoven's Symphony No. 5 might quite accurately by explained in terms of harmonic function as 'a prolongation of the tonic chord'. However, these terms, which represent a formalist interpretation of these musical events, do not offer much connection to the experience of attending to this music. Worse, the terminology of the explanation itself seems to cut off further investigation into such experience. If the question here is 'What are listeners experiencing when they hear this music?', then the response 'a prolongation' seems almost as irrelevant as the answer 'the firing of neurons in the cortex' is to the question 'What are viewers experiencing when they see red?'. One benefit of solving the hard problem of music, then, would be to connect functional analytical explanations to the totality of musical experience, and thus to make the analyses themselves more meaningful.[4]

As already mentioned, a second connection between the twin hard problems is their common sensitivity to time. More precisely, the temporal qualities of musical experience seem close to those of conscious experience. It is generally accepted that time is of central importance in the experience of consciousness; thus philosopher Brian O'Shaughnessy argues that: 'a direct confrontation with time is constitutive of consciousness as such' (2000: 51). This means not only that the condition of being conscious is a temporal state, but also that the ability to create a series of events in a temporal sequence, or to experience a single event as continuous, is in some sense constitutive of consciousness itself. As William James put it

> Consciousness . . . does not appear to itself chopped up in bits . . . It is nothing jointed; it flows. A 'river' or a 'stream' are the metaphors by which it is most naturally described. *In talking of it hereafter, let us call it the stream of thought, of consciousness, or of subjective life.* (1890: 239)

If all conscious experiences are temporal, then music most closely approximates this quality of flow, more so, for example, than literature or figurative art. Music both takes place in time and moulds time in its passing; listening to music demands attention in the immediate present (now) or the opportunity is lost. Moreover, on a pragmatic level, temporal issues are a core concern for musicians of all genres. The need to play together in time is manifested by the presence of a conductor for a classical ensemble, or by the centrality of the rhythm section in a rock or jazz band. Even when practising solo, musicians regularly pay homage to the importance of exact temporal synchronicity through the use of a metronome. Music, like consciousness, must confront time, and thus discussion of music must find ways to acknowledge the centrality of time.

Given these structural similarities, it might be objected that a hard problem of music is not really a distinct problem: the experience of music, as conscious experience, is merely one aspect of consciousness, and thus the hard problem of music will be solved whenever the hard problem of consciousness is. In one sense it is true that musical experience is part of the general problem of consciousness: thus, Chalmers argues that solving the latter is the all-encompassing problem, as aesthetic questions 'do not pose metaphysical and explanatory problems comparable to those posed by conscious experience' (1996: 84). Yet, in a disciplinary sense, the hard problem of music is conceptually distinct. For the language of formal music analysis is sufficiently removed from so many of the varied ranges of musical experience that even if we were to have a satisfactory theory of consciousness tomorrow, this would not by itself suffice to connect musical experience and analytic discourse. We might imagine a satisfactory explanation as to why a particular neurological event is accompanied by a particular sensation—for example why I experience sadness when a particular collection of neurons fire. Such an explanation, however, would have no immediate purchase on the language and vocabulary of musical analysis, and it would be a quite separate task to map these findings on to music. The two problems are similar in type, but do not admit of the same solution.

Nonetheless, approaches to one hard problem may well have relevance for the other; therefore, in approaching music's problem it is useful to consider consciousness studies. Responses to Chalmers have been many and varied, ranging from the denial that such a problem exists, to the belief that the problem is inherently unanswerable. The very existence of the debate, however, has increased interest in approaches that value subjective experience, and among these is the European phenomenological tradition. Chalmers himself, with a background in Anglo-American analytic philosophy, argues that a phenomenological approach 'must be absolutely central to an adequate science of consciousness: after all, it is our own phenomenology that provides the data that need to be explained!' (1997: 35). From the other side of the analytic/Continental divide, philosophers from the phenomenological tradition have been attracted to the increasing emphasis on consciousness, as well as the ongoing successes of cognitive science, and many phenomenologists have worked to bring their discipline into a constructive dialogue with natural science. The fruits of this growing intersection of interests can be found in the burgeoning literature on embodied cognition.[5]

This *rapprochement* between the two traditions is not without its oddities. In strict phenomenological terms the hard problem does not exist but is simply the result of a misguided emphasis on empirical objectivity, as there is, at base, no external/internal divide in perception. Thus, most phenomenologists initially answered Chalmers' dilemma by redirecting the question to the mode of inquiry, demanding close and detailed attention to the data of our experiences.[6] Informed by the work of philosophers such as Maurice Merleau-Ponty on the role of the physical body in perception, scholars such as Varela and Gallagher worked to incorporate cognitive science, placing the body at the centre of subjective experience and its investigation. I believe that similar phenomenological approaches to musical experience, incorporating the physicality of the body, hold promise for the hard problem of music. To demonstrate this, I turn

to a key inquiry in early Continental phenomenology, which provides a suggestive methodology: Husserl's analysis of time consciousness.

Husserl, music, and time consciousness

Husserl's concern with issues of time and consciousness began in his lectures of 1905. These lectures were published later, and became the best-known source for his views, but he continued to write on these topics throughout his career, making several important revisions to his earlier positions. Thus, the lectures are most usefully read as part of an ongoing engagement with the temporality of consciousness, which is how they appear in John Brough's translation in *On the Phenomenology of the Consciousness of Internal Time (1893–1917)* (Husserl 1991). It is in the 1905 lectures that Husserl first uses the experience of perceiving a melody to answer a number of questions about time and human consciousness. These questions stem from what Husserl thought of as a primary task of phenomenology: to explain how the objects we perceive through what he termed the 'natural attitude' come to be objectified as such. In other words: How do the processes of our perception work to create the persistent, three-dimensional objects that we see, touch, and use in everyday life, given that we are never able to perceive such an object in all of its dimensions at once? To use a common spatial example, how is it that we see a table as a four-sided object, even though we only see it from one side at any one time? For Husserl, the answer lies in the relationship between the raw data that we perceive and our objectifying, in-the-world, consciousness.[7] In further investigating the workings of this consciousness, Husserl chooses the apprehension of a melody as a model example of how any object is temporally constituted. Therefore, he undertakes a phenomenological analysis, putting to one side ('bracketing') our initial perception of a melody as such, in order to analyse the structures involved in the apprehension of any melody.

Through this analysis, Husserl argues that certain temporal mechanisms of consciousness form the conditions for the creation of objects, whether in sound (as in a melody) or in sight (as in a table). In hearing a melody, we do not in fact hear merely one note at a time, just as we do not see merely one side of a table at a time. Rather we perceive both aural object and visual object as continua, structured by the immediate past and anticipated future.[8] The mechanisms that create such continua he called, respectively, *retention*, the incorporation of past experience into the present, and *protention*, the effect of future events on current experience. These twin devices of time consciousness allow a melody to exist as an object and to be conceptualized as such.

As mentioned above, Husserl revisited the relationship of time and consciousness many times over the years following the 1905 lectures. He generally used diagrams to illustrate his insights, and Figure 2.1 shows such a diagram, reproduced from the unpublished Bernauer manuscripts (1917–18). It appears in a re-assessment of Husserl's ideas on time by the philosopher Lanei Rodemeyer, to whose insightful analysis I am indebted (see Rodemeyer 2003: 130).

Using Husserl's own example of a melody, we might interpret the first element on the left, E_1, as a single perceived event—the hearing of an individual pitch is perhaps

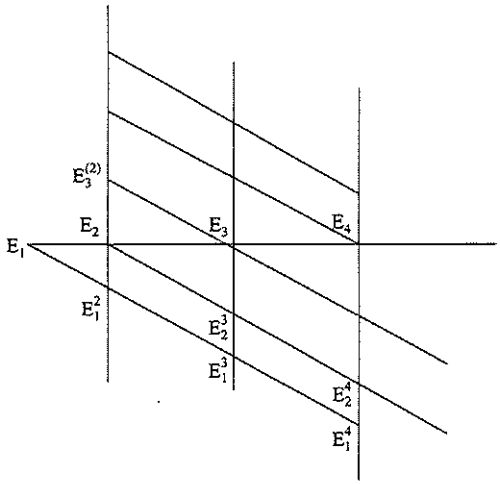


Fig. 2.1 Diagram of the structure of time-consciousness from Husserl's unpublished papers. Adapted from Rodemeyer, L. (2003). Developments in the theory of time-consciousness: an analysis of protention, in D. Welton (ed.), *The New Husserl: A Critical Reader,* 125–56 Copyright ©, Indiana University Press. Reprinted with permission of Indiana University Press.

the most convenient example. The diagonal line extending down from E_1 then illustrates the consciousness of this pitch in the time following its sounding as it becomes ever more distant, a phenomenon that Husserl variously called 'running-off' or 'slipping away'. Each sub- or superscripted number in the diagram indicates, respectively, past or future experiences within the current present, or 'phase' of consciousness. Thus the point E_1^2 found on the diagonal line, represents the retention of the musical event that occurred at E_1 as it is experienced in the phase of E_2. The retention of E_1 cannot be detached or set apart from the experience of E_2: it is a fundamental aspect of the latter phase. Similarly, protention also structures the experience of each phase: $E_3^{(2)}$ indicates how the coming of E_3 is intuited in prescience as part of the experience of E_2. Finally, the vertical lines on the diagram illustrate the connectedness of this experience, showing how the various retentions and protentions not only join to the 'now' phase, but constitute it.

The mechanisms of retention and protention are therefore fundamental to the formation of time consciousness. However, as Rodemeyer suggests, these mechanisms do not operate on or in a pre-existing temporal flux: the continuum represented by the horizontal line in the diagram is the *last* thing to emerge, and it does so only as the product of retention and protention. Time, therefore, is not a series of now-points upon which retention and protention act. Rather, it is the pushing together of protentions and retentions that forms temporal continuity. Thus, if Figure 2.1 were to be animated, E_1 would first appear, together with the ongoing retention of this sound illustrated by the diagonal line downwards. As E_2 occurs, so too would the first vertical line appear, since it is the perceived relationship between the retention E_1^2 and the new

sound E_2 that in part constitutes the now point (the relevant protentions also, of course, play their part). Then, and only then, would the horizontal line connecting E_1 to E_2 appear, as the temporal continuum emerges out of the retentional–protentional mechanisms.[9]

Husserl uses his deliberations on melodic perception as a way into a discussion of consciousness. He argues that this analysis illustrates 'the phenomenon of time-constituting consciousness, of the consciousness in which temporal objects with their temporal determinations become constituted' (Husserl 1991: 28). Thus, Husserl suggests that not just one but every example of a melody *qua* object is constructed through retention and protention, and, further, that this method of constructing time consciousness is itself a universal law of all acts of consciousness.[10] In this reading, the temporality he discovers becomes the foundation of consciousness: a synthesis of diverse lived experiences into a stream that determines how consciousness exists.

Despite the emphasis on musical experience in Husserl's account, it has largely been ignored by music scholars. In part, this may be due to its apparent lack of detail: the seemingly vague references to 'a melody' give little in the way of musical crumbs to follow. Those few scholars who have approached music from a phenomenological perspective have certainly been influenced by Husserl's analysis, yet have taken it as a general account of time consciousness in which the specific role of music tends to fall out of view.[11] Even F.J. Smith's (1973) evaluation of Husserl's ideas, which is exceptional in the extent of its attention to Husserl's writing, tends to focus less on the details of Husserl's analysis of time and more on its larger philosophical contexts. The result is that the finer points of Husserl's analysis of time consciousness have not been discussed in the context of studies of rhythm and musical temporality.

This situation is unfortunate, for in Husserl's suggestion that the formation of musical objects depends on details of perception is the kernel of a solution for music's hard problem. In what Husserl would call the 'natural attitude' of discourse about music, we commonly and fruitfully talk about objects such as melodies, chords, harmonies, textures, timbres, and indeed prolongations, among many others. Such musical 'things' are, of course, the stuff of analysis. If Husserl's account of temporal consciousness is correct, such objects depend for their existence on the details of phenomenological experience. Thus, there is a clear interrelation between the emergence of musical objects of analysis and subjective experience, a connection that promises a path toward a solution for music's hard problem.

Temporal continuity and the performing body

To realize this promise, two further questions must be addressed. Husserl's account explains how musical objects appear, but who is the listener who hears these objects? And, can we assume that such perceptions are shared by all who hear music? Shaun Gallagher has argued for a negative answer to the second question. In particular, he takes Husserl to task for ignoring the diverse temporal possibilities in the act of listening, finding that his analysis is so inflexible in its serial temporality that 'one almost begins to wonder whether Husserl ever listened to music' (Gallagher 1998: 97). For Gallagher, Husserl's apparent ignorance of non-serial forms of temporal experience that are made possible through listening renders his account quite insufficient.

However, Gallagher's criticisms may miss the intention of Husserl's account. Klaus Held has remarked that 'All Husserlian constitutive analyses are guided by the basic goal of explaining how objectivity . . . arises for consciousness' (2003: 43). Thus, as argued above, Husserl chooses a melody because it is the best, and simplest, example of a temporal *object.* He does not attempt to describe a set of general conditions for listening to music because his goal is more limited: an investigation into how the musical object 'melody' emerges into consciousness as part of our natural attitude, and how this object itself conditions temporal experience. In one sense, of course, this very limitation proves Gallagher's wider point: Husserl's analysis is indeed quite flawed if considered as a general account of the phenomenology of music. We cannot assume that all listeners hear such objects or that they are constrained by the temporality of objectivity. This has been something of a problem for music analysis as it seeks to locate a perspective from which to discuss its object. Often analysts find recourse in the figure of 'the listener', assumed or explicit: an all-attentive, all-purpose recipient of the aural stimulus, who faithfully follows the chronological course of the music in its entirety. Yet this recourse is ultimately unsatisfactory from a methodological standpoint, not only because it tends to deprive the analysis of any specific links to subjective experience but also because, as Gallagher argues above, there is no real ground for the notion that listeners must be following the temporal *flux* of the music in a serial fashion.

However, if listeners as a general category do not necessarily hear complete musical objects, there remains a sub-category of more specialist listeners who, by virtue of the conditions under which they engage with music, hear and understand it as a set of objects (melodies, phrases, harmonies) that unfold in a serial fashion. This sub-category of listeners, who might therefore more closely operate under the conditions described by Husserl, includes performers. A performer who uses his or her body to produce sound through the medium of an instrument will need to know through physical gesture exactly 'what comes next' and 'what has just been'; and this knowledge, contained in the body, will rely on the experience of the melody as a serial temporal succession.[12] David Sudnow's account of practising jazz is revealing in this regard: 'I specifically recall playing one day and finding . . . that I'd expressly aimed for the sounds of these next particular notes, that the sounds seemed to creep up into my fingers . . . [realizing] a specific sound I'd gone there to make' (2001: 40). Sudnow speaks of bodily knowledge, implying that his fingers are themselves agents. Such agency creates a particularly concentrated relationship with time as a series of events.[13] When I am playing, my body is playing *now*, in a focused, committed engagement with time. One gesture follows another in necessary succession, and only when I finish, or stop suddenly, will this temporality end. In a common phrase with a very apposite double meaning, when playing music, it is of decisive importance that I play *in time*. Both the time in which I play and the objects which are fashioned through my playing are created through the interaction of protentions and retentions.

This is not to say that the subjective experience of temporality in performance is exclusively serial; far from it. However, due to the intense engagement with time that is a requirement of musical performance, the body's activity in playing music

creates, of necessity, a series of gestures. These gestures exist for the performer's body as musical objects, realized on and through an instrument. And these objects, in their seriality, imply the existence of a temporal continuum, just as the perception of a melody as a musical object implies the temporal flux described by Husserl.

If performers create, and therefore rely on, a temporal continuum, this kind of time is also important for another type of listener: musical analysts. In the undertaking of any analysis, there is an acceptance of, and commitment to, some sort of objectivity: without this there is no "object" to investigate. Listeners such as Gallagher may indeed wish to emphasize non-serial forms of temporality. Analysts, however, cannot be so quick to dismiss the objectifying qualities of a temporal continuum, as discussed by Husserl. Indeed, as noted above, many insightful studies of musical pieces and experiences rely on an all-purpose listener who functions as a receptacle for the sounds in the order of performance, thus guaranteeing the objectivity of the music. A problem with such methodological sleight-of-hand is that it risks departing from subjective experience: the hard problem already discussed. Against this, the physical gestures of a performer offer an alternative purchase on serial temporality in music, and thus an opportunity to discuss the experience of music as a continuous event, structured in a Husserlian sense by the interactions of protention and retention.[14] Insofar as the body relies on this time, then, musical analysis based on this understanding of seriality will succeed in presenting one aspect of subjective experience. This aspect, to paraphrase Nagel, will be one part of what it is like to be a performer.[15] Such analysis should speak to the hard problem of music in bringing together subjective experience and the creation of musical objects.[16]

The performing body and its objects: a brief analysis

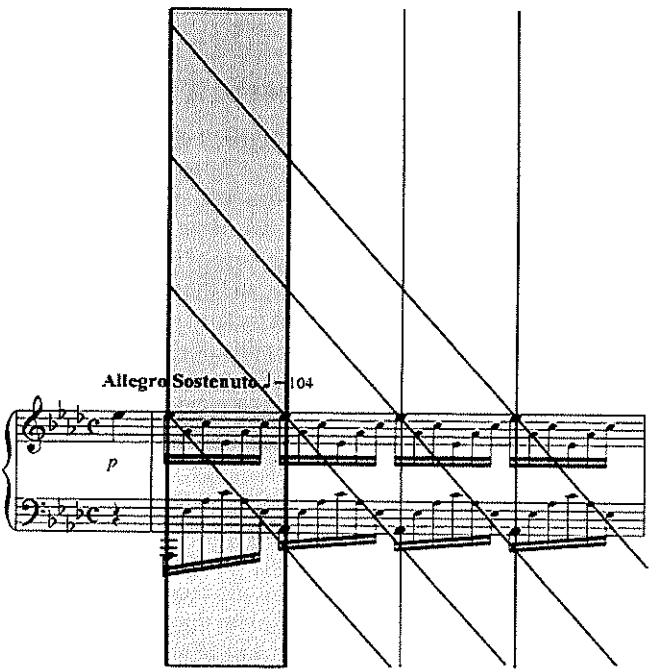
I close this chapter with a brief analytical investigation of bodily movement in performance. I have chosen a piece, Chopin's Étude in A flat major, Op. 25 No. 1, in which the physical movements required of the performer are limited, given that the player must repeat a similar gesture (defined by a spreading of the fingers, and a lateral movement of the forearm) through almost the entire course of the music. This economy of gesture is typical of the musical genre of the étude, and the consequent straightforward quality of this music in relation to movement makes an analysis of bodily action attractive. In this analysis, then, the object is not principally the sound considered in isolation, but the sound reflected through the demands on the performer's body in performance. This approach creates an ontological link between the analytic object and the performer's physical actions, thus connecting the subjective experience of movement with the objective quality of the music in its temporal continuity.

In common with most pieces of Western art music, this étude is traditionally communicated through a score, and my analysis begins from that text, using the score as a way to draw inferences about a performer's movements. As a score provides the pitches to be played, and the relative times to play them, it also constitutes a reservoir of information about the performative gestures necessary to the piece.[17] These gestures are subjective, experienced by the performer at the time of performance. Thus, they are

comparable to the hardness or redness that might be an initial tactile or visual impressions of a table. Likewise, following Husserl's analysis of a melody, the initial subjective impressions characterized by gestures become part of a protentional–retentional network, and part of the musical object—the temporal continuity—that is the piece.

It is the performer's absorption of his or her gestures into the temporal continuity of performance that allows the piece, as object, to emerge. When I begin to play this étude one of the central tasks for my body is to create a temporal flow through the piece, and I create this through an ordered succession of gestures. Within this flow, each past gesture influences how I approach the next, and the need to make future gestures equally determines my current movements. Which is to say that my gestures, interacting through retention and protention, constitute a serial temporality like that described by Husserl: these gestures (with which I create *this* music) are analogous to the 'phases' that constitute time consciousness.[18] The consequent serial organization of my gestures is motivated by sound, but independent of it, for the organization is created through the activity of playing the music alone: thus, performance on a dummy keyboard would create the same serial order, even if the music did not sound.

Example 2.1 maps Husserl's diagram onto the opening bar of the étude to show how phases relate to each other, forming retentions and protentions. The nature of the performer's gesture suggests that each current phase begins with the E♭5 played

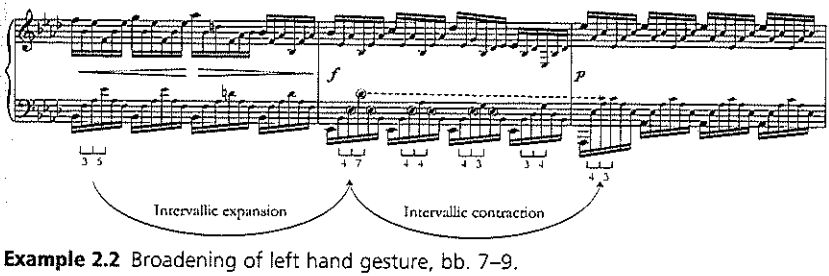


Example 2.1 Phases in the performance of Chopin's Étude, Op. 25 No. 1.

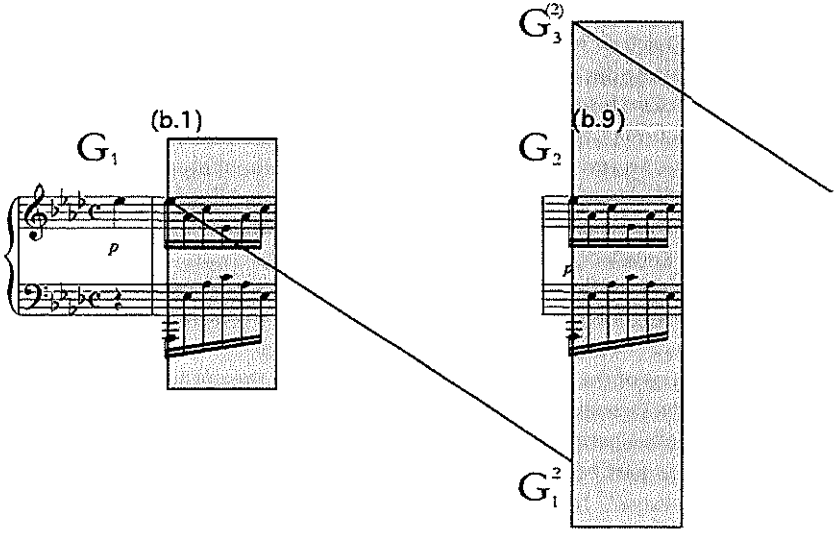
by the right hand, and then, as suggested by the diagonal line, recedes as part of the 'running off' characteristic of retention. The initial shaded area implies that the first phase consists in the duration of the six-note gesture in both right and left hands; this is also true of each successive phase, though the shading is discontinued in the example for practical purposes. As these phases form the piece in performance, they generate retentions and protentions and thus create the temporal continuum. However, unlike in Husserl's sketches, there is no horizontal line here, for the score itself stands in as the visual presentation of temporal continuity.

As I play, my knowledge of the music arises through a network of retentions and protentions as defined through bodily gesture. Such a network is flexible; it is not based on a mathematically fixed unit, and the duration of a gesture may vary without disturbing its place as a phase in the musical flux. As a rough example, I might respond to the spaciousness of the low A♭1 at the start by playing the opening gesture somewhat more slowly, then speeding up over the course of the next three gestures. This is arguably an unsubtle performance, but it remains a performance of 'the' piece nonetheless, at least in part because I maintain a retentional–protentional relationship between my gestures.[19] Indeed, the very regularity of the repeating gesture makes fluctuations in its duration an important characteristic of the piece. The score implies such fluctuations through its detailing of the span of successive notes, and hence its implications for their fingering. These details become physical experiences of expansion and contraction for the performer, experiences that are objectified within the network of protentions and retentions. This process defines two particularly important moments later in the music: a sequential passage in bb. 7–9 and a modulation to A major in bb. 22–24.

In b. 7 a B♭ dominant seventh resolves onto an E♭ harmony; this in turn becomes a dominant seventh that resolves onto A♭ at the start of b. 9 (see Example 2.2). The sequential aspect of this harmonic progression is explored in the figuration of the chords: b. 8 is an almost exact copy of b. 7, transposed down a perfect fifth. Almost, but not exactly. As Example 2.2 shows, the left hand figuration in b. 8 includes three pitches that are not exact transpositions of b. 7, leading to an intervallic expansion in the first arpeggio. Such small changes do not alter the harmonic character of the chord: they might well pass unremarked by a silent and static listener, and many traditional analytic approaches would ignore them. Yet, they necessarily change the experience of performing the piece. In terms of physical gesture, the first arpeggio in



Example 2.2 Broadening of left hand gesture, bb. 7–9.



Example 2.3 Network of protention and retention brought about by b. 9.

the left hand in b. 8 demands an unusually wide span, making increased demands on the pianist's speed of movement. Thus, the performance becomes somewhat more difficult, and literally, broader, a change which both justifies and motivates, in phenomenal terms, the *forte* at this bar. The physical experience of broadening thus becomes part of the experience of playing this bar.

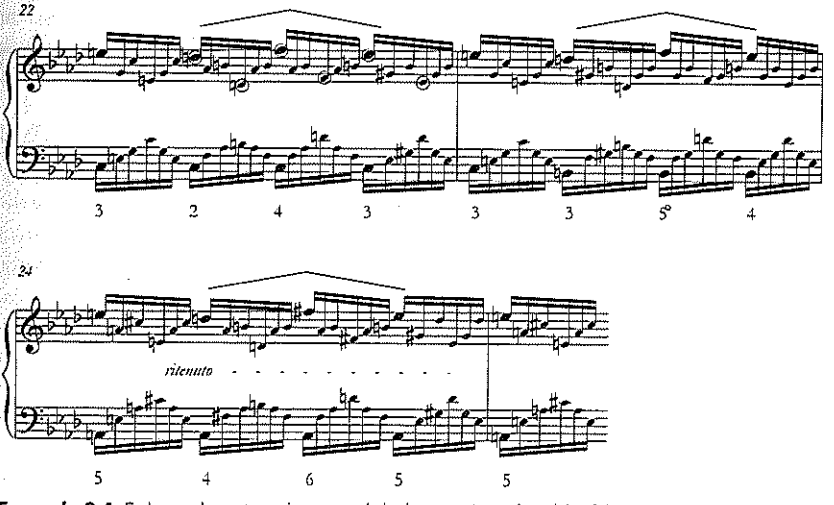
The resolution onto the tonic in b. 9 brings an easing of this stretch, with its return to the gestural organization and sound of the opening music; and with this return comes an intensification of temporal relationships. As shown in Example 2.3, this repeat of the opening music creates a retentional marking-point, with the quality of hearing the same object (the opening arpeggio) at a different temporal moment. In this example I have marked the phases with letters, as Husserl did in his diagram, using 'G' to stand for gesture. As with the construction of a melody for Husserl's listener, a player does not need to actively *remember* the opening at this time for the retention to come into effect: it is simply a facet of the emerging object that is the piece (just as seeing the same table from a different angle will, intentionally or not, inform our understanding of the table object). Moreover, as the retention emerges, a protention comes into effect, again shown in Example 2.3, presenting the potential for this music to return again. The interactions of temporal structures intensify the effect of temporal continuity, just as in Husserl's discussion of his melody. In turn, this continuity supports the nature of the piece as an object, created through the retentional–protentional network.

This network is available in sound, and thus may be heard by a listener, including any performer of the piece. However, given the potential freedom of the listener from the constraints of objectivity, it is certainly possible that a listener may not

hear b. 9 as a return of the opening: for such a listener the retentional structure shown in Example 2.3 will not come to pass, and this aspect of the piece as object will not emerge. For the performer, however, the retention is also a matter of physical reality, given the necessity to repeat the opening gesture. Therefore, the temporal continuity shown in Example 2.3 is defined through gesture, not sound.

A further temporal subtlety thickens the quality of b. 9 for the performer. As shown by the dotted line in Example 2.2, the D♭4 in the left hand arpeggio of b. 8, which demanded the broadened gesture, can be heard and felt to move to the C4 of b. 9, through the voice-leading resolution, but also through the physical sensation of keyboard proximity in the left hand thumb. Such temporal relations enrich the emerging object of the piece for the performer, allowing the subjective experience of expansion and contraction to become inextricably entangled with the properties of the object. In this sense, the analytic qualities of both a formal return and a resolution of a chordal seventh exist within and through the subjective experience of the performer; and, from a phenomenological perspective, it is this mode of existence that casts permanent doubt on the utility of maintaining a split between the subjective and the objective.

A similar wrinkle in the fabric of performance occurs in bb. 22–24, this time created in a chromatic modulation to A major, and involving a movement of the right hand 'inwards' from white to black keys on the piano keyboard (see Example 2.4). In bb. 22–3 the right hand moves from a chord of C major through a diminished seventh to E major, while maintaining a position over the white keys of the piano: the melody E–D–F–E played by the fifth finger and the thumb is based on all white notes, as shown in the circled pitches in Example 2.4. Despite the move to A major in b. 24, this hand position does not alter until the third beat, when the melody changes to F♮ on the third note. This shift necessitates moving the right hand inward towards the piano as well as a wider leap from the D before it and to the E following (D–F♮–E replaces



Example 2.4 Enlarged gesture in a modulation to A major, bb. 22–4.

D–F–E, as shown by the angled braces in Example 2.4). The change here is not dramatic, but is nonetheless quite marked in the limited context of the gestures of this piece, so that the physical sensation of moving 'wider' and 'inward' are central elements in the experience of playing this passage. The *ritenuto* marked above the score pays tribute to this experience, the 'holding back' of the tempo motivated by the physical conditions of the phrase.

The objective qualities of these measures are again a product of retention and protention, in at least two related ways. First, as shown in Example 2.4, there is the local context for the right hand's F♮: it is only when set against the repeated E–F–E of bb. 22–23 that the whole step to F♮ gains effect. This context includes dissonant harmonic intervals between the melodic F and the bass in b. 22 (a fourth) and again in b. 23 (a diminished fifth), as shown by the numbers below the stave in Example 2.4. Thus, the shift to F♮ brings both physical and harmonic expansion, as the interval changes to a sixth. Both these gestural and intervallic qualities emerge only through the situating of the F♮ within a retentional context, allowing it to attain objective status. The second way in which retention affects this moment in the music is more wide-ranging, coming in the resolution to A major in b. 25. This resolution brings a momentary return to the layout of the opening arpeggio, with the exception that the first note in the left hand is played in a higher register. As with the A♭ major arpeggio in b. 9, then, this return is marked by retention, now involving both b. 1 and b. 9. Such retention, once more, may not be available through listening alone, but it is unavoidably contained within the physical gestures of the player, thus forging the temporal continuity of the piece. Yet, this retention also brings an element of comparison: the 'return' is not quite right, because the hand position has now shifted one key to the right, since the tonality has modulated to A major, even as it invokes a similar gesture of gestural expansion to that found in bb. 7–9. Thus, much as with the events of bb. 7–9, the specific experience of gesture in b. 24 acquires both a local and a long-range context through the structures of retention and protention. And these structures, creating the piece as object, also become imbued with the experience of playing, so that the performance of this F♮, in the context of this piece, becomes a moment of particular poignancy.

Conclusion

In these two brief examinations of moments in this étude, I have argued that the physical experiences of the performer create musical objects through the activity of protentional and retentional mechanisms. The resultant objects are open to analytic investigation, and concepts of harmonic resolution, formal design, and voice leading can all be used productively in this context. In a mode of understanding that is faithful to phenomenological theory, objective explanation is inescapably linked to my subjective experience *qua* performer. Thus, analysis in such a manner provides an important connection to subjective experience, while retaining, and indeed depending on, the objective qualities of musical events.

In all cases, the human act of performing music generates the potential for a creation of temporal continuity through a network of protentions and retentions.

Such networks may be realized in several ways, which can include musical sound, the usual focus for analysis. However, if sound is considered through the lens of the physical gestures required to produce it, then it is clear that these gestures also create temporal continuity through a similar network. The special character of this continuity is that it is rooted in the body and the actions of the performer. While there may be uncertainty as to whether a listener hears continuity in sound, the player's gestures are a *sine qua non* of the performance. Therefore, such gestures—the shared bodily experiences of performers—offer objective bases for the explorations of analysis, as well as interesting phenomenal grounds for analytic judgements.

At the start of this chapter, I suggested that the hard problem of consciousness shared significant similarities with what I termed the hard problem of music, based on their common difficulties in resolving the claims of objective analysis with the realities of subjective experience. Following the lead of many scholars of consciousness and its related disciplines, I turned toward phenomenology, examining Husserl's account of objectivity and the role played by time consciousness. Based on the results of this examination, I argued that the temporal conditions for the formation of objects can be located, quite clearly, in the gestures of a performing musician, and that such gestures can be used productively as the basis for analysis.

This argument, unfortunately, cannot be directly extrapolated to the wider field of consciousness studies. More work on the relationship between performers' gestures and their conscious experience would be the minimum required before such connections could be drawn. However, in discussing the logic and meaning of physical gestures, this chapter brings concepts from the field of embodied cognition into the musicological arena, and thus advances the potential for further interdisciplinary work. Moreover, in providing one methodological solution to the hard problem of music, I propose an understanding of musical events that unites objective qualities and subjective experience. Such a proposal is at least suggestive for the more general study of consciousness, as it brings together the two poles of the hard problem. Any further investigation of the role of physical movement in creating performance and defining music should narrow the gap between subject and object and thus contribute to solutions for both hard problems, of music and of consciousness.

References

Adlington, R. (1997). Musical temporality: perspectives from Adorno and de Man. *Repercussions*, 6, 5–60.

Bermúdez, J. (1998). *The Paradox of Self-Consciousness* (Cambridge, MA: MIT Press).

Bermúdez, J. (2003). *Thinking Without Words* (New York, NY: Oxford University Press).

Berthoz, A. (2000). *The Brain's Sense of Movement*, trans. G. Weiss (Cambridge, MA: Harvard University Press).

Chalmers, D. (1996). *The Conscious Mind: In Search of a Fundamental Theory* (New York, NY: Oxford University Press).

Chalmers, D. (1997). Moving forward on the problem of consciousness. *Journal of Consciousness Studies*, 4, 3–46.

Clifton, T. (1983). *Music as Heard: A Study in Applied Phenomenology* (New Haven, CT: Yale University Press).

D'Ausilio, A., Altenmuller, E., Olivetti Belardinelli, M., and Lotze, M. (2006). Cross-modal plasticity of the motor cortex while listening to a rehearsed musical piece. *European Journal of Neuroscience*, **24**, 955–8.

Damasio, A. (1999). *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York, NY: Harcourt).

Gallagher, S. (1998). *The Inordinance of Time* (Evanston, IL: Northwestern University Press).

Gallagher, S. (2005a). *How the Body Shapes the Mind* (New York, NY: Clarendon Press, Oxford).

Gallagher, S. (2005b). Phenomenological contributions to a theory of social cognition. *Husserl Studies*, **21**, 95–110.

Held, K. (2003). Husserl's phenomenology of the life-world, in D. Welton (ed.), *The New Husserl: A Critical Reader*, 32–64 (Bloomington, IN: Indiana University Press).

Husserl, E. (1991). *On the Phenomenology of the Consciousness of Internal Time (1893–1917)*, trans. John Barnett Brough (Boston, MA: Kluwer Academic Press).

Huxley, A. (1931). *Music at Night and Other Essays* (London: Chatto and Windus).

James, W. (1890). *The Principles of Psychology*, Vol. 1 (New York, NY: Henry Holt).

Jeannerod, M. (2006a). Consciousness of action as an embodied consciousness, in S. Pockett, W.P. Banks, and S. Gallagher (eds.), *Does Consciousness Cause Behavior?* 25–38 (Cambridge, MA: MIT Press).

Jeannerod, M. (2006b). *Motor Cognition: What Actions Tell the Self* (Oxford: Oxford University Press).

Kerman, J. (1980). How we got into analysis, and how to get out. *Critical Inquiry*, **7**, 311–31.

Kramer, J. (1988). *The Time of Music: New Meanings, New Temporalities, New Listening Strategies* (New York, NY: Schirmer).

Lewin, D. (1986). Music theory, phenomenology, and modes of perception. *Music Perception*, **3**, 327–92.

Miller, I. (1984). *Husserl, Perception, and Temporal Awareness* (Cambridge, MA: MIT Press).

Nagel, T. (1974). What is it like to be a bat? *Philosophical Review*, **83**, 435–50.

O'Shaughnessy, B. (2000). *Consciousness and the World* (Oxford: Clarendon Press).

Petitot, J., Varela, F., Pachoud, B., and Roy, J.-M. (eds.) (1999). *Naturalizing Phenomenology: Issues in Contemporary Phenomenology and Cognitive Science* (Stanford, CA: Stanford University Press).

Rodemeyer, L. (2003). Developments in the theory of time-consciousness: an analysis of protention, in D. Welton (ed.), *The New Husserl: A Critical Reader*, 125–56 (Bloomington, IN: Indiana University Press).

Searle, J.R. (1984). *Minds, Brains and Science: The 1984 Reith Lectures* (London: BBC).

Searle, J.R. (2002). *Consciousness and Language* (New York, NY: Cambridge University Press).

Searle, J.R. (2004). *Mind: A Brief Introduction* (New York, NY: Oxford University Press).

Searle, J.R., Dennett, D.C., and Chalmers, D.J. (1997). *The Mystery of Consciousness* (New York, NY: New York Review of Books).

Shear, J. (1996). The hard problem: closing the empirical gap. *Journal of Consciousness Studies*, 3(1), 54–68.

Smith, J. (1973). Musical sound as a model for Husserlian intuition and time-consciousness. *Journal of Phenomenological Psychology*, **4**(1), 271–96.

Sudnow, D. (2001). *Ways of the Hand: A Rewritten Account* (Cambridge, MA: MIT Press).

Varela, F. (1996). Neurophenomenology: a methodological remedy for the hard problem. *Journal of Consciousness Studies*, 3(4), 330–49.

Notes

1. The *Journal of Consciousness Studies* was founded in 1993 (see http://www.imprint.co.uk/jcs.html). The Association for the Scientific Study of Consciousness was founded in 1996 (see http://assc.caltech.edu).
2. Chalmers self-deprecatingly acknowledged the importance of his phrase: 'Because of the unexpected influence of the "hard problem" formulation, I have occasionally received far more credit than I deserve . . . the reason the formulation has caught on is that everyone knew what the hard problem was all along' (1997: 4).
3. Definitive authorial attribution of this phrase remains elusive.
4. This hard problem, like that posited by Chalmers, is hardly new. The question is highlighted by many undergraduate textbooks that ask 'Why study music?', and suggest that the formal study of music enhances musical enjoyment. On a more advanced level, Joseph Kerman's (1980) celebrated attack on analysis as a disciplinary activity was in many ways a counterpart to Nagel's article: both scholars suggested that there were fundamental problems in the basic methods of a discipline, and both provoked numerous responses, both enthusiastic and critical.
5. An early and prime example of this literature is the collection of essays published as *Naturalizing Phenomenology* (Petitot *et al.* (eds.) 1999). Other relevant publications can be found in the work of José Bermúdez (1998, 2003), Shaun Gallagher (2005a, 2005b), Marc Jeannerod (2006a, 2006b), Francisco Varela (1996), and many others, including several mentioned in this chapter.
6. See, for example, the responses to Chalmers by Shear (1996) and Varela (1996).
7. This understanding of consciousness as fundamentally directed outside the self, and concerned with external objects rather than internal processes, is a distinctive contribution of Continental phenomenology, and marks a basic contrast to analytic accounts of consciousness as an internal state of the brain.
8. In this context, Husserl's choice of a melody as a model seems motivated by music's intimate relationship with temporal experience, as discussed above.
9. This point is missed in Itzhak Miller's computational account of Husserl's theory of time, as convincingly demonstrated by Shaun Gallagher (Gallagher 1998; Miller 1984). Miller's interpretation is important to musicology as his account directly influenced David Lewin's (1986) magisterial article on different modes of musical perception. While Lewin's paper is full of musical insight, its theoretical reliance on independently existing now-points runs counter to most accepted readings of Husserl's concept of time consciousness.
10. This is reading consciousness as *intentional* consciousness (i.e. consciousness *of* something)—in the accepted phenomenological sense.
11. Thus Thomas Clifton, author of what is arguably the most thorough English-language study on music and phenomenology (Clifton 1983), uses Husserl's analytic terms quite readily, without any detailed discussion of how they relate to, or stem from, musical experience.

12. Indeed, it is arguable that Husserl was not considering mere listening in his *Phenomenology*, but had in mind the kind of listening associated with performance. For example, he speaks in the lectures of the active reproduction of heard events, such as the transposition of a melody and the repetition of two tones (Husserl 1991: 14, 52). Such activities are impossible for someone 'just' listening, and are likewise inconceivable without an understanding of the melody as an object.
13. Many other activities, for example reading, writing, painting, or mowing the lawn, do not have this particular relationship with time.
14. Jonathan Kramer (1988) and Robert Adlington (1997) have presented compelling and lucid accounts of non-serial temporality in music. It is striking, however, that even in such writing, serial temporality is treated as a norm, the 'default' understanding of time, as it were. This suggests that there may be more to say about this sort of temporal experience, particularly since, as Husserl would argue, we cannot reduce it to a mere series of mathematical now-points.
15. At the time of performance this experience may not be conscious: a performer does not need, and indeed probably does not want, conscious control over every movement.
16. Recent work by philosophers and neurologists working both inside and outside the tradition of embodied cognition has illuminated the role of the body in determining conscious states and in affecting perceptual experience. Several empirical studies have addressed specifically the relationship between musical performance and listening. Of these, the most striking is that by D'Ausilio *et al.* (2006), which shows that the neurological activity of pianists listening to music will differ depending on whether or not they have practised the music. This suggests there may be a close link between bodily movements and listening experience.
17. This does not, of course, mean that the totality of every performer's experience can be deduced from the score. However, the common movements that are a necessity to the performance of the piece will provide a basic experience that is shared by all its performers.
18. My consciousness of the piece as a listener is, in theory, independent of this physical experience, though it is may be desirable that they interact with each other. David Sudnow, as quoted earlier, implies that his fingers have their own agency, but later in the same paragraph he argues that 'how the paths sounded to me was deeply linked to how I was making them. There wasn't one me listening, and another one playing along paths' (2001: 40).
19. A corollary of this view might be that a performance that does not maintain such a relationship—that is, a performance in which the gestures are not experienced as continuous will not be a performance of the piece. This is, I think, a defensible proposition, but such a defence would go well beyond the purview of this chapter.