Varia 1

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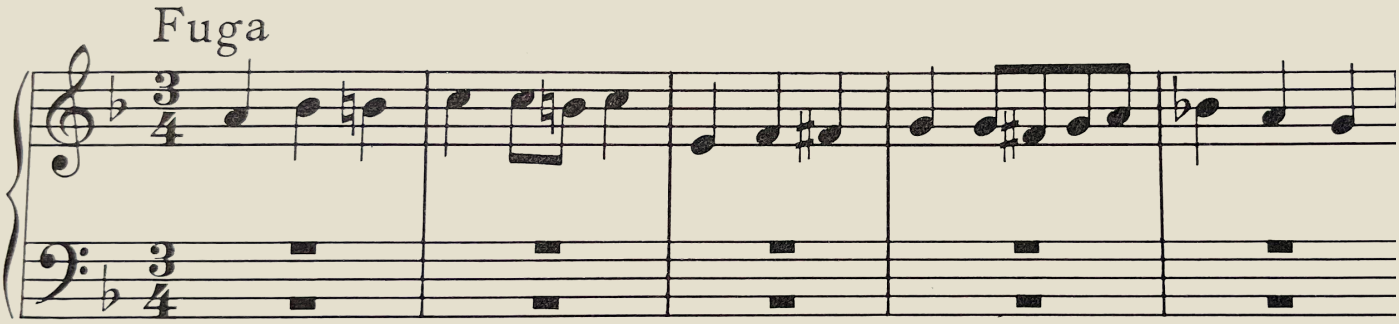

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Preface

The texts included in *Varia 1* are related to the four volumes published by Peter Lang Verlag, and particularly to *Wits and Interpretation* (Berlin 2023).

The first two papers bring full reports on an experimental investigation studying the relationship between notated rhythm/meter and performance, sponsored by *Humanistiska forskningsrådet*.

The two following items are essays discussing two important properties of musical structure –anticipation and symmetry.

Chapters 5–8 deal with interpretational issues in works by Beethoven, Debussy, and Chopin, and two further studies apply the concept of dialogue to the interpretation of works by Mozart and Bach. Chapter 11 makes up an addition to the essay "Directions and Compliance" in *Wits and Interpretation*. The next-to-last item presents the basic proprioceptive conditions pertaining to the execution of music on different instruments.

The final chapter traces the musical form of a pioneer work of abstract film, Viking Eggeling's *Diagonal Symphony*.

Lund, 15 March 2024

Bengt Edlund

Bengt Edlund

Representation of Metre in Performance. A Study of Bach Melodies

Introduction

The subtle and complex interrelationship between rhythm and metre in tonal music has not as yet been fully understood – will it ever be? – but the metric notation seldom appears problematic to musicians. Firm theoretical convictions, supported by simplified accounts in elementary textbooks, and habitual manners of playing together with intuitive understanding of the music's structure and character preclude confusion.

The music "is" in the metre specified in the score, and the bars begin at the bar-lines. The metric signs seem to confirm certain qualities already present in the music rather than to provide any information. And it is a fact that music often, merely in virtue of its own structure, *is* capable of conveying its metric organization.

Whereas it is far from clear what the metric signs actually require the musicians to do, it is a common view that strong beats should or must be "accented" – a word that is often and summarily taken as referring to dyna-

mic emphasis. Since the metric organization of the music most often emerges by itself, others maintain that strong beats do not need to be marked in any way, or that it would be detrimental to do so especially if you constantly resort to dynamic stressing.

The present investigation takes as its point of departure the assumption that musicians more often than not let the notated metre imprint their performances, or that they play in ways that inconspicuously support the metre. But "metric" playing is not a primary characteristic in most performances, nor are stresses used throughout to give metric cues. It is also assumed that at least in some situations musicians are obliged to express the notated metre quite clearly – otherwise the music will loose its proper rhythmic character and sometimes even its very identity; in such cases the notated metre is normative for performance.

But on second thoughts the metric signs may be normative in other situations as well since even people who hold that metre is not normally to be expressed in performance are likely to complain if someone were to play in a manner suggesting a metric organization not prescribed in the score. Thus, whatever the metric signs actually require the musician to do – there are several possibilities – they exclude some ways of playing. And it should again be observed that even if metric cues are often dispensable when it comes to correct identification of the notated metre, "metric" playing may nevertheless be essential for achieving the proper musical character.

Whether serving metric identification or rhythmic characterization, parts of what the musician adds when making music out of notations emanate from his/her reading of the metric signs, and some musical effects are crucially dependent on an observant and loyal attitude towards the metric notation. Generally speaking and unlike in much improvised music making, there may be a characteristic rhythmic quality in renderings of notated music, a quality that is deeply rooted in and derives from our acquired, notation-borne conceptualizations. Granting all desirable flexibility in performance, notated music seldom sounds as if it were never put to paper, nor should it perhaps do so.

The investigation to be accounted for has three main purposes.

The first one is to undertake a comprehensive study of what musicians actually do in order to express the notated metre. That they in fact do so, and also how it may be done has already been established in some recent studies.[1] But these matters should be studied using other, more varied musical excerpts and other instruments than the piano.

Secondly, it will be studied to what extent the musicians' metric cues actually convey the notated metre to the listeners, a question that has also been dealt with previously.

Performance and perception have only been given supplementary roles in the theory of musical rhythm, being mainly concerned with notated rhythm. As will become apparent, such a limited approach is not tenable, and – stating the third aim – insights gained from the present investigation may complement the results from a number of earlier studies, thus contributing to a better understanding of the relationship between rhythm and metre.

The account of previous research may be restricted to a succinct presentation of a study, Sloboda (1983), which is closely related to the present one by serving as its model, a model to be changed and expanded.[2]

Sloboda composed two metrically ambiguous melodies: lacking signs disclosing the metric organization, each melody could be read in two different ways seeming equally possible or natural. One of the melodies made sense in both 6/8 and 4/4 time; in the other melody, obviously conforming to 4/4 time, the bar-lines could be moved by one eighth-note. Distinguishing the alternatives by means of metric signs, four metric variants were obtained. The variants were played five times by 6 pianists of different ability on a

[1] The present investigation dates back to the late 1980's.

[2] For an investigation along the same line as the present one and complementing Sloboda's study, cf. Edlund, "Communicating Musical Metre. An Expanded Restudy" in Varia 1. For other simi-lar investigations, cf. Edlund, 1985 and Talley, 1989

grand piano equipped to register "inter-onset intervals", "touch" (i.e. articulation), and "loudness" (cf. Shaffer 1980). Using various statistical methods, Sloboda then established metrically pertinent "expressive variation" with regard to these three performance factors. Finally, in order to study the effectiveness of the cues, the renderings were assessed by 10 listeners, required to select the actually played notation from the two possible ones.

Rhythm and metre

"Rhythm" should preferably be thought of as a quality pertaining to music as perceived, and it cannot merely be understood as a sequence of durational relationships. Rhythm is a primary aspect of the musical structure as an integrated whole, an element within music that interacts with its other elements, and that is crucially dependent on how the music is performed.

"Metre" is preferably to be regarded as an aspect of rhythm, and hence it is essentially a perceptual phenomenon as well: the sense of layers of regularly recurring events within the ever-changing rhythmic flow. It presupposes a basic series of equidistant pulses and at least one further regular sequence of more sparse, coinciding events (or qualities that bring out some of the basic pulses) that give rise to a hierarchy and hence to a sense of metre.

Musical metre, then, is the result of regularity on at least two closely interacting levels. High-level events (recursively) differentiate lower-level events into strong and weak beats, while low-level events (recursively) measure the temporal distances between the higher-level events. Or, putting this relationship somewhat differently, while high-level events mark off equal formats on the lower level, low-level events subdivide the formats on the higher level.

Turning from theory to practice, perfect coincidence, unbroken temporal regularity, and uniformly distributed joint emphases are not necessary to

produce a sense of metre. Rather, some disagreement among the factors making for regularity and metric emphasis is a prerequisite if structures of musical interest are to arise. And whereas the metre normally enjoys support from the web of events, once established it can persevere without structural cues and even (for some short time) if it is counter-indicated by conflicting cues for metric emphasis. Indeed, owing to our propensity to hear regular emphases, to identify accents, a subjective sense of metre might even be induced by a quite uniform, monotonous sound sequence. Metre is evidently not merely something perceived – it is also a mental construction, a way to organize and cognitively master musical processes.

The somewhat idealized and simplified account just given may serve to define the concept 'inherent metre'. As a result of complex interactions between various elements in the musical structure some events emerge as more emphasized than others: "inherent emphases" arise, and they are of many kinds and finely differentiated as to their weight. When related to each other, these emphases (if sufficiently co-ordinated and regular) generate a metric hierarchy, within which they represent "inherent accents" of various weight.

As the just mentioned "subjective rhythmization" suggests, there is much more to be said about "phenomenal emphasis". Just as failing objective cues for accent in a uniform sequence of sounds might be compensated for by subjective ones, there is reason to believe that music listening entails that actually occurring emphases are supplemented and modified through musical empathy. Listeners, anticipating the accented events, are likely to strengthen the inherent emphases by adding a subjective increment to them. Likewise, they are prone to support metrically strong events that seem to be challenged by more prominent weak ones by means of subjective emphases so as to uphold the regular metre.

And what takes place in an alert listener's mind is also likely to happen when a competent person reads (i.e. inwardly listens to) a musical notation. Furthermore, since musicians try to play and convey what they "hear" in the

score, it is quite probable that a good deal of subjective emphasizing can be found also in musical performances. Such metrically active playing cannot but in turn influence the listeners, relieving them of some of the burden to supply subjective emphases – or, as the case may be, encouraging them to engage even more in the rhythm.

Since such subjective emphases are not arbitrary, but the result of informed structural understanding and a sign of musical competence, it seems proper to call them "implied emphases": the musical structure, whether heard, read, or played, seems to demand them. Indeed, some implied emphases are already taken down in the scores, as evidenced by the frequent, more or less redundant dynamic marks, articulation slurs etc. that support the inherent metre.

Being virtually inevitable, implied emphases call in question the phenomenal existence of so-called "un-interpreted structures", the starting point and working concept of many accounts of the relationship between rhythm and metre, such as the theories of metric parsing.[3] While it is clear what is meant by such a pure structure, and what fundamental function it serves in the attempts to formulate a theory of musical metre without reference to performance – a dubious undertaking – it does not seem to be accessible, overlaid as it is bound to be by implied accents and other kinds of interpretational interferences that turn up when we as listeners, readers, or musicians deal with sequences of notes.

When it comes to the crunch, then, all rhythms are performed even if the "performance" takes place in our heads, and thus there are no un-interpreted structures. What a listener hears even in a deadpan rendition of music, and what a reader reads out of a score even if all graphic signs referring to metre are erased, is phenomenal rhythm and metre, conditioned by the structure of the music *and* by an imagined performance. It does not

[3] Cf. for instance Lee, 1985 and 1991

make much difference to the listener/reader whether the metric cues, the "phenomenal emphases", are inherent in the structure or implied by it.

The term "accent" exclusively refers to metric accent, and since metre is hierarchic, "accentedness" is always a relative quality. Within a perceived or imagined metric hierarchy accents appear as phenomenal facts, but they are caused by "emphases", whether inherent ones brought about by various structural properties or interactions, or implied ones emanating from our willingness as listeners, readers, or musicians to complement the structure.

From this follows that neither accents, nor emphases have any necessary association with acoustic intensity and/or perceived loudness. A sudden rise of intensity/loudness is only one of several possibilities to achieve an impression of emphasis. And emphases in turn do not necessarily give rise to accents: once a metric hierarchy has been established, metrically weak events may be loaded with considerable emphasis and still not be heard as accented.

The "accent signs" found in scores – the term is evidently a misnomer since these signs may occur irrespective of metric position – prescribe dynamic emphasis as well as other effects that tend to be associated with dynamic emphasis or that implicitly accompany accent signs. In order to preclude misunderstandings, the word "stress" should be restricted to refer to dynamic emphasis.

The notated metre; metric units and rhythmic groups

Active apprehension of inherent metre is not the only source of implied emphasis. Two further reasons for supplying implied emphases (or for modifying those already present) when hearing, reading, and playing music are of crucial importance for this investigation.

Whereas in normal, metrically unequivocal passages the inherent and the notated metre agree with each other and become inseparable aspects of the

actually perceived, phenomenal metre, there are passages in which the notated accents disagree with the inherent ones, and in which the notated metre emerges as a distinct, independent force. When not sufficiently indicated by structural, inherent emphases or when contradicted by them, the notated metre more or less urgently requires to be supported by implied emphases; otherwise one might get a wrong impression of the music.

The notated metre consists of time signatures, bar-lines, and beams indicating the accentual hierarchy, and the size and distribution of the metric units. The metric signs organize the sound events but they do not refer to any exactly defined property – and yet the notated metre may be the object of specific, more or less conscious performance intentions. We will return to these matters in the next section, proposing five types of relationship between inherent and notated metre, but before doing so another complicating matter must be dealt with.

Besides constituting a metric hierarchy, music also presents a grouping structure, and this aspect of its rhythm is associated with both inherent and implied emphases. Metric units and rhythmic groups are to a large extent produced by the same parametric interrelationships within the musical structure. This fact – and generally the presence of rhythmic groups coexisting and interacting with the metric organization – causes considerable problems for any study concerning the expression and communication of metre.

Regularly recurring groups of equal duration make up a very strong cue for inherent metric formats; conversely, the distribution of the rhythmic groups onto the metric framework determines the phenomenal character of the groups. The groups may start either with a downbeat or with an upbeat, or putting the matter differently: the grouping structure may be either congruent or incongruent with (may be either in phase with or out of phase with) the metric structure.

Turning to performance, metric demarcations and group boundaries tend to be signalled by the same means, making it a very delicate matter to distinguish metric cues from cues that serve to mark out rhythmic groups. This

is of course particularly the case when the rhythmic groups and the metric units are congruent. On the other hand, when metre and rhythmic grouping are out of phase, the cues used to bring out the grouping may be easier to distinguish from those maintaining the metre. But unless the musician manages to achieve a proper balance between the inherent and/or implied cues for grouping and the inherent and/or implied cues pertaining to the metre, the listener might mistake emphasized upbeats to rhythmic groups for accents starting metric units, and hence get a wrong notion of the bar-line position.

"Rhythmic group" has been variously defined. Lerdahl & Jackendoff keep metre and rhythm strictly apart whereas according Cooper & Meyer, whose system of rhythmic description will be used in the present investigation, a rhythmic group is a quite flexible entity absorbing the effects of several structural parameters, including the accentual relationships between events at various metric levels. Drake & Palmer simply define a "rhythmic group" as a matter of notated durations only: the events constituting a rhythmic group emerge as an entity because a (final) longer note-value separates them from what follows.[4]

Due to the lack of more precise knowledge making it possible to distinguish between cues for metric units and cues for rhythmic groups, all that can be done when studying musical performances is to have both the metric structure and reasonable options for rhythmic grouping in mind.

Relationships between notated and inherent metre

The musician, knowingly or not, has to deal with two kinds of metre. On the one hand, the musical structure embodies cues for the inherent metre, cues to which implied emphases might be added; on the other hand, the notation

[4] Lerdahl & Jackendoff, 1983; Cooper & Meyer, 1960; Drake & Palmer, 1993

normatively indicates a metric organization which, when the notated accents more or less fail to be confirmed by inherent emphases, must be maintained by means of implied emphases. And it is the relationship between the structural/inherent and the notated metre that gives rise to the phenomenal metre, the metre that we actually hear when we listen to music. The interaction between inherent and notated metre may be quite intricate, but it can be described by distinguishing five types of relationship. They are of paramount importance for the present investigation since they have determined the design of the experiment as well as the choice of melodies, and they will now be presented together with the options at the musician's disposal when dealing with them.

The music may be such that only one inherent metric organization, safely indicated by structural emphases, appears to be possible, and when this organization agrees with that of the notated meter, the metre is *unequivocal*. This is the normal and by far most common type of relationship between inherent and notated metre, and it can be dealt with in three ways. It may be musically desirable to support the inherent/notated meter by adding implied emphases to the structurally given, inherent accents. But it is also possible to restrict oneself to a minimum of interference, leaving it to the music to convey its metric organization by means of its inherent emphases only. Finally, the musician is free to provide counter-emphases at weak metric positions, a manner of playing that is quite common since the character of the music often seems to demand it, and since metre and grouping are often incongruent – upbeats may be signalled by means of implied emphases. Such counter-emphasizing is quite well endured by the notated meter, being patently rooted in the structure.

On the other hand, if the musical structure allows of two (or in some cases several) incompatible, and yet quite strongly indicated inherent metric organizations, the passage is metrically *ambiguous*. One of these inherent metres will agree with the notated metre, which means that it is selected to

dominate the impression of the music. Ambiguous metric structures are sometimes thought of as conflicts, but since the notation grants priority to one of the inherent metres, there is no conflict, properly speaking. And nor do the inherent metres actually compete in performance since ambiguous passages are usually to be played so as to bring out the notated meter, leaving the other metric option, unconfirmed by notation and performance, as a latent alternative. Generally speaking, this seems to be the right thing to do because the listener, exposed to disparate inherent cues, cannot positively identify the metre prescribed to be dominant in the absence of sufficient implied emphases supplied by the musician to support it. But in some cases it may be favourable to avoid all distinguishing cues in order to keep the various inherent metric options in equilibrium.

The state of metric *vagueness* is characterized by the presence of two (or several) incompatible but weakly indicated inherent metric organizations, one of which agrees with the notated metre. The musician can play so as to bring out the notated meter, strengthening what inherent emphases it may have in its favour by means of supporting cues. But in many cases it seems to be a good solution to leave the metric indeterminacy of such passages intact; structurally, they tend to be more or less uniform, giving rise to a vague quality that the player should preserve.

Conflict involves an opposing relationship between inherent and notated metre. In the paradigmatic cases there is a clash between an inherent metre that is strongly indicated by structural emphases, and a superimposed notated metre that is structurally counter-indicated. The bar-lines and/or the time signature do not organize the structure in the "natural" way – but they are crucial for producing the rhythmic quality intended by the composer. Such conflicts between inherent and notated metre clearly demonstrate the normative aspect of metric signs. A bar-line before an event having a weak position in the inherent metre forces that event to assert itself as accented by means of implied emphases added by the musician. Conversely, when an accented event in the inherent metre appears on a

weak position in the notated meter, it must take on a prominent, syncopated character. Syncopation as met with in classical tonal music is a rhythmic configuration that is unconceivable without the idea of a normative notated metre.

Conflicts between inherent and notated metre may be dealt with in three ways. In the great majority of cases it is mandatory to maintain the notated metre at the expense of the inherent metre. But the latter may be suggested by implied counter-emphases opposing the dominating notated metre, as evidenced by the frequent off-beat "accent signs" added to syncopated notes – but often such stresses are not written out since the composers presuppose that the musicians will feel the need for implied emphases. If the notated metre is not sufficiently supported in such conflicts, the performance will be a misinterpretation conveying a wrong bar-line position. But sometimes it may be appropriate to play so as to concurrently suggest both the notated and the inherent metre. Finally, in some passages the conflict might be regarded as a pseudo-conflict since the metric notation (perhaps left unchanged for practical reasons) fails to yield to an inherent metric shift that actually takes place in the music. When such situations amount to a suppression of a decisive change as to the metric organization, the inherent metre should be reinforced at the expense of the notated metre.

In addition a fifth type of relationship, that of *discrepancy*, may be introduced in order to cover cases that can be categorized either as varieties of mild conflict between notated and inherent metre, or as metric ambiguities involving metric organizations that are not strictly incompatible; conflicts and ambiguities, respectively, that are often more or less latent within structures that emerge as metrically unequivocal.

While some disagreements with respect to measure format, such as hemiola configurations, entail a strong sense of conflict, others are just barely noticeable. In duple metres the musical substance sometimes warrants halving or doubling the notated bars, a reconfiguration that gives rise to a difference that may be reflected by certain slight changes in performance.

And while a change of bar-line position by one quarter-note in 4/4 passages would most often generate a strong conflict and corresponding substantial changes in performance, it can sometimes be observed that the bar-lines could just as well (or preferably) have been written in the middle of the bars in 4/4 passages, a difference that is likely to produce much less radical (if any) modifications. There may also be discrepancies in terms of the accentual hierarchy: the musical structure suggests another gradation and distribution of accentual weight than the one usually associated with a given time signature. Pieces written in 4/4 time, but actually holding 2/2 music, are cases in point.

General design of the investigation

As already mentioned, the investigation aims at studying both the performance and the perception of metre. In the first stage 6 professional musicians playing 4 different instruments performed metric variants of 48 Bach melodies, chosen so as to exemplify the five categories of relationship between inherent and notated metre. The recordings were analysed with respect to cues for metre and then judged by 8 listeners, requested to determine which notated metre that seemed to match the playing.

Current understanding among musicians as well as previous research have identified three performance factors that may be used as cues for communication of metre.

The durational pattern as defined by the sequence of note values is of course a most powerful cue for inherent metre. Whereas the notated values are unalterable, it lies within the competence of the musicians to slightly displace the moments of tone onset in order to express the metre. Durational interventions of this kind are for evident reasons most (or perhaps only) effective as cues for metre in passages having equal note values.

Some composers prescribe articulation in great detail while others more or less leave it to the players' discretion. But no matter their origin, differences in articulation can be used to signal both emphases and demarcations. That "slurring" is a most effective cue is well-known among musicians: the beginning of a short articulation slur is tantamount to a kind of emphasis that may be used to signal the start of metric units and/or rhythmic groups, and short silences indicate separation between such units/groups. When detached articulation prevails, differences as regards the time each tone is actually sounding tend to function in the same way as articulation slurs – such differences may be heard as emphases indicating metric accent.

Stresses may result from implied emphases or from "accent signs" in the score. Sudden increments of loudness may of course be heard as cues for metric accent, but stresses can also be used to signal the beginning of groups.

These three factors can of course be used separately, but it seems that they are closely interdependent. Stress reinforced by long inter-note duration and/or by long sounding duration or start of *legato* articulation make up natural and quite decisive combinations, but these cues for accent may also be used so as to counteract each other, and so as to represent each other when one (or two) of them is not available.

The interactions between inter-note durations, articulation patterns, and intensity differences when it comes to give cues expressing metre is as yet not fully understood, but it is likely to depend on such matters as the instrument played, stylistic considerations, the tempo, the expressive qualities of the music, and the performers' idiosyncratic playing habits. The instrument is a crucial variable since its characteristics determine the means at disposal for metric cueing. Indeed, it appears that the instrument influences the entire musical outlook of a musician – he/she is inclined to imagine music in terms of the sounds and resources of his/her instrument.

In order to study the relationship between instrument and expression of

metre, four instruments, characterized by their various capabilities/limitations as regards the means for metric cueing, were used in the investigation.

A pianist has all performance factors at his/her disposal. When playing the organ, the possibility of intensity differences is eliminated, and so it is in harpsichord playing. But whereas the organ can produce tones of infinite duration without any change in intensity, piano and harpsichord tones decay slowly and quickly, respectively.

When playing the side drum, finally, you can vary the inter-note timing and the intensity, but due to short sounds all notes are detached, making articulation in current sense impossible. Furthermore, since the pitch is constant, you cannot play melodies on a drum – unless you read the notation and concurrently imagine the pitches of the melody, which amounts to an interesting experimental condition. (It would have been possible to use, say, a xylophone instead of the side drum.) A sequence of note values in single-line notation, on the other hand, is deprived of the incitement to express the rhythmic grouping that otherwise is part and parcel of any melody. Drum playing as currently practised represents a peculiar condition, in which both the encoding and decoding of metre take place in the absence of vital parts of ordinary musical information.

The intensity factor of the keyboard instruments warrants some further comments. The presence of metrically relevant intensity differences in harpsichord playing cannot be altogether excluded. Although not approved of by some harpsichordists, noticeable increments of mechanical noise might appear as by-products of rhythmically vivid playing motions. It is also a fact that certain tones on keyboard instruments may differ slightly in intensity and timbre due to uneven regulation and intonation. So even when playing on instruments in quite good condition, a few comparatively strong or weak tones may turn up. But it appears that such deviating tones are seldom mistaken for metric cues, or else heard as intentional. Since they tend to be associated with a more or less peculiar sound quality, and since they are correlated with certain notes occurring irrespective of the metric orga-

nization, they are likely to be heard as characteristics of the individual instrument rather than as bringing any metric information.

If the same material is played on different instruments by different musicians, the expressive variation to be found in the renderings does not only reflect the instrument and its means for metric cueing, but also various interpretational decisions/habits on the part of the musicians. Given the aim of the present investigation, it was desirable to minimize the latter influence.

To control the interpretation variable as far as possible, two all-round musicians took part in the experiment, playing the melodic material on the three keyboard instruments.

It is very likely that the metric cues get more pronounced when two or more metric variants of the same melody are closely juxtaposed, than when you just play one such variant with no conscious intent to express its metre. Both situations – the unprovoked kind of playing representing what musicians generally do and the conscious efforts to clarify the notated metre – and the playing characteristics associated with them are of great interest.

In order to study the difference between these two conditions, the musicians were to participate in two recording sessions. In the first one they only played Bach's original melodies; in the second they played the metric variants of these melodies (including the original "variant"). And the material was arranged so as to force the subjects to clarify the notated metre: the different variants of the same melody were juxtaposed and played in immediate succession, and the instructions asked the subjects to distinguish carefully between the notations.

Selection of melodies

In order to find melodies exemplifying the five categories of metric structure

presented above, Bach's entire output of keyboard music was scanned, and 48 melodies were finally selected from some twice as many melodies initially picked out as suitable. In addition to exemplifying the five categories, the melodies were chosen so as to represent a wide variety of tempos, time signatures, and rhythmic configurations.

When analysing these melodies, none of the extant algorithms for metric parsing were used. It was essential for the aim of the investigation to identify different metric organizations potentially present in the melodies in those very cases – ambiguity, vagueness, conflict, and discrepancy – where the parsing algorithms, working quite well in unequivocal melodies, would pick out just one of the inherent metric organizations or run into difficulties.

Instead, the time signatures and the bar-line positions of the melodies under consideration were changed/moved, and when "listening" to the results, the crucial criterion was whether the new variants made sense as music or not. Thus, if only one of the conceivable metric readings produced a musically satisfactory sequence, the melody was considered unequivocal. When an original melody allowed of two (or several) metric interpretations seeming about equally meaningful, it was classified as ambiguous or (when the melody had a uniform structure) as vague. If an original melody was more or less syncopated, and if a changed metric notation gave rise to an additional, rhythmically plain reading, it was categorized as a case of metric conflict. Some of the melodies, finally, exemplified varieties of discrepancy rather than ambiguity or conflict.

Checking that the differences in metre, tempo, and character were great between the melodies, two sets of melodies were assembled. For the keyboard players the first of these sets included all 48 Bach melodies in their original form. Omitting the unequivocal melodies, the second set included the original notations of 32 of the melodies from the first set, each of them immediately followed by one (or several) metric re-notation(s). This second set thus included juxtaposed metric variants of each melody, variants differing with respect to time signature and/or bar-line position.

The first set for the drum players included 31 single-line rhythms, selected and derived from the original Bach melodies of the keyboard players' first set. 20 of these items, being non-unequivocal, were complemented by juxtaposed metric variants taken from the keyboard player's second set. The drum players' second set was made up of 8 items, all of them selected from their first set, but now the players were given full melodic notations inciting them to express both the metric distinctions and, as best they could, the musical structure of the melodies.

The performance experiment

6 highly qualified musicians were used as subjects – 2 pianists, 2 all-round musicians, well versed in organ-, harpsichord-, as well as piano-playing, and 2 percussionists.

The first set of melodies/rhythm sequences was sent to the subjects about one week before the first recording session. The written instruction allowed them to study and practice the melodies as much as needed, and asked them to make music out of each item just as in a real performance. The percussionists were requested to notice the differences between the variants and to bring them out when playing.

About one month later and one week before the second recording session, the second set of melodies was administered to the keyboard players. The written instructions read as before, but the subjects were now also requested to play so as to bring out the metric differences between the variants. As to the percussionists, they were given their second set, featuring melodic notations, immediately after completing their first recording session. They were allowed some ten minutes of preparation before playing again, and they were asked to imagine the melodies as vividly as possible while drumming.

To ensure that the variants were played at roughly the same pace the tempos were fixed at a suitable pace by means of metronome figures. Since

the notations (with just a few exceptions) did not have any signs referring to articulation, the subjects were allowed to "articulate" the melodies in appropriate ways if they so wished. Some fingerings were provided in order to reduce the possible influence of an irrelevant variable. The drummers were to use only one stick, thus avoiding undesired interference (if any) from stick alternation patterns. The pianists were asked to refrain from using the sustaining pedal, and the organists were to use an 8-foot reed voice with distinct tone onsets. If the subjects were not content with a version, they could just play a new one.

In order to check the instruments and the acoustics, and to guide the ensuing study of the analog registrations, three simple tests were played and recorded: a *(mezzoforte) legato* chromatic scale throughout the range to be used, a few tones in different registers with very long/intermediate/very short duration, and (on the piano) a few tones, again in different registers, played *piano, mezzoforte* and *forte*. In this way some information was gained as to the dynamic evenness, the tone decay and damping, and the dynamic range of the instruments.

Assessment of performance cues

By means of a Synclavier II computer the acoustic signals from the recordings were converted to analog registrations on paper. From these registrations, plotting amplitude over time, data pertaining to all three relevant performance variables could be obtained.

Turning first to the inter-onset timing factor, it was ascertained as follows. Exact inter-note intervals, or Dii ("Duration-in-in") values, were measured with a ruler permitting an acuity equivalent to 5 ms. Metrically effective or not, variation in this factor is bound to be made up of mostly quite small differences. These values were then combined to form overlapping patterns of two tones, ensuring that every duration was compared with that of the preceding and following value. The patterns were classified

as LS (long-short) or SL (short-long), and patterns exhibiting substantial deviations, i.e. deviations from mechanical regularity exceeding or equal to 20 ms., were especially noted. Dotted rhythms, syncopations, and other configurations featuring unequal note values do not allow of direct comparisons of durations in the way just described. Instead the fraction between the durations was calculated and compared with the theoretical ratio derived from the note values. "Too long" notes were marked with "+", "too short" with "–".

Differences in articulation were ascertained by means of visual inspection without any exact measurement. Silences between tones were noted, and it was also observed if these Doi ("Duration-out-in") values were of different magnitude. When detached playing prevailed, the sounding durations of consecutive tones were studied in the same manner as described above for the inter-onset factor; patterns with respect to such Dio ("Duration-in-out") values were signified by the letter combinations LS and SL. Slurred notes were of course noticed.

Amplitude (A) differences were also ascertained, and the peaks were grouped so as to form overlapping patterns in a manner corresponding to that used for the Dii values. The A-patterns were classified as IW (intense-weak) or WI (weak-intense), and among them intensity differences manifestly greater than the others were notified. Amplitude-level differences less than approx. 1 dB were disregarded; as to the limit for substantial changes in intensity, differences smaller than 4–5 dB were not regarded as conspicuous.

This assessment of performance cues in terms of pattern type and magnitude of difference may seem crude, but it was sufficient and well suited to the qualitative analysis in view. Exact values, lending themselves to statistical calculations but of uncertain perceptual significance, might have cluttered up the picture making attempts at explanation more difficult.

When dealing with complex and varying musical situations and with data of possibly heterogeneous origin, current statistical methods of genera-

lization, involving calculations across bars within versions and then across versions of the same variant played by different musicians, entail a risk of levelling away interesting tendencies possibly present in the material. Both within versions and between them there may be differences that should be studied in their own right for what they might disclose about such matters as the interrelationships between performance factors, the relationship between cues for metre and cues for rhythmic grouping, and the influence of melodic structure on rhythmic patterning.

The aim was certainly to establish and verify principles of expressive variation that are used to encode, and that may help listeners to decode, metre, but this was achieved by first studying the properties of each version separately. In order to understand the playing characteristics as, at least partly, conditioned by the local musical context, the observations were related not only to plausible strategies for expressing metre, but also to the musical structure, including the options for rhythmic grouping. Only then was it considered feasible to proceed beyond individual renderings to comparisons between different versions of the same variant as played by various subjects and on various instruments, and finally between variants in order to arrive at general conclusions. Thus, the process of generalization proceeded cautiously step-by-step, carefully avoiding undue clustering of data of possibly heterogeneous origin, but noticing manners of playing that tended to turn up frequently in systematic and meaningful ways.

This much in defence of detailed study and piecemeal generalization, but besides generalization there is another reason for the application of statistical methods. It may be considered necessary in experiments of this kind to ask the subjects to play each variant several times producing renderings that can be compared and averaged, and also to correlate expressive variation occurring at corresponding metric positions within individual versions. In short, scientific standards demand consistent behaviour, i.e. high performing stability exhibited in large materials – otherwise the observations may be suspected to be due to chance.

Granted that expressing the metric organization was a primary intention when playing the variants, the subjects presumably also wanted to render the rhythmic qualities of the melodies with some flexibility. Consistent metric cues could therefore not be expected to turn up on every possible occasion. Uniform playing would sound demonstrative and monotonous, and a certain metric organization can often be clarified by less persistent means, for instance by giving suitable emphasis to certain crucial notes.

The listening test

8 musicologists, musicians and music theory teachers were selected to form a reference group of discriminating and musically informed listeners.

From the tapes of the performance experiment were assembled five 2 x 40 min. audio cassettes containing all 1102 versions. When preparing the cassettes, renderings on the same instrument were kept together, while versions of variants of the same melody were placed widely apart in order to avoid comparisons.

Since the melodic cadences of the variants often disclosed the metric organization, all versions of equivocal melodies were faded out before the end. Turning to the melodies featuring unequivocal metre, early cues are likely to be important when identifying the notated metre. Therefore some of the unequivocal melodies were faded out quite early in order to find out whether the "natural" manner of playing in the first recording session provided sufficient cues for metric identification even before the structure itself had supplied enough information to establish the metre. Alternatively, in some unequivocal melodies a middle portion was isolated in order to find out whether the running cues for metre were sufficient for disclosing the notated metre. A few unequivocal melodies were not included in the listening test at all since the one and only metric organization was most patent.

27 versions, selected at random from the total collection, reappeared on the cassettes. Hence, these versions were listened to twice, and in this way a measure of the reliability of the listeners' judgements could be gained.

To go with the cassettes a series of response sheets was prepared. Each rendering on the cassettes corresponded to two (or several) notations, exhibiting differences with respect to bar-line position and/or time signature, and the listeners were requested to mark which metric variant they had heard and to make a few other observations. Thus, if the listeners felt that the player expressed the metre in a very demonstrative way, they were to report this by writing the letter "D" in the margin. In addition they were asked to state if any specific tones or manners of playing were crucial for clarifying the metre.

The cassettes and response sheets were sent to the subjects who listened to the renderings at home. The instruction allowed them to listen several times to versions that were hard to assess, and asked them to state the number of extra hearings needed to feel certain. If they were unable to determine which notation that was played, they were instructed not to guess but to write a question mark in the margin.

Scoring of the listening test

The outcome of the listening test was registered by taking down for each version the relative frequency of correct assessments of the notated metre. The ratio 5/7, for instance, means that five listeners out of totally seven were correct; in this case one of the eight listeners refrained from answering.

Obviously, the number of subjects in the listening test was too small and the procedure too free to allow of a meaningful statistical evaluation of the significance of the outcome. Rather than having a large group of listeners quickly judging a small number of items in a formal test situation, it was

considered more valuable to have a few expert listeners assessing the entire material.

But since the point of this investigation was qualitative understanding rather than strict generalization, the listening test was used to supplement the investigator's own painstaking efforts to penetrate into the perceptual properties of the renderings. First and like the other listeners, I ventured to determine the notated metre of each version. Then, using the advantage of knowing which variant that was actually played in each case, I tried as far as possible to separate inherent, structural accents from cues deriving from the execution of the music. Finally, the versions were again listened to in order to find out whether the various performance characteristics expressed the metre or rather indicated the rhythmic grouping.

Listening to and trying to determine the notated metre of particularly the renderings of ambiguous melodies sometimes recalled the rabbit/duck paradox: both metric organizations could be distinguished, but not at the same time, and whether the rabbit or the duck was recognized in the melody partly seemed to depend on my mental set. If the correct notation was before my eyes, the various metric cues of the performance seemed to support, or at least to be compatible with, that variant; on the other hand, if I looked at the wrong notation, a number of inappropriate cues emerged.

Results: Preliminary observations

Considering the number of versions – 1102 renderings were studied – a complete and detailed account of the outcome cannot be given. The results of the keyboard players' first and the percussionists' second session will therefore only be presented in general terms. As to the keyboard player's second and the drummer's first session, only 32 out the 48 Bach melodies will be selected for a thorough – but certainly not exhaustive – discussion. Results

pertaining to one further melody, yielding no less than five variants, is accounted for elsewhere.[5]

As may be recalled, the keyboard players first performed all 48 melodies as originally notated by Bach – a condition eliciting "normal" playing, i.e. renderings with no additional, pronounced cueing in order to clarify the notated metre, with no conscious efforts to play the melodies as metrically distinct from any other possible inherent metric organization they might have. When the original melodies as played in the first recording session were compared with the renderings of the corresponding metric variants as played in the second session – in which variants stemming from the same original melody were juxtaposed in order to make for distinguishing cues, and in which metrically distinctive playing was required – appreciable differences in degree were sometimes found, but very rarely differences as to the kind of cueing. Generally, the expression of the notated metre was strengthened in the second session.

The identification scores of the renderings from the first recording session were generally quite high, but the listeners scored slightly, and sometimes considerably, better when assessing the notated metre of the corresponding versions from the second session. They also marked more D's (signifying demonstrative metric cueing) and fewer question marks (signifying that the task was too difficult) when listening to renderings from the second session. It also turned out that metric cues, giving surplus information with respect to metric identification, were frequently and systematically present also in the renderings of the unequivocal melodies, i.e. in melodies played (as were all items in the first session) without any conscious intention to bring out the metre.

To sum up, the outcome of the keyboard players' first recording session indicates that metric cueing – the cues were sometimes rather subtle but sufficient for correct metric identification, sometimes quite obvious – is part

[5] Edlund, 1996, accounting for melody 44; cf. also Edlund, 1994 (melody 26)

and parcel of the rhythmic character of these Bach melodies, whether they are inherently unequivocal or not.

Turning to the percussionists, performing in their second recording session a selection of metric variants from full melodic notations, and being requested to imagine the melodies when playing the rhythms, some differences were found between the versions of this session and corresponding renderings of their first session, in which they played from single-line notations. The melodic structure induced some additional features reflecting the overall structure – such as passages of gradually increasing dynamics and more marked final retards – as well as cues probably related to the drummers' efforts to demarcate phrases and express rhythmic groups. Notes with upbeat function were sometimes slightly lengthened in Dii terms and also somewhat louder.

These cues did not generally worsen the metric identification, but in some cases the conspicuous grouping cues of the second drummer outdid his running metric cues and were taken as indicating accents; the listeners tended to hear such variants incorrectly. Apparently, off-beat emphases may easily be misleading if the melodic information, making them understandable, is absent.

Before starting the presentation of the outcome of the keyboard players' second and the percussionists' first recording session, a few general remarks are due.

As already mentioned, the listeners were requested to report when the playing seemed metrically demonstrative, and if any tones or manners of playing were particularly effective in disclosing the metre. They were also asked to take down the number of extra hearings needed to feel certain, and to write question marks for versions that still resisted metric identification. When comparing this information with the scores for correct assessment of the notated metre, there was generally a good agreement. Reports of conspicuous cueing and demonstrative metric character correlated almost per-

fectly with high identification scores. Many repeated hearings and many question marks tended to be associated with versions having lower scores, i.e. with versions presumably played in unclear ways, or with melodies having a particularly ambiguous and confusing structure. But there were also a small number of versions that were associated with many incorrect responses although they did not give rise to any puzzlement. In these cases the players' way of expressing the metric organization did not work very well, apparently, and since successful communication of metric organization may be crucially important, these versions were probably misinterpretations.

It may be recalled that in order to get an idea of the reliability of the identification scores, the listening test included 27 versions that were assessed twice. The correlations were generally quite high, but a few, apparently more "difficult" versions, associated with relatively many mistaken responses and question marks, and requiring some extra hearings, were more often judged differently.

Results for each melody

The 32 melodies to be accounted for in detail retain their numbers within the complete set of 48 melodies. Bach's original melodies are always designated by A, the metrically changed variants with B and C. An analysis in terms of rhythmic groups is given for each variant. The brackets show where the music was faded out or started in the listening test. Above the unequivocal melodies is sketched the metric probe alternative that the listeners were given to consider along with the original notation.

The two pianists are referred to as P1 and P2 while the two subjects playing the piano, harpsichord, and organ are called P3 and P4, H3 and H4, and O3 and O4, respectively. D5 and D6 designate the two drummers. For the keyboard players, the performance data for the unequivocal melodies stem from the "normal" playing of the first recording session, while the re-

sults pertaining to melodies allowing of alternative metric variants are taken from the second session, where the musicians were requested to clarify the metre. The outcome of the drum versions derives from the first session when the percussionists were playing from single-line notation.

For each melody/each group of related melody variants the discussion of the outcome will start with a short presentation of structural traits pertinent for the expression of the notated metre, including hypotheses as to possible distinguishing cues. In some cases a tentative explanation will be proposed for why a certain version failed to convey the notated metre. It should be pointed out, however, that the fact that some renderings were not altogether unambiguous with respect to the notated metre does not necessarily imply that these versions were without artistic merits. Some of the melodies are inherently ambiguous in quite intricate ways, and concurrent efforts to express rhythmic grouping may sometimes impinge on metric clarity.

Although variant 1B begins with closed trochees and relegates the rising line to weak-beat positions, **melody 1** may be regarded as metrically ambiguous. Closed trochees are far from "unnatural" and fairly frequent both in Bach's music and elsewhere, and variant 1B emerges as a musically satisfactory metric alternative to the original melody. Due to the way it starts, variant 1A is iambic throughout whereas in 1B iambs may eventually complement the trochees. To distinguish 1A from 1B the quarter-notes and then the upper line must be emphasized; to bring out 1B the first of the eighth-notes and then the b^1's have to be rendered prominent.

Turning first to the initial melodic motifs, the configuration ♪♪|♩ in 1A is generally characterized by an SL Dii relationship between the eighth-notes and (excepting O4 and D6) also by an SL Dii quarter-note pattern; the pianists and drummers stressed the accented quarter-notes, and the keyboard players usually slurred the iambs. As to the |♪♪♩ configuration in variant 1B, the eighth-notes are often of equal length whereas the quarter-note Dii proportion (excepting again O4) is in many cases SL. Three of the pianists

(but not the drummers) ventured to stress the weak-beat quarter-notes of the rising melodic contour in opposition to the notated metre. The slurring is much the same as in 1A, but sometimes a tendency to slur just the two eighth-notes could be discerned.

In the quarter-note part of variant 1A, the Dii pattern within the half-measures is (excepting the versions of P3, O3, and D6) most often LS, and the pianists invariably stressed the accented beats. As to the Dio factor both LS and SL patterns occur. In variant 1B (and excepting P3, D5, and D6) the strong beats are also lengthened in Dii terms, and while P2 and D6 played the accented notes loud, P1 and P3 gave dynamic emphasis to the weak-beat rising line. The Dio patterning is often LS, and H4 slurred the quarter-notes so as to form rising gestures supporting the metric organization. It seems, then, that this part of the melody released more distinctive cues than the initial part.

In the concluding eighth-note passage of the variants, the pianists and drummers often stressed the accented notes. Turning to the Dii relationships within the eighth-note pairs at accented positions, SL patterns predominate in versions of 1A whereas LS patterns are more frequent in renderings of 1B.

While it cannot be denied that there may be a certain structural bias in favour of hearing 1A rather than 1B, and although the versions of 1B had certain properties in common with the renderings of 1A, the listeners most often managed to correctly identify the notated metre of the various versions. The problematic renderings of 1B were not those of P1 and P3 featuring "displaced" stresses on the weak beats, but the two versions played on the organ.

The three rhythmically identical bars of **melody 2** are inherently ambiguous. In variant 2A the |♪♪♪ motifs give rise to mordent-like starts, that may be heard as accents, whereas in variant 2B, featuring ♪♪|♪ motifs, the sixteenth-notes function as upbeats transferring the accent to the eighth-note. The triad figurations as well as the harmonic shifts lend them-

selves to both bar-line positions. In order to distinguish between the variants it seems crucial that the first eighth-note after the two sixteenth-notes is played as soft and loud, respectively, and also that the first eighth-note of especially the first of the regular triplets is properly brought out – in 2B, however, the latter cues might be obscured by efforts to follow up the ♪♪| upbeats by emphases signalling the start of further amphibrach groups.

Irrespective of the variant, the two sixteenth-notes are generally played SL in terms of Dii-values, and the duration of these two notes taken together tends to be shorter than that of the following eighth-note. In many cases these three notes are kept together by a *legato* slur.

Turning specifically to variant 2A, the pianists and percussionists often used stresses to indicate the proper location of the accents so as to clarify the metre after the otherwise misleading, upbeat-like start of the bars. Thus, all the pianists played the first two eighth-notes of the second triplet LS and IW, supplying two cues for accent, and to the same effect subject 4, when playing the harpsichord and the organ, slurred these notes or played them with an LS Dio pattern.

The percussionists stressed the accented notes in variant 2B, and P4 among the pianists played the first crucial note of each bar loud. The first two notes of the regular triplets were generally played with an LS Dii pattern, and subject 4 again slurred these notes or lengthened the Dio value of the first note.

Apart from two misidentifications, the notated metre of the versions was correctly understood by the listeners.

Melody 3 as a whole is unequivocal due to the low note a, the return to e^1 after three f^1's, and the release of motion after the c^1; later on the eighth-notes on $g\sharp,^1$ $d\sharp^1$, and b, occurring at regular distances, confirm the metre. This does not preclude that the metric organization is fairly open up to the eleventh note, and that an alternative metric organization is possible until that point. The bar-line might be shifted by one quarter-note as indicated in variant [3B], a variant that (in full melodic notation) was also shown to the

listeners in order to find out whether the early metric cueing of the versions of variant 3A was sufficient to convey its notated metre.

Both P2 and P3 stressed the accented positions, but P2 did not bring out the crucial low a. The reason why this version, also featuring a stressed second note, did not evoke more wrong listener responses is probably that the following stressed main accent on e^1 unmistakably clarified the metric organization. Subjects 1, 3, and 4 tended to slur the a and then the e^1 with the next note or to give these accented notes long Dio values. Subjects 3 and 4 lengthened the Dii value of the e^1 starting the second bar.

Due to the tonal and durational structure of especially mm. 2–5, **melody 6** is metrically unequivocal, but the rhythmic organization in terms of grouping is quite complex. The alternative metric reading [6B] presented to the listeners in full notation is (as far as it goes) possible although the second tonic note b^1 is understated.

The listeners virtually never mistook versions of 6A for renderings of [6B] – evidently there were cues early on in the performances to prevent mishearing. Throughout the versions the pianists and drummers frequently stressed the accented notes, and subjects 3 and 4, irrespective of the instrument played, used articulation patterns expressive of the metre: strong beats were emphasized by long Dio values, and H4 slurred the first two eighth-notes in mm. 1, 3, and 4. Turning to the Dii patterning, most versions exhibit a quite strong tendency to lengthen the accented notes. The first two notes of the sixteenth-note figurations were played both LS and SL.

The metric structure of **melody 7** is unequivocal as a whole, but since the melody at first behaves in a rather capricious way, the notated metre is likely to be clarified in various ways: by making the proper accentual relationships within the initial five-note motif unmistakable, by mimicking the quality of its final rising gesture when playing the following two fragments, and by taking care that the a^1 beginning m. 3 sounds like a strong beat.

Quite early cues were obviously present in the renderings since the alternative reading of the beginning of the melody in 3/8 time [7B] was not heard by any of the listeners. But the Dii patterning within the initial five-note fragment was hardly expressive of the correct metre: the accented first and third notes were sometimes lengthened, sometimes shortened, and the fourth note was frequently long, probably due to the iambic skip up to the accented note. But the pianists (excepting P1) and percussionists took care to stress the third and fifth notes, and in the harpsichord and organ versions two-note slurs or LS Dio patterns support the notated metre.

In the final part of the melody P1, P3, and D 5–6 stressed the crucial starting accent on a^1 in m. 3, and the strong metric positions were generally expressed by means of dynamic emphases; the d^1's on the second and third beats are most often also long in Dii terms. The harpsichord and organ versions of subject 4 feature slurs and Dio differences co-ordinated with the metre. The sixteenth-note pairs at accented positions have both LS and SL Dii patterns with some preponderance of the latter.

Melody 9 features a conflict between inherent and notated rhythm in a quite peculiar way. Both bars of variant 9A are syncopated, but the bridging 𝅘𝅥𝅯𝅘𝅥𝅯| 𝅘𝅥𝅯 rhythms are plain anapaests; in variant 9B the initial syncopations have disappeared, but the anapaests of 9A are turned into closed, quasi-syncopated inverted dactyls. Obviously one must treat the seven intermediate notes with great care and distribute the emphases properly if the metric organizations of 12A or 12B, respectively, are to emerge.

The 𝅘𝅥𝅯𝅘𝅥𝅯 particles are played both SL and LS, but whereas the former Dii pattern dominates in versions of 9A where the pairs of sixteenth-notes form upbeats, SL and LS proportions are about equally frequent in the downbeat particles of 9B. The complete configuration 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 is predominantly rendered as an SL Dii pattern in versions of 9A; in renderings of 9B both SL and LS patterns occur. The eighth-note note of the |𝅘𝅥𝅯 𝅗𝅥 configuration in m. 2 of 9A is longer than expected according to mechanical Dii proportioning in all versions excepting those of the percussionists, who did not play from melo-

dic notations. In the corresponding ♪| ♩ particle in 9B this Dii patterning turns up only in the renderings of P1, P3, and H3 – in the other versions the eighth-note is shorter than its share according to notation.

Turning to the A factor in the versions of variant 9A, P1, P3, D5, and D6 stressed the unaccented second f^1 in m. 1, and P2 played the syncopated g^1 in m. 2 loud; on the other hand, P1, P4, and also D5 and D6 supplied stresses supporting the forth and then the first beat. Excepting a loud unaccented eighth-note g^1 in m. 1 of P2's rendering of 9B, the pianists and drummers frequently clarified the metre of the quasi-syncopated portion of this variant by stressing the accented notes. Conspicuously long Dio values on the accented eighth-notes are found in the 9A-versions of P1, H3, O3, and O4; as to the opposed variant 9B, P4 and 04 played LS Dio patterns, and P3 and H4 had two-note slurs in the sixteenth-note pairs.

The latter trait seems expressive of both the closed trochees and of the proper position of the accent in 9B in a way that three-note slurs are not; hence the low identification score for O3's version of 9B. Displaced stresses were probably the reason for some of the misidentifications of 9A.

Turning to **Melody 12**, the short 3/8 measures in variant 12A make for a conflict between the notation and the inherent metre, which is (more) at home in the double-size 3/4 measures in variant 12B. Whereas 12A features a reversal from normal trochees to inverted ones, 12B brings larger dactyls or anapaests. In order to convey 12A, the accented eighth-notes in mm. 2 and 4 must have a firm quality, quite out of place for the corresponding unaccented notes in mm. 1 and 2 of 12B. And the following quarter-notes must have a sense of syncopation in 12A, distinct from the sense of a weak secondary accent in 12B. This variant, on the other hand, can take some emphasis on the $f\sharp^2$ and e^2 on the second beats of mm. 1 and 2, a feature that is not compatible with 12A.

No distinguishing metric cues could be discerned with respect to the Dii patterning of the versions of 12A and 12B, and this holds both for the pair of eighth-notes and the quarter-note combinations. P1 and P4 stressed both

eighth-notes when playing 12A – a way of playing that does not fit 12B. As to the latter variant, P3, P4, D5 and D6 stressed the primary accents; P1 brought out the following eighth-note by dynamic means.

The most important metric cues apparently derived from the articulation. P1's and O4's sustained quarter-notes and SL Dio patterns for the eighth-notes are quite compatible with variant 12A but hardly with 12B, and dividing the four notes of the repeated motif into slurred groups of two notes, as did P3 and H3, speaks decisively for 12A. Turning to variant 12B, the LS Dio articulation of the two eighth-notes are suggestive of a secondary accent, especially when the final quarter-note is short in Dio terms, a trait that was more frequent and quite becoming in the renderings of this variant. In the version of O4, where there were no such LS Dio patterns within the eighth-note pair, the SL Dii relationship evidently took over and misled the listeners. It is not likely that anyone would slur variant 12A as did P3, H3, and O3 when they played 12B: all four notes, the last three notes, and just the two eighth-notes were slurred, respectively.

Melody 13 is an almost perfect specimen of metric ambiguity: the note values of the melody are quite compatible with both 2/2 and 3/4 time. If you want to distinguish the two variants clearly, certain notes appear to be crucial. In variant 13A the second b^1 in m. 1, the $c\sharp^2$ beginning m. 3, and the second e^2 in m. 4 have to be emphasized, whereas in variant 13B it is the first b^1 in m. 1, the d^2 starting m. 3, and the first e^2 in m. 5 that must be brought out. On the other hand, some other notes are not distinctive since they may be rendered important in both variants of the melody, although for different reasons. Thus, the very first note may be marked because it represents a downbeat and an upbeat, respectively, and the accented e^2 in m. 2 and the accented $f\sharp^2$ in m. 4 of 13A turn up as rhythmically salient afterbeats in 13B.

The pianists as well as the percussionists often stressed the first (and third) beats in their versions of 13A and the first beats in their 13B renderings. Off-beat intensifications also occur at notes where they can be expected according to the rhythmic patterning of the variants, i.e. at impor-

tant upbeats and afterbeats: the first b^1 in m. 1, the d^2 in m. 2, the first b^1 in m. 3, and the first e^2 in m. 4 of variant 13A, and the very first note, the e^2 in m. 2, the b^1 in m. 3, and the $f\sharp^2$ in m. 4 in variant 13B. Excepting perhaps P2's and D5's versions of 13B, these weak-beat stresses did not mislead the listeners – apparently, there were other cues (in terms of stress and articulation) that could guide the metric identification.

Turning to the Dii patterning within eighth-note pairs starting rapid motions at primary and secondary accents, SL configurations predominate slightly over LS patterns in both variants; the relative frequency of these two ways of patterning is not correlated with the metric position. Studying the Dii patterning within the crucial quarter-note sequence e^2–d^2–$c\sharp^2$ in the various versions of the two variants, the d^2 is short in four renderings and long (presumably reflecting its latent upbeat function) in four versions of 13A; in renderings of 13B this note is long in six performances and short in just one.

The keyboard players' articulation – various different configurations turned up – most often supported the metre of the two opposed variants. In versions of 13A the quarter-notes beginning the bars often have long Dio values, and slurs (comprising two, three or four notes) or LS Dio patterns frequently start from the third eighth-note in mm. 1, 3, and 4. But this trait is less common if the preceding two eighth-notes are slurred or articulated LS. H4's way of dividing m. 4 into equal halves by means of slurs was evidently a most effective cue for the 2/2 time of variant 13A.

As to 13B, a few temporarily confusing long Dio values occur on the first upbeat note, as well as on the salient afterbeat notes e^2 in m. 2 and $f\sharp^2$ in m. 4 – notes that should perhaps rather be played shortly in order to clarify the metre. In the renderings of this variant, slurs or LS Dio articulations supporting the notated metre are often started from the first eighth-notes of mm. 1, 4, and 5. But the 2+4 eighth-note articulations in m. 1 and m. 5 as played by P3 and H4, respectively, apparently suggested the wrong metre. Five versions feature a slur between d^2 and $c\sharp^2$ in m. 3 – it lends a convincing emphasis to this crucial accent, but it is hardly a decisive cue since

such a slur is also possible when expressing the corresponding iambic group in variant 13A.

Melody 14 seems unequivocal indeed, but if the first three notes, establishing a triplet organization, holding together the C-minor chord and indicating the 12/8 metre, are removed, the rest of the melody is perfectly at home also within half-size 3/4 measures, as in the notation [14B] shown as a melodic alternative to the listeners. The rhythmic grouping of these two variants is patently different. In order to express 14A it is necessary to keep the c^2–$b♭^1$–c^2, $b♭^1$–$a♭^1$–$b♭^1$, and $a♭^1$–g^1–$a♭^1$ motions together, as well as not to bring out the last notes of these motifs at the expense of the following accented f^1, $e♭^1$, and d^1, notes that are crucial for distinguishing between the two variants.

P 2 and D 5 took care to use dynamic stress to define the first note of all four metric units within the 12/8 bars of 14A as accents, whereas P1, P3, and P4 only marked the beginning of the neighbour-note motifs by dynamic means. These motifs were also rendered metrically unequivocal by the Dio and Dii patterning. Turning first to the articulation, LSS Dio patterning or a two-note slur plus a detached note occur in five versions. P2 played LSL Dio patterns throughout, which apparently worked since the following note a fifth down was stressed; O3 on the other hand, offered no articulation cues within the motifs but (like several other performers) gave a long Dio value to the following low note. The first eighth-note pair within the neighbour-note motifs is variously played LS or SL in Dii terms, and the third eighth-note is often lengthened, separating the two motifs making up the theme. Generally, the crucial low notes are often rendered with long Dii (and Dio) values, and they are frequently stressed.

The versions are characterized by various kinds of emphases on the regularly occurring outer notes of the melody, thus bringing out its inherent descending fifth-fourth sequence. On the other hand, little emphasis is given to the potentially subversive third eighth-note of the neighbour-note motifs – in order for these notes to emerge as accents suggesting variant [14B],

they should have been played either with long Dio values or with dynamic emphasis. Having this in mind, it is not surprising that the listeners were not mislead by the notation [14B], and virtually always managed to identify the correct metre of the otherwise potentially ambiguous fragment from the 14A versions offered as stimuli in the identification test.

Melody 15 is metrically unequivocal. The repeated ♩ ♪♪ configurations make for accented quarter-notes, and the half-note indicates the proper location of the primary beat in the 2/2 time. A shift of the bar-lines by one quarter-note would give rise to closed trochees and some strangely prominent, high-pitched weak beats, and the melody is not easily fitted into 3/4 time either. The notated metre is in fact so patent that 15A invites to (and can take) a good deal of weak-beat emphases expressing the start of the ♪♪ upbeats; the emerging rhythmic groups will emerge as anapaests anyway. Since there is no quarter-note in the middle of the third bar, dactyls may seem to overrule the anapaests; to counteract this reversal of the rhythm the c^2 might require some extra emphasis.

The playing was quite consistent and also expressive of the notated metre – the bar-line position of the probe alternative [15B] showing the middle, potentially ambiguous part of the melody was not accepted by the listeners. Considering first the Dii patterning and the constitutive ♩ ♪♪ rhythmic configuration, the ♪♪ particle was generally played SL, whereas the Dii proportion between the quarter-note and the pair of eighth-notes was LS in most cases. The pianists and drummers stressed the accented quarter-notes at the start of the melody. The quarter-notes were sometimes slurred into the following eighth-notes or played with conspicuously long Dio values. Turning to mm. 2–3, the Dii patterning is in some cases reversed to LS for the ♪♪ configuration. Two of the pianists and the percussionists stressed the eighth-note c^2 on the third beat of m. 3 – presumably attempts to counterbalance the quasi-syncopated d^2 – and the accented position of this note was also expressed by slurring or LS Dio patterning.

Melody 16, featuring a quarter-note at the first accented position and then a series of eighth-notes forming groups of three, is most unequivocal indeed, and offers an opportunity to study running cues for metre.

Dynamic differences are little used – although the versions of P1 and P4 feature quite a few stressed weak notes – and the Dii patterning does not bring out the accents in any consistent way – metrically strong notes are played both relatively long and relatively short. But most of the versions bring articulation patterns (two- or three-note slurs and Dio configurations) in support of the metre. This feature is most obvious in the later, more regular, part of the melody and emerges most consistently in the renderings of subject 4.

The metric framework set up by the first two notes makes **melody 17** unequivocal, but later on mm. 3 and 5 feature syncopations, which means that a sense of conflict is introduced between the inherent and the notated metre. This passage might therefore be written as in the alternative probe variant [17B], letting a more straightforward rhythmic organization emerge. In order to prevent such an impression and to bring out the element of syncopation in 17A, musicians are likely to supply clarifying emphases underscoring the accents on the first and (when feasible) third beats of the bars.

The scores of the listening test showed that – despite the possibly misleading emphases required by and also given to the syncopated notes – the metric cueing in mm. 3–5 was in most cases distinctive of the bar-line positions of 17A. The pianists made consistent use of stresses to bring out the strong beats, whereas D6 sometimes stressed rhythmically salient weak notes. The ♪♪ particle is generally played SL, and the first quarter-note in mm. 3 and 5 is most often long in Dii terms when compared with the preceding quarter-note; the first note of mm. 4 and 6 is also lengthened in several renderings. Subject 3 tended to play the pre-syncopation notes with short Dio values, whereas subject 4 marked the accented first and third

beats of mm. 4 and 6 with long Dio values. The upbeat-to-downbeat slurring in P3's version strongly suggests the upbeat grouping inherent in variant 17A, but this demonstration of non-congruence between metre and rhythm did not lead to metric misunderstandings to any great extent.

Melody 18 is about equally well at home in 3/4 and 6/8 time – the first of the two syncopations in variant 18A, e♭^{2} in m. 2, turns up at a strong metric position in 18B, whereas the second syncopation, g^1 in m. 3, is still present but seems a little strained in 18B. Since the two alternative measure units are of the same length and also in phase with each other, the distinctive notes, offering opportunities for clarifying the metre, are few: the b♮^{1} in m. 1 and the b♭^{1} in m. 3, for instance, are likely to be brought out in 18A but not in variant 18B where they are not accented. The difference in metric position of the g^1 and the following e♭^{2} in m. 2 may be hard to render distinct and difficult to understand since the configuration downbeat-to-syncopation in 18A is merely changed into a privileged-afterbeat-to-downbeat relationship in 18B.

The Dii factor is not consistently used in the renderings, but some details may have a crucial role in conveying the proper metric character. The b♮^{1} and the preceding c^2 in m. 1 of variant 18A and 18B, respectively, are considerably lengthened in some renderings, supporting the accented position with durational emphasis, and sometimes this applies also to the first sixteenth-note of the descending-fifth motions – although the b♭^{1} in m. 3 of 18B is not a primary accent. The dynamic patterns in the piano and drum versions often provide cues confirming the notated metre – the b♮^{1}, the g^1, and b♭^{1} in 18A, and the c^2, e♭^{2}, and c^2 in 18B are loud – but these renderings also feature some potentially misleading dynamic emphases on crucial notes such as the upbeat c^2 in m. 1, the syncopated e♭^{2}, and the upbeat c^2 in m. 3 of variant 18A, and the unaccented b♮^{1} in m. 1, the g^1 ending the first sixteenth-note descent, and the b♭^{1} in m. 3 of 18B.

It seems, then, that an important part of the metric cueing is likely show up in the articulation domain. The first two notes of the sixteenth-note de-

scending fifths are sometimes slurred, giving emphasis to the accents beginning these motions, and the two opposed variants are in some cases effectively distinguished early on by slurring differences. In variant 18A P4 divided the first four notes into two groups; H4 played the first note detached and then slurred the final two eighth-notes of m 1. On the other hand, when playing the piano and the harpsichord, subject 4 slurred the first two eighth-notes in 18B. Turning to m. 3 in variant 18A, the versions of P3, H3, H4, and O3 feature short Dio values on the upbeat c^2, whereas subject 4 when playing 18B prolonged the corresponding downbeat c^2 in Dio terms – a quite decisive difference, as can be seen from the low identification score for O4's version of 18A with its weak-beat c^2 being emphasized by long Dii and Dio values. In 18B, O3 slurs this note, which is hardly compatible with the opposed variant.

The initial phrase of **melody 21** is at first ambiguous, cf. the alternative notation [21B] presented to the listeners along with the original one. (Later on in the syncopated passage this 6/8 reading of the melody would have become massively counter-indicated.) The renderings of 21A should exhibit early distinguishing cues, and then traits typical of syncopations.

It turns out that stressing is used to clarify the metre of the first phrase in the piano and drum versions: the second, fifth, and seventh notes are generally loud. Version D6, featuring stresses on the first and eighth notes, was difficult for the listeners – otherwise the early cueing of the renderings made for almost infallible metric identification. The Dii factor was used so as to support the metric organization: the accented notes (especially the second note) are often lengthened. The sixth note tends to have a long Dii value as well, a fact that probably reflects a phenomenal emphasis felt on g^1 as an afterbeat. The articulation often made the notated metre even more patent: the first and last of the accented $e^1\flat$'s are most often either long in Dio terms or emphasized by means of downbeat slurs.

In the following sequence of syncopations, P1 and D 5–6 played both the syncopated and the immediately preceding, accented notes loud, while P3

stressed only the syncopated note; P2 and P4 rather gave dynamic emphases to the accented notes. The versions of subject 4 feature long Dio values on these pre-syncopation notes, whereas subjects 2 and 3 gave them conspicuously short Dio values, supplying "inverted" Dio emphases helping the listener to distinguish between the regular strong beat and the prominent syncopated event.

Assuming that | 𝅘𝅥𝅯𝅘𝅥𝅯 𝅘𝅥𝅮 rhythms are as musically natural as 𝅘𝅥𝅯𝅘𝅥𝅯| 𝅘𝅥𝅮 rhythms, **melody 23** is ambiguous, allowing of two strongly indicated metric alternatives. Variants 23A and 23B are patently iambic and trochaic, respectively, and it is probably crucial for correct metric identification that the cueing is such that the phenomenal accents are located properly already within the first five-note motif. In 23A the second c^2 and $a♭^1$ have to be brought out whereas in 23B the first c^2 and the g^1 must be prominent. The f^1–g^1–$a♭^1$ motion leads to a syncopated note in 23A but to a regular accent in 23B, and this difference is likely give rise to clarifying emphases on f^1 when playing 23A.

Again it turns out that the 𝅘𝅥𝅯𝅘𝅥𝅯 particle is most often rendered with an SL Dii patterning, and again it can be established that the 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅮 configuration is played SL on the eighth-note level irrespective of the metric position – the only exception being P2's version of 23B. As to the corresponding iambic and trochaic eighth-note groups in the versions of 23A and 23B, respectively, it appears that in 23A the SL patterning is most often retained throughout, whereas in renderings of variant 23B the playing of the same notes is often reversed so as to produce LS patterns, giving straightforward durational emphases to the accented notes.

In their performances of the trochaic variant 23B the pianists and drummers frequently offered stresses confirming the notated metre. The iambic rhythms of 23A, on the other hand, gave rise to upbeat intensifications when played by P2, P3 and D6; D5 stressed according to the metre in this variant as well. The pre-syncopation f^1 in 23A is generally played loud.

The mordent-like three-note motif is slurred in various ways; a more distinguishing fact is that its final eighth-note often has a long Dio value in versions of variant 23A but is kept short in renderings of 23B. When playing the latter variant, P4 and C4 slurred the following two eighth-notes – evidently a very effective cue for the notated metric organization. The combination of SL Dii patterning and no articulation difference within the eighth-note pairs in O3's and O4's renderings of 23B probably made many listeners misunderstand the notated metre.

Melody 24 is metrically vague – the amorphous pitch structure and the even note values give no firm support for any of the two possible metric interpretations. A player wanting to distinguish variant 24A and 24B from each other has to use the means at disposal to impose the proper 2x3 and 3x2 organization, respectively, suggesting two or three accents in each bar.

The various renderings do not present any clear patterns. The pianists' versions abound with (often not very prominent) off-beat stresses, and some of these renderings got low scores in the listening test. The second beat of the even-numbered bars in 24A was dynamically confirmed by all pianists, and in 24B P1 and P3 played the second and third beats of the bars louder than the surrounding weak events. P2's rendering of this variant consistently features intensified upbeats which amounts to a "negative support" for the notated metre.

The Dii patterning is also inconsistent and no general trends can be found. As to variant 24A, the versions of subject 4 often exhibit long Dii values at accented positions, and such a tendency emerges in some renderings of 24B as well; P1 and P4 prolonged just the main accents in this way. On the other hand, in H3's version of 24A and in P3's rendering of 24B SL Dii patterns predominate.

Apparently, this melody did not invite to clear metric distinctions. The rhythmic groups overlap each other in complex ways, and although the experimental design and the instructions encouraged the subjects to clarify the notations, they might have wanted to give the melodies an undeter-

mined quality. But some *non-legato* versions did express the notated metre by means of unmistakable articulation patterns. The three-note slurs and the LSS Dio patterns in H4's version clearly define the 6/8 time of 24A, and so would also the playing by O4, had not the even-numbered bars deviated from the scheme originally introduced. As to variant 24B, the two-note slurs turning up in the versions played by P3, O3, and O4 patently expressed the 3/4 time.

The two metric variants that can be derived from the ambiguous **melody 25** by shifting the bar-line by one eighth-note present a difficult problem for the musician. The slurred falling semitones give rise to trochees and iambs, respectively, and while short articulation slurs of this kind suggest that the first note is to be stressed (or else brought to prominence), such a manner of playing involves the risk of misleading the listener with respect to the metric organization. Variant 25A, featuring slurred trochees congruent with the metric units, does not present any problem; the difficult thing is to avoid that the beginning-emphasized, out-of-phase iambic motifs in 25B are heard as beginning-accented metric units indicating 25A. The difference as to performance (if any) between the two-note motifs in 25A and 25B is perhaps to be found in the properties of the second note. Since it is such a delicate matter to bring out the crucial metric/rhythmic distinction between 25A and 25B, it is all the more important for correct identification that clarifying cues turn up already when playing the first three notes.

And in some performances there are such early cues. P2 and O4 presented the Dio patterning SLS in 25A, while O4 played LSS in 25B. H3 and H4 rendered the first note detached and slurred the remaining two notes, making it clear that they were playing 25A, whereas H4 slurred the first two notes to form the first beat of 25B. P 1–3 played the second note of 25A louder, and in 25B P1 stressed the third note and P3 the first – but on the other hand, as if anticipating the rhythmic grouping to come, P2 gave dynamic emphasis to the second note. In versions of 25A the first two notes

are predominantly rendered with SL Dii patterns, while in 25B the most frequent pattern for these notes is LS.

Leaving the very beginning of the variants, the A factor is used very consistently in the versions of 25A to stress the first note of each beat, being also the first note of the slurred trochaic motifs. In variant 25B, where the metric units and the iambic rhythmic groups are out of phase, P1 and P4 provided some clarifying stresses on the metrically strong notes, whereas P2 and P3 were more prone to let dynamic emphases indicate the weak-position start of the iambs. Turning to the Dii proportions within the units/groups in 25A, LS patterning prevails (except in the organ versions); in variant 25B P1 and P2 retained the LS patterning within the iambic motifs, whereas subjects 3 and 4 exchanged it for a consistent use of SL patterns. The latter observation is confirmed by the Dii patterning within the metric units in the versions of 25B: SL timing prevails in the renderings of P1 and P2 while in the remaining versions LS patterns take over almost completely, i.e. the upbeats were played somewhat closer to the following lengthened downbeats, thus supplying cues for the metric accents as well as for the iambic motifs.

The listeners generally had some problems when trying to identify the notated metric organization, and if the first three notes had been removed from the versions, the confusion would in all probability have been much greater. The many upbeat emphases of P2's version of 25B made for some confusion.

Melody 26 is metrically ambiguous with respect to the position of the bar-line, and both variants feature a slight sense of conflict between inherent and notated metre. Whereas the sixteenth-notes in mm. 1 and 4 in 26A form upbeats to the following eighth-note, giving rise to anapaests, the accented eighth-note leaps up to the syncopated high-pitched quarter-notes in mm. 2 and 3 cannot but be rendered so as to suggest firm inverted trochees. In mm. 1 and 4 of variant 26B the sixteenth-notes give rise to closed dactyls,

whereas the high-pitched quarter notes in mm. 2 and 3 start normal trochees.

It seems that m. 1 is not very likely to bring distinguishing metric cues – the eighth-notes and then the first of the sixteenth-notes might be emphasized both as metre-supporting accents and as signals for upbeats. But when playing mm. 2 and 3 in variant 26A, one must both express the reversal to downbeat grouping and prevent the syncopated long top note from emerging as an accent – to achieve this, the preceding low eighth-note has to be emphasized in a way that would be entirely out of place in 26B. It is also necessary to render the b^1 and the d^2 starting mm. 3 and 4 as accents – again a feature that does not agree with 26B. This variant, on the other hand, must be characterized by clarifying emphases on the a^1''s beginning mm. 2 and 3, and by passive preceding b^1's – properties that certainly do not fit in with 26A.

Turning first to m. 1 and to some extent to m. 4, stressing is frequently used by the pianists and percussionists to bring out the accented eighth-notes in the renderings of variant 26A, and with few exceptions these notes have long Dii values as well. Furthermore, crucial for the rhythmic stability in m. 4 as they are, these eighth-notes are generally long in Dio terms – a most decisive feature, considering the low identification scores of H3's and O3's versions featuring accented eighth-notes with short Dio values. The accented first sixteenth-notes in mm. 1 and 4 in the versions of 26B are loud in most cases, and the final metrically weak eighth-notes often have long Dii values – just as the corresponding notes in the renderings of 26A but probably for another reason, namely group separation. The metric character of variant 26B is invariably expressed by means of afterbeat eighth-notes with short Dio values, and in the versions played by subject 4 the metric position of the sixteenth-note descents in m. 4 is further clarified by an initial two-note slur followed by an LS Dio pattern.

As regards mm. 2 and 3, intensity patterns confirming the metre are the rule in the versions of 26B, and (apart from a few off-beat exceptions) dynamic metric cues turn up also in the renderings of 26A; D6's version of this

variant apparently featured too many weak-beat stresses to be correctly identified. The eighth-notes before the quarter-notes are usually long in Dii terms irrespective of whether they are accented or not, i.e. whether they start an inverted trochee in 26A or mark the distance between groups in 26B. In both variants, the first of the three eighth-notes tends to be played with a long Dio value (or be slurred together with the next note), thus clarifying the metric position.

Generally, the musicians managed to play in ways that distinguished the variants from each other.

The 2/4 and 3/8 alternatives of the ambiguous **melody 27** are equally well supported by the musical structure. Whereas the first note may be brought out as either an upbeat or a downbeat, respectively, a prominent f♯^{1} will indicate variant 27A. Later on, the a^1 might be emphasized, being either a downbeat or a salient afterbeat, respectively; then a conspicuous b^1 would fit in with variant 27B but not with 27A, whereas a prominent c♯^{2} is compatible with 27A but not with 27B. Two accented notes do not distinguish between the versions: the d^2 in m. 2 and the f♯^{2}. The metric cues might be obscured by cues pertaining to the rhythmic grouping – variant 27A is predominantly iambic, and latent iambs occur also in the otherwise dactylic 27B.

The Dii patterning of the ♪♪ particle is mostly SL, and so is the eighth-note Dii proportion within the ♪♪♪ configuration. The Dii pattern of the eighth-note pairs f♯^{1}–c♯^{2} and a^1–b^1 in the versions of 27A is mostly LS and SL, possibly reflecting accent and upbeat emphasis, respectively, and this is also the case of the eighth-notes c♯^{2}–f♯^{1} and b^1–c♯^{2} in the renderings of 27B in spite of the fact that the dactyl as well as the trochee involved are beginning-accented rhythmic groups. Turning to the A patterning, the versions of both variants feature many off-beat stresses in addition to the dynamic emphases given to the accented notes – a fact that may be explained by the frequent opportunities for upbeat grouping present also in 27B.

In some versions of variant 27A the main accents on d^2 and $c\sharp^2$ in mm. 2 and 3 are played with long Dio values in contrast to the preceding eighth-notes, and H4 slurred the d^2 with the following note. O4 lengthened the d^2 and a^1 in m. 2, but the accented $c\sharp^2$ starting m. 3 was played short in Dio terms. P2 and P3 rendered the second-beat sixteenth-notes $f\sharp^2$–d^2 in m. 3 with an LS Dio pattern, and H4 slurred the initial sixteenth-notes in m. 4. Turning to the renderings of 27B, subjects 3 and 4 frequently played the accented eighth-notes of mm. 1–3 with long Dio values, and in mm. 2–3 these notes were also in some cases slurred to achieve emphasis. In H4's version the $c\sharp^2$ in m. 3 obviously had a misleadingly long Dio value – otherwise, the listeners generally managed to identify the notated metre of the variants quite well.

In **melody 28** the initial, upbeat-like sixteenth-note pair seems to make for a shift of bar-line position, but since the beats of the 3/4 bars are likely to have about the same accentual weight, this possible shift does not amount to any metric ambiguity – the melody merely allows of two slightly discrepant metric notations. From a practical point of view variant 28A may be regarded as unequivocal, but if the first two notes are disposed of, the start of the melody can also be read in 6/8 time, as in the probe variant [28B].

Early and effective cues indicating the notated metre were apparently present in the renderings. As regards the eighth-notes in m. 1 and those in mm. 2–3, the pianists stressed the accented notes, and so did the percussionists but not as consistently. The Dii patterning displays a mixed picture – both strong and weak notes are lengthened; the version played by P2 features long accented notes throughout, whereas the rendering of O3 generally has long off-beat notes. In some versions the articulation supports the metre: the two organ renderings exhibit LS Dio patterns while the two versions played on the harpsichord feature two-note slurs. P4 played three slurred eighth-notes in m. 1, and P1 marked the bar-line position by means of a single long Dio value on the f^1 starting m. 3.

The syncopated c^3 is stressed in the versions of P1,2 and D 5,6 whereas P3,4 supported the preceding accented note by means of a dynamic emphasis. In all keyboard renderings but one the pre-syncopation note is conspicuously short in Dio terms, a "negative", bouncing emphasis signalling the true location of the accent.

Melody 29, first spelling out the metric hierarchy by means of repeated notes, and then proceeding with repeated melodic motifs, patently congruent with the already established metre, is most unequivocal indeed. (The bar-lines might also be placed in the middle of the bars, but this is a quasi-equivalent alternative.) From the point of view of metric identification this melody certainly does not need any additional metric cues, and yet it demands an energetic "metric attitude" from the player, and perhaps also upbeat-like sixteenth-note 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 configurations in mm. 3–5.

The Dii proportioning within the initial four-note units in the keyboard versions is generally LSLS or LSSL, the latter pattern probably reflecting the pitch disjunction with respect to the following note. Subject 4 used initial LS Dio patterns to signal the primary downbeats. The pianists quite consistently stressed the first eighth-note of each beat, and like the drummers they played the first sixteenth-notes loud; the sixteenth-note motifs were sometimes held together by a slur. P3 slurred so as to include the following eighth-note, bringing out a iambic group on the quarter-note level; O4 rendered the sixteenth-notes with an LSLS Dio pattern, suggesting a metric subdivision of the beat.

Melody 30 represents a conflict between inherent and notated metre, but the conflict is not primarily a matter of the late syncopation in 30A, but of the tension between the triple 9/8 time and the duple least common denominator of the melodic motion – in the 2/4 variant 30C the metric disagreement as well as the syncopation disappear. Variants 30A and 30B must be distinguished from variant 30C as well as from each other by somehow bringing out accents according to the time signatures and the bar-

line positions. The duple metre in 30C is strongly and sufficiently indicated already by the melodic motion, but it may nevertheless be supported by additional metric cues.

Turning first to the twin variants 30A and 30B, the pianists' versions feature many off-beat dynamic emphases in addition to the stresses supporting the metre, but as the identification scores showed, this did not necessarily lead to poor identification. The renderings of P3 and P4 exhibit additional, distinguishing articulation differences. Indeed, articulation seems to be the most important factor: subjects 3 and 4 expressed the 9/8 time by means of slurs – either a three-note slur or a two note-slur plus a final detached note – or LSS Dio patterns. The Dii proportion between the first two notes of each metric unit is both LS and SL; the former pattern tends to be associated with LS Dio patterning and/or metric slurring, lending further emphasis to the accented positions.

This observation is strengthened by the renderings of the 2/4 variant 30C as played by subjects 3 and 4. In their versions two-note slurs or LS Dio patterns are almost invariably associated with LS Dii patterning. In the piano versions both strong and weak notes are stressed. P1 and P2, apparently taking account of the upper line, or bringing out latent, metrically incongruent iambs made up of falling thirds, almost exclusively brought off-beat dynamic emphases, a fact that did not affect the scores for correct metric identification.

The shift of bar-line position in the two variants of **melody 31** discloses a subtle but meaningful metric distinction within an otherwise essentially unequivocal melody. Whether musicians will consider this discrepancy important, or indeed present at all, is a matter tempo and the gradation of accent within the 2/2 bars. Are they bent to give more metric emphasis to the first than to the third quarter-note in each bar, or do they rather prefer to treat them as metrically identical? Since early cues are important, the character of the quarter-note b♭1 on the third and first beat, respectively, will inform the listener whether variant 31A or 31B is played. Later on, the

three repeated b♭^{1}'s and c^{2}'s, leading up to and receding from the main accent, respectively, are likely to be rendered in a distinguishing manner.

In the descending first part of this melody P1–3 often played the metrically weak quarter-notes louder than the strong ones, thus suggesting upbeats, whereas P4 supported the metre by means of dynamic emphases on the first and third beats. In the second part all pianists, excepting P3 when playing 31B, stressed the primary accent of the bars. Irrespective of the variant and turning to Dii patterns, the ♪♪ particles were always played SL, and so were the ♪♪♩ configurations on the next metric level. In both variants, the predominant Dii pattern in the first part of the melody is LS, thus underscoring the accentual relationship by means of durational emphases. LS is also the preferred Dii relationship between the first two of the repeated quarter-notes in the second part of variant 31B, whereas these notes are more often played SL in versions of 31A, a difference that presumably reflects the afterbeat and upbeat function of the second note, respectively.

But the decisive cue distinguishing 31A from 31B is probably to be sought elsewhere. With respect to the quarter-note pairs in the first part of the melody and to the accentual weight of the third and first of the repeated notes in the second part, the crucial factor turns out to be the articulation. Subjects 3 and 4, generally playing in a detached manner, often slurred the first pair of quarter-notes of each bar in the first part of the melody, or played them LS in Dio terms, metric cues further enhanced by their LS Dii patterning. The third, most accented repeated note in variant 31A was often played with a long Dio value or slurred with the following eighth-note(s). In versions of 31B the first of these notes, being the most accented, was frequently long in Dio terms, and so was in many cases also the third note, which was never slurred with the following notes; they were left to form a separate upbeat particle. According to the identification scores, competing emphases on the third repeated note in 31B were not confusing provided that the main accent on the first quarter-note of the bars was not played with a short Dio value as happened in the versions P3 and O3.

The swinging figurations making up **melody 33** are patently unequivocal, but as appears from the analysis the rhythmic structure is replete with overlapping groups.

The accented fifth note was stressed by pianists 3 and 4 as well as by the drummers. Turning to the preceding notes, P1 and P2 played the second and fourth notes loud – perhaps to suggest upbeats – whereas P3 and P4 concurrently supported the metre and brought out the rising line of the first and third notes. In the piano versions the metrically strong notes of the first bar are marked by long Dii values, but taking all keyboard versions into account, the articulation factor seems more important: several renderings exhibit slurs or LS Dio patterns underscoring the metre. This observation is confirmed in mm. 2–3 where slurring and/or long Dio values give emphasis to the strong metric positions; this is particularly obvious in the renderings of P1, P2, H4, and O4. The eighth-notes on the third beat were stressed by the pianists and drummers; H4 gave the sixteenth-note starting the first and second beat of mm. 2–3 a substantially prolonged Dii value.

Melody 34, which may be classified as either ambiguous or vague, conforms to triple time in two ways: the melody may either be taken to proceed in units of three quarter-notes as in the original variant 34A, or it may (halving the note-values) be fitted into 3/4 bars of double size as in 34B, which means that a low-level metric unit comprising two notes instead of three is introduced. It appears to be crucial that the c^2 beginning m. 2, the g^1 starting m. 4, and the initial $f\natural^1$ in m. 6 are sufficiently marked when playing variant 34A – otherwise the mordent-like ♪♪♩ motif and the semi-tone steps leading up to these notes might easily give rise to a sense of accent falling on the first eighth-note. In order to clearly express variant 34B, the $b\natural^1$, $f\sharp^1$, and g^1 on the second beat of the double-size bars must be rendered prominent, but since $b\natural^1$ and $f\sharp^1$ are rising leading-notes in upbeat position in 34A, they may also be brought out when playing this variant.

Starting with the Dii patterning, the ♪♪ particle is played SL slightly more often than LS. Whereas the chromatically rising notes in variant 34A do not exhibit any consistent Dii patterning, a predominant timing profile emerges in the versions of 34B if overlapping two-note patterns are taken into account: the typical configuration in the keyboard renderings is LS/SL/LS – i.e. the first and third notes are relatively longer as fits the notated metre.

Turning to the A factor in the renderings of variant 34A, there are loud main accents – as well as some stressed third beats corresponding to the upbeat-like notes b♮^{1}, f♯^{1} and g^1 in mm. 1, 3, and 5, notes that are also distinctive of the metre of 34B. Consequently, three piano versions of 34A had low identification scores. In the renderings of variant 34B, on the other hand, stressing is obviously and consistently used to express the metre.

The frequent four-note slurring of the chromatic motif was not helpful for the listeners since it is compatible with both variants. But H4's three-note slur, O3's long initial Dio value followed by a two-note slur, and O4's LLS Dio patterning strongly suggested the metre of variant 34A. Turning to the versions of 34B, P3, H 3–4, and O 3–4 decisively clarified the low-level duple division by playing two-note slurs or LSLS Dio patterns.

The structure of **melody 38** in its original form seems metrically unequivocal, and yet it may be used as the point of departure for a variant exemplifying a conflict between inherent and notated metre: in 38A the long notes invariably coincide with the primary accents, whereas in 38B they occur on the second beat in a quasi-syncopated way. Since the notated metric organization is strongly indicated in variant 38A, supporting cues are hardly necessary, but on the other hand the melody invites to an energetic approach expressive of the metre, which (due to the fact that the second beat is suppressed until m. 5) is characterized by a strong secondary accent on the third beat. This quality makes for an affinity with variant 38B, in which the third beats are initially suppressed and the very notes carrying

the secondary accents in 38A are promoted to primary metric positions – a situation that may make for confusion when identifying the metre.

In order to render these variants in a distinctive way right from the start, the third/first beat configurations in 38A must be given a profile that disqualifies them as first/second beat configurations in 38B, and the other way around. A further complication is that from m. 4 onwards both variants may be played with the same slurring, thus reducing the scope for distinguishing articulation patterns.

Excepting to some extent P4, the pianists' renderings of 38A generally feature stresses giving support for the main accents as well as lending prominence to the third beats. This way of playing is on the whole kept unchanged when they play variant 38B, implying that the quasi-syncopated second beats of the bars now get at least as much emphasis as the preceding main accents. This uniformity of approach applies even more to the Dio patterning throughout the versions. In renderings of 38A the notes on the first beats are often long while the third-beat quarter-notes in mm. 1–3 are short, whereas the versions of 38B feature long second beats and short first beats – excepting some cases where the main accent also has a long Dio value. The drummers consistently stressed according to the metre when playing 38A, but excelled in off-beat emphases in their renderings of 38B.

Considering these findings, the identification scores for the conflict variant 38B are remarkably high. Part of the reason for this is probably that a fair amount of off-beat emphasizing agrees with the character of the music, but this outcome may also to some extent be explained by certain articulation details: P4 and H3 slurred the f♯^{1}–e^{1} motion starting m. 4, and O4 played it with an LS Dio pattern. But when P4 used this slurring for the corresponding iamb in 38A, several listeners got a wrong notion of the barline position. Subjects 3 and 4 slurred the eighth-note pair beginning mm. 5–7 in 38B or played it with an LS Dio pattern. While the quarter-notes carrying the main accent in mm. 2–4 of 38B often had short Dio values – a potentially misleading feature – they were frequently also played loud, a combination of cues that effectively clarified the metric organization.

The analysis of the Dii proportioning indicated that another distinctive cue may reside in the inter-note durations of the first four bars. In all versions of variant 38A (excepting that of P2) the eighth-note and the quarter-note are "too short" when compared to the duration of the accented dotted quarter-note. This Dii pattern often turns up in the renderings of 38B as well, but the deviations from mechanical regularity are much less pronounced.

The structure of **melody 39** lends itself to re-notations that disclose both an element of metric discrepancy and a more substantial ambiguity. Depending on whether the quarter-note beats are considered to have equal or slightly different accentual weight, variant 39A is identical with or subtly different from variant 39B, in which the bar-line position is shifted by a quarter-note. But the melody also allows of a bar-line shift by an eighth-note, and the musical character of the iambic groups in 39A or 39B is patently different from the grouping in variant 39C, where the decisive closed trochees run in phase with the metre. In versions distinctive of 39A and 39B the third and the first of the repeated notes, respectively, have to get the main emphasis, whereas in 39C the second of these notes and also the first of the sixteenth-notes must be given prominence.

The Dii relationship within the ♪♪ particle is almost constantly SL, while the Dii patterning of the ♪♪♪ configuration varies. As to the versions of the closely related variants 39A and 39B, the pianists generally stressed the eighth-notes according to the metre; in some renderings all four beats were stressed, in others only the first and third beats – i.e. the third and the first of the repeated notes were loud, respectively. Turning back to the Dii factor, the eighth-note pairs are frequently rendered SL in 39A versions and LS in 39B versions, suggesting a greater accentual weight in the latter variant, and presumably also the fact that the second repeated note has an upbeat quality in 39A and functions as an afterbeat in 39B.

When rendering variant 39A, the third of the repeated notes is invariably given a long Dio value, and this is most often combined with a shorter Dio

value when playing the first of these notes: apparently cues for a differentiated accentual weight. These notes were of equal length and intensity in P1's version, making it hard for the listeners to establish the bar-line position. In versions of 39B the first and in some cases also the third of the eighth-notes feature lengthened Dio values. In the harpsichord and organ renderings of 39B as played by subject 3, the first note carrying the primary accent is given a short Dio value, a trait that contradicts the metre; these two versions were misunderstood, taken for renderings of 39A, by all listeners.

The pianists' versions of 39C feature loud notes supporting the metre as well as some off-beat stresses. The Dii pattern of the eighth-note pair is often SL, perhaps reflecting the demarcation between the five-note phrases. It seems that the distinctive feature of the renderings of variant 39C is the slurring of the accented sixteenth-note particles in combination with the fact that the following eighth-notes are not differentiated with respect to the Dio factor – the secondary accents are suppressed and the time seems to be 2/2 rather than 4/4.

The uniform note values and the un-patterned pitch sequence of **melody 40** make it metrically vague – starting with a three-note upbeat it can be written both in 3/4 and 6/8 time – until finally a 3x2 organization gains the upper hand. In performances intended to distinguish clearly between the metric alternatives 40A and 40B, a metre featuring 3x2 or 2x3 eighth-note units must somehow be established at an early stage.

In the renderings of variant 40A the Dii patterns of the eighth-note pairs are variously SL and LS – without affecting perfect metric identification, the version of P4 is predominantly SL, while O3 is mostly LS – and the pairs on the first beat of the bars are not treated differently from those on the second and third beats. Picking out the first two eighth-notes in each half of the bars in versions of 40B, a similar picture emerges: SL and LS patterns occur inordinately, but the two organ versions predominantly feature LS. In 40A the pianists (in addition to a number of off-beat stresses)

supported all three accented beats by dynamic means – P2 marked the primary accents quite consistently, and the top notes $e♭^2$ and g^2 on the second and third beats of m. 3 were generally played loud. The versions of 40B also exhibited stress patterns conforming to the metre; especially P2–4 provided stable dynamic cues for the 6/8 time.

The most important cue distinguishing between the two variants is the slurring. Two-note slurs (or in a few cases LS Dio patterns) clarifying the 3/4 metre of variant 40A occur frequently in the versions of P2, P3, H3, H4, and O3 – when applied only to the primary accents, such slurs are also compatible with the 6/8 metre of 40B. In the renderings of the latter variant, three-note slurs, LSS Dio patterns or initial two-note slurs are frequently used as cues for accent on both beats or on just the first beat. Probably due to a mistake, O3's version of 40B featured two two-note slurs followed by LS Dio patterns, and it was therefore consistently misheard for a rendering of variant 40A. The two-note slurs only at the main accents in H3's rendering of 40B were evidently not distinctive.

Melody 41 exemplifies metric ambiguity since it may give rise to two different and quite strongly indicated metric alternatives. Variant 41A in 4/4 time features a stable | ♪ ♪♪ configuration at the beginning of m. 2, whereas variant 41B in 6/8 time brings the more unusual, quasi-syncopated pattern (|)♪♪♪ ♪♪ . On the other hand, the three a^1's followed by three b^1's that start the melody as well as later on the sequence a^1–b^1–c^2, b^1–c^2–d^2 agree very well with 41B. A musician wanting to convey 41A is likely to emphasize the second a^1 and the third-beat b^1 in m. 1, and then to give prominence to the c^2's on the first and third beats of m. 2. In 41B the initial a^1, the first b^1 in m. 1, and then the second b^1 in m. 2 should be marked as accents, and so should the sixteenth-note d^2 in m. 1 in order to prevent that the following quasi-syncopated eighth-note sounds accented.

The Dii relationship within the ♪♪ particle is generally SL in both variants. Turning to the Dii patterning of the eighth-note pairs in the versions of 41A, both patterns occur: P1 and O4, for instance, played mostly LS

while the versions of P4 and O3 exhibit an SL predominance. The renderings of 41B also fail to yield a dominating Dii pattern: taking account of the first two eighth-notes in each three-note unit, P4 favoured LS proportions while the renderings H3 and O3 mostly feature SL patterns.

Off-beat stressing is fairly rare in both variants, and in some versions the stresses occur rather late in the melody. As to variant 41A, P1 and P3 played the early main accents on b^1 and c^2 loud; P2 already brought out the second note of the melody, whereas P4 gave dynamic emphasis only to the third and fourth beats of m. 2. In variant 41B, P1–3 stressed the decisive sixteenth-note d^2 in m. 1, and P1 and P4 marked the b^1 starting m.1; later on P3 and P4 stressed the crucial b^1 on the second beat in m. 2.

While the pianists generally resorted to stressing, the harpsichordists and organists were prone to distinguish between the opposed variants by means of articulation differences. In variant 41A, the c^2 beginning m. 2 either has a long Dio value or is slurred with the following sixteenth-notes. The duple organization of the eighth-notes is expressed either with LS Dio patterns or by means of two-note slurs. Turning to variant 41B and its second bar, subjects 3 and 4 either used a two-note slur plus a detached note or an LSS Dio pattern to provide emphases expressing the 6/8 time. The crucial configuration in m. 1 of 41B was effectively rendered by subject 4 and also by P1 by means of a two-note slur (or an SL Dio pattern) followed by either a three-note slur or a two-note slur (or an SL Dio pattern) for the remaining sixteenth-notes.

Melody 43 is almost perfectly ambiguous: the 2/2 variant 43A as well as the 3/4 variant 43B are strongly indicated by the structure; both variants are characterized by anacrustic rhythmic groups. In 43A, the b^1 in m. 2 may be emphasized as becomes an upbeat. Helpful notes when distinguishing 43A should be g^1 in m. 1, and then $a\sharp^1$ and especially $c\sharp^2$ in m. 3, whereas the distinctive notes of 43B are the e^1 and the b^1 beginning mm. 2 and 4, respectively.

In both variants the f♯¹–e¹ eighth-note pair in m. 2 is played both SL and LS in Dii terms, whereas later on the relationship within the d²–b¹ and d²–c♯² pairs are almost always SL; the ♪♪♩ configuration is generally rendered SL. The initial upbeat was prolonged by P1–3 and shortened by H3–4, O3–4, and D6 in variant 43A, and played long in variant 43B by P1–4 and H3–4, and short by O3–4 and D5–6. As to the syncopation at the end of variant 43A, the keyboard players rendered the preceding quarter-note longer than strictly stipulated by the notation; the drummers shortened it. The Dii patterning of the quarter-note pairs b¹–f♯¹, g¹–e¹, and a♯¹–b¹ varies in the versions of 43A, but LS predominates in b¹–f♯¹ while SL gains the upper hand in g¹–e¹, possibly expressing b¹ as a downbeat and e¹ as an upbeat, respectively. Studying the corresponding pairs in 43B, the Dii patterning is diverse – metrically strong notes as well as weak ones, presumably functioning as upbeats, are sometimes lengthened.

Corresponding tendencies can be seen also in the A factor of versions played on the piano and the drum: stresses occur frequently both on strong beats and on rhythmically privileged weak beats. It seems that this made P2's renderings, lacking conspicuous articulation differences, difficult for the listeners.

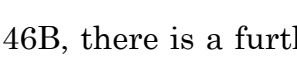
The articulation frequently provides cues supporting the notated metre. In versions of 43A either the first or both quarter-note pairs in m. 1 are sometimes played with LS Dio patterns or slurred, and slurred are also in some versions the f♯¹–e¹ eighth-notes and the a♯¹–b¹ quarter-notes beginning mm. 2 and 3, respectively. In 43B the quarter-notes starting mm. 1–5 are often long in Dio terms, and initial two-note slurs in mm. 1, 4, and 5 give further confirmation of the 3/4 metre. The six-note slur from e¹ down to b played by P1 is most decisive since it is inconceivable in variant 43A.

Melody 45 is patently unequivocal as a whole, but before the sixteenth-note units have settled the metric pace, the long syncopated a¹ is likely to be understood as an accent – unless the player prevents this impression by some-

how emphasizing the very first note and then b^1 at the secondary accent in m. 1.

All pianists but P3 stressed the syncopated note. P1 balanced this emphasis by rendering the first two notes IW and SL with respect to both the Dii and Dio factors. The b^1 in m. 1 as well as the following main beat on d^2 in m. 2 are generally loud in the piano versions, and LS Dio patterns (P2 and H4) and two-note slurs (P3 and H3) are also used to bring out the accented quality of these notes; as to the Dii patterning SL predominates over LS patterns.

In the later part of the melody the cues for metre are less persistent, but some examples of stressed accented notes and metric slurring were found; within the first metric unit of each bar the duration of the first sixteenth-note pair is generally longer than that of the second pair.

The ambiguous **melody 46** actually allows of three readings – in addition to 46A and 46B, there is a further one, starting  , and in which the chromatically falling three-note motifs are congruent with the metric units. This variant "46C" was not included in the material to be played since the crucial thing to be studied was the conflict between metric units and melodic motifs, the endeavours, if any, to supply distinctive cues for both the accentual and the melodic structure when they are out of phase.

P1's versions do not exhibit any stresses at all while the other pianists marked the accents by means of dynamic emphases. In the renderings of 46A, the accented notes are long in Dii terms in all versions but those of P2 and H3, whereas the renderings of variant 46B present a mixed picture: P3, P4, O3, and O4 feature lengthened accented notes, and P1 and H4 shortened. Various articulation patterns are used to express the metric organization and the motivic make-up in all versions but P1's of variant 46B, featuring just a sequence of long *portato* notes with equal Dio values.

As to the renderings of 46A, two-note slurs or initial LS Dio patterns in congruence with the metre turn up in all versions but P4's. Three performances appeared to give cues indicating amphibrach rhythmic groups – in

concurrence with slurs expressing the metre, P1 and H4 emphasized the second and fifth notes by means of long Dio values, whereas in P4's rendering the entire chromatic three-note motifs were slurred. But most of the versions rather gave an impression of dactylic, falling-second motifs. Combining the three-note slurs with long Dio values on the first, fourth and seventh notes, P4's interpretation of 46A is compatible with 46B, and this version of variant 46A was also heard in the wrong way by some listeners.

In the versions of variant 46B, P2, P3, H3, and H4 used two-note slurs to indicate the beginning of the anapaest groups; P4's rendering features three-note slurs and O3 played initial LS Dio patterns to the same effect. Only the LLS Dio patterns of O4 give unequivocal support for the metre at the expense of the chromatic motifs. The renderings were mostly heard correctly due to concurrent cues expressing the metre: long Dio values at accented notes (P4 and H4), long Dii values at metrically strong positions (P3, P4, and O3), stressed accents (P3 and P4).

Summary and discussion of the outcome

Some general observations based on traits and tendencies emerging from the renderings of all 48 melodies/variants are now highly due. To begin with a few remarks on some major differences between the instruments and between the players are due.

In the second session the four subjects playing the piano tended to use dynamic stressing in a more pregnant and systematic way in order to clarify the notated metre. The two pianists were less prone to resort to slurring when expressing the metre, and when using the Dio factor the patterns were not very pregnant – presumably effects of their "non-Baroque" training and outlook. P1 sometimes played more or less *legato* and very softly, and made conspicuous *crescendo* effects. In some of P2's versions the cues for metrically out-of-phase rhythmic groups – off-beat stresses and long Dii values – made the notated metre hard to determine for the listeners. P2 pre-

dominantly rendered swift 𝅘𝅥𝅯𝅘𝅥𝅯 and 𝅘𝅥𝅮𝅘𝅥𝅮 rhythmic particles as LS Dii patterns; otherwise such configurations were mostly played SL.

The harpsichord and organ renderings often feature various articulation patterns and/or pregnant Dio profiles distinctive of the notated metric organization; subjects 3 and 4 sometimes used these devices also when playing the piano, although dynamic emphases were available. But "metric" slurs or long Dio values did not always influence the listeners' responses as intended – there may be several ways to distribute slurs or Dio values in a given melody. In some cases subject 4 also used quite conspicuous LS Dii patterns, apparently in order to bring out metric emphases. When playing the harpsichord, both players (and especially H3) sometimes spiced their performances with additional mechanical noise at particularly prominent notes.

Turning finally to the performances on the side drum, D5's Dii- and A-factor cueing was generally quite consistent but frequently also very subtle: almost regular inter-note durations and virtually uniform intensities characterized many of the renderings. D6, on the other hand, operated with greater differences, and not only when playing from melodic notations this drummer often stressed and lengthened upbeat notes, which in some cases obscured the metric structure for the listeners.

The performance and perception of melodies featuring unequivocal, ambiguous, vague, conflicting, and discrepant metric organizations have been studied, and the results indicate that professional musicians – even when playing instruments like the organ, producing notes of fixed intensity, or the side drum, only allowing of sounds with the same short duration – can and do express the notated metre in ways that are correctly understood by listeners. Indeed, metric cues seem to be an integral part of musical expression: such cues were found also in the renderings from the first recording session when the musicians' primary intention was not to clarify the metre, as well as in versions of metrically unequivocal melodies, whose metric organization does not need to be confirmed when playing.

Among the three performance factors that are relevant for expressing notated metre, articulation (i.e. Dio patterns and slurring) emerged as a frequently used and quite decisive cue for metre – as is also evidenced by the fact that composers (after Bach) often prescribe slurs bringing out the notated metre. Although introducing slurs when playing a melody written without any articulation marks amounts to a considerable intervention, the slurring patterns were seldom heard as conspicuous metric cues by the subjects in the listening test: no matter whether they are inscribed by the composer or added by the musician, slurs seem to belong to the composition. In comparison with the harpsichordists and especially the organists, the pianists (including P3 and P4) used Dio differences and slurring patterns more sparingly when clarifying the metric organization, a fact that may be due to either learned manners of execution associated with Baroque music or long acquaintance with the nature of the harpsichord and the organ – instruments without access to intensity differences.

Turning particularly to the Dio patterning, it sometimes amounted to a kind of "half-slurring". Substantially prolonged sounding duration of metrically strong notes in passages played *non legato* emerges as a less conspicuous way of conveying metric accent than articulation slurs. Yet Dio patterning turned out to be quite effective: relatively long Dio values were often heard as cues for accent, and LS and LSS Dio patterns suggested duple and triple metric units, respectively, almost as patently as slurring patterns at home in duple and triple metre.

The musicians were also bent to use slurs to keep rhythmic groups and melodic motifs together, irrespective of whether these structural entities were in phase with the metric units or not, a finding that is also corroborated by compositional practice – slurs starting at upbeats are quite frequent. The results of the listening test indicated that renderings featuring slurs starting at upbeats may give rise to metric confusion if these potential cues for accent are not properly counterbalanced by other cues that, whether

deriving from the musical structure or from the playing characteristics, maintain the accented positions of the notated metric framework.

Stressing notes at strong metric positions certainly gives rise to emphases, and stresses were often and obviously used to convey metric accents. But highly effective as this device is, its usefulness emerged as restricted when it came to indicating the metric organization in an unmistakable way. Stressing is used for various other purposes as well, such as suggesting the beginning of rhythmic groups/melodic motifs and underscoring notes of structural prominence or emotional charge. The more or less regular dynamic cueing for metre frequently found in the piano and drum versions was sometimes obscured by occasional stressing – or by consistent off-beat dynamic emphases, making the listeners confused if no other reliable cues clarifying the metric organization were present, or if the musical structure was not patently unequivocal.

The Dii patterning found in the material – ranging from mostly quite small differences in the drum versions to substantial and clearly audible durational inequalities in some organ versions – was generally pregnant enough to be perceptually significant, and these inter-note durational proportions most often turned out to be co-ordinated with the strong/weak positions of the notated metre. But to what extent Dii patterns alone are capable of expressing the notated metre remains somewhat uncertain. Except when substantial inequalities were involved, the Dii patterning seemed to be a comparatively weak cue for metre; on the other hand, moderately pregnant and consistently recurring Dii patterns sometimes contributed to a sense of a regular sequence of phenomenal accents – at least when the composed structure and the other metrically relevant cues did not present any contrary impressions.

Regular series of LS Dii patterns co-ordinated with the metric units were quite frequent in the material, and so were also (although to a lesser extent) sequences of SL patterns. While it may be taken for granted (since it seems

"natural") that the former kind of Dii patterning supports the metre, it is not obvious that patterning of the latter, opposed kind counteracts it. The identification scores of versions featuring sequences of SL Dii patterns were not negatively affected to any appreciable extent, and it might therefore be concluded that "negative inequality" within metric units is compatible with the notated metre, at least as long as it enjoys firm structural support. SL patterning lent a certain sprightly character to the rhythm, and SL playing is an acknowledged device in historical performance practice as well as a phenomenon known from folk music, as testified by concepts like *"inegalité",* "Lombardian rhythms", and "Scotch snap".

It could be observed in quite a few renderings that important upbeat notes were sometimes brought out by means of (frequently stressed) long Dii values. But this finding did not preclude the presence of another, less expansive way of playing upbeats: non-stressed notes with short Dii values.

Finally, some words are due about the relationships between the various means for metric cueing and to the phenomenal character of particular rhythms.

Inter-note timing, articulation, and stressing may of course be combined so as to reinforce each other in the "natural" way. And instances of metrically congruent and consistent LS Dii and Dio patterning correlated with IW stress profiles did show up in the material, and so did more occasional stressed notes with long Dii or Dio values. More interesting, however, are the "contradictory" combinations that were also found in the renderings. It turned out that short Dii and/or Dio values went with dynamic stresses, and that this combination at accented positions was quite common when the notated metre was counter-indicated by structural emphases. Particularly at pre-syncopation notes, this way of playing lent a peculiar, firm character to the dynamic emphases and made the short Dii and Dio values musically understandable as contributing cues for accent. Apparently, SL Dii patterns may express and characterize metre if this "negative" inter-note patterning is supported by metric stressing – indeed, it might even work without such

support, provided that the composed structure does not invite to an improper location of the perceived accent.

In any event, the recorded material provided ample evidence showing that in a certain rhythmic configuration SL Dii patterns are quite frequent. In variants featuring subdivided primary beats, and a fairly brisk tempo, the first note was short in a great majority of the renderings, giving rise to an elastic, bouncing kind of emphasis, quite different from the gravity of the LS Dii patterns that sometimes were found in these configurations as well. Thus, rhythms of the | ♪♪ type were most often played SL, and the duration of the following non-divided note (if any) was virtually always lengthened. In fact, irrespective of the metric position ♪♪♪ configurations were predominantly rendered SL on the eighth-note level: in musical practice, then, two sixteenth-notes is often less than an eighth-note.

Performance and parsing algorithms for metre

Referring back to the ideas advanced in the theoretical introduction, we will conclude with a discussion of the crucial relationship between musical performance and the various attempts at devising parsing algorithms predicting how listeners will apprehend the inherent metre of rhythmic sequences. By and large, these parsing algorithms yield plausible results, but they turn out to be inadequate when it comes to the actual musical information we encounter as listeners.

Although it is most ambitious, Lee's algorithm of 1991, for instance, only takes account of sequences of note values, uniform not only in pitch, but also in intensity and articulation. Thus, like in most attempts at metric parsing, the influence of performance is left out. It seems that the perceptual poverty of the signals to be parsed is the main cause of the complexity of the algorithms, and that, conversely, a richer, more natural input would make for simpler rule systems. In a way, then, the problem to be solved is unnecessarily difficult.

It is a fact that metric parsing in everyday musical practice does not operate with note values, i.e. with articulation-free sequences of tones having strictly mechanical durations and being equally loud. In other words, actual metric parsing does not involve identifying the inherent metre of "uninterpreted" musical structures. What we apprehend when we play, listen to, or read music, is a phenomenal structure, made up of the musical structure as it emerges when it is performed/imagined, i.e. when it is supplied with additional information like metric cues. Phenomenal metre is a mental construct, and we enjoy it actively, adding "implied" emphases to the inherent, structural ones. Implied emphases, in turn, derive from our understanding of the structure, including our notions of a suitable metric organization, and they are reflected in performance, whether real or just imagined.

Consider the rhythm sequence ♩ ♪♪ ♩ ♩ 𝄽 ♩ ♩ which, when matched with the pitch sequence c^2–g^1–g^1–a^1–g^1–𝄽–b^1–c^2, adds up to a cadential cliché known to have the metric organization 2/2 ♩ ♪♪|♩ ♩ 𝄽 ♩ |𝅗𝅥 . But it is the implied performance characteristics of this pitch/time sequence that make it emerge as metrically unequivocal: in any competent performance (real or merely imagined) this "correct" metric reading will be clarified by giving some kind of emphasis to the fourth note. But the sequence itself is in fact perfectly ambiguous, the other inherent metric alternative being 3/4 |♩ ♪♪♩ | ♩ 𝄽 ♩ |𝅗𝅥 . It is true that the fourth note of the sequence appears to be accented after the two short notes, a fact that suggests the current 2/2 interpretation. But, on the other hand, the secondary downbeat of the duple-bar reading is suppressed, lending a quasi-syncopated quality to the fifth note, which in turn makes us render the fourth note with a pre-syncopation, counter-balancing emphasis. This complication is avoided in the 3/4 reading, which locates the note with the longest inter-note distance to an accented position, and does away with the sense of syncopation. So, the triple-time variant may after all emerge as the most natural parsing of the sequence.

Todd, advancing a model for how the auditory system may process sequences like this one, gives the 2/2 reading the upper hand. But he also shows that a slight dynamic emphasis on, or a slight (Dio) lengthening of, the fifth note will tilt the perception over in favour of the 3/4 alternative.[6] This is certainly what a competent musician playing the 3/4 variant is likely to do, but this performer would also be careful *not* to play the fourth note in the way he/she would play it in the 2/2 variant, i.e. slightly stressed or lengthened (in Dii or Dio terms), thus underscoring the metric salience that this note, according to Todd, will have even in a dead-pan version. Thus, a comparatively loud or long fifth note will not turn up as a surprise in a performance of the 3/4 variant, nor will these very same cues making for an accent on the fourth note in a rendering of the 2/2 variant.

Furthermore, wouldn't a good musician also find ways to render the ♪♪ pair so as to make it disclose its upbeat position in the 2/2 reading – so as to give it qualities that would not sound proper if the pair occurred in an intermediate metric position in a 3/4 bar? And wouldn't implied cues be "heard" by a good listener when attending to a deadpan version of the well-known pitch/time sequence, or when just reading its 2/2 notation, deadpan as it is? Generally speaking, when trying to grasp a sequence like 𝅗𝅥 ♪♪ 𝅗𝅥 𝄽 𝅗𝅥 𝅗𝅥 , don't such imagined "performance cues" support the metric organization we are groping for, whichever it may be?

Or consider the very common rhythmic formula ♪ 𝅘𝅥𝅯𝅘𝅥𝅯 or 𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 present in the cliché just discussed. Steedman holds that dactylic ♪ 𝅘𝅥𝅯𝅘𝅥𝅯 rhythms make up structural cues for metric accents.[7] But if the current left-to-right model for metric parsing is consistently applied, the effect is rather a matter of anapaest 𝅘𝅥𝅯𝅘𝅥𝅯♪ rhythms since it is actually the long note occurring *after* the two short ones that gets the accent. In other words, it is the anapaest that gives rise to the sense of accent, but it is the dactyl that (somewhat retroactively) comes to define the metric unit. From the present point of view, however,

[6] Todd, (in press).

[7] Steedman, 1977

the effect may partly be explained by our propensity to render or inwardly hear already the note preceding the subdivision in a way that betrays that it is accented.

All the same, according to Steedman some parsing algorithms more or less rule out | ♪♪♪ configurations in favour of ♪♪| ♪ ones since the former pattern is considered to be counter-evidential – the long note occurs on a weak beat. But Lee (1991), supported by experimental results indicating that listeners might very well locate the downbeat to the first of the short notes, treats both variants as metrically stable.

Turning to the metric preference rules in Lerdahl & Jackendoff (1983), listeners are considered to be equally inclined to locate the accent to the first and to the third note in ♪♪♪ patterns, although ♪♪| ♪ is considered to be slightly preferred to | ♪♪♪ .

According to Cooper & Meyer (1960) | ♪♪♪ and ♪♪| ♪ are entirely different rhythms. The "inverted" dactyl (or "closed" trochee) | ♪♪♪ – with its dense initial attacks, forming a mordent-like structural emphasis if the tempo is not too slow – is just as musically natural as the very frequent anapaest (or iamb) ♪♪| ♪ , and it is implicitly taken for granted that a competent musician brings out the location of the accent according to the notation. Thus, when playing a | ♪♪♪ rhythm, a dynamic emphasis and/or some other suitable cue for accent will be provided at the first note in order to counter-balance the long third note. And this is also what a parsing listener, who for some reason thinks that a | ♪♪♪ configuration is present, will do: his/her percept will include an implied emphasis on the first note.

Why do relatively long notes tend to be stressed; why, and more specifically when, do long tones emerge as salient or, as the case may be, even accented? That the third note in the configuration ♪♪♪ is twice as long as the preceding note, is not a positive fact making for emphasis and perhaps for accent until a fourth event has put an end to it, although – if the tempo is not too fast – a listener might anticipate the occurrence of a longer duration already when the lengthening actually starts, i.e. when the eighth-note

turns out to be longer than a sixteenth-note. But experiencing an emphasis after the onset of a tone is highly implausible, and therefore musicians are prone to clarify the situation by signalling the long duration to come by marking the eighth-note with a stress already at its inception. Hence, metric cueing in performance, and presumably implied emphases in attentive listening as well, tends to be a clarifying bit ahead of the facts.

In conclusion, we have no access to inherent metre as an independent, virginal framework, and – if we want to leave pure theory for insights into actual musical cognition – there are no "uninterpreted" structures, but only interpreted, i.e. somehow performed, ones. It also follows that if we want to know what happens when we identify the metre in a piece of music, we must take account of the intricate dialectics between inherent and notated metre – ambiguous and conflicting metric organizations are after all no less "natural" as musical phenomena than metrically unequivocal ones. We must also accept the fact that the emergence of the phenomenal metre cannot be properly understood if the cues deriving from performance, real or imagined, are left out of consideration.

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Representation of metre in performance

Ex. 1A
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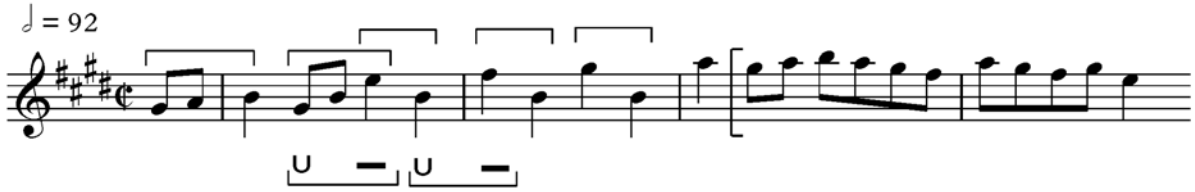

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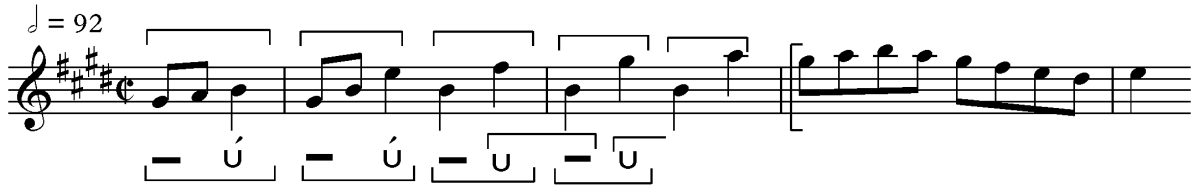

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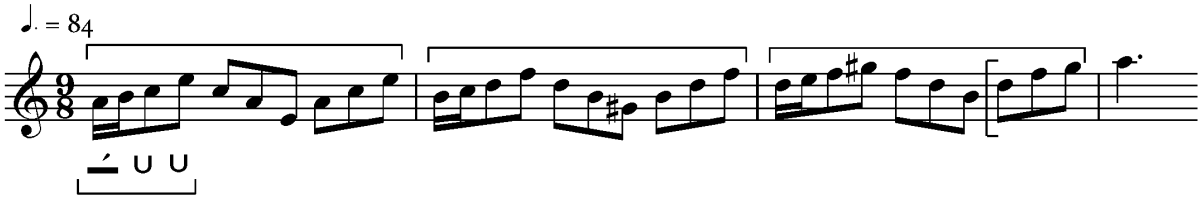

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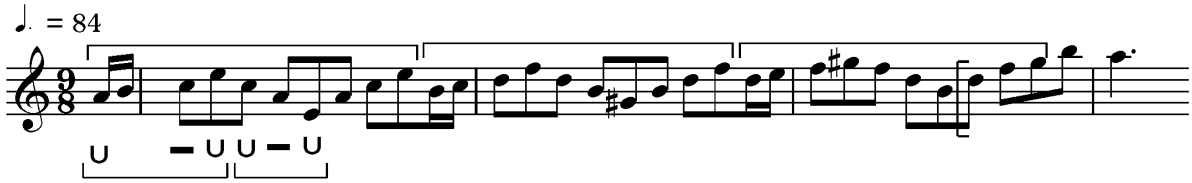

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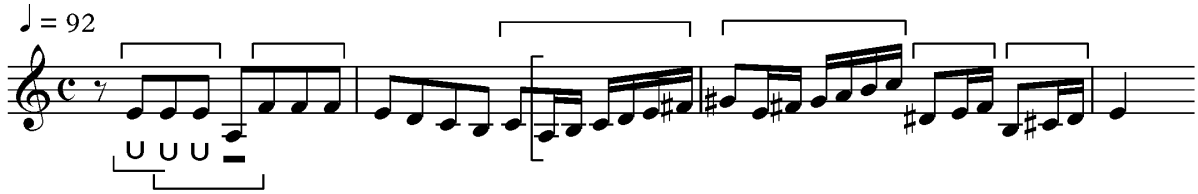

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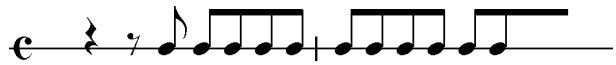

Ex. 6A

BWV 893

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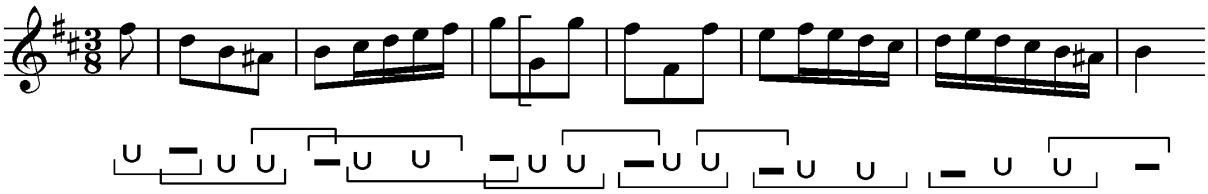

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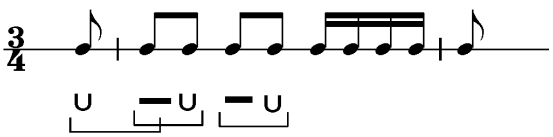

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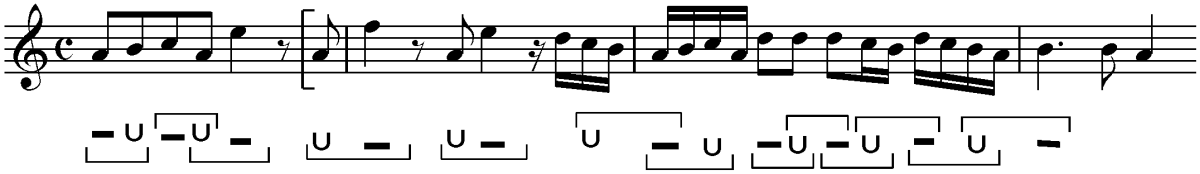
BWV 904

♩ = 96

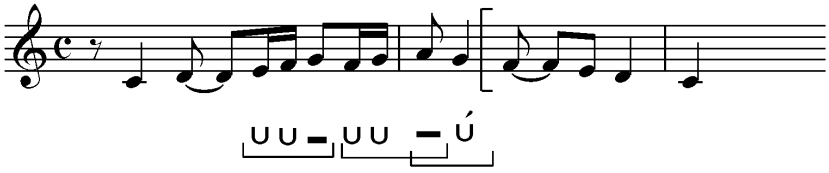


(Ex. 7B)

Ex. 9A

BWV 946

♩ = 84



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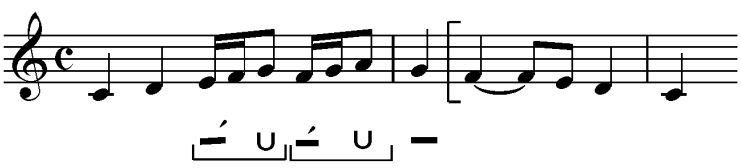

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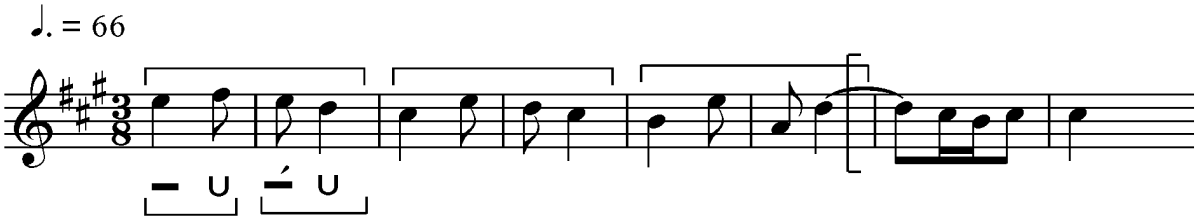

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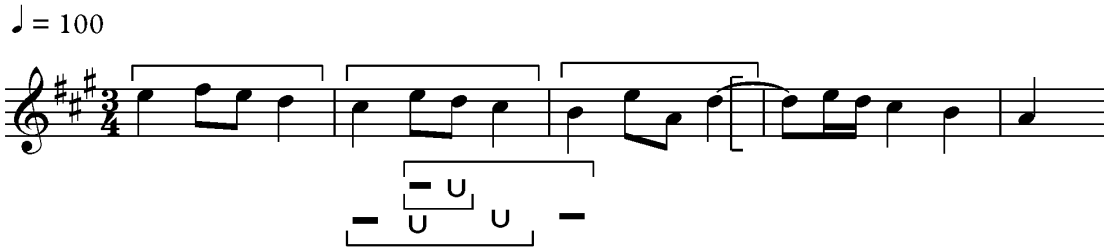

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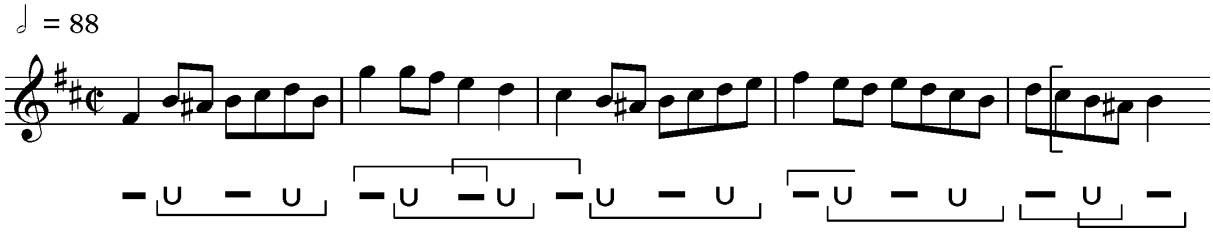

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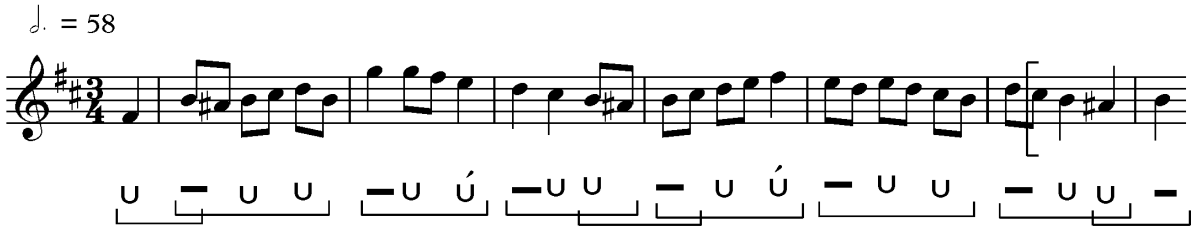

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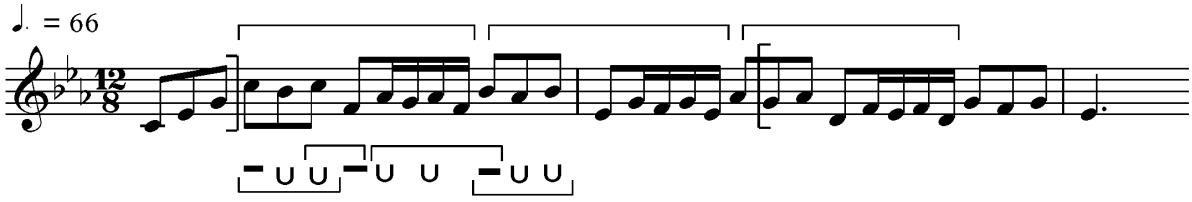

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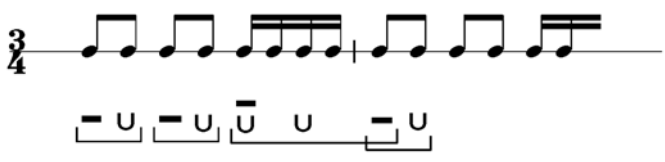

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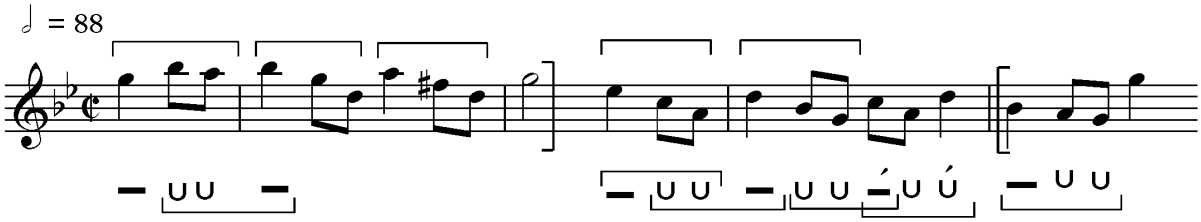

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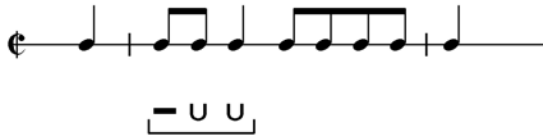

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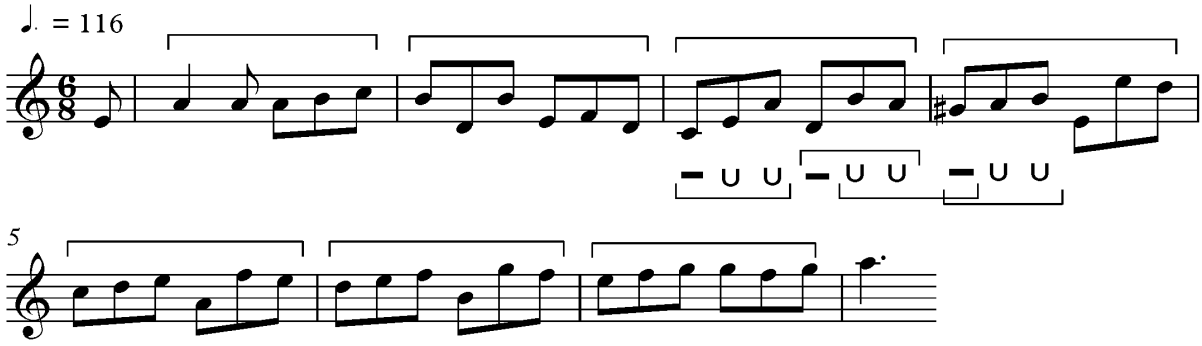

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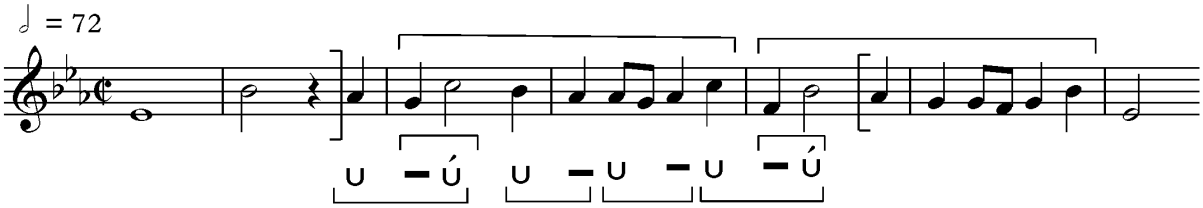

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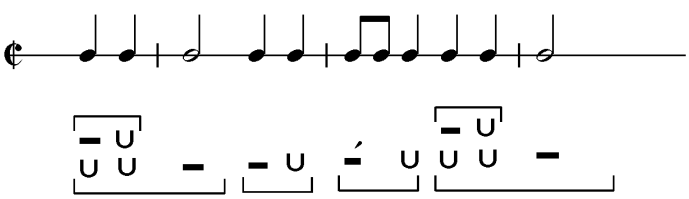

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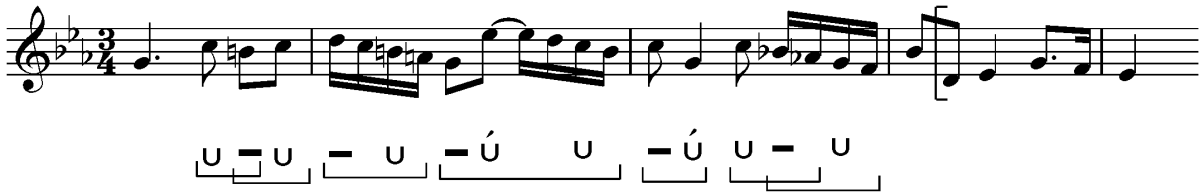

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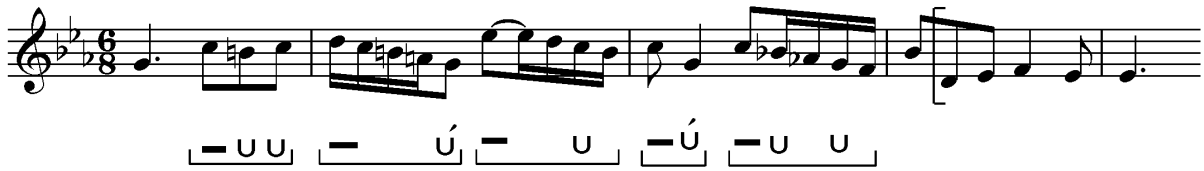
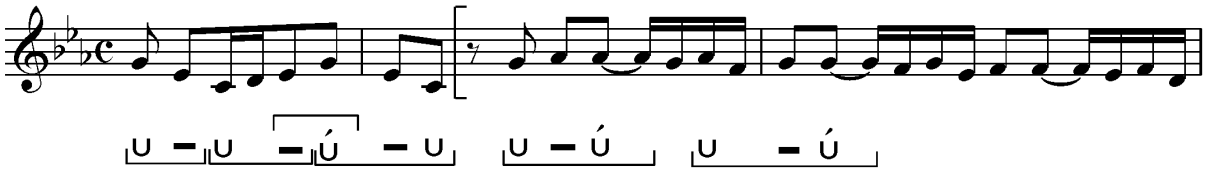
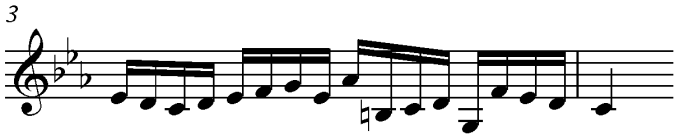
♩. = 60



Ex. 21A
BWV 911

♩ = 84





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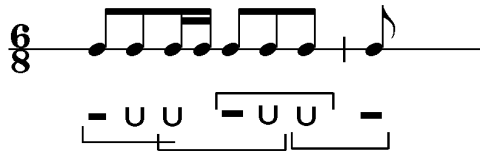

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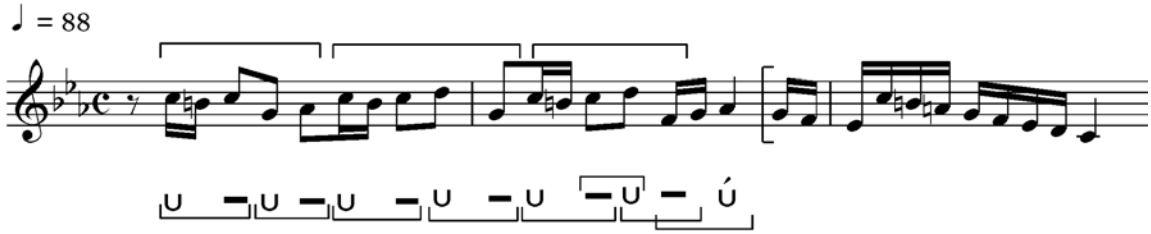

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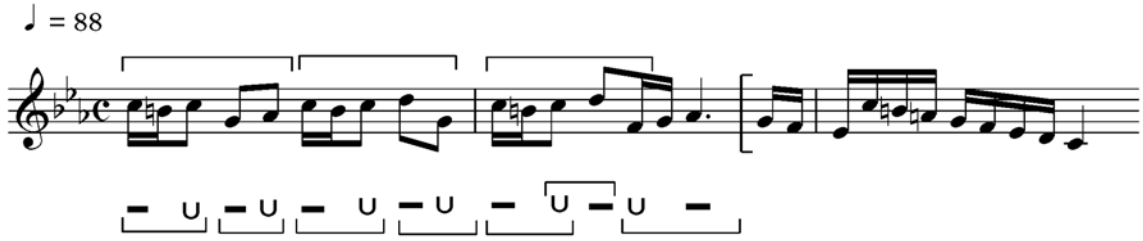

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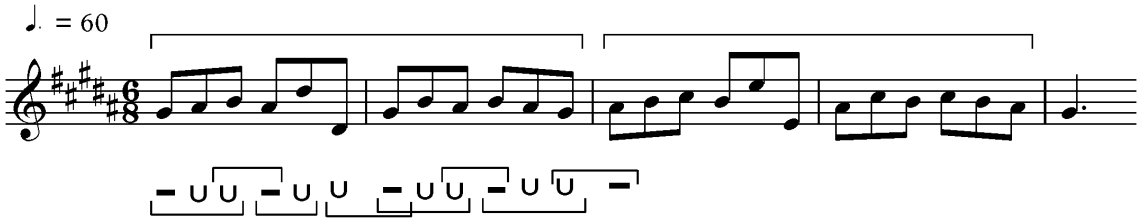

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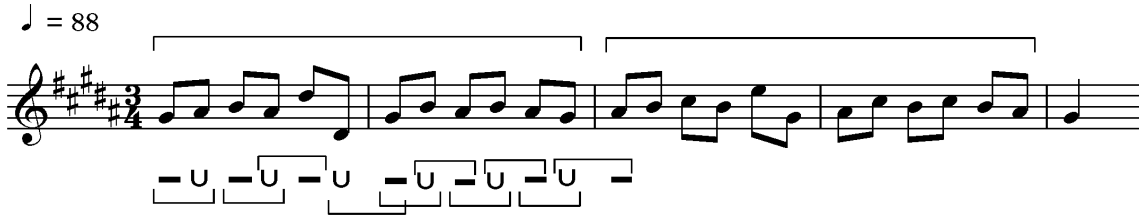

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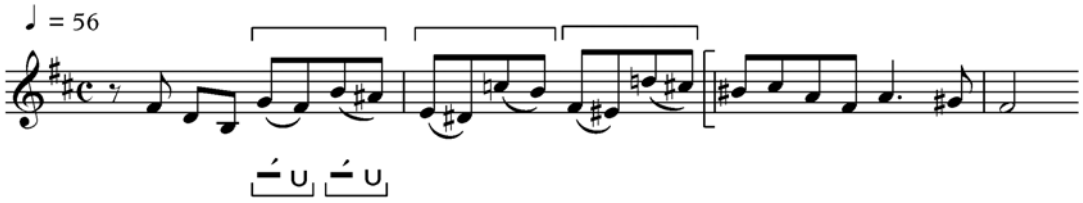

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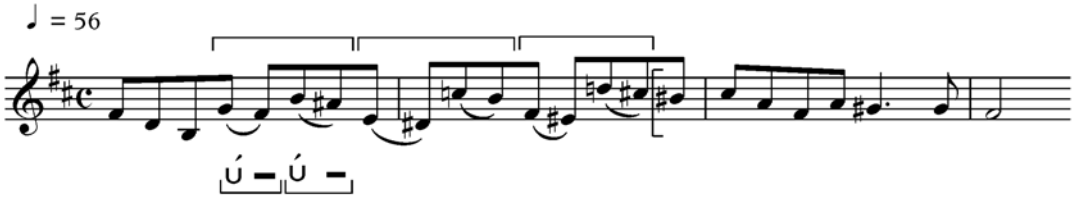

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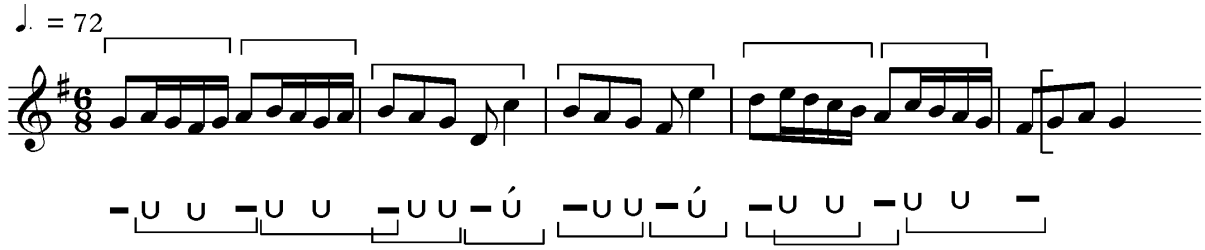

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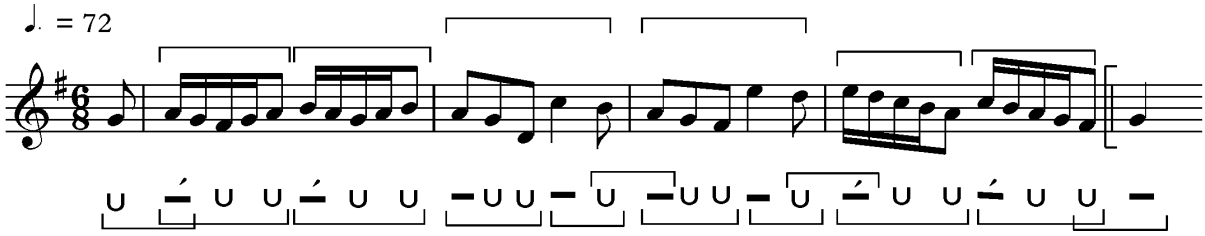
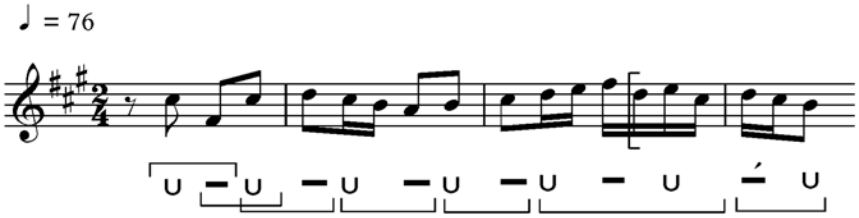
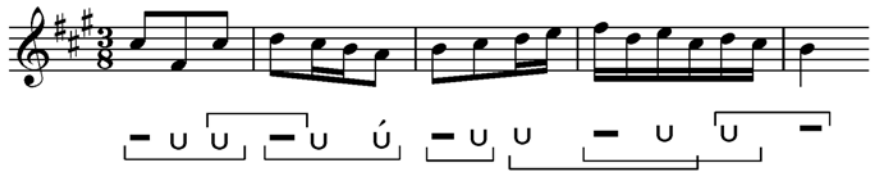


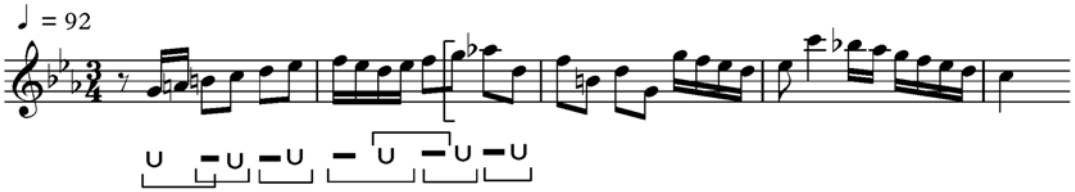
Ex. 27A
BWV 687



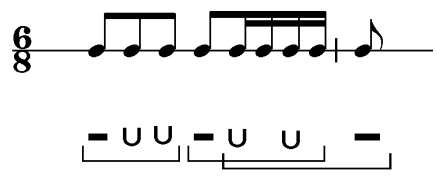
Ex. 27B



Ex. 28A
BWV 826

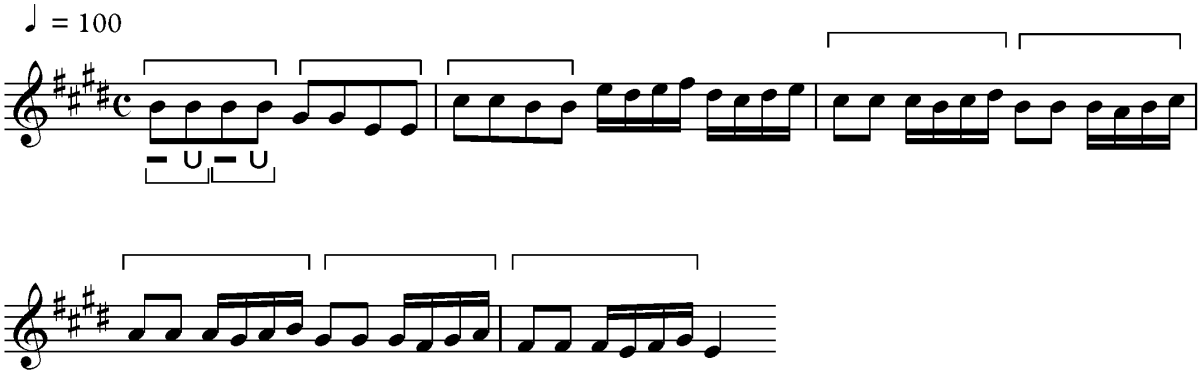


(Ex. 28B)



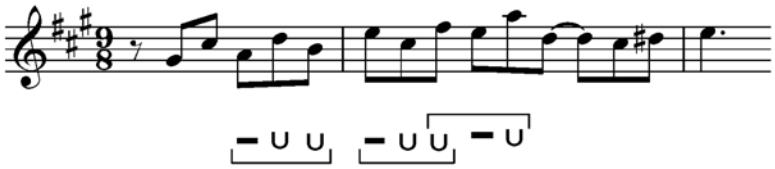
Ex. 29
BWV 566

♩ = 100



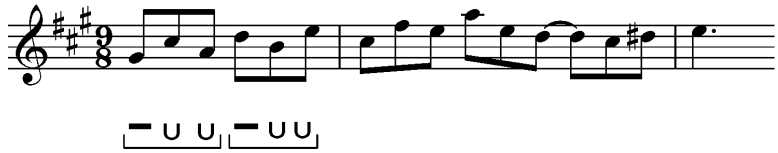
Ex. 30A
BWV 864

♩. = 54



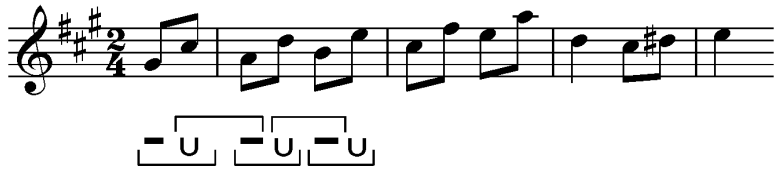
Ex. 30B

♩. = 54



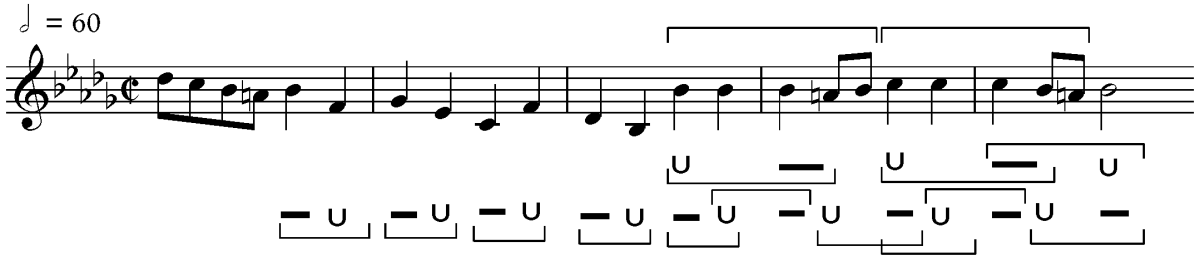
Ex. 30C

♩ = 80

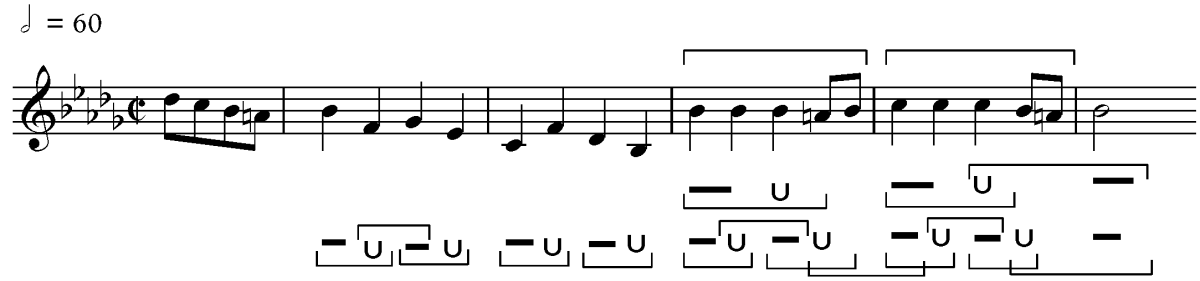


Ex. 31A

BWV 891

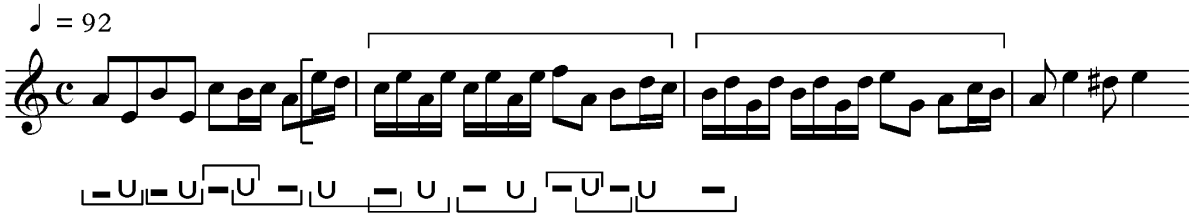


Ex. 31B



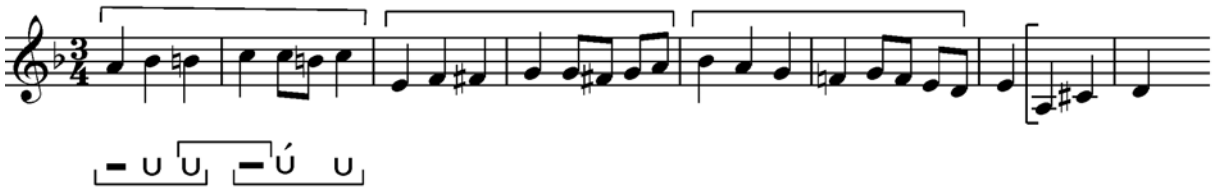
Ex. 33

BWV 561

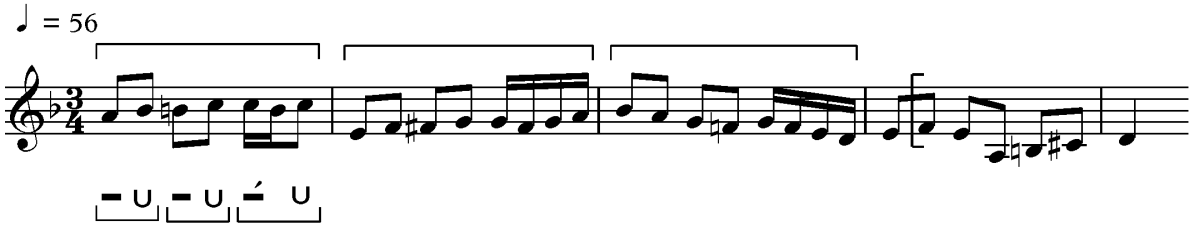


Ex. 34A

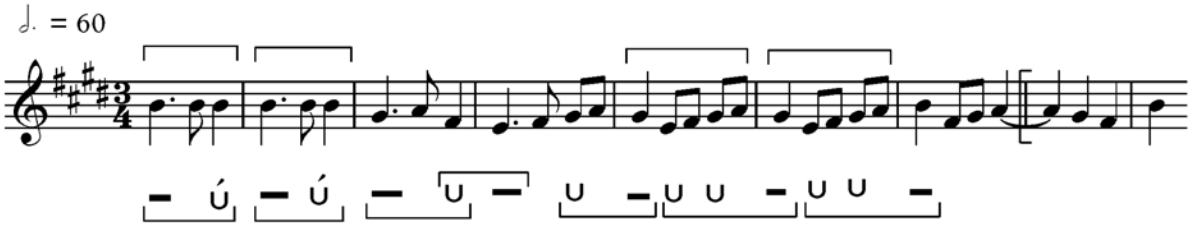
BWV 903



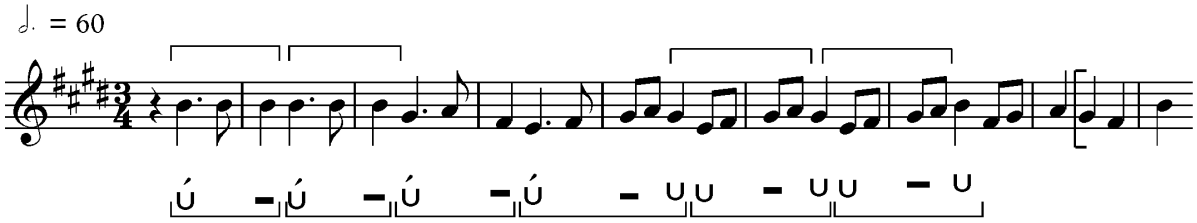
Ex. 34B



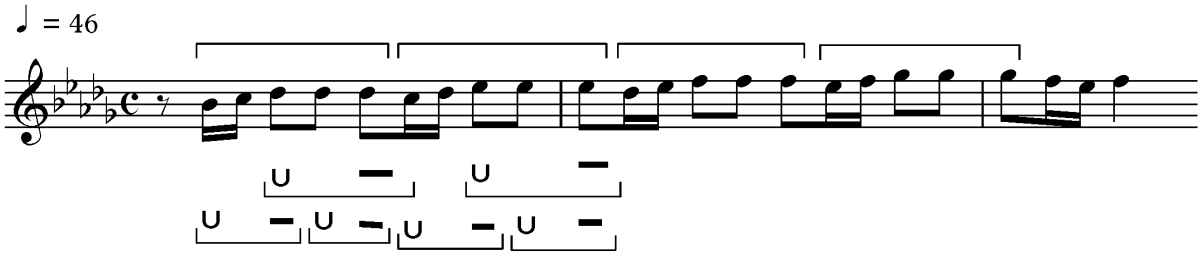
Ex. 38A
BWV 566



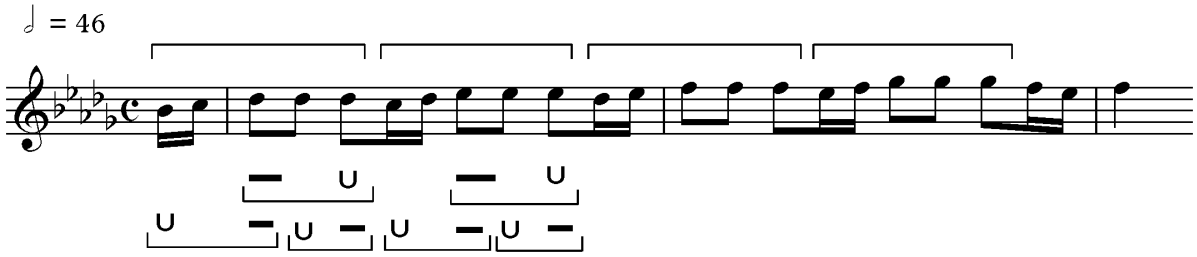
Ex. 38B



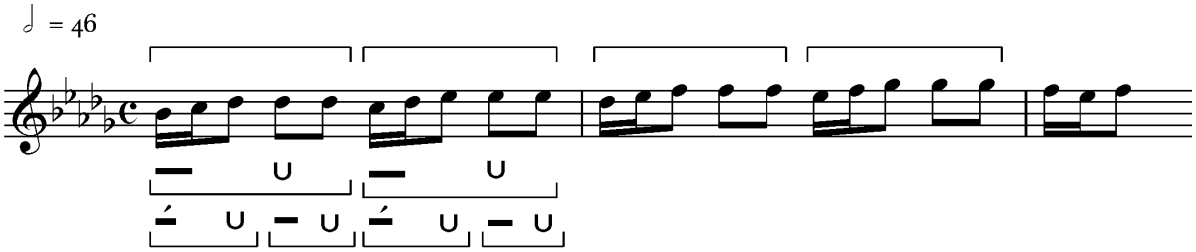
Ex. 39A
BWV 867



Ex. 39B



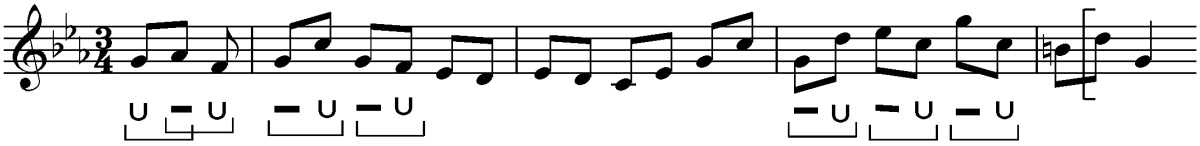
Ex. 39C



Ex. 40A

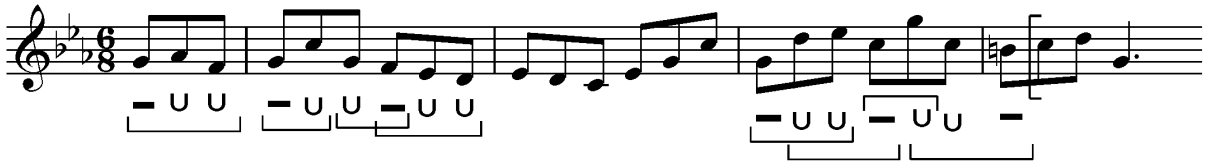
BWV 813

♩ = 138



Ex. 40B

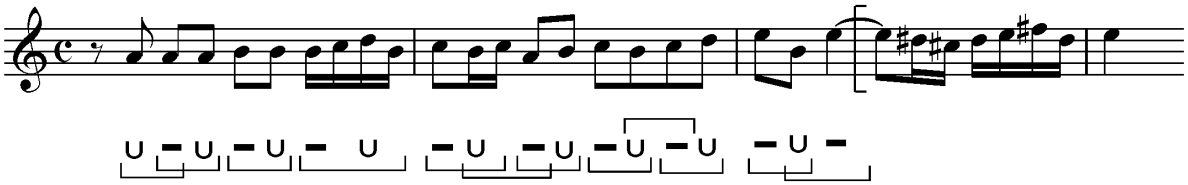
♩. = 92



Ex. 41A

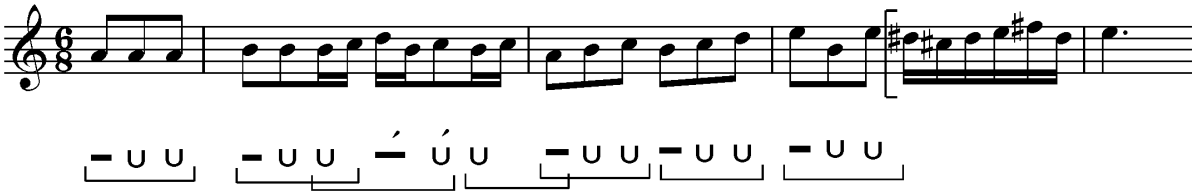
BWV 947

♩ = 88



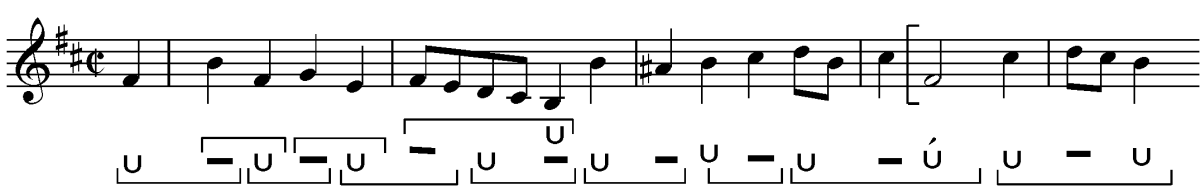
Ex. 41B

♩. = 60

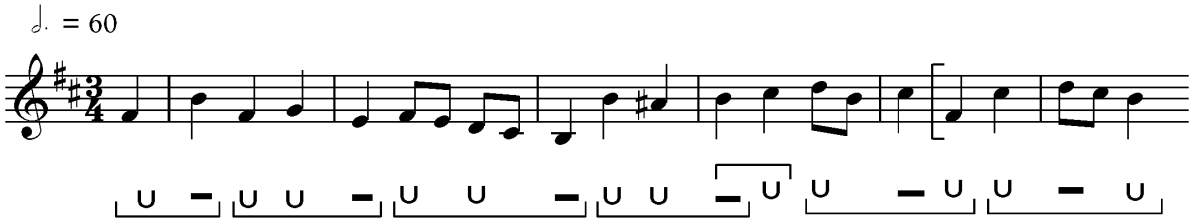


Ex. 43A

BWV 831

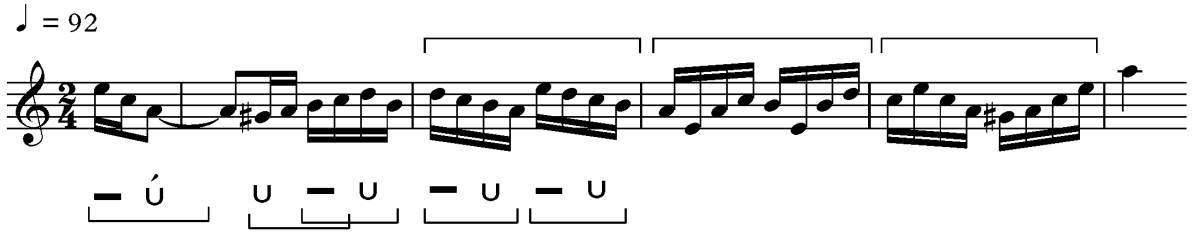


Ex. 43B



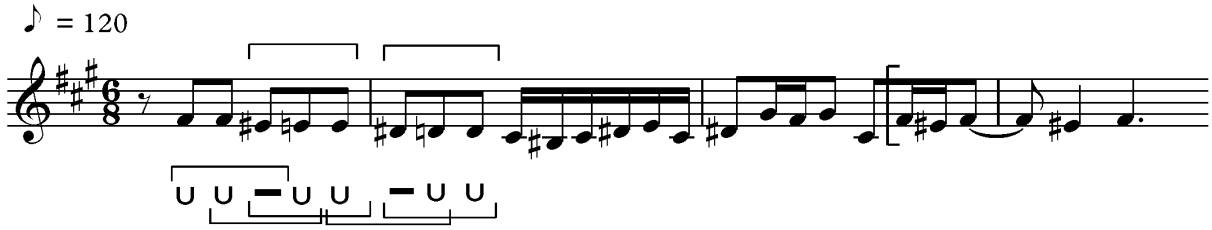
Ex. 45

BWV 827

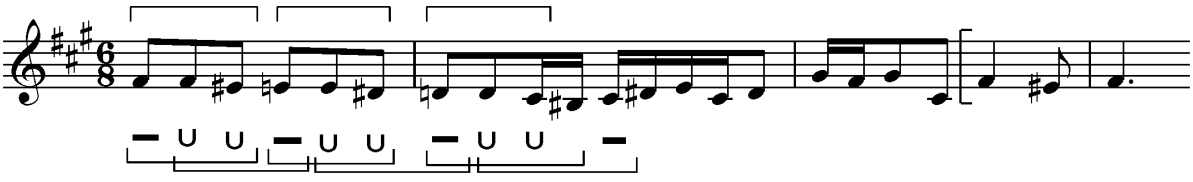


Ex. 46A

BWV 910



Ex. 46B



Bengt Edlund

Communicating Musical Metre.
An Expanded Restudy

Introduction

During the last few decades there has been a growing interest in music performance, a comparatively neglected field of investigation. And rhythm, an element of music that to an appreciable extent can be influenced by the musician, is of vital importance in this research.

Metre is intimately related to rhythm, but the exact nature of this relationship is evasive. Metre is often (and preferably) regarded as the sense of layered regularity within the very complex phenomenon of rhythm, itself a product of the interaction of all and any elements of the musical structure. But metre may also be described as an independent force, opposing or dominating the rhythm, or as a hierarchical framework that the rhythm complies with and differentiates.

Part of the confusion seems to be due to the fact that although the metre is specified by the musical notation, the metric signs do not refer to any particular actions or qualities. Indeed, most often the notated metre just confirms what the musical structure itself would have told a musically informed person anyway. It comes closer to the truth to say that the purpose

of the metric signs is to modify how the musical events are to be rendered (and read) – an observation suggesting that you have to go beyond notational matters in order to grasp the relationship between rhythm and metre.

Rhythm and metre are primarily elements of music as a living, perceived phenomenon, and the understanding of their interrelationship may therefore gain important insights from empirical studies, taking account of what happens when scores are turned into music as well as of the process of communication between musicians and listeners. When and to what extent are metric signs normative and decisive for performance? Which means do performers actually use in order to express the notated metre? To what extent do musicians manage to convey the prescribed metric organization to their listeners?

The studies of John Sloboda

Quite a few studies have dealt with aspects of rhythm as performed, and among them the following ones are particularly relevant for the present work since they touch upon the relationship between rhythm and metre: Bengtsson & Gabrielsson (1980, 1983), Clarke (1985, 1988), Edlund (1985), Gabrielsson (1985, 1988), Gabrielsson, Bengtsson & Gabrielsson (1983), Shaffer (1981), Sloboda (1983, 1985), Talley (1989), and most recently Drake & Palmer (1993). The two papers by John Sloboda are of particular interest since they focus on metre and pay attention to both production and perception, and since his two melodies turn up again as stimuli in the present investigation.

For his performance experiments, Sloboda (1983) composed two melodies, which are ambiguous with respect to their inherent metre, i.e. if notated and read without time signatures, bar-lines, and beams, or if played completely "dead-pan", each melody allows of two different metric organizations seeming equally possible or natural. In the first melody, being in 4/4 time,

the bar-line position can be shifted by one eighth-note; in the second melody it is possible to change the time signature – its structure allows of both 6/8 and 4/4 time. When distinguished by means of notation, four metrically different melody variants emerge; cf. Exs. 1 and 2.

These variants were played by 6 pianists of different ability on a grand piano especially equipped (cf. Shaffer, 1980) to register three performance factors: "inter-onset intervals" (the timing of successive tones); "touch" (the *legato* or more or less *non legato* articulation, measured as the positive or negative time interval, respectively, from the onset of the second tone to the release of the first tone in each pair of successive tones), and "loudness" (being inversely proportional to the duration of the hammer movement from rest position to string contact).

In order to distinguish between random and "expressive" variation with respect to these three performance factors, the pianists were requested to play five versions of each metric variant; the tempo was prescribed. Random deviations from mechanical timing, uniform touch, and even loudness level were then filtered away by calculating mean values for all five versions of each variant as played by the various performers. Taking these average values as a point of departure, variation due to the notated metre (in contradistinction to other kinds of intentional variation) was defined as inter-note changes between the two variants of the same melody as played by the same performer. "Expressive contrasts" induced by the two metric notations were then established by application of standard tests of statistical significance. Further statistical calculations – analysis of variance and orthogonal contrasts between pairs of means – were finally used to assess the metric position of these expressive contrasts.

In the ensuing listening test, 10 musically literate subjects determined for each performed version which metric variant that was played. They were also asked to mark any notes that seemed crucial for their choice of notation. The responses were suitably scored, and subsequent statistics analysed the relative effectiveness of the expressive contrasts in the three

performance factors with regard to correct identification of the notated metre.

In a supplementary study (Sloboda, 1985), 28 versions of the two variants of the second melody were produced on a computer and then assessed as to their notated metre by 18 listeners. These simulated versions, based on values stemming from actual performances by the least and most experienced pianists in the first study, were devised so as to bring metrically relevant and significant expressive cues in each of the three performance factors, separately as well as in the four possible combinations. In this way the perceptual effect and relative strength of different kinds of expressive variation could be studied under controlled and systematically varied – and yet reasonably realistic – conditions.

The results of Sloboda's two investigations indicate that differences in touch and loudness are often used as means to express notated metre – metrically strong notes were played more *legato* and louder than surrounding notes. It also turned that accentuation by means of touch and dynamic stress tends to be functionally linked in piano playing. Touch and loudness variations were effective cues when conveying the notated metre to the listeners.

Some metrically relevant timing variation was also present in the performed versions, but inter-onset interval differences of the magnitude observed were not by themselves sufficient to produce correct metric identification of the inherently ambiguous melodies. The performances exhibited functional co-variation between loudness and timing: loud tones tended to have longer inter-note durations than the surrounding softer ones.

Expressive variation co-ordinated with the notated metre turned out to occur more frequently, more substantially, and more systematically in the versions played by the more experienced players – consistent inter-onset timing variation was found only in the renderings of the expert pianists – and their performances also conveyed the notated metre most effectively.

Purpose of the present work

Sloboda's studies have been accounted for at some length since the present investigation takes them as its point of departure: the work to be reported here can be described as a modified amplification of Sloboda's first study. While by and large retaining his melodic variants and the main traits of his experimental design, the scope and aim of the inquiry are changed and expanded in some respects; the methods of measurement and analysis are also different.

The aim of this study is certainly also to find out how the notated metre imprints the performance of music, and how cues introduced by the musicians help listeners to identify the notated metric organization – thus perhaps adding something to Sloboda's findings – but its main purpose is methodological. Further complexities within the subject matter will be discussed and alternative procedures will be proposed, but this should not be understood as a criticism of Sloboda's work, whose qualities and value are not called in question, but rather as a token of the importance and interest of the subject *per se*.

Accent, emphasis, and stress

"Accent" refers to metric accent, which is understood as a phenomenal, hierarchic quality in music as heard (or read by a competent person). Accents have a physical (or merely imagined) substrate – certain time-points are marked for consciousness, emphasized, rather than others.

"Emphases" are produced by various interacting events or actions specified in the score and then duly executed (or modified) by the performer. It should be observed that emphases, whether prescribed in the score or provided by the player, do not necessarily give rise to accents – metrically weak events might be quite heavily emphasized and yet remain unaccented as

long as the strong events are systematically privileged by the overall musical structure.

"Stress" refers specifically to dynamic intensification, and it is only one of several means to achieve emphasis. So-called "accent signs" in musical notation indicate dynamic stress – in the first place, since they may elicit other concomitant actions/properties as well. The term is a misnomer since these signs may occur irrespective of metric position.

To what extent musicians give *supporting* emphases in "normal", metrically unequivocal passages is a question that neither Sloboda's investigations, nor the present one are designed to answer. The fact that such passages are likely to disclose their metric organization without interventions from the musician does not imply that performance cues expressing the metre are absent. While being redundant as far as correct metric identification is concerned, they may often be vital for the character of the music.

Turning to metrically ambiguous passages, allowing of two (or several) different metric readings, they are likely to encourage musicians to provide *distinguishing* emphases. The musicians will bring cues that clarify the notated metric organization of the music, and that are incompatible with the other, unwanted metric alternative, being present only as a latent, suppressed possibility.

In Sloboda's performance experiment the metric variants of the two melodies were hidden among other material to be played, and the pianists took on the various items after just a very short preview of each passage. This experimental design was suitable for Sloboda's dual interest: to study performance cues pertinent for metre as well as immediate musical cognition as it appears in sight-reading situations with players of different ability. The differences as regards expressive variation and communicative success between more and less experienced players may thus be explained by the fact that the former were not only more accomplished pianists in full command of the means to convey metre, but also more proficient and re-

liable sight-readers, having the cognitive skill needed for a swift and correct mental representation of the notated sequences. Furthermore, due to the experimental design, Sloboda's pianists expressed the metre of the variants without focussing on the fact that the melodies were metrically ambiguous.

Whatever difference there may be in kind or degree between supporting and distinguishing metric cues, the aim of the present study is to find out what musicians do in order to clarify the notated metre in metrically ambiguous passages.[1] In order to bring the distinguishing cues into relief, only professional musicians were used as subjects, and they were given opportunity to study and practice the variants in advance – hence, they cannot but have been aware of the fact that the melodies were ambiguous. Furthermore, the metric variants were recorded in immediate succession, making distinguishing expressive variation virtually inevitable.

The accentual hierarchy and the influence of tempo

Metre as defined by time signatures is far from a determinate matter: two regularly coinciding pulse trains of different pace are indicated, but nothing is explicitly stated as to the relative accentual weight of the various metric positions within the measure. This is either left to be determined by simple rules of thumb or – which seems better in keeping with good music making – considered to depend on the musical structure. According to the latter view, one and the same time signature allows of various metric configurations distinguished by different distributions of the accentual weight – the distance between the accented events may vary, and so may the gradation of weight between relatively strong and weak events.

[1] What they do when expressing metre in passages that are unequivocal with respect to metre, or in passages exhibiting conflict between notated and inherent metre, are related matters that deserve equal attention; cf. Edlund 1994, 1996 as well as "Representation of Metre in Performance. A Study of Bach Melodies" in Varia 1.

The actual metric configuration is also crucially dependent on tempo as is illustrated by the dual implication of the distinction between 4/4 and 2/2 ("*alla breve*") time, a distinction acknowledged by all competent musicians.

It is obviously of interest to get an idea of how differences with respect to the accentual hierarchy are reflected in musical performances. Therefore the subjects were requested to play variants 1A and 1B (cf. Ex. 1) in five widely different tempos. Although the time signature 4/4 was retained, the musicians sooner or later were likely to shift to 2/2 metre due to the increased tempo. Conversely, while sticking to the same eighth-note pace, variant 2B in 4/4 time was complemented with an otherwise identical variant 2C in 2/2 time (cf. Ex. 2).

Instruments and metric cues

Another important expansion in relation to Sloboda's study concerns the influence of the instrument on the kind and range of variations used to express metre and on the efficiency of metric communication.

Instruments differ greatly with respect to their acoustic properties, ways of tone production, and playing motions, and they leave the musician with varying options for expressive variation. It may be assumed that – excepting perhaps some very intricate situations – the metric organization of the music can be expressed and conveyed on any instrument; high competence in playing a certain instrument is likely to entail a more or less automatically applied ability to use the cues at disposal. Indeed, musicians seem to be deeply imprinted by their instrument; they are inclined to imagine music in terms of the sound qualities and expressive possibilities they know so intimately. It may therefore be expected that the expression of notated metre on various instruments is characterized by specific combinations of performance cues, or by the fact that certain performance factors have to carry all the burden of metric communication since the other means of expressive variation are not available.

To study the influence of the instrument on the expression and communication of metre, the variants were played on three keyboard instruments associated with quite different conditions of tone production: the piano, the harpsichord, and the organ.

A pianist has all three factors of expressive variation at his/her disposal – the inter-note timing is of course free, the range of intensity is great, and the instrument responds quite readily to any short articulation silences that one wants to insert between the tones. In harpsichord and organ playing the possibility of (immediate) loudness variation is (virtually) eliminated. The harpsichord sound has a rather swift decay whereas organ tones may be held infinitely without any change in loudness.

The intensity factor warrants some further comments. The presence of small, but metrically relevant intensity (or timbre) differences in harpsichord playing cannot be altogether excluded. Besides, and perhaps not approved of by some harpsichordists, quite noticeable increments of mechanical noise may appear as by-products of rhythmically vivid playing motions. It must furthermore be admitted that certain tones on all three instruments may differ slightly in intensity due to uneven regulation. This means that, even when playing on instruments in quite good condition, a few comparatively strong or weak (or just different) tones might turn up. But it appears that such deviating tones are very seldom mistaken for metric cues, or else heard as intentional. Since they tend to be linked with a more or less peculiar sound quality, and since they are associated with certain pitches but occur irrespective of the metric organization, they are likely to be heard as characteristics of the individual instrument rather than as cues for metre – if they are noticed at all.

In this context another aspect of the experimental design should be briefly discussed. Differences as regards expressive variation between renderings of the same metric variant played on different instruments do not only reflect the influence of the instrument on the metric cueing; the variance between the versions may also be due to differences in musical interpretation. In

order to control this background variable – i.e. to ensure as far as possible that the musicians actually tried to convey the same musical idea when playing a certain variant – the two professional pianists were complemented by two highly qualified all-round musicians playing the variants on all three instruments.

Metric units and rhythmic groups

That musicians use various expressive devices to convey further musical information than just the metric organization is a trivial fact that holds even in contrived experimental situations. Of crucial importance in the present context is the concurrent expression of rhythmic or motivic groups, which is a vital, indeed virtually inevitable, aspect of the interpretation of tonal music. Evidently, rhythmic grouping causes considerable complexities in any study of metre as performed and perceived.

Group boundaries are likely to be signalled by means of the same performance cues as metric demarcations, making it hard for the investigator as well as for the listening subjects to distinguish to what extent the expressive variation is in fact associated with efforts to convey the notated metre.

Particularly the influence of variations in touch is likely to be difficult to assess: interpolating short moments of silence is a most powerful device both when signalling the demarcations between metric units and when expressing the boundaries between rhythmic groups – just as *legato* articulation gives an impression of cohesion. "Slurring", then, is a most effective cue for both metric accent and group inception. But one should not forget that there is also another kind of articulation having a different function. When all tones in a sequence are played *non legato*, tones having longer sounding durations tend to be heard as emphasized – and hence as cues indicating the beginning of either metric units or rhythmic groups.

Forming a continuum, these two kinds of articulation are of course closely related: where connecting slurring ceases, emphases suggesting the beginning of metric units or rhythmic groups by means of lengthened sounding durations begin. Furthermore, and as any musician knows, articulation slurs do not just request a local *legato*; they also suggest initial emphases. This means that slurring is frequently associated with initial stress or inter-note timing differences, which in turn may signal metric accents and/or the start of rhythmic groups.

A further complication is due to the fact that the rhythmic grouping structure may be either "congruent" or "non-congruent" with the metric framework. When the rhythmic groups agree with the metric units, the cues for metre and grouping will be mixed up to the point of being inseparable. On the other hand, when the rhythmic groups overlap the metric demarcations, the expressive variation pertaining to upbeats may in principle be distinguishable from the cues indicating metric accents, but unless the metric organization is unequivocal, the listener might misunderstand the cues for grouping and take the groups for metric units.

It was not desirable – and nor is it possible – to counteract the tendency to express rhythmic groups along with the cues for metric units. Instead, when studying the performance data and the scores of the listening test, this dual function of expressive variation was taken into account, making an attempt to distinguish between cues that seemed to serve different purposes.[2]

The metric ambiguity of the melodies

If you want to study how musical metre is encoded and decoded, it is necessary to analyse the inherent metric qualities of the musical structure upon which the notated metre and then the performance are superimposed. And especially when ambiguous passages are involved, it seems imperative

[2] For further research on this problem, cf. Drake and Palmer, 1993

that the delicate balance between the various metric readings is carefully described.

To compose a melody that is perfectly ambiguous with respect to its inherent metre and still reasonably worthwhile to play is a difficult task. Sloboda's melodies are certainly acceptable, but a discussion of whether they are biased towards one or the other of the possible metric readings, as well as an account of their grouping peculiarities, is nevertheless called for; cf. Exs. 1 and 2. The comments can be restricted to the initial parts of each melody since the efforts to convey the metre must set in immediately in order to be effective – the listeners' identification of the metre is likely to rely quite heavily on the initial structural information and on a few, but crucial, early distinguishing performance cues.

Sloboda holds that variant 1A is the preferred metric reading of melody (1) since according to the parsing principles proposed by Steedman (1977) a listener tends to hear the two d^1's as accented. And it is indeed quite straightforward to start with a downbeat introducing a trochaic grouping, congruent with the metre. But rising fourths bear an inherent, quite strong dominant-to-tonic quality suggesting that the first and third notes, the d^1's, of the melody are upbeats. It may furthermore be argued that it is variant 1B with its non-congruent iambic grouping that emerges most clearly to the performer, i.e. the one who actually produces the music to be heard, and to whom the ingrained, upbeat-like rising-fourth motion presents itself as the first musical gesture to be expressed.

Initially, variant 1B may therefore seem most natural, whereas variant 1A is likely to appear as somewhat strained, as requiring some kind of clarifying emphasis on the two d^1's to be unmistakably conveyed. Variant 1B may call for some cueing as well in order to confirm that the g^1's are metrically strong, but this variant also begs for some expressive variation to bring out the starts of the two iambic groups, a situation that might make for confusion between metre and grouping. Thus, listeners might possibly

mistake 1B for 1A – unless there are ways of playing that convey the distinction between beginning an upbeat group and starting a metric unit.

Immediately after the two rising-fourth motifs one meets with a combination of note values that takes on a quite different character in the two metric variants, a fact that calls for distinguishing cues that may be very important for correct identification of the notated metre. In variant 1A the two sixteenth-notes willingly form a weak beat that transfers metric weight to the surrounding eighth-notes, and particularly to the following one: the two short notes tend to form an upbeat linked with the ensuing two eighth-notes so as to give rise to an amphibrach group. Conversely, in variant 1B the sixteenth-notes are forced to become a strong beat, and together with the following eighth-note they form what Cooper & Meyer (1960) call a closed trochee, causing a momentary reversal from non-congruent iambs to congruent trochees, a shift that is likely to be restored at the following barline.

The amphibrach group in variant 1A is very common and "natural" since the accent falls on a long note. The first eighth-note within this amphibrach may therefore in itself be heard as a metre-defining event even without any additional emphasis, which otherwise seems quite due. (Steedman (1977) accords metre-defining function to dactylic durational sequences, in this case the notes c^2–b^1–a^1, but this seems to involve an anticipation of the effect: from a perceptual point of view the decisive temporal configuration is rather the anapaest b^1–a^1–b^1.)

The closed trochee in variant 1B, on the other hand, is counter-indicated by the fact that the long note occurs at a weak metric position. And yet this peculiar rhythmic configuration may be heard correctly – if it is clarified by effective metric cueing, and/or if the strong metric position of the first sixteenth-note is already established by the notes preceding it, by the way they have been played. In addition, the dense attacks of three temporally proximate notes form a kind of emphasis that may be heard as a structural cue for accent; particularly in fast tempos this pattern has a mordent-like character.

To summarize, while the first part of the first bar of melody (1) may have a slight bias towards variant 1B, its second part rather favours variant 1A.

Turning to melody (2), it can readily be seen that according to Steedman's repetition principle the structure is initially biased towards variant 2A in 6/8 time. The motif of three notes in variant 2A is simply apprehended before the competing motif of four tones in the duple-time variants 2B and 2C. But the three-note pattern is not pursued while the four-note pattern persists for another unit helping the latter variants to gain the upper hand.

Evidently, early distinguishing cues for accent are necessary if a listener is to grasp the notated metric organization, whether it is the triple metre of 2A or any of the duple metres of 2B or 2C. The impression of variant 2A is hard to restore if the three-note pattern has not been unequivocally established from the very beginning, since later on in variants 2B and 2C there is an exact in-phase recurrence of the first four notes of the melody, a restatement that is announced by a tonic-defining neighbour-note motion. This internal new start cannot but confirm that the initial duple-metre understanding of the inherent metre was correct. Hence, melody (2) is slightly biased towards 2B/2C.

The performance experiment

4 highly qualified musicians took part as subjects. Two of them (henceforth called P1 and P2) were pianists and played the metric variants on the piano; the remaining two musicians were highly accomplished piano, harpsichord, and organ players, and performed the variants on all these instruments. They will be called P3 and P4, H3 and H4, and O3 and O4, respectively.

The variants 1 A/B and 2 A/B/C were used as stimuli, and the notations were sent to the performers about one week before the recording sessions. As can be seen from Ex. 1, Sloboda's original variants of the first melody were changed so as to form one-bar circuits to be played four times in im-

mediate succession. In addition to increasing the basis for conclusions, this modification served to eliminate the syncopated note occurring later on in Sloboda's first variant.

The written instructions requested the subjects to distinguish clearly between the different notations and yet make good music. If they were not content with a taking, they could just discard it and play another one in its place – a possibility rarely used. Since the notations did not feature any articulation signs, it was pointed out that the performers were free to "articulate" the melodies if they wanted to do so.

On the other hand, the tempos were fixed. The quarter-note was set to M.M. 60, 80, 100, 120, and 144 for each of the variants of melody 1, whereas the dotted quarter-note, quarter-note, and half-note were set to M.M. 92, 120, and 60, respectively, for the variants of melody 2, so as to get the same eighth-note pace. During the recording sessions the performers used the metronome to settle the tempo.

In order to minimize fingering differences – whatever their importance when it comes to professional keyboard players – a few fingering indications were given at crucial points. The pianists were requested not to use the right pedal, the harpsichordists to play with an 8-foot register, and the organists to choose an 8-foot reed voice (so as to get tones with distinct onset).

The performances were made on high-quality instruments in spacious coaching rooms with alert acoustic conditions at the Malmö College of Music – the organ room having a somewhat church-like reverberation. Two Revox A77 tape recorders were used – one of them registered the sound close to the instruments, the other documented the performances at a suitable listening distance in the room. The former recordings were used for the analysis of the acoustic cues, the latter for the listening test.

In order to check the instruments and the acoustics, and to guide the study of the analog registrations, three simple tests were played and recorded: a *legato* chromatic scale throughout the range to be used, a few notes in different registers with very long/intermediate/very short durations, and (on

the piano) some notes, again in different registers, with *piano, mezzoforte* and *forte* dynamics. In this way some information was gained with regard to the dynamic evenness, the characteristics of tone decay and damping, and the dynamic range of the instruments.

Assessment of performance cues

In what follows the analysis of the performance data will be described and motivated.

Sloboda gained exact data as to the three pertinent performance factors by means of automatic computation of time points directly delivered from the piano, whereas in the present investigation the recorded performances were fed into a Synclavier II computer, which by means of digital analysis converted the acoustic signals to analog registrations on paper. The registration mode of plotting amplitude over time was chosen, which yielded not only intensity differences but also information on all relevant durational properties: inter-onset intervals and articulation silences (if any). The ensuing analysis was made according to the procedures described in detail in Edlund (1985), although with some modifications to meet the present purposes.

Inter-onset time intervals (Dii, "Duration-in-in", values) were measured with an acuity equivalent to 5 ms by means of a ruler – metrically effective or not, variation in this factor is bound to be made up of mostly quite small differences. These values were then combined to form overlapping patterns of two tones, ensuring that the duration of every tone was compared with that of the preceding and the following tones. The Dii patterns were classified as LS (long-short) or SL (short-long), and patterns exhibiting substantial deviations, i.e. deviations from mechanical regularity exceeding or equal to 20 ms., were especially noted.

The other two factors were studied by means of visual inspection without any exact measurement. Silences between tones were noted, and if, in se-

quences of detached notes, systematic differences as to the sounding durations (Dio, "Duration-in-out", values) were observed, the patterns were signified by the letter combinations LS and SL. Slurred notes were of course also noticed.

Clearly observable amplitude (A) differences between consecutive tones were taken down and then grouped so as to form overlapping patterns as described above with respect to the Dii factor. The loudness patterns were classified as IW (intense-weak) or WI (weak-intense), and patterns involving particularly manifest amplitude differences were noted. Differences less than approx. 1 dB were disregarded; as to the limit for substantial differences in intensity, differences smaller than 4–5 dB were not regarded as conspicuous.

This assessment of performance cues in terms of pattern type and magnitude of difference may seem crude, but it was sufficient and well suited to the qualitative analysis in view. Exact values lending themselves to statistical calculations but of uncertain perceptual significance might have cluttered up the picture making attempts at explanation more difficult. Furthermore, when dealing with data of possibly heterogeneous origin, current statistical methods of generalization entail a risk of levelling away interesting tendencies possibly present in the material. Both between versions and within them there may be differences that should be studied in their own right for what they might disclose about such matters as the interrelationships between performance factors and the relationship between cues for metre and cues for rhythmic grouping.

A primary aim of the investigation was to establish and verify principles of expressive variation that are used to encode, and that may help the listeners to decode, metre. This was achieved by first studying the properties of each version separately, relating the observations not only to plausible strategies for expressing metre, but also to the musical structure in order to understand the playing characteristics as (at least partly) conditioned by the local musical context, including rhythmic grouping. The process of generalization then proceeded cautiously step-by-step in order to

eventually arrive at conclusions valid for certain variants, instruments, and players, and eventually for the expression of metre, carefully avoiding undue clustering of data of possibly heterogeneous origin, and noting manners of execution that turned up frequently in systematic and meaningful ways.

This much in defence of detailed study and piecemeal generalization, but besides generalization there is another reason for the application of statistical methods – that of checking the significance of the findings. It may be considered necessary in experiments of this kind to ask the subjects to play each variant several times producing renderings that can be compared, correlating expressive variation occurring at corresponding metric positions within the individual versions. Scientific standards demand consistent behaviour exhibited in large materials – otherwise the observations might be due to the workings of chance.

However, previous research (Edlund, 1985) has established that qualified performers display a high degree of rhythmic stability when required to repeat sequences, and that consistent patterning as regards timing, articulation, and intensity within individual versions is very common at least when the material to be played has a highly uniform musical structure – a condition that is not quite satisfied in Sloboda's melodies. Even granted that expressing the metric organization was a primary intention, the subjects may also have wanted to render the rhythmic and melodic properties of the variants with some flexibility. Consistent metric cues can therefore not be expected to turn up on every possible occasion. Such playing would sound demonstrative or monotonous, and the notated metric organization can probably be clarified by less persistent means.

The listening test

8 musicologists, musicians, and music theory teachers were selected to form a reference group of discriminating and musically informed listeners.

From the tapes of the performance experiment was assembled an audio cassette lasting approx. 30 min. and containing all 104 versions of the five variants. Keeping renderings on the same instrument and of each of the two melodies together, the individual versions were arranged in shuffled order. The very last notes of the variants were sometimes played in ways that made the notated metre quite obvious. Since the focus of interest was on the current expression of metre, and especially on the important initial cues, all versions of variants 1 A/B were faded out during the first part of the fourth (repeated) bar, whereas all renderings of variants 2A and 2 B/C were faded out after the first note in the fifth and fourth bar, respectively.

To go with the cassette a set of response sheets was prepared. Each performance on the cassette corresponded to two notations, and the listeners were requested to mark which one they had heard and to make a few other observations. Renderings of variants 1 A/B were to be identified with respect to the bar-line position, and it was also asked whether the renderings seemed to have a 4/4 or a 2/2 character. The versions of variants 2 A/B/C were assessed in two steps. First the listeners had to mark whether the rendering just heard was in 6/8 time or not. Then – after listening to other material – versions actually deriving from 4/4 or 2/2 notations were to be identified with regard to what kind of duple metre they were expressive of.

A copy of the cassette was sent together with the response sheets to the members of the reference group. The instruction allowed them to listen several times to versions that were hard to assess, and asked them to state the number of extra hearings needed to be certain. If they were unable to determine which notation that was played, they were instructed not to guess but to write a question mark in the margin. On the other hand, if they felt that the player expressed the metre in a very demonstrative way, they were to report this by writing the letter “D” in the margin. In addition they were asked to indicate whether any specific notes or manners of playing were crucial for clarifying the metre.

Scoring of the listening test

The outcome of the listening test was registered by noting for each version the relative frequency of correct identifications of the notated metre. The ratio 5/7, for instance, means that five listeners out of totally seven were correct; in this case one of the eight listeners refrained from answering.

The more qualitative vein of this investigation as compared with Sloboda's two studies is evident also from the treatment of the data from the listening test. Whereas he used 10 musically literate adults/18 music undergraduates, who listened to the performances/simulations once/twice, the present study employed 8 highly qualified listeners who were allowed to hear the versions as many times as needed in order to be certain. Rather than making up a group of subjects reporting their immediate metric impressions, these expert listeners are to be regarded as a reference group, whose assessments complemented those of the investigator, who – knowing in each case which variant that was actually played – tried to identify the cues used to convey the notated metre.

Results: Variants 1 A/B

The Dii-values do not consistently agree with the metre, but when they do, a tendency emerges: the eighth-notes within the beat make up LS patterns in variant 1A and SL patterns in 1B. There is also some evidence indicating that the tempo may influence the Dii patterning – LS in 1A and SL in 1B seem to belong to moderate tempos (i.e. to 4/4 rather than 2/2 time). But the perceptual effect of the Dii patterning with regard to metre cannot be positively established since other cues of relevance are also present. Since variants 1A and 1B initially feature trochaic and iambic rhythmic groups, respectively, the general trend of the Dii patterning can also be formulated as follows: in the trochees of 1A the downbeats are lengthened to give

durational emphases while the iambs of 1B are expressed by long/early upbeats.

The |♪ ♪♪ configuration in variant 1A tends to be rendered as LS on the eighth-note level whereas the configuration |♪♪♪ in 1B is often played SL. When studying the versions in detail, there is some evidence indicating that these rhythms sometimes bring about a reversal of the Dii patterning: the prevailing pattern during the first two beats of the bar is sometimes exchanged for the opposite patterning within the fourth beat – a reversal that in some cases persists during the first beat of the next bar as well.

Turning to the A factor, both the frequent IW patterning of the eighth-notes within the beats and the numerous marks for conspicuous emphases in the listening protocols indicate the importance of dynamic stressing as a cue for metric accent. This is also apparent from the fact that the three versions giving rise to the greatest number of metric misunderstandings as to the bar-line position feature dynamic emphases on weak beats. Whereas, generally speaking, iambic grouping may otherwise be expressed by means of stressed upbeats, this manner of playing can obviously be misleading when the inherent metre is ambiguous.

Whereas P1 plays *legato* throughout in variant 1A and phrases in measure units in 1B, the other subjects frequently and apparently very successfully use various articulation patterns co-ordinated with the notated metre. The basic principle is simple: the slurring agrees with the metric units. Whereas a variety of different slurs can be found in P2's versions, subjects 3 and 4 use both slurs and *non legato* articulation – detached articulation is characteristic of the renderings on the harpsichord and the organ, and it is often preferred by subjects 3 and 4 also when playing the piano. Both LS and SL Dio patterning within the beat occur, but the latter articulation is seldom used in the versions of variant 1B. The functional equivalence of slurring two notes together and LS Dio patterning is quite obvious in some versions, exhibiting both ways of articulation.

The listeners' location of the bar-lines in versions of variant 1A and 1B is virtually always correct: the players' efforts to convey the notated metre

were effective. Turning to the other task of the listening test, that of determining whether the version heard is in 4/4 or 2/2 time, the result is less clear-cut, but 2/2 time character prevails in fast tempos. The pulse shift apparently takes place in the M. M. 100–120 region, but performance characteristics also turn out to be important: depending on the number of cues for accent in each bar, the versions were heard as featuring either quadruple or duple time.

Results: Variants 2 A and 2 B/C

Turning to variant 2A in 6/8 time, the renderings of P1, P4, and especially P3 exhibit A patterns giving the measures a patent 2x3 triple organization. In the version played by P3 this feature is underscored by the Dii factor: the first and fourth notes in each bar are lengthened. Initial LS Dii patterns occur in some other versions as well, but the inter-note timing is sometimes different in the two halves of the bars. In some performances the articulation is used so as to suggest distinct patterns of three notes. P1 and P2, playing *legato* throughout, provide a clarifying dynamic emphasis at the g♯¹ in m. 3.

When studying the scores of the listening test, the importance of consistent patterning in more than one factor stands out. A few renderings of 2A, offering comparatively sparse cues for metre, were taken to be in duple or quadruple time; the inherent metre of the melody, favouring 4/4 or 2/2 in the long run, might have dominated some listeners' impression.

The versions of 2B and 2C show few traces of systematic A patterning, but phenomenal stresses, due to Dii or Dio patterning, or to slurring configurations, come to the fore. P3 helpfully stresses the a¹ in m. 3. Turning to the Dii factor, the secondary accents on the third notes within the four-note motifs are suggested by means of both LS and (most often) SL patterns. Some versions feature a distribution of Dii values indicating that the bars are divided into two equal parts: both 4/4 and 2/2 versions some-

times exhibit LSSL patterning. Subjects 3 and 4 use both Dio patterning and slurring in support of the metre: LS patterns and particularly two-note slurs are quite frequent. Several of the articulation configurations divide the bars into two equal halves.

The performances of variants 2B and 2C do not disclose any distinct ways of expressing 4/4 and 2/2 metre, but when versions of these variants played by the same musician are compared, some possibly effective cues emerge. P1 exchanges SL Dii patterning within each beat in 2B for double-size LSSL patterns in 2C; the consistent LS Dii patterning emphasizing each beat in P2's rendering of variant 2B turns more amorphous in 2C; P3 introduces a distinct initial SL Dii patterning in variant 2C and a suitable articulation configuration to go with it. The renderings of O3 and O4 exhibit a difference between 4/4 and 2/2 metre at least as far as articulation is concerned. On the other hand, C4 uses the same 4/4 slurring and the same LSSL Dii patterning in both variants, and C3 rather seems to remove cues for 2/2 metre when playing 2C.

As to the metre identification test, the versions of variants 2B and 2C were rarely mistaken for renderings of 2A being in triple 6/8 time. The confusion was greater, however, when the listeners were to distinguish between quadruple 4/4 and duple 2/2 time. Granting that this task is more difficult, it seems that some of the renderings may have been more or less misleading with respect to this distinction.

Summary and discussion

It appears that articulation – Dio patterning to some extent, but particularly slurring – is a very effective and common metric cue, and also that articulation is used most often and most consistently when playing the harpsichord and the organ. Pianists rather resort to dynamic emphases in order to bring out accents; stressing is a quite effective cue as well, but since

upbeats can also be signalled by dynamic means, such emphases may make for confusion when playing metrically ambiguous material

Turning to inter-onset timing, Dii patterns in congruence with the metre are fairly frequent. Although probably to some extent an effect of the trochaic and iambic rhythmic organization, the difference in terms of Dii patterning within the beats between versions of variants 1A and 1B indicates that metric accent may be suggested both by relatively longer and relatively shorter durations – provided that the musical structure and the metric cues in the other performance factors so allow. This finding cannot but recall the "positive" and "negative" varieties of *inegalité* known from Baroque treatises dealing with performance. A further interference between rhythm and metre should also be noted: the amphibrach and closed-trochaic rhythmic groups involving the two sixteenth-notes in variants 1A and 1B tend to upset the ensuing Dii-patterning, making for a temporary reversal of the prevailing inter-onset cueing.

The performances of variants 2 A and 2 B/C provide some evidence of consistent Dii and Dio patterning spanning not just the separate beats but the entire bar by dividing it into two uniformly – or differently – patterned three- or four-note motifs, respectively. A further notable aspect of these renderings is the tendency in harpsichord and organ playing, where the A factor is not available, to use slurring and sometimes quite substantial Dii and Dio patterns in order to express the notated metre.

The findings of the present investigation should be regarded as incitements to further research rather than as once and for all established facts. This is not only due to the qualitative and somewhat informal approach, and to the fact that several experimental variables are involved. The great variety of musical styles and performance traditions, the complex relationships between notated metric framework and rhythmic structure, and the many possible interactions between the performance factors, mean that more work is needed before metric communication in music is fully understood.

The three main factors of metric cueing, suspected by discerning musicians and identified by Sloboda and others, are confirmed by the present study. It remains to diversify the insights, to study metric communication in more diverse musical contexts, and to find out how the expression of metre is controlled by the player's musical intentions. Musical metre is no doubt subject to categorical perception, but it might safely be assumed that there is a "categorical production" to go with it.

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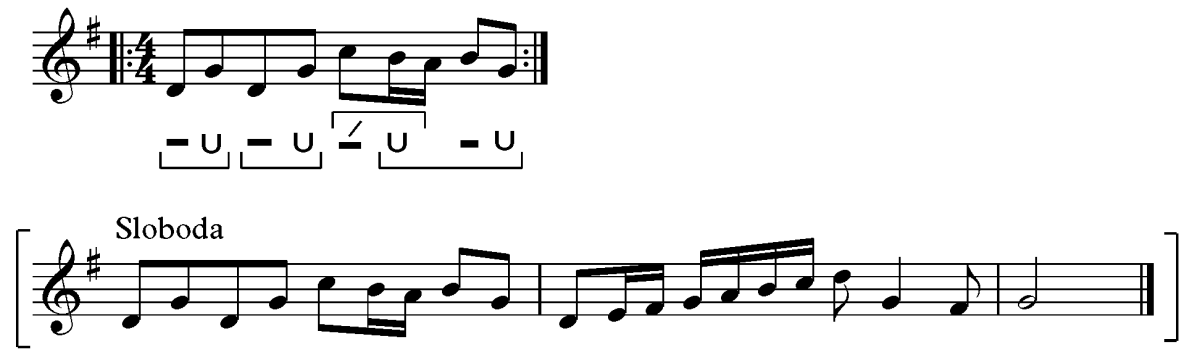
Communicating musical metre

Ex. 1A



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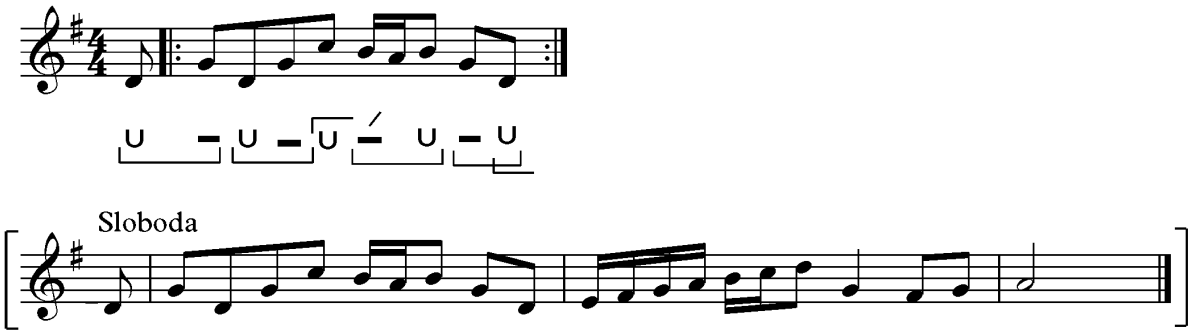
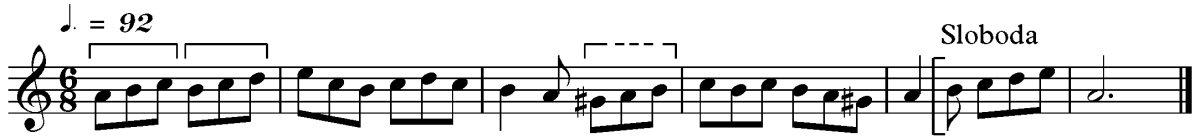


Ex. 2A



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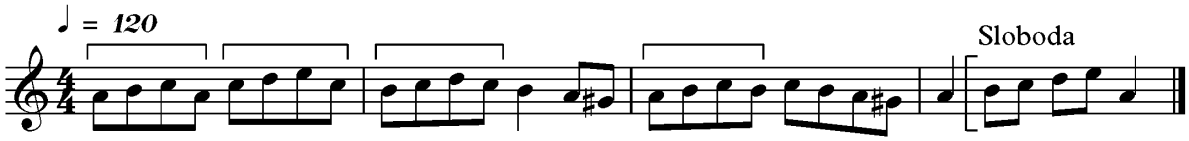
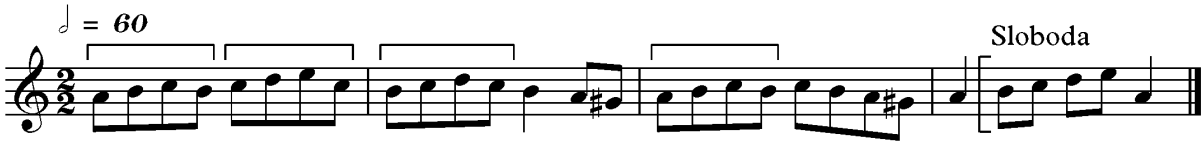


Ex. 2C



Bengt Edlund

Categories and Types of Anticipation in Music

Introduction

Effects of anticipation abound in music, and anticipation is evidently an important vehicle of musical self-reference, yet the varieties and exact workings of anticipation merit a thorough study.

What follows is an attempt to analyse the concept of 'anticipation' as used in music, to present an inventory of the possibilities of musical anticipation, and to give an idea of the cognitive mechanisms involved. Rather than offering an account of the views of various music theorists, I will advance my own understanding of the phenomenon and finally bring a few illustrative music examples. This somewhat egocentric and at times introspective approach will hopefully be productive.[1]

This may be the proper, preliminary moment to file an etymological protest: for some reason the English language has got the prefix wrong. The

[1] Since "anticipation" as understood in this paper is a quite frequent feature in music, discussed under various headings in the analytical literature, it has become an integral element of my musical thinking, an element for which it is impossible to give exact, let alone exhaustive, references. As will be (all too?) apparent, the writings of Leonard B. Meyer and Eugene Narmour, dealing with the workings and ramifications of musical "implication" (expectation) and with the ways melodies behave, are a major source of inspiration.

present topic is by rights “antecipation”. The prefix “anti” suggests a kind of opposition, which is irrelevant, whereas “ante” (before) clearly hits the mark.

But no matter how the core term of this essay is spelled, it has two logically quite distinct meanings, giving rise to two fundamentally different categories of anticipation. “Anticipation” can be used to refer to a situation in which an event, that we have very good reasons to think will occur at a certain moment, turns up before it is due. It seems appropriate to call such premature occurrences of foreseen events “factual” anticipations. In other situations the future event in question has not yet occurred, but we have a fairly exact idea as to what it will be like and perhaps also as to when it will turn up: we actively envisage, “anticipate” the event. Such effects, involving imagined occurrences of events, will be called “prospective” anticipations.

The distinction between forestalling and foreboding, between factual and prospective anticipation, applies to music. This should not come as a surprise since music is not only the art of sound, but also the art of time. Another way to put the crucial distinction is to say that in the first case it is the music that presents the anticipation, whereas in the second case it is the listener that entertains an anticipation.

It is the latter, prospective kind of anticipation that has most attracted music theorists with a cognitive bent, and that will be the main topic here. Why and when do such anticipations occur, what is their range, and how exact is the envisaging? And even more important: what is the relationship between memory and anticipation, and to what extent is anticipation, paradoxical as it may seem, a retrospective experience?

Questions like these lead to broader considerations. Music is certainly the art of sound, and listening is at the core of most research in music cognition. But analysts tend to take the written record of the music as their point of departure and to benefit to the full from using scores, providing readily surveyable maps of the musical events, and sometimes they do so

with little regard to how and whether their observations come off when the music is set into motion and listened to as an evolving process. In addition, and regrettably neglected by most analysts, music is also something that you perform. In order to fully understand anticipation, all three modes of engaging with music should be taken into account.

Turning to how music is processed by the listener – and anticipating what is to come – there are (at least) four different structural mechanisms that may give rise to more or less distinct types of anticipation. The phenomenon of anticipation takes on a different character depending on whether it derives from apprehending music in terms of its immediate continuity, its piecemeal segmentation, its emerging hierarchic structure, or its network of associations.

Factual anticipation

Let's first dispose of the factual, already-here, category of anticipation. "Anticipation" is the technical term for a conventional device described in any textbook on harmony or counterpoint. One note (or several notes) from a chord, bound to appear on a strong metric position, is (are) introduced prematurely on the preceding weak beat, producing a dissonant clash with the notes of the unaccented chord which is still in force – only at the following strong beat will it (they) yield to the new chord. While the applications of this device in some late Romantic music may be highly complex and ambiguous, this kind of anticipation tends to be readily understood. Paradigmatic cases can be found in Baroque cadences where a note (or notes) belonging to the forthcoming tonic chord is (are) anticipated, intruding upon the harmonic and metric territory of the preceding dominant.

In such cases the anticipated note is understood with reference to a chord that has not yet occurred but is safely foreseen. A closer phenomenological analysis of standard Baroque cadences suggests that the ele-

ment of expectation, and hence of prospection, is very slight – there is no need to actually envisage the chord that will bring consonance since the harmonic/metric situation is patently structured beyond any doubt. The relationship between the two events is very close: in a way, the accented tonic chord seems already to be present when the unaccented and stylistically given weak-beat dissonance occurs. Indeed, one might even say that the premature, partial entry of the tonic chord does not so much point forwards to the proper metric location and full statement of that chord, as it derives its meaning backwards from the forthcoming, due-time occurrence of the target chord.

But the phenomenon of forestalled occurrences of events, and hence the category of factual anticipation, is far from exhausted by "anticipation" in this restricted and stereotyped technical sense. Notes belonging to ensuing chords are not the only events that can be introduced before they are due, and the concept of 'factual anticipation' has a much broader application. Two observations are pertinent when considering factual anticipations in general.

Apprehending an event as occurring too early presupposes that, given our understanding of the structural implications of the emerging passage, the expected event is foreseen with considerable certainty, and that its proper temporal location can be taken for more or less granted. In such cases the occurrence of the anticipating event does not give rise to a sense of expectation. Routine Baroque cadences aside, a too-early presentation of something that as far as we know is bound to happen later will rather elicit a sense of surprise.

On the other hand, and this amounts to the second and contradictory observation, factual anticipations of a non-stereotyped kind may sometimes be associated with a sense of envisaging. Since they involve a forthcoming event being introduced prematurely, this event will be actualized: the musical future is suddenly drawn closer. Thus, disregarding again conventional anticipation clichés, factual anticipations may sometimes

give rise to a quite peculiar, immediately satisfied variety of prospective anticipation.

Categories of prospective anticipation

Before turning to prospective anticipations, the second main category of anticipation, a debt should once again to be declared. Most readers will notice that the following account has much in common with Leonard B. Meyer's ideas of how well-founded expectations as regards future musical events are evoked in the minds of competent listeners, or – shaking off the psychological limitations – with his notions of "implication", "generative event" and "realization", phenomena that may be analytically identified by studying musical structures in the score.[2]

When dealing with anticipations in a prospective sense, we turn to a wide range of possibilities of inventing structures that may make the listener envisage the future course of the music. But it is important to notice that the outcome is not given, cannot be entirely foreseen – this is why alert listeners get interested. On the other hand, it also crucial to understand that when entertaining anticipations, our expectations are not indefinite either; the music must suggest its future course in not too uncertain terms. This means that we will leave aside (for the moment) situations in which the music induces a sense of general uncertainty in the listeners – there may, for instance, be a strong but indefinite expectation that a change is about to occur, but there is little sense of musical self-reference.

The (relatively) specific foreboding to be considered here is therefore not triggered by highly ambiguous or uniform generative events. We must also be wary not to unduly extend the concept of 'anticipation' so as to cover all expectations we might entertain, however trivial, at almost any spot in the

[2] Leonard B. Meyer, Explaining Music (Chicago 1973)

music, however insignificant. Just stop the CD, and a latent (quasi-) anticipation will make itself felt. But even with these restrictions in mind prospective anticipation emerges as a vital and frequently employed mechanism of musical coherence and internal reference.

Various types of anticipation-as-expectation will be presented in a following section; here the phenomenon as such is of primary interest. Given that we have a generative, triggering event suggesting a fairly specific future event, and given that nothing is factually anticipated in the music, the pointing towards the expected event emerges as a decisive element in our understanding of the situation – we reach for what is about to come.

But the heightened awareness of a prospective reference is accompanied by several retrospective effects. In order to entertain an anticipation, we must sometimes recall past events as a basis for the prediction we are making; envisaging a future event also means that the generative event must be retained in memory for some time. And when the anticipated, implied event, the realization, has turned up, it reflects back on the event that triggered it. Thus, anticipation in prospective sense is characterized by the fact that the prospection is complemented by retrospection: musical self-reference works in both directions.

It remains to present two special cases of prospective anticipation. The first of them involves situations in which the expected event fails to turn up. This non-appearance does not make the anticipation as such less real – expectations cannot be withdrawn – but our idea of the triggering event is likely to be accommodated in retrospect to allow of an alternative prospective meaning; apparently, the generative event also implied something else. The second case seems (at first) to upset the definition of prospective anticipation: no expectation was aroused. This happens when we discover an event that is understood as related to an earlier event in the same way as an expected event is related to its triggering event. In such

situations there is in fact and after all a generating event, but it was not noticed as such when it occurred, and therefore nothing was foreboded. There was a sense of anticipation, an implicative configuration, albeit a missed one.

Such "past-tense" or "retroactive" anticipations should be understood as constituting a third category in its own right rather than as a sub-category of prospective anticipation. Whether the anticipated event failed to turn up or the triggering event was missed, the listener entertains the anticipation retroactively, feeling that a prospective anticipation might have been present; it is a retrospective experience with a prospective content.

It must be observed, however, that it is necessary that there is a preceding event with a generative potential; if not, the retrospective relationship rather amounts to some kind of association or reminiscence. Such relationships are of course also vehicles of musical self-reference and coherence having their own cognitive mechanisms, but they are distinct from anticipations and fall outside this account.

Generally speaking, anticipation (together with its concomitant effects of retrospection) works so as to extend the narrow frame of the psychological present by holding out future events for the imagination and by fixing the memory of past ones. Anticipation is one of the phenomena by means of which music moulds our sense of time.

Modes of engaging with music

When we listen to a piece of music for the first time, we do not know what will happen after the note just heard. Or rather, we do not know for sure since, using our stylistic knowledge and whatever information we have gained from the piece so far, we can often come up with one or several good predictions. Whether we actually do so, depends on whether the musical situation invites us to envisage how the music will continue, depends

on whether we notice an event triggering an anticipation. Listening is the paradigmatic mode of engaging with music as far as entertaining anticipations is concerned because listening involves moments of temporary uncertainty arousing our interest in future events.

Before dealing with the two other modes of engaging with music, a complication must be settled. Much of our music listening is rehearing, and it might be argued that when we listen repeatedly to the same piece of music, there is no uncertainty and hence no scope for anticipations. But it may be held that we by and large can and do keep our first listening reactions intact.[3] The assurance that a certain continuation (to the extent that we remember it) will turn up does not replace our expectation, but coexists with it. Furthermore, it does not matter very much whether our inclination and ability to anticipate future events derive from our evolving understanding of the musical process, from internalized familiarity with stylistic and structural constraints, or from more or less detailed memories of the work in question.

When reading a score, analytically demonstrable anticipations may be established as timeless objects. But it would be wrong to insist that all analytic observations must necessarily correspond to, and be corroborated by, events that can be readily heard – there are less rigorous ways to establish the desirable relationship between score-based analytic findings and the evasive impressions of music in motion.[4] But since musical anticipation is essentially an aural phenomenon, the problem persists, and it

[3] Meyer, Leonard B., "On Rehearing Music", *The Journal of the American Musicological Society* 14 (1961), 257-267; reprinted in *Music, the Arts, and Ideas*, Chicago 1967, pp. 42-53; cf. also the critical discussion in Jackendoff, Ray, "Musical Parsing and Musical Affect", *Music Perception* 8(1991)2, 199–229

[4] Cf., for instance, Joseph Dubiel, "Hearing, Remembering, Cold Storage, Purism, Evidence, and Attitude Adjustment", *Current Musicology* 60/61 (1996), 26-50

must be admitted that analysts are prone to exaggerate the amount of anticipation that actually takes place when enjoying music.

Detecting anticipations in the score, i.e. establishing that some event in the musical structure may reasonably be heard as somehow foreboding a later event, is of course a legitimate enterprise, and it makes up an important aspect of structural understanding. But analyses of this kind sometimes grant themselves the privilege of operating outside the temporal constraints that hold for prospective anticipation as an aural musical phenomenon. When inspecting a score, recollection as well as foresight are unlimited, and the "anticipations" thus identified may therefore turn out as implausible. Sometimes it is not very likely that any listener will actually be triggered by the alleged generative event; sometimes it is doubtful whether anybody will envisage, and then appreciate, a forthcoming event as being implied.

Since you are free to study notated musical events in reversed order so as to discover whatever relationships that may obtain between them, it is probable that some of the anticipations identified when studying scores are not genuinely prospective but rather retroactive, "past-tense" anticipations. Yet they may after all work as "present-tense", prospective anticipations once you know that the relationship is there, and if you choose to use this insight when listening the next time.

To sum up, anticipations identified in scores should always be critically assessed in order to distinguish those that are likely to be operative (whether prospectively or "retroactively prospectively") in actual listening situations, presupposing attentive and stylistically informed listeners.

The third mode of engaging with music, performance, occupies a mediating position between listening and reading. Far from being just a matter of converting signs into sound, an artistic performance is always based on an interpretation, i.e. on a certain way of apprehending the musical events and their relationships. Interpretation in turn involves a

number of more or less conscious choices, some of which concern the rendering of anticipations – you simply cannot avoid treating them one way or the other.

Anticipatory relationships can be suppressed or brought out when playing the music. Depending on which anticipations the musician has discovered in the score, quite prominent anticipations may be suppressed, whereas analytically negligible anticipations may be rendered as important. The role of interpretation when it comes to how and whether listeners actually perceive anticipations is evident, and in particular it seems that the timing of the player's interferences is often crucial.

It must be stressed that analysts cannot escape the influence of interpretation when studying anticipations. To the extent that they base their observations on the sounding musical substance at all, analysts are bound to experience the music in terms of some interpretation, whether one of their own or recalling that of someone else.

Turning finally to the musicians, they are not likely to really entertain anticipations in a prospective sense. While analysts in spite of their omniscient perspective may with some success listen prospectively, expectations, i.e. truly prospective anticipations, cannot be entertained by musicians. They know exactly what the forthcoming events are, and what configurations these events will give rise to when joined with present and past events; and they plan how to deal with such situations. How else could they convey a sense of anticipation in a convincing way?

Types of anticipation

In this section four types of anticipation will be distinguished, and they will be described in terms of their generative events and the expectations evoked. Although these mechanisms of anticipation are logically distinct, they may of course be combined; the actual specimens met with in musical

practice are often hybrids. It is not claimed that the types to be proposed exhaust the possibilities of musical anticipation.

Short-range anticipations arise from the fact that music brings a continuous flow of events that are mutually dependent and functionally related to each other. If we apprehend music in this way, it will emerge as an additive, chain-like, cause-and-effect phenomenon, making it possible to predict its future course a few notes ahead with some precision. Memory is hardly required for entertaining such expectations – anticipations pertaining to this mode of listening are based on events that seem to be present more or less simultaneously. And if the expected event or events fail to turn up, there is normally no problem: new local goals are envisaged to fit the continually changing background of past events. Short-range anticipations based on musical coherence are likely to be very frequent, and many of them, being more or less trivial, tend to pass unnoticed or emerge as merely transient phenomena.

But there is a certain kind of anticipation based on continuity that brings quite important effects, and that may characterize fairly large passages of music. It is not just note-to-note, routine coherence that is at work here; the passages tend to be artfully designed, and they may take anticipation to monumental heights. The core of the phenomenon is gradual, cumulating change, and various compositional/perceptual mechanisms may be involved, but the net result of the process is usually some kind of expansion (or withdrawal). The sense of anticipation may be very strong, and yet the expectation is often quite vague in terms of content: a resolving event bringing change is likely to occur, but we have no very specific idea as to what this shift will be like and when it will occur.[5] Since the initial triggering and final resolving events are only weakly related, there is little sense of internal reference involved.

[5] A breathtaking example is the longer-than-possible, rising-twelfth gesture in the *Lacrimosa* movement of Mozart's Requiem.

More often than not, the effect of expansion is heightened by a concomitant feature which is again of anticipatory nature. Before the expansion sets in, the musical activity is reduced or almost brought to a standstill: an extended state of suspense is created, from which the ensuing gradual intensification will eventually emerge. Both these devices – gradual intensification and an initial passage of suspended activity – tend to be used at important formal junctures or crucial turning points in the music, and the sense of anticipation felt is well captured by the word "foreboding", although the mood of the phenomenon must not necessarily be ominous.[6] This particular variety of continuity might aptly be called "preparatory" anticipation.

But music is seldom just a continuous chain of events. Regularly or intermittently, the structure signals (relative) closure in a variety of ways, and as a result of these demarcations the music emerges as divided into units of various size. In concurrence with its sense of continuity, then, music is heard as segmented.

Segmentation allows of more extended anticipations – a whole unit of a certain size and presumably bringing certain events is expected – but envisaging entire units presupposes, at least if it is to be a vivid musical experience, that a triggering unit of comparable format can be held together as an immediate percept in our short-term memory. The anticipated unit may sometimes be envisaged in considerable detail, but the core of the phenomenon seems to be that it is the size of the forthcoming unit that is anticipated, including the temporal location(s) of some salient event(s) within it. Segmentation, then, tends to give rise to the impression that the timing of future events is foreseen.

Much music has a more or less strict hierarchic structure, and it appears

[6] The most famous, one might say paradigmatic, example is no doubt the charged transition to the finale in Beethoven's fifth symphony.

that two kinds of hierarchy are of interest with respect to anticipation. If the segmentation is consistent and regular (or fairly so), we tend to hear the music as a hierarchy in terms of units: when units add up to, and are subsumed under, larger units, a hierarchy is formed. Experiencing such hierarchies in the making means imagining quite extended passages of music as made up partly of memorized units, partly of envisaged ones. It also implies that not-yet realized higher-level properties of the hierarchy are foreseen: prospective and retrospective relationships between units begin to emerge, and internal proportions, balances, and symmetries are felt in advance.

The other pertinent hierarchy is a matter of selection. Some events appear to be more salient, or are for some reason considered to be structurally more important, than others, and when taken out of their continuous substratum and joined together, they form a second layer, superior to, and yet inherent in, the basic layer comprising all events. If the music is apprehended as a hierarchy of such layers (there may be several), the chances of entertaining long-range anticipations are considerably increased since higher-level generative events may set up their own more or less foreseen, distant realizations. This presupposes that the foundation of the higher-level anticipations, i.e. the sparse selected notes making up the triggering event, is retained in memory.

The selective layers in view are not primarily those arrived at by means of Schenkerian reduction. Whereas foreground and some middleground motions, if reasonably salient, may give rise to significant anticipations, tonal connections residing at background levels will hardly do so. They are likely to be too extended, and when approaching their often theoretically predetermined goals they will have lost much of their force as anticipations.

In addition to its hierarchic construction, music also tends to have a looser organization in terms of associative networks. More or less distant events

appear to be related to each other on the basis of similarity or some shared quality – model/copy relationships have a potential to give rise to anticipations. But it is important to realize that, due to the intermittent nature of networks, most of these associations are detected only after the fact. Anticipations grounded on associations therefore tend to emerge as retrospective, "past-tense" anticipations: the second member of the associative connection reminds us of a preceding event, retrospectively emerging as having an anticipative quality.

However, if an event has a triggering quality while you hear it – it may sound enigmatic or have a sense of incompleteness, qualities arousing our curiosity and making us listen attentively to find a matching future event that will eventually provide satisfaction – associative anticipations can also be prospective, informing and spanning very large portions of the musical structure.

Mozart, the variation theme of the Piano Sonata K. 331

It remains to bring and comment upon some examples illustrating the types of anticipation presented above. In addition to serving as a recapitulation, this discussion may further clarify the phenomenological issues involved. The examples will be drawn from three works, the first of which is the theme of the variation movement of Mozart's Piano Sonata K. 331; cf. Ex. 1. This choice could be anticipated, considering the status of this piece in music theory, but the K. 331 theme offers an opportunity to distinguish between anticipations arising from specific pre-knowledge on the one hand, and anticipations based on the internalized assumption that musical formulations are subject to familiar tonal and stylistic conventions, on the other.[7]

[7] The K. 331 theme is thoroughly studied in Bengt Edlund, "Analytical Variations on a Theme by Mozart", ch. 1 in *Analytical Variations*, Frankfurt 2020, Peter Lang Verlag

Segmentation is a pervading trait in Mozart's theme. This means that once m. 1 and the first note of m. 2 have been played, listeners at home in Classical music will suspect that a further unit of 6/8 size will follow. And having heard two more notes, virtually all listeners are able to anticipate the two d^2's completing m. 2 – a quite safe expectation since the melodic model given in m. 1 has been confirmed by the recurrence of the initial three-note motif. By this time a higher-level motion in parallel tenths has also emerged: the motion $c\sharp^2$/a–b^1/$g\sharp$ is selected and becomes the triggering event for anticipating a^1/$f\sharp$ in m. 3 as the proper continuation.

And this sonority does turn up, but in other respects the content of m. 3 is not expected. The dotted motif fails to occur; instead the note-repeating motif is used twice, bringing the melody back to $c\sharp^2$/a at the beginning of m. 4. This goal is anticipated due to the ascending parallel-tenth motion emerging during m. 3, a continuity that is made conspicuous by the faster pace of the ascent; indeed, $c\sharp^2$/a has a sense of having arrived too early. On the other hand, and due to a (perhaps) retrospective higher-level discovery, the completion of the third member of a descending series of rising thirds in the treble is delayed, $c\sharp^2$–e^2, b^1–d^2, and a^1–(b^1)–$c\sharp^2$; and delayed is also the third note of a complementary upper-line descent begun back in m. 1, e^2–d^2– –$c\sharp^2$. Paradoxically, the $c\sharp^2$ starting m. 4 has also a quality of being too late, a fact that cannot but make it even more expected.

As a result of the delay within especially the rising third a^1–(b^1)–$c\sharp^2$, the listener will feel that the formal unit under way will be stretched to double size, and he/she will also be able to envisage the proportions and balanced make-up of the emerging 1+1+2 bar metric configuration. The final dominant sonority b^1/$g\sharp^1$/e in m. 4 is not only expected from a harmonic point of view, but also (weakly) anticipated as the final outcome of three parallel descending-fourth motions begun in m. 1 from e^2, $c\sharp^2$, and a, respectively.

Turning to the consequent, m. 7 brings a crucial deviation. In comparison

with m. 3 the returning motion to c♯^{2} takes only half the time – as a result mm. 5–8 seem to be shorter than mm. 1–4, although the music finally reaches past the dominant to the tonic. This means, on the other hand, that the duration of the rising third a^1–(b^1)–c♯^{2} is adjusted so as to fit in with that of the preceding members of the sequence, and also that the upper line from e^2 arrives at c♯^{2} in due time. The c♯^{2} in the middle of m. 7 is no less anticipated than the "same" note at the beginning of m. 4, but the situation is subtly different.

Due to the general similarity there is clearly a model/copy association between mm. 1-4 and mm. 5-8, but it neither gives rise to a prospective anticipation, nor to a "past-tense" one, since m. 3 could not reasonably be heard as, and cannot retroactively be understood as, a triggering event with respect to m. 7. The listener, remembering mm. 3–4 and being startled by the unexpected quick melodic rise in m. 7, will rather enjoy a quality of factual anticipation when the c♯^{2} turns up "too early", urging the conclusion of the period, but the recognition of the swift a^1–b^1–c♯^{2} gesture as a deviation from the tranquil, note-repeating a^1–b^1–c♯^{2} motion in mm. 3–4 is likely to happen slightly after the fact.

Bar 7 may be understood as a shortened variant of mm. 3–4 – both motions bring the melody back to its point of departure after the lower-line descent c♯^{2}–b^1–a^1 – but it can also be heard as a fresh gesture issuing from a^1 with greater determination. And it seems that the pianist can easily tip the perception over in favour of the latter option by giving m. 7 a more decisive quality – this will in fact come as quite natural since the motion up to c♯^{2} is demonstratively quicker than the one in mm. 3–4. Indeed, the pianist may choose to play the note-repeating ascent in m. 3 in a more resolute manner as well, which would amount to a kind of factual anticipation in the interpretational domain – the rendering appropriate for m. 7 is applied prematurely in m. 3. (This may seem to be slightly against the grain, but there is a long-term, "strategic" support for this interpretation; cf. below.) Turning to the listener, this way of playing, suggesting an in-

tentional interference in the musical process, will strengthen the network association and give a retrospective hint to the effect that the slow ascent in mm. 3–4 was after all a triggering event. Thus, the situation may in a way involve an element of "past-tense" anticipation.

A deviation from the melodic model turns up after the double-bar, but the fact that the motion is reduced to just a rising second should not be presented as a surprise – the pianist had better prepare for the heightened tension before it is a fact by already bringing out the first three notes. This interpretative anticipation is also desirable, indeed necessary, from a long-range perspective since it highlights the fact that the tonal core of the melody is raised from $c\sharp^2$ to e^2.

The unexpected, premature occurrence of the contracted a^1–(b^1)–$c\sharp^2$ variant already in m. 15 means a frustration of the anticipation that the antecedent of the initial period will be replicated, and this in turn suggests that the hierarchical design of the theme might not turn out as expected. One might vaguely feel that the four-bar unit mm. 13–16 has to be stretched, passably restoring overall balance by means of a local disproportion. And an ensuing extension is what m. 16 announces in a most extraordinary way: first the entirely surprising clash between right-hand dominant and left-hand tonic, then the unusual rising resolution, asking for a continuation.

The second right-hand chord in m. 16 is apparently the resolution of the preceding six-four sonority, but retrospectively, when we have heard this chord repeated at the strong beat, it also or rather emerges as a factual harmonic anticipation of the dominant. This impression can be supported, made "present-tense", if the player slightly stresses the resolution chord as becomes an anticipated chord – and as becomes an acute dissonance.

This device is immediately applied once again: the final rising inflection in the right hand in m. 16 seems less to be a resolution of the preceding

dissonance than a factual anticipation of the tonic chord at the ensuing main downbeat. But this twist of meaning is hardly retrospective – due to the unusual rising resolution, the option to construe the last event in m. 16 as a factual anticipation is likely to present itself immediately. This conspicuous afterbeat/upbeat chord is acutely anticipative in a prospective sense as well, and it is crucial since it welds together the two-bar coda and the preceding section, producing a final six-bar unit.

The passage mm. 17–18 is more than an appended coda, however; while being demonstratively forged with m. 16, it concurrently signals a new start.[8] The listener may also hear that m. 17 is a raised-pitch imitation of m. 15, an association that the pianist can suggest by playing m. 15 in a determined manner anticipating the *forte* entry to come.

Thus, if the interpretation invites to it, a network of associations, made up of "past-tense" (but nevertheless prospective) anticipations, may seem to span the entire theme from m. 3 via mm. 7 and 15 to m. 17. This means that the descending tendency of mm. 1–2, 5–6, and 13–14 is counterbalanced and finally overcome by a crowning rise. For undoubtedly the last-moment a^2 in m. 17 is a factual melodic anticipation of a non-realized a^2 in m. 18 – it is represented by a^1 – an a^2 that in tonal terms brings the eighth degree.

Beethoven, the first movement of the Violin Concerto

Finally, two anticipations worked out on a broader canvas should be presented. Beethoven provides a bold and yet very subtle specimen in the first movement of his Violin Concerto Op. 61; cf. Ex. 2. The passages in ques-

[8] It might be argued that it represents the fourth, shortened and drastically varied, entry of the main thematic material – a relationship that comes clearly to the fore in the variations; cf. Bengt Edlund, *Analytical Variations*, ch. 1.

tion have been carefully analysed from a structural/phenomenological point of view by Joseph Dubiel.[9] What follows is a brief account bringing out some important points of his discussion.

The orchestral exposition begins with five soft tonic d's in the timpani, and this pattern is repeated in m. 5, featuring five dominant A's. At this stage the listeners will understand that the five d's were not just an introductory background for the woodwind melody, but a motivic idea: a five-note regular rhythm closing with a downbeat.

But what happens in m. 10 is entirely unexpected: four soft, tonally out-of-place d♯¹'s are heard, and these tonic-raised-by-a-semitone notes are played by the first violins, imitating the timpani in a very strange way. Furthermore, instead of a final downbeat d♯¹, m. 11 brings a dominant seventh-chord. This is in a way a normal continuation – the pitch-class E, to which the preceding, tonally unstable d♯¹'s seemed likely to move, is a member of the dominant seventh-chord – but the e that actually turns up in m. 11 is one octave too low, and the dominant seventh-chord is played by all the other strings in *forte*. There is a strong sense that the first violins have been interrupted, that the note-repeating motif is incomplete, and that no satisfactory resolution of the strange d♯¹'s has been provided. This odd shift is immediately repeated in varied, heightened form in mm. 12–13, but this time the resolution chord is displaced upwards, and the pitch-class E is omitted altogether from the dominant ninth-chord. Then, as if nothing had happened, the music proceeds with a four-bar phrase closing in the tonic.

But a triggering event, brought twice to be on the safe side, has been planted in the listeners' ears. Left in the air is a feeling of suspense – something has been promised but it is withheld. The analyst can tell us what it is: we expect the motif to be restored to its rhythmically stable, five-note length, and the music to come up with a proper way of ridding itself of the d♯¹'s. As listeners, on the other hand, we are just likely to have

[9] Cf. Joseph Dubiel, "Hearing, Remembering"

a feeling that something is "wrong": we are aroused, and however vague our idea of the satisfying event may be, our attention is directed towards it.

And after a long while – interspersed are among other things a vigorous B♭-major outburst and the entire second-theme episode – a duplicated event turns up that fits so well that it cannot but associate back to the two triggering events. Bars 65 and 67 bring four soft diminished-triad sonorities containing the dyad d♯^{1}/d♯^{2}, chords that are led a half-step upwards to dominant seventh-chords, a parallel motion producing at long last the wanted e^1/e^2. A prospective anticipation, fed by a vague expectation and eventually activated by a retrospective association, and spanning almost the entire exposition, has finally been satisfied. As if confirming that this huge detour is over, the music then grows into an emphatic cadence, an expansion that is prepared for by the pent-up energy in mm. 65–68.

Schumann, Piano Concerto Op. 54

In Schumann's Piano Concerto Op. 54, cf. Ex. 3, the second movement finally dissipates into ever more sparse motivic particles, until a motif recalling the very start of the main theme in the first movement turns up twice in the woodwinds. The first time it is changed into A major (m. 103), the second time, adding a plaintive touch to the longing gesture, it is restored to A minor (m. 105); these *ritardando* motifs are followed by dreaming veils in the solo part. In mm. 107–108 the motivic recurrence is tightened up: two A-major statements of the motif are heard in close succession, and the second one is to be played very urgently (*crescendo* and *stringendo*). Then the lively finale immediately ensues. But the initial fanfare brought by the piano is a varied statement of the next motif from the main theme of the first movement. The first eight bars of the third movement turn out

to be introductory; the complete finale theme, beginning with the fanfare, does not start until m. 9.

The recurrences in mm. 103, 105, and 107–108 at the end of the second movement are of course not realizations of an anticipation, incited by a motif from the main theme of the first movement, and this goes of course for the fanfare starting the finale as well. However retroactive and "past-tense" anticipations may sometimes be, these associations make up reminiscences. Neither when it was heard, nor in retrospect, does the main theme of the first movement give any reason to suspect that it will be used as a link between the second and the third movement, and if there is no sense of triggering there can be no anticipation. The music harks back, and the composer excels in unifying his work by means of thematic transformations. But the first eight bars of the finale, on the other hand, are clearly prospective. When the music brings an emphatic cadence already in mm. 5-8, the listener anticipates a more complete thematic statement than the motif delivered by the piano, and it is promptly delivered.

But what about mm. 103–106 in the second movement? A major is back in m. 107, for good as it will turn out, and m. 108 is then irresistibly attracted by the finale as if by a strong magnet: the tempo is steeply increased and so is the dynamics, and all instruments are brought in. The change of mood is anticipated as a flush shortly precedes overt anger, but no specific expectation is involved. It appears that mm. 103-106 have a dual meaning. They do not just present reminiscences: their static character sets them off and accumulates tension, and by bringing the contrasting stillness out of which the radical shift in mood will be born, they certainly make up the preparatory first stage of the anticipation of the finale theme. The second and third stages are of course the A-major mm. 107–108 and the *Allgro vivace* fanfare. Take mm. 103–106 away, and the urging two-bar allusion to the first-movement theme now left to trigger the finale will lose most of its power.

Summary

The discussion has indicated that there are three categories of anticipation.

"Factual anticipation" means that a musical event, whose proper moment of occurrence is patently known, turns up prematurely: the event is in fact anticipated. Beyond the melodic/harmonic anticipation cliché, factual anticipations may work so as to direct the listener's attention towards future events, and are thus to some extent prospective.

A genuine "prospective anticipation" involves a triggering event making the listener envisage the future course of the music with some certainty. Nothing is presented prematurely; it is the listener who entertains the anticipation, and the core of the phenomenon is expectation or foreboding.

"Past-tense" or "retrospective anticipation" makes up the third category. Nothing is envisaged by the listener because no triggering event was noticed. Later on, however, when an event has been presented that invites to be understood as related to, as being held out in prospect by, a certain earlier event, this preceding event is reactivated, and the listener may discover that it did after all have a potential to trigger a prospective anticipation. The anticipation is only established in retrospect, after the missed fact.

Whereas listening is the paradigmatic mode of musical engagement as far as anticipations are concerned, it is necessary to consider reading as well as performing for a full understanding of the phenomenon. The reading analyst, unimpeded by the limitations of memory and with free access to future events, is able to detect more anticipations (or would-be-anticipations) than any listener can appreciate. Interpretation involves mediating the musical structure in all its phenomenal complexity. It may therefore entail both suppressing and bringing out anticipations that seem to be in-

herent in the text. Musicians, knowing what will happen, do not themselves entertain anticipations, but when devising their interpretations anticipation effects should be taken into account.

Four types of anticipation have been proposed.

The fact that music mostly appears to be continuously coherent may give rise to sequences of short-range anticipations – or to quite extended and intense states of foreboding, if the music is designed as a gradual or static preparation for events to come.

Segmentation in music makes it possible to anticipate entire units in some detail, and in particular to envisage the size of forthcoming units, including the occurrence of salient future events.

Hierarchic structure seems to be relevant for anticipation in two ways. An evolving hierarchy of structural units may lead the listener to predict the properties of fairly large portions of music. Conspicuous or otherwise important events may stand out and be selected from the musical process, and when joined to form extended sub-surface connections, a higher-level continuity may emerge inviting the listener to envisage distant events.

A composition may exhibit a network of associations binding together widely separated events that sometimes seem to refer to each other in anticipatory terms.

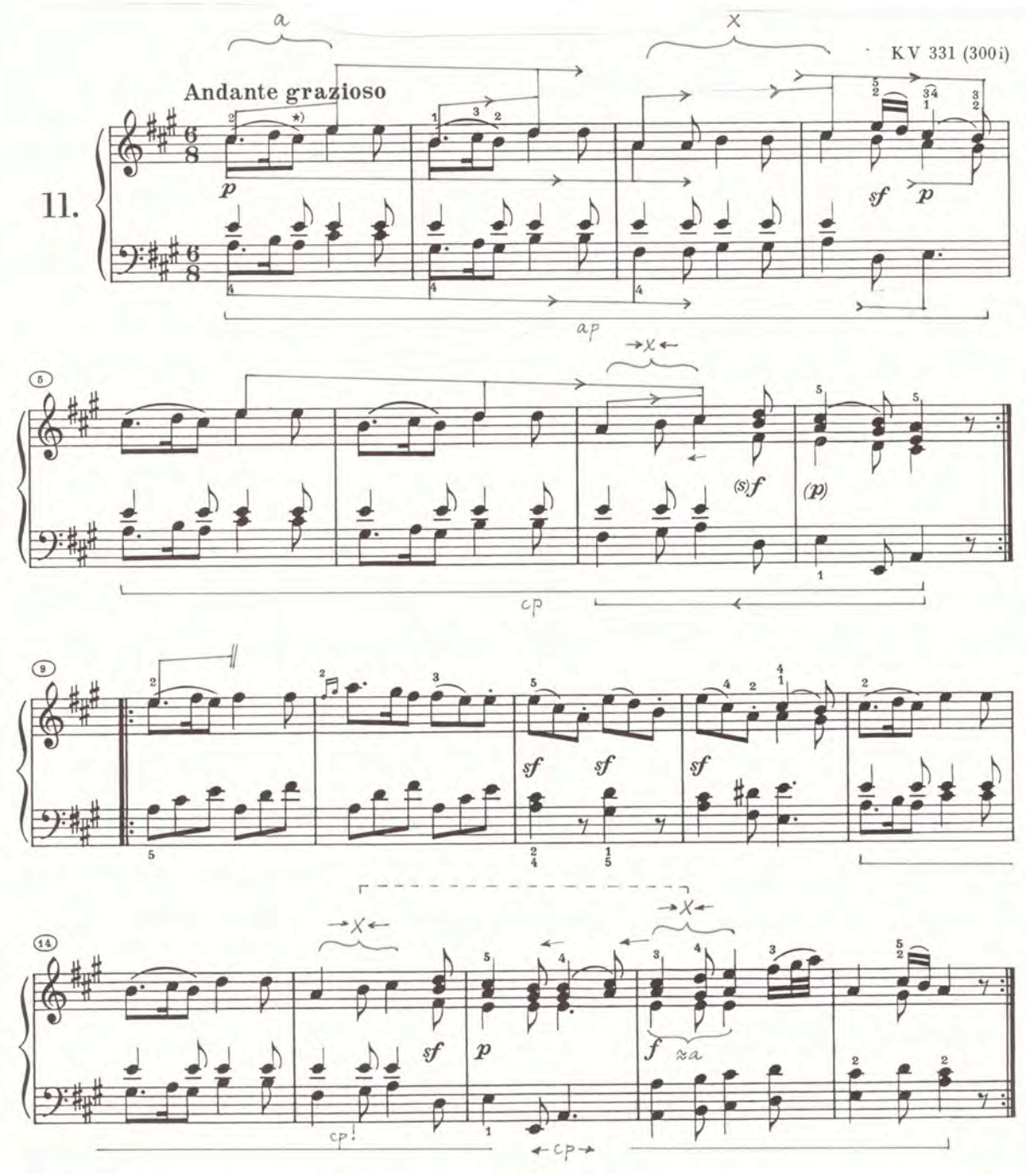
'Anticipation' emerges as a most valuable, indeed indispensable concept when it comes to analysis with the intent to describe and explain how music understanding works. But it is no doubt an intricate object of study. The inventory presented here suggests the complex ramifications of this phenomenon, and it is necessary not only to make distinctions between various categories of anticipation, but also between different types of anticipation depending on the kind of structural mechanism that is involved. But no matter what categories and types of anticipation you propose, artis-

tic practice will always come up with fresh applications and unforeseeable combinations that transcend any imposed order.

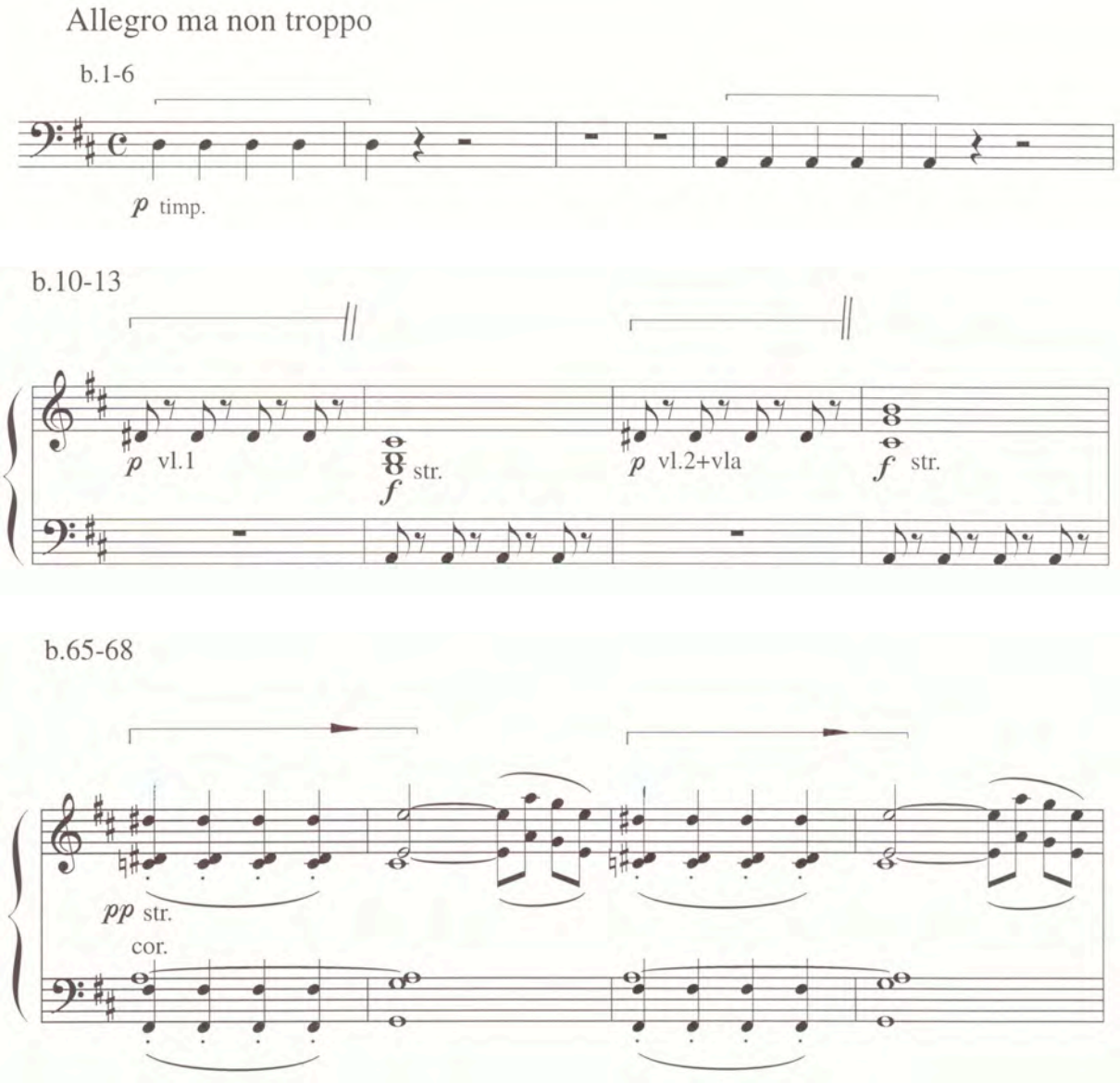
It is of vital importance to understand the interplay between the prospective and retrospective aspects that characterize this peculiar sort of musical self-reference, as well as to take account of the fact that anticipation takes on different forms when applied to listening, reading, and performing.

Categories and types of anticipation in music

Ex. 1 Mozart Piano Sonata K. 331, 1st Mov.



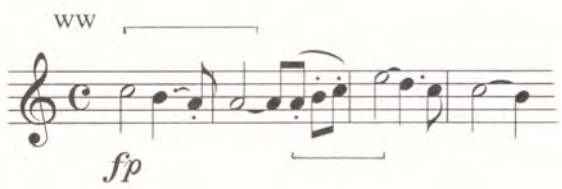
Ex. 2 Beethoven Violin Concerto, 1st Mov.



Ex. 3 Schumann Piano Concerto

I Allegro affetuoso

b.4-7

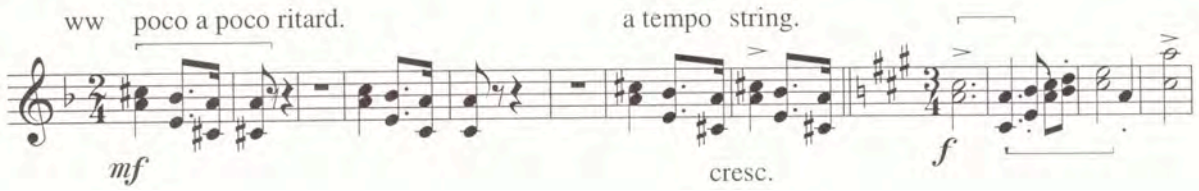


II Andantino gracioso

b.103-108

III Allegro vivace

b.1-4



Bengt Edlund

Symmetry in Music

The concept of 'symmetry'

Various kinds of symmetry have been mathematically defined, and physics, chemistry, and biology teach us that nature abounds in symmetries of all sorts – indeed, where no symmetry has as yet been observed, it is often taken for granted as a heuristic device. Cultural anthropology and the history of ideas have shown that reasoning in terms of symmetry is deeply ingrained in us, and cognitive studies suggest that symmetric schemes belong to the basic tools of understanding. No wonder, then, that the world of artefacts – and not least the works of literature, visual arts, and music – is replete with objects and processes exhibiting symmetry, and no wonder that this fact has attracted the interest of aestheticians and analysts. Some of them have even been obsessed by the Golden section, a peculiarly balanced asymmetry of proportions considered to possess exquisite perceptual properties.[1]

If one studies the concept of 'symmetry' as applied in the natural and social sciences, and finally in the humanities and the arts, it can be observed

[1] Cf. Bengt Edlund, "Mozart out of proportion", ch. 3 in *Analytical Variations*, Frankfurt 2020, Peter Lang Verlag, and "Evidence and counter-evidence", ch. 2 in *Chopin. The preludes and beyond*, Frankfurt 2013, Peter Lang Verlag.

that deviations from strict symmetric replication begin to be accepted, that fairly woolly senses of 'symmetry' are introduced, and that widened definitions betraying influences from or confluences with other related concepts gain ground.[2]

Strictly understood, 'symmetry' is a matter of mirroring and congruence, and it can be defined in terms of exact correspondence in size, form, and position on each side of a line/plane or around a point/axis. In the arts further varieties of reflection might be subsumed under the notion of 'symmetry': uniform, regular occurrence of more or less equal parts, balance between constituents making up a whole, ordered juxtaposition of opposites, and even conspicuous display of contrasts. The idea of 'symmetry' as a matter of uniformity and regularity of design emerges as the most far-reaching extension since the identity, similarity, or contrast involved obtains recursively from unit to unit.

It seems that the concept of 'symmetry' primarily derives from visual perception and the notion of space, and that this origin has thoroughly influenced how we conceive of symmetries in music.[3] But music is an art that evolves in time, which implies that it is likely to have its own kinds of symmetry, deriving from the dual fact that musical processes cannot be reversed and are difficult to take in. A core problem, then, is that we are prone to see too much symmetry when looking in the score but hear too little of it when we listen to the music, that many alleged symmetries in music do not come off as perceived musical phenomena. It may be said, and it sometimes is, that music is "floating architecture", but the grain of truth in this cliché needs many grains of salt to precipitate. Indeed, if we take seriously Schelling's corresponding, symmetric statement *"Die Architektur ist gefrorene Musik"*, the buildings run the risk of collapsing when the thaw sets in.

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[2] There is no reason to complain about this state of affairs; insights may be promoted both by widening and narrowing conceptual content.

[3] Conversely, it makes sense to consider 'rhythm' as a primarily temporal category, having a close connection with the auditory sense and with music.

The aim of this essay is to present and discuss various kinds of symmetry in music. In the first section to follow, and when pertinent elsewhere, musical symmetry will be illuminated by actualizing some differences between music and the visual arts.

Symmetry in music and in the visual arts

Apart from the fact that sculptures make additional sense when you touch them (if you are allowed to do so) and from other non-paradigmatic ways of enjoying visual art, art works are there to be seen. But the corresponding notion that music is (of course) the art of sounds, is on second thoughts a delusion. There is, particularly in Western art music, a complementary possibility: some people are able to read music. And when the music emerges as a visible "thing" in the score, it may – disregarding the fact that it is supposed to move in time – be studied in the same, non-temporal way as you observe a picture. And even more important, there is a further, quite valid way to enjoy music: to perform it. Indeed, some people maintain that making music is more gratifying than (just) listening to it since you actively produce, and can influence, what you are hearing. Furthermore, playing and singing involve further sensations emanating from the fact that you bring forth the music by means of your own body.[4]

The symmetries of buildings and sculptures come gradually to the fore as you walk inside or around them, trying to make a synthesis out of the various perspectives. But – leaving aside saccadic eye movements, lateral eye differences, as well as rabbit/duck perceptions – the properties of paintings and drawings are there to be seen at a single glance. (This is of course not to

[4] The proprioceptive sensations associated with performing music make up a crucial aspect of music, and to the musician they give rise to patterns complementing the structures inherent in the music as an auditory and visual phenomenon; cf. Bengt Edlund, "A comprehensive approach to musical idiomatic", ch. 6 **in** *Wits and Interpretation,* Berlin 2023, Peter Lang Verlag, and "Proprioceptive patterns in music" in Varia 1.

deny that you must observe some pictures for quite a long time before you can be said to have appreciated them.) Works of music are like three-dimensional visual artworks in as far as there is a temporal process involved when you acquaint yourself with them. But unless you are reading a score, you cannot stroll around at your own discretion in a piece of music; you have to listen to its passages and to each of its notes in the very order prescribed in the score. Genuine, phenomenal, musical symmetries are therefore never actually present, but always in the making – they reside in a complex of past events stored in your memory and future events that the evolving musical structure induces you to envisage.

In art as well as in music there may from time to time be rules or conventions regulating how symmetries are to be created and perceived, rules or conventions distinguishing between possible, permissible, and meaningful symmetries on the one hand, and symmetries that seem strange or simply do not work on the other. In representational art, and particularly in art that is subject to the laws of perspective, some symmetry arrangements are likely to strike the beholder as odd, implausible, or incorrect – a fact that of course does not prevent such artworks from being aesthetically rewarding. In most musical idioms the very tonal substance embodies tendencies and effects, which emerge as seemingly inescapable dispositions of the tones to move and to be heard in certain ways. In "tonal" music the notes are not entities that can be freely arranged in order to produce symmetries – the notes must also give rise to syntactically well-formed musical formulations.

How do we discover musical symmetries, and how can they be confirmed? Normally we listen to someone playing a piece of music, and if we want to check our observations, we can hear the music again by recalling the music in our memory or by listening to the recording once more. Alternatively, and provided that we are capable of doing so, we can read the score and hear the music inwardly.

But, as already pointed out, using scores entails a risk of making mistakes – you never know for sure whether you have heard, or become aware

of, a certain symmetry only because you have (first) seen it. And beyond this problem there is a further one that may jeopardize the objectivity of any aural observation of symmetry. Music cannot be heard without being performed, without being transformed from signs to sounds according to a certain interpretation, and this holds not only when the music is actually played by someone, but also when you read it, i.e. when you listen to the music according to your own imagined interpretation.

It is likely that at least some of the interferences associated with the act of interpretation involve cues making for symmetry, and hence that a particular performance might affect the musical substance in ways that either bring out latent symmetries or hide away otherwise perceptible ones. Phenomenal symmetry, then, is not ultimately a property of the structure-as-composed, but a feature of the structure-as-performed. This means that it may sometimes be difficult to positively specify what makes a musical passage symmetric, and that phenomenal musical symmetry may lack intersubjective validity – since interpretations can be quite different, our experiences do not derive from the same object.

Beholding a work of visual art also comprises an interpretation of its structure, but the problem in music is different since two superimposed interpretations are involved. Two listeners may understand a certain performance in different ways, and two performances (real or imagined) of the same work tend to be different because they are different interpretations of the composed structure. Spectators, on the other hand, may see different configurations in a picture that – leaving out of account contingent circumstances such as various lighting and pigment changes over time – retains its physical properties. Since there is (in the paradigmatic cases) no intervening interpreter in a visual work of art, there is but one object to which the beholder's observations refer, whereas in music there are two – the musical substance inherent in the score and the musician's interpretation of it.

Furthermore, when we read, recall, or imagine music in order to check our aural impressions, we run the risk of being deluded since inward, silent performances may take (much) less time than actual renderings of the mu-

sic. And yet the tempo does not seem to be hurried; what probably happens is that certain details or indeed entire passages are displayed as discrete chunks in our memory rather than being inwardly performed and actually experienced. This means that the musical flow is turned into a compressed sequence of selected fixtures – it is deprived of some of its temporality – and that attempts at confirming phenomenal symmetries are liable to involve mistakes.

Three delimitations

Large-scale symmetries in music works tend to be quite obvious; indeed, (approximate) symmetry is often required by the "form" governing the piece in question. For instance, when the music starts again after the contrasting Trio section in a minuet or scherzo, any attentive listener will recall that he/she has heard this melody, this rhythm, these sound qualities before, and appreciate the fact that he/she is (presumably) about to experience a repeat of the initial section and then the foreseeable close of a symmetric musical construct. The perception of such large-scale recurrences does not involve musical memory and expectation in a very dynamic way – the listener simply steps back from the ongoing events and enjoys the music at a greater distance – and symmetries involving extended and obviously similar sections of music will therefore be put aside in the following discussion.

In contrast, when presented with a (fairly short) passage of tonal music, alert listeners will to varying degrees be aware of an evolving musical entity displaying both an intricate network of relationships and a complex hierarchic structure. Such passages, extending the "psychological present" by integrating resonances of the not too remote past with glimpses of the near future, are at the core of the present study, and it is from this domain that most of the examples of symmetry will derive.

Non-tonal twentieth-century music is sometimes constructed according to abstract and quite rigorous principles, and eager analysts have certainly not

missed the opportunity to demonstrate various kinds of symmetries in such music. There is no reason to doubt their findings, although such symmetries tend to be as positively present in the score as they are difficult or impossible to discover or even confirm when listening to the music. Indeed, although their aesthetic significance is often taken for granted, few people claim that they can or should be heard. Since the aim of the present study is not to establish what we more or less readily may discover when inspecting scores, but to deal with symmetry as an aural phenomenon, devices based on serial practices and the like will be left out of account.

Yet another kind of musical symmetry will be disregarded. The system of tones/keys allows of a number of more or less speculative, pre-compositional symmetry relationships, of which several can be demonstrated by means of, say, the circle of fifths. But such relationships tend to be of little relevance for the listener – unless they are underscored by obvious structural cues, they will not give rise to any perceived symmetry.

If, say, an expanding resolution of an augmented fourth is immediately followed by a contracting resolution of the same pitches conceived of as a diminished fifth, the latter motion will not appear as a symmetric counterpart, but rather as a harmonic surprise. And a motion from tonic to dominant has altogether other musical properties than the would-be corresponding motion from tonic to subdominant, just as the "upstairs" quality of clockwise modulations towards sharper, "brighter" keys is very different from the effortless sinking down into the region of flatter, "darker" keys. Mediant harmonic relationships, on the other hand, may sometimes contribute to an impression of symmetry by introducing contrasting and independent key areas and pitch collections, by giving rise to changes in the "tonal aura". Such changes may have little to do with symmetry as such, but they may activate, or be activated by, other aspects of the musical design in ways suggesting a sense of symmetry.

Structural mirroring

Analysts have been keen on symmetries involving strict mirroring giving rise to "congruent" structures. Such symmetries are comparatively rare in tonal music and testify to supreme craftsmanship and rigorous compositional integration. Their presence cannot be denied when looking in the score, but they often fail to emerge as aural phenomena.

The mirror can be placed "vertically" in the score, producing a replica making up an exact retroversion of the model. But tonal relationships cannot be reversed in time and yet retain their musical identity and/or function. This fact applies already to tiny fragments – a rising semitone, for instance, has a tonicizing effect that its retrograde, falling counterpart lacks – and makes for a total change when larger entities are involved: a melody played backwards is simply not recognized. If the similarity is gone, the symmetry finds very little hold in perception.

Whereas everyone, when made aware of it by studying the score, can appreciate the utter austerity of the retrograde canon from J. S. Bach's *Ein musikalisches Opfer,* very few listeners are able to pick up that one of the voices ends as the other started (and certainly not the other way around), that there is a midway point of exchange of material between the voices, and that from this very moment on there is an exact retrograde overall symmetry; cf. Ex. 1.

It seems that inversion, the use of a "horizontal" mirror producing a replica that turns the intervals of the model upside down, fares only slightly better. Although the notes to be associated are not changed as to their order, pitch inversions are quite hard to recognize since the tonal implications of each member of the sequence is radically altered. But inversion relationships are sometimes noticed, and they may give rise to a sense of symmetry if the model and its replica are closely juxtaposed, and if supporting cues (such as rhythmic similarity) are present.

There is another canon from *Ein musikalisches Opfer* illustrating that symmetry in terms of inversion may be a hard nut to crack for the listener even if these conditions are fulfilled. The entries of the flute and the violin

are immediately juxtaposed and clearly separated, and the rhythm is retained – yet the overlapping inversion relationship starting in m. 3 is all but easy to grasp; cf. Ex. 2.

Musical symmetries usually involve two (or several) configurations in temporal succession that when, and if, they are associated with each other suggest a sense of symmetry. Inversions work best when played off simultaneously against each other. Exposing the model and its inversion at the same time makes for a sense of opposition, and contrary motions clearly displaying expansion or contraction bring in a quasi-spatial aspect of the musical process, comparable to the relationship between elements in visual space. And the concurrent presentation of model and inversed copy makes the listener less aware of the actual, and often substantial differences between them; exact mirroring (which is hard to achieve in tonal music) may be dispensed with without disturbing the sense of symmetry.

Although the right- and left-hand parts are far from identical, there is a clear sense of symmetric contrary motion, of slow expansion of the tonal space followed by rapid contraction, in the climactic passage from the second movement of Beethoven's C-minor Piano Sonata Op. 111; cf. Ex. 3. The music continues with a passage exhibiting symmetry in terms of a dialogue.

Formal symmetries – pairs

Before turning to symmetries based on configurations reappearing in identical, similar, or contrasting form, we will briefly discuss and dispose of passages involving addition of several units. As in the visual arts, a series of recurring units does not really evoke a sense of symmetry, but rather an impression of regularity – provided that there are sufficient demarcations between the units to make them stand out. And since a passage of music cannot be surveyed while listening to it, a series of repeated units will give rise to an expectation that something new is bound to happen. The working principle of musical minimalism is to suspend the gratification of this urge

for change, and to present an almost subliminal difference when a change eventually occurs. But in Chopin's Waltz Op. 64, No. 1 the point of the reiterated motif is to build up a tension that must be resolved by a new initiative; cf. Ex. 4.

These observations also apply to sequences of repeated units occurring along a scale or some other identifiable pitch scheme. Such sequences mean that a sense of direction has been introduced – an impression that even more reduces the symmetry, and that often enables the listener to anticipate when and how the uniform process will end.

Just as in visual art, true symmetry in music is associated with duplication, but repeats – a quite frequent phenomenon in music – do not automatically give rise to a sense of symmetry. The reason appears to be that identical configurations lack cues turning them into a pair. To form a patent pair, the first unit must exhibit a certain incompleteness requiring a further unit, and the second unit must have enough sense of closure to satisfy the demand of the first unit and to preclude the possibility that a third unit will turn up.

Symmetry, in visual art as well as in music, is a reflexive property, but in music the reflexivity necessarily involves time. Thus, the second unit of a pair often deviates from the first unit, but any deviation will not do, and various types of deviation work differently. Variation, for instance, tends to suggest long-term continuity, and the listener has to wait for what happens next before he/she knows whether the two units did make up a pair or not; the symmetry, if any, will have a retrospective quality. Formulations giving rise to a sense of antithesis, on the other hand, quite willingly form a pair, but it should be observed that although clear-cut contrasts may make for symmetry, it seems that the most effective antitheses retain an obvious similarity in all but one respect, providing the decisive difference. Replicas introducing softer dynamics (rather than the other way around), another pitch register, or a different timbre have a quite strong tendency to form second units in symmetric pairs.

The variation theme of Mozart's Piano Sonata K. 331 is suitable to illustrate the subtle ways in which duplication may suggest symmetry (or *quasi*-symmetry); cf. Ex. 5. The five-note motif of the first bar is immediately reiterated one step lower along the scale, bringing a second, less exposed replica. But this pair, or rather pair-perhaps-to-be, is not closed. The next bar might have come up with the third unit of a descending sequence, or it might have introduced a clear-cut change demarcating the two preceding units and retrospectively turning them into a kind of pair. Both alternatives come true: while proceeding along the scale the immediately preceding note-repeating motif is replicated, and doubling the pace m. 3 then brings the melody back to its point of departure. An ordered motion, symmetric as to pitch direction but asymmetric in temporal terms, binds together the melodic process. In the consequent the return back to $c\sharp^2$ is even more hastened, making for a drastic temporal disproportion between the downward and upward motions. At the level of the period there is a pair at the 4+4 bar level, but a pair in which the second unit (somehow) seems shorter than the first.

Formal symmetries – "triptychs"

Triptychs in art and main buildings with wings in architecture make up three-partite symmetries, in which a central, important or large/massive unit is flanked by two similar, smaller and less significant outer ones. This type of symmetry is encountered in music as well, and it is constitutive of all ABA forms. But, as the Trio section in minuets/scherzos shows, in music the middle section may also be shorter, more relaxed, and less structurally dense – a layout that is rare in art and architecture and that would make for disappointment. And in many ABA pieces the final, closing section is shortened or expanded, making for disproportions that do not appreciably affect the musical symmetry – differences that would give rise to odd or vitiating deviations in architecture.

Shorter musical forms tend to lack central units, and instead we may find AAB configurations. They are quite frequent in periodic music, and sometimes they suggest a kind of three-partite symmetry despite the fact that the main unit is heard after the two less weighty ones. Such a layout of the parts would not work very well as a symmetry in a picture if applied horizontally, but it may make for a certain balance if oriented vertically, at least if the weighty part is placed at the bottom.[5] If the joint duration of the two A units (approximately) equals the length of the final B unit, a sense of symmetry may be present in terms of proportions.[6] But if the symmetry is to be grounded in the musical process, the A units must emerge as a pair, or as a compound unit leading up to a point where a concluding, longer formulation is required.

The English-horn melody from the second movement of Franck's D-minor Symphony provides a good illustration of the latter, ready-steady-go design; cf. Ex. 6. The second unit features an expansive variant of the initial idea and indicates that a further, weightier formulation will turn up. The third unit starts like the first one, a fact that retrospectively turns the two preceding units into a pair, but it is subsequently extended to form a balancing double-size unit. The overall effect is symmetry in terms of proportions as well as a hierarchic symmetry obtaining between the paired preparatory units and the longer concluding one.

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[5] There is no meaningful correspondence in music to the important difference in art and visual perception between the up/down and right/left spatial dimensions. We do speak of "vertical" and "horizontal" dimensions in music, but this probably derives from thinking in terms of notation. Whereas the idea of high and low pitches has become an accepted metaphoric element in musical terminology, the left-to-right ordering of musical events in scores merely reflects a graphic convention.

[6] It is interesting that the experience of symmetry is not disturbed by repeats whereas the lack of repeats sometimes amounts to a problem. Listeners (or at least listeners having a keen ear for structure) are likely to be disturbed when repeats are haphazardly left out in variation works with AABB themes, as in the second variation of Beethoven's Diabelli variations where the first part is not to be repeated.

Symmetry in terms of proportions – periods

Symmetry in terms of temporal proportions has already been mentioned, and it is a fact that units of the same length give rise to a sense of balance, order, and regularity. But the impression of proportional symmetry is considerably strengthened if the units are clearly demarcated from each other, and if the musical substance suggests a system of hierarchic levels, i.e. if the units are not just added together forming a sequence with little interior organization, but are arranged so as to make up a layered hierarchy. This kind of proportional symmetry is quite common. Whether ultimately deriving from poetic forms or choreographic patterns, or perhaps stemming from ordering principles within music itself, "periodicity" in music means that the otherwise evasive tonal process becomes easier to survey.

Standard, paradigmatic, periodicity means that units on the same level are paired, and that the lengths of the units on adjacent levels are regulated by the factor 2. The (2+2)+(2+2) scheme is very frequent but other periodic configurations are possible, configurations involving none, little, or substantial loss of symmetry as the case may be. Levels in the hierarchy may be skipped, the units can be lengthened or shortened in symmetric or asymmetric ways, and the factor 3 may dominate a certain level or even imprint the entire layout.

The second-theme episode from the first movement of Mozart's C-minor Serenade K. 388, a passage counting 24 bars in all, is in fact a 12-bar period in which both halves are repeated and varied; cf. Ex. 7. If one listens to the two middle sections, the 6+6 bar symmetry is evident, but the antecedent has a 2x3 bar interior organization whereas the consequent features 3x2 bars. Due to the midway motivic shift, and to the fact that the melody returns to its point of departure, the antecedent suggests a symmetry axis between the third and the fourth bar. In the consequent, the third and fourth bars are sequentially appended after the (similar) first and second

bars; the result is a tonic-to-dominant progression making for a symmetric pair that issues into and is balanced by a two-bar cadence.

In addition to cues suggesting symmetry by means of demarcations and hierarchic structure, periods are characterized by tonal properties that contribute to and differentiate the sense of symmetry. Virtually all periods come to a final rest at the tonic, but after the inconclusive dominant usually ending the antecedent, the consequent may either start again from the tonic or proceed from the dominant or some other suitable harmony.

When the consequent begins in the tonic, the two half-periods are often similar enough to make for pairing, but the symmetry actually obtains between two units, of which the antecedent has an opening character and signals dependence while the consequent is closed, harmonically circular, and self-contained – a complementary difference that heightens the sense of pairing and symmetry. In a painting, whose parts are seen simultaneously, an open form plus a closed one are less likely to make up a configuration evoking a sense of symmetry.

The main theme from the first movement of Beethoven's Violin Concerto Op. 61 presents a most symmetric 8-bar layout, in which the third and fourth bars bring a free melodic inversion and an exact rhythmic replica of the two preceding bars, as well as a patent harmonic shift to the dominant. The consequent features an exact replication of mm. 1–2 and a closing formulation issuing into the tonic; cf. Ex. 8.

But when the consequent starts from a non-tonic harmony, the period as a whole gives rise to a sense of symmetry in terms of an opening motion away from the tonic and a closing motion back to it. This periodic layout is perhaps as close to a readily understandable retrograde symmetry as tonal music can come, and in some cases there is only a modest degree of similarity linking together the units on each side of the midway demarcation.

In the starting period of Mozart's D-major Piano Sonata K. 576 the tonic is not used to begin the consequent, nor is the dominant, but the fanfare motif reappears in E minor announcing the start of a unit that presumably

will bring the theme back to the tonic; cf. Ex. 9. The sense of symmetry is quite strong.

Broken symmetry and elements of musical content

So far the discussion has brought up a number of structural cues that seem to be operative when it comes to promoting symmetry: regularity of proportions, clear demarcations between units, a sense of antithesis or associative relationship between the constituents, and hierarchic layout rather than merely lined-up units.

But it is important to realize that just as tonal music must not necessarily exhibit symmetries, symmetry (when present) must not emerge as the only, uncontested phenomenal organization. Great art excels in ambiguities, and the cues for symmetry may be used so as to counteract each other, giving rise to passages in which an otherwise too obvious symmetry is undermined, or in which the symmetry makes itself heard although the structure at first does not invite to it. Symmetry is one of the norms in tonal music, and therefore we are apt to notice deviations; non-standard symmetries may suggest that there is a content beyond the form.

The following three examples show how inventive composers refine and diversify symmetry, how they conceal it and yet let it emerge, how they charge symmetries with extra-musical meanings.

The last "Sarcasm" of Prokofiev's Op. 17, displaying in turn a sudden outbreak of fierce rage, a long contrasting episode of utmost desolation, and finally a section of strange, deep-register grunts, is at first likely to be heard as a piece in a rhapsodic, almost bizarre ABC form. And yet the last section is in a way an exact replica of the first – the music is just radically slowed down and transferred to the lowest register of the piano; cf. Ex. 10. The symmetric recurrence is masked and emerges as a total contrast both to the preceding section and to its model. But as soon as the relationship is no-

ticed, as soon as the contrast is identified as a transformation, the demonstratively broken symmetry of the basic ABA layout gives substance to the grim joke promised by the title of the set.

The rising melodic phrase beginning (and ending) Schumann's piano piece *Warum?*, Op. 12, No. 3 seems like a question, and the alto voice then answers this gesture in a more insistent vein, a continuation that both evokes a sense of symmetry and suggests a dialogue; cf. Ex. 11. And yet the initial rising inflection is not far from being an assertion – the harmonization inherent in the melody is symmetric and prosaic: tonic-dominant-tonic. But *der Dichter spricht*, and the dominant-of-the-dominant chord actually used to support the start of the melody means that the tonic in the third bar is approached from a foreign harmonic territory. What we hear is a symmetry-concealing stroke of genius combining the opening, harmonically circular melodic rise with a harmonic progression suggesting arrival: the piece starts with a formulation that is concurrently interrogative and affirmative.[7]

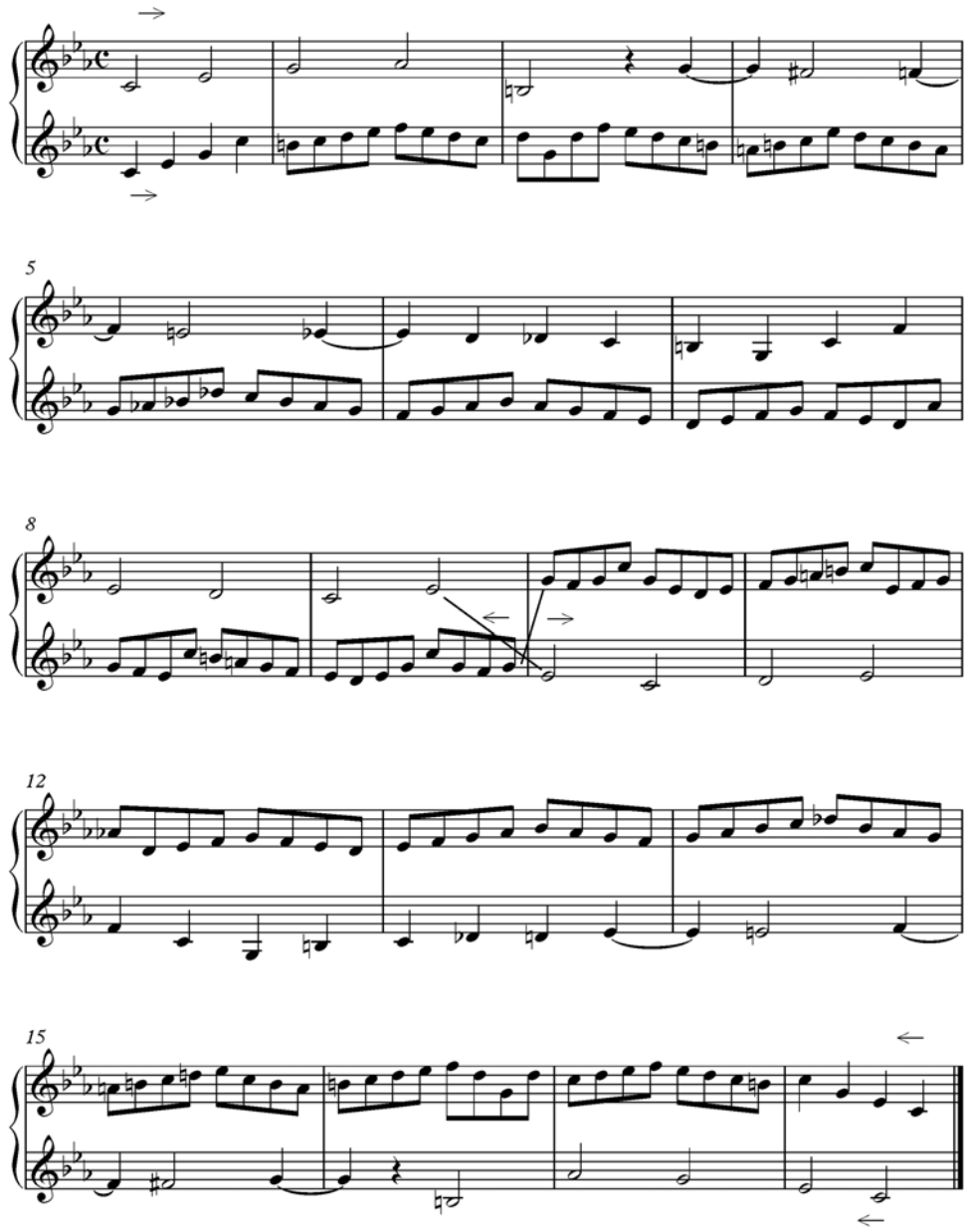
The coda of the second movement of Mozart's Piano Concerto K. 482 demonstrates how shifts of mode and discontinuity of instrumentation give rise to a strong sense of symmetry where no symmetry would otherwise have been heard; cf. Ex. 12. The melody of the passage is actually a remnant of a symmetry: a separate four-bar consequent lacking its antecedent, a melody consisting of just a short falling motif, appearing three times in descending sequence, and a closing formula. The piano – introducing a shimmering C-major seventh-chord instead of the C-minor tonic expected to conclude the preceding passage expressive of utmost grief – gently plays the first two motifs; then the flute, clarinet, and bassoon abruptly break in, replacing the tender high-register statement of the soloist with multiple octaves and restoring the tragic mood of the minor key. The piano is robbed of the melody and plays only the accompaniment, and since it is actually the piano that brings the F-minor turning point, it seems as if it knew that it

[7] For a more penetrating discussion of this and the following piece of Op. 12, cf. Bengt Edlund, "*Warum Grillen*?", ch. 6 in *Analytical Variations*, Frankfurt 2020, Peter Lang Verlag

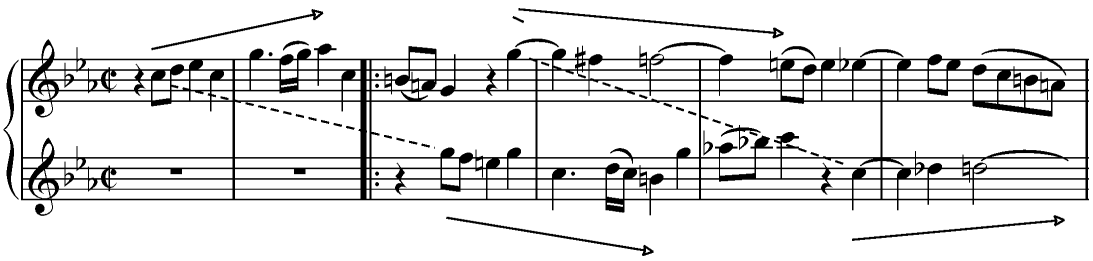
had to give up its melody, its hope. Has a dark shadow ever been introduced in a more heart-rending way, has the inevitability of fate ever sounded more definite – and more consoling – than in this truly, and of course repeated, non-Salieri passage?

Symmetry in Music

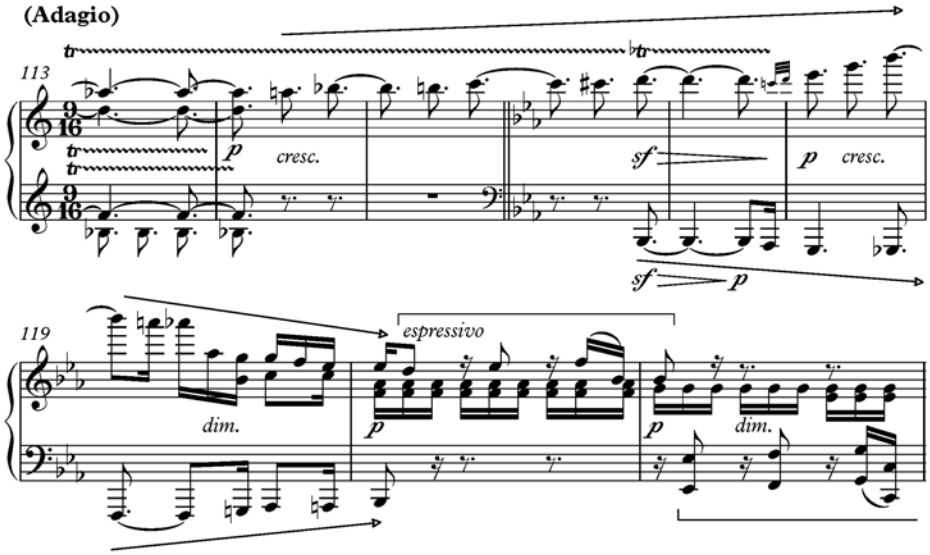
Ex. 1 Bach Musikalisches Opfer



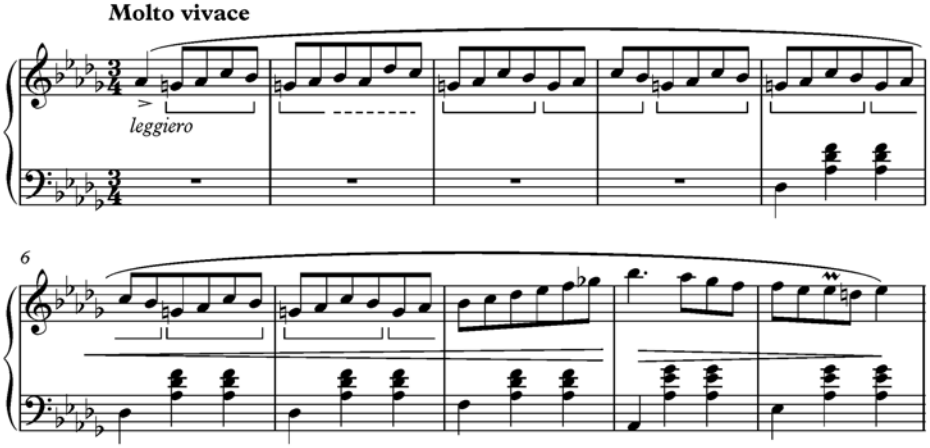
Ex. 2 Bach Musikalisches Opfer



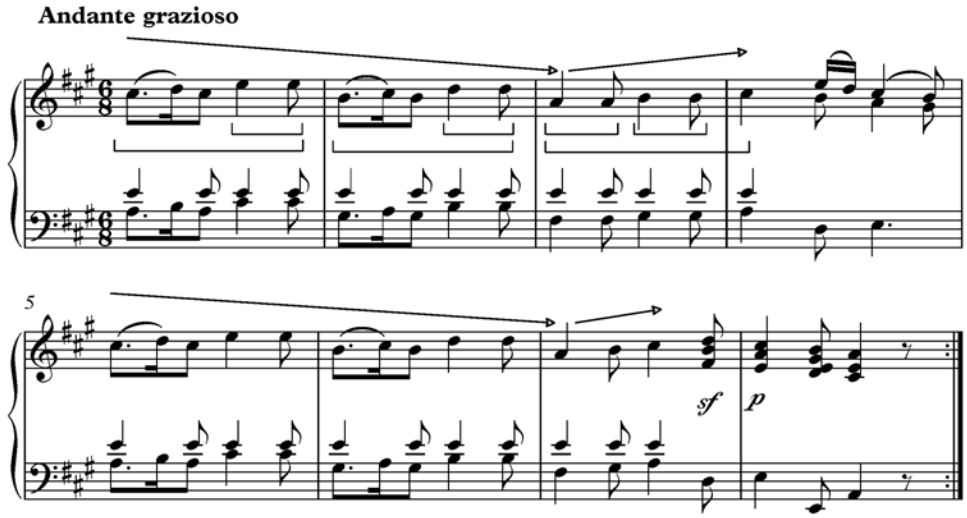
Ex. 3 Beethoven Piano Sonata Op. 111



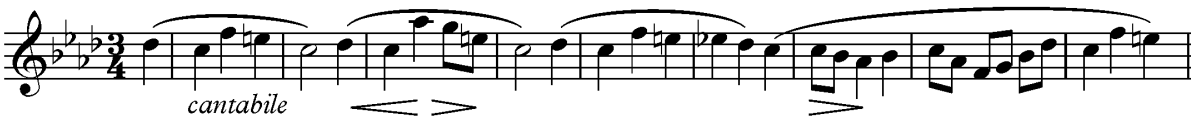
Ex. 4 Chopin Waltz Op. 64, 1



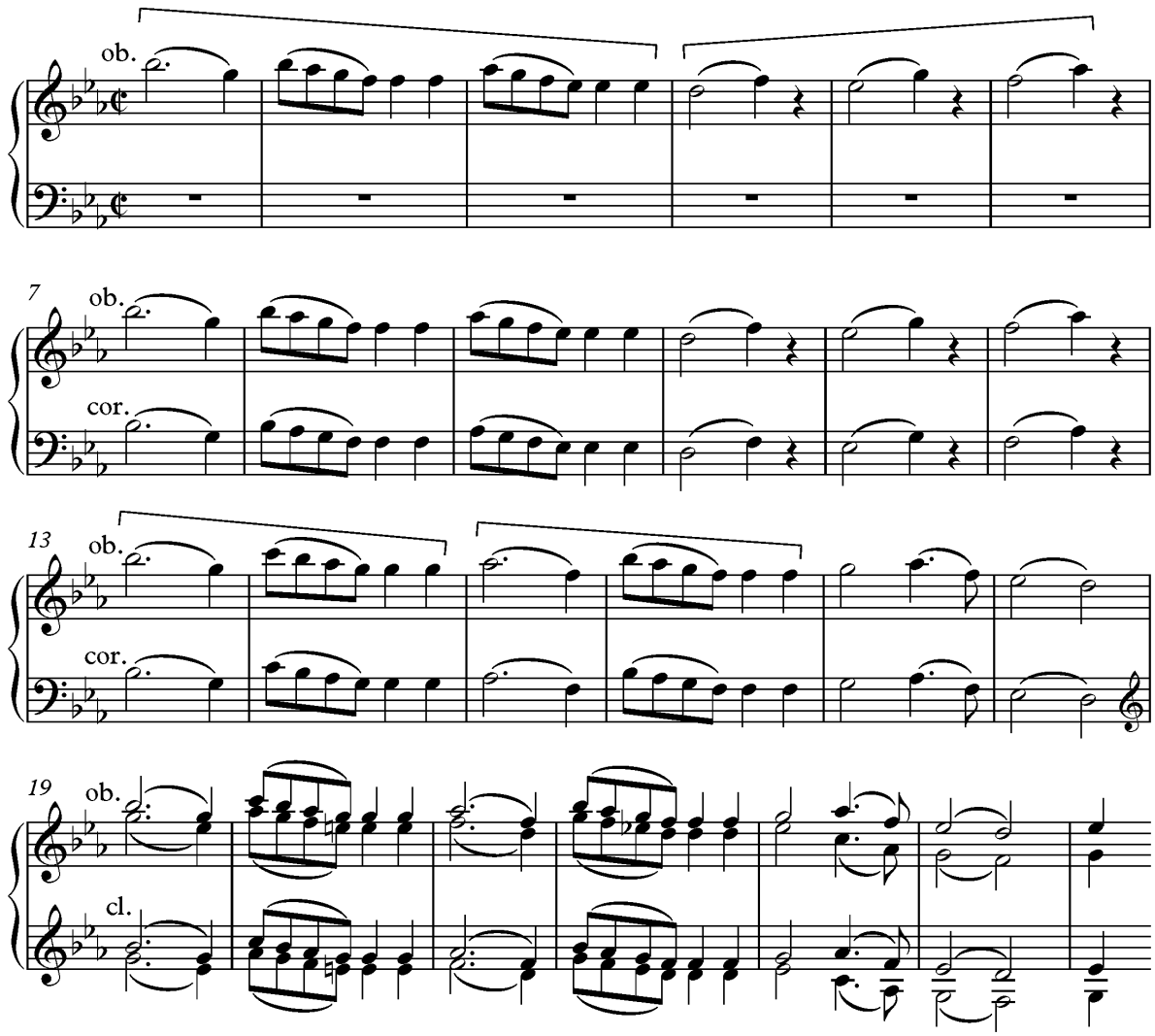
Ex. 5 Mozart Piano Sonata K. 331



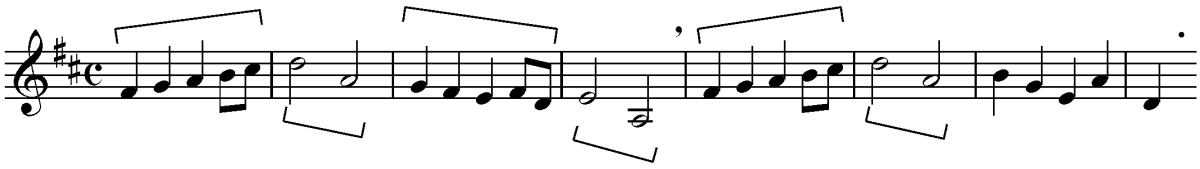
Ex. 6 Franck Symphony



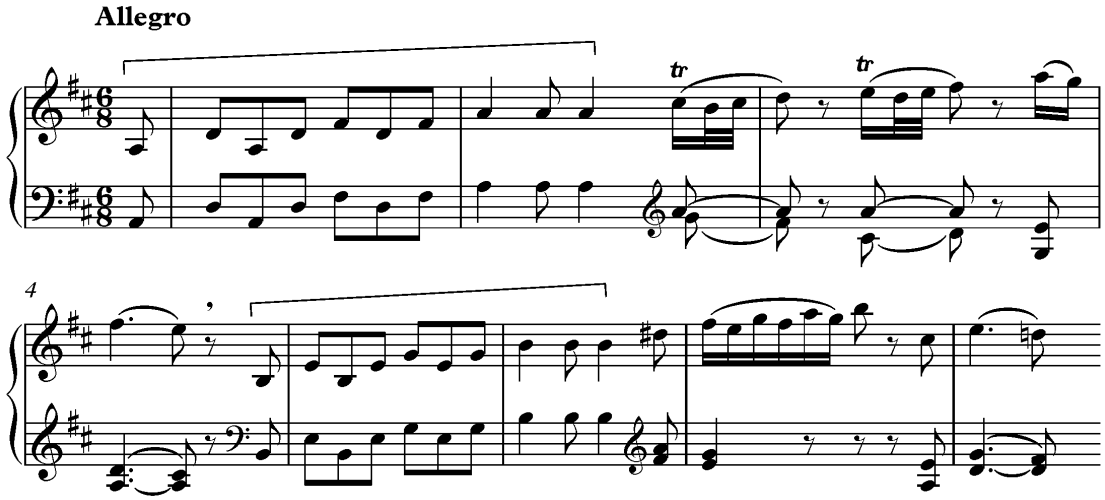
Ex. 7 Mozart Serenade K. 388



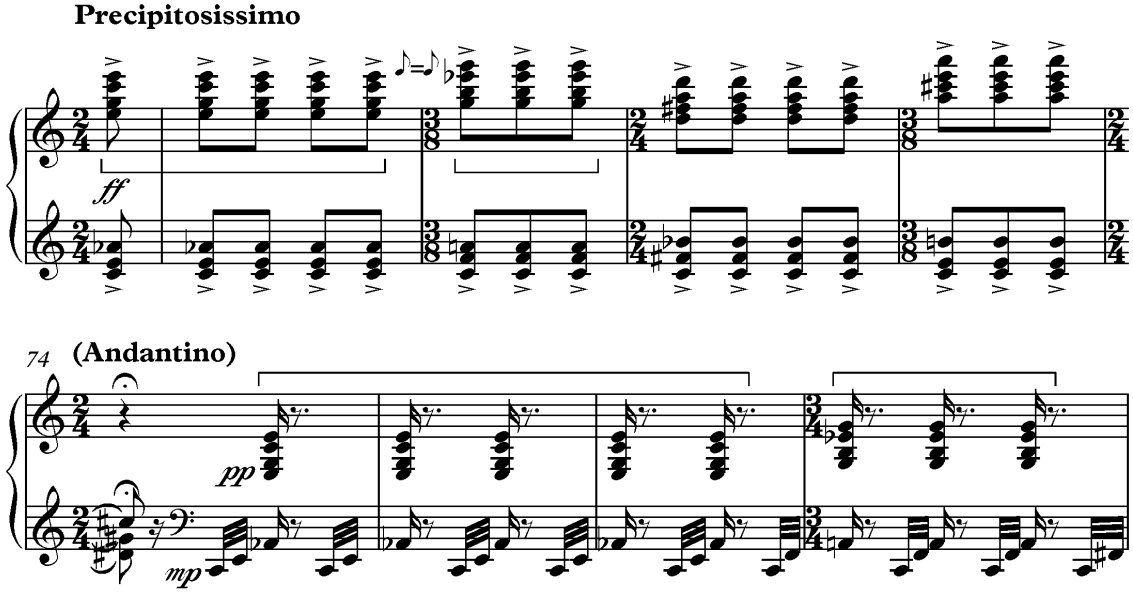
Ex. 8 Beethoven Violin Concerto



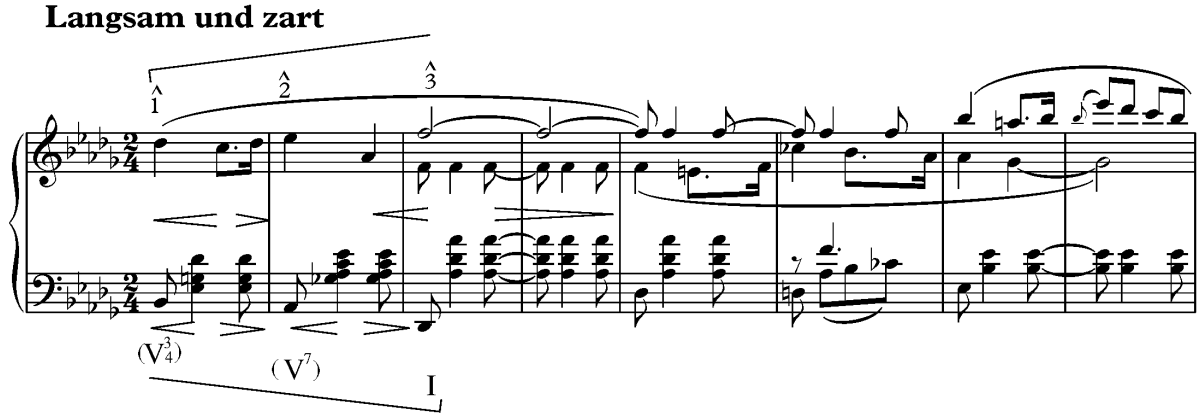
Ex. 9 Mozart Piano Sonata K. 576



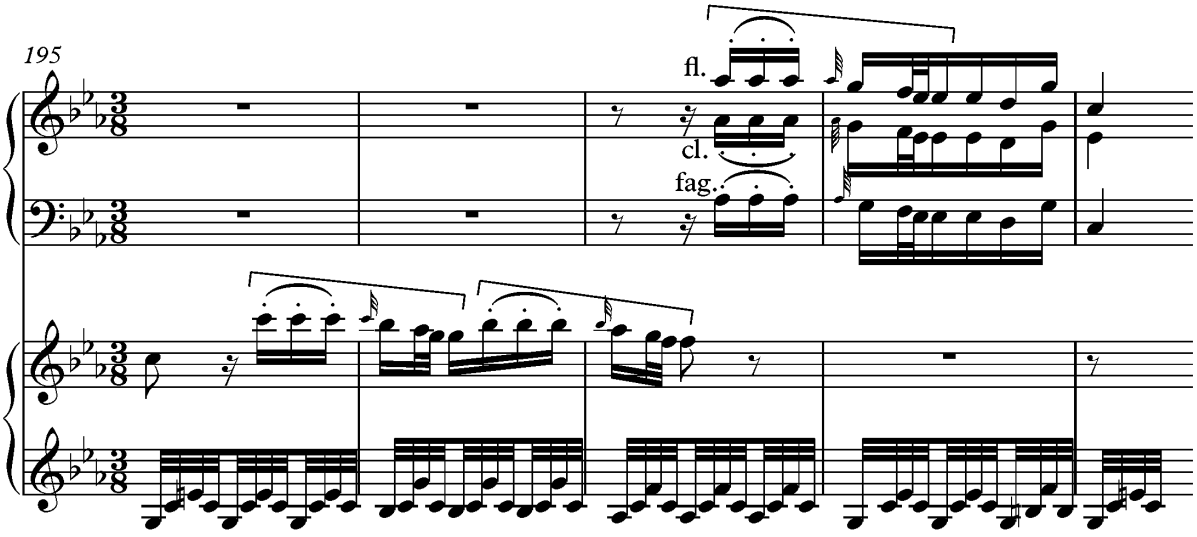
Ex. 10 Prokofiev Sarcasm Op. 17, 5



Ex. 11 Schumann Warum? Op. 12, 3



Ex. 12 Mozart Piano Concerto K. 482



Bengt Edlund

Interpreting another bagatelle

In her "split-personality" essay dealing with two Beethoven Bagatelles, Janet Schmalfeldt addresses a very important issue: what can a music analyst offer that is helpful to a performer?[1] I found her study representative, thought-provoking, and – after some provoked thinking – requiring a thorough discussion paving the way for another and quite different understanding of the issues.[2] Apparently there are quite a few people who believe that Schenkerian analysis is a most valuable tool for musicians; hence the present text written by an observer who is not a member of that church.

Are there any hidden repetitions in Op. 126, No. 2?

[1] Janet Schmalfeldt, "On the Relation of Analysis to Performance: Beethoven's Bagatelles Op. 126, Nos. 2 and 5", *Journal of Music Theory* 29(1985), 1–31. According to footnote 18, her graphs have been sanctioned by John Rothgeb. For a discussion of her analysis of Op. 126, No. 5, cf. Bengt Edlund, "Interpreting a bagatelle". ch. 10 in *Wits and Interpretation,* Berlin 2023, Peter Lang Verlag

[2] Some years after this study, I wrote a further one on the relationship between analysis and interpretation, a text adopting Schmalfeldt's dialogue approach; cf. Bengt Edlund, "Dissentient views on a minuet", ch. 9 in *Wits and Interpretation,* Berlin 2023, Peter Lang Verlag

The first section of Beethoven's Bagatelle Op. 126, No. 2 is to be found in Ex. 1, and Janet Schmalfeldt's reduction of it is shown in Ex. 2 A/B. According to JS the first expositional section exhibits three different manifestations of the same tonal idea: three ascents to the fifth degree, embellished by its upper neighbour-note. These motions – Schenker would probably have called them *verborgene Wiederholungen*, "hidden repetitions" – are (disregarding the slightly varied repeat mm. 9–16) to be found in mm. 1–4, 5–8, and 17–26; JS names them the "basic idea", the "contrasting idea", and the "closing statement", respectively. In the contrasting idea a lower neighbour-note is added giving rise to a turn-like motion, which according to JS will gain great importance in the climax of the piece and in the transition to the "codettas", passages that "subtly allude" to the contrasting idea.

Generally speaking, it is unfortunate to equate analysis with Schenkerian tonal reduction to the extent that JS does. There is more to analysis, and canvassing people for a restricting theoretic outlook should not be the first priority if one wants to convince musicians of the benefits of analysis. Let's therefore examine the first section of the bagatelle in some detail, keeping in mind that the present purpose is not to provide the start of an *Urlinie* issuing from the fifth (or any other) degree, but to come up with musical insights that may be of some avail to a pianist.

In JS's "basic" G-minor idea the ascent from g is quickly, one might even say insignificantly, disposed of by means of a triadic, fanfare-like upbeat figuration, which appears three times highlighting the neighbour-note motion d^1–$e\flat^1$–d^1; cf. Ex. 2A. But in m. 3 the fifth-degree is pursued down to a fourth-degree c^1, supported by a made-up C-minor subdominant "unfolding" having little hold in Beethoven's music. It would be much less strained to conceive of m. 3 as a gradual transition along the G-minor scale down to the dominant. In m. 4 the dominant root is prematurely

shown from the very start, concurrently representing and eclipsing the finishing second-beat d of the right-hand passagework.

But this is not the end of JS's structural line. No matter the dividing D-major dominant in m. 4 and the concomitant change of pace and register, the tonal connection proceeds from the c^1 in m. 3 to the bass note b♮ under the g^1 starting the following rising melodic phrase – a most improbable continuation, likely to make any musician suspicious since it connects voices and formal units that should be kept apart.

The "contrasting" G-major idea spends much more time on the ascent winding up along the scale from g^1 to d^2; cf. Ex. 2A. The turn-like motion around d^2 accompanied by a iv–V cadence involves an upper neighbour-note $e♭^2$, entering off the beat as a C-minor resolution of a dissonant f^2, and a lower neighbour-note $c♯^2$, represented by an anticipated appoggiatura. This is as a quite complex event, understood (if at all) as a d^2–$e♭^2$–d^2 motion only in retrospect, only when the root-supported dominant-note d^2 is a fact.

Bars 5–6 are provided with a non-existent G-major root – an unwarranted and musically blunt reading, suppressing an artistically vital element of tonal uncertainty.[3] In order to establish a stepwise ascent to the fifth degree, JS reads these bars as featuring lower neighbour-note motions issuing from a^1 and c^2 – accented notes that are themselves dissonant in relation the virtual, non-existent g in the bass – although it seems more in keeping with the dissonant appoggiatura start of m. 7, and with Schenkerian analysis, to understand mm. 5–6 as starting with a^1 and c^2 appoggiaturas resolving downwards to g^1 and $b♮^1$. But if understood in the latter, triadic way, the ascent to d^2 emerges as less "contrasting".

According to JS, the "basic idea" is characterized by its quite prominent

[3] Musicians are reluctant to add notes, and particularly crucial ones. They respect, for instance, the difference between root-position and first inversion chords, and so should analysts.

d^1–$e\flat^1$–d^1 upper neighbour-note motion and by the following sixteenth-note transfer to the deep-register d, whereas the "contrasting idea" exposes the initial g^1–d^2 ascent, a rising motion that almost swallows the neighbour-note $e\flat^2$. This observation agrees with the notion of opposition that JS regards as the germ of the piece, an opposition that is evident as a "pre-analytic" fact already from Beethoven's antithetic layout of mm. 1–8.

But on the other hand it may be argued that the two "ideas" are disparate almost to the point of having no structure in common – the credibility of the allegedly shared sub-surface substance is diminished by quite significant differences in terms of melody, harmony, and proportion. The long and winding, allegedly stepwise ascent up to the fifth degree, a motion that makes up the first part of the "contrasting idea", lacks sufficient similarity to remind the listener of the swift triad figuration heard three times during the fifth-degree neighbour-note motion beginning the "basic idea". And the embellished double neighbour-note motion over the subdominant-to-dominant half-cadence finishing off the "contrasting idea" does not appreciably recall the patent upper neighbour-note motif within a tonic context that starts the "basic idea".

Hence, the two "ideas" hitherto discussed are quite different, not only at the surface, which is obvious, but also in terms of their sub-surface tonal essence. It is very questionable whether they actually make up a "hidden repetition".[4]

An attempt to give another idea of what happens in mm. 1–8 is presented in Ex. 3. If the aim is to encourage pianists to play the "basic" and the "contrasting" idea as opposed to each other, Ex. 3 arguably has a clear advantage over Ex. 2 A/B. But such an advice is not necessary – they will irrespective of analytic efforts do their utmost to bring out the contrast, unmistakable already when scanning the score. Ex. 3 straightforwardly

[4] Problems of the Schenkerian notion of sub-surface similarity are discussed in Bengt Edlund, "Hidden repetitions and uncovered parallels", ch. 4 in *Analytical Variations,* Frankfurt 2020, Peter Lang Verlag

shows that the two passages are patently different, instead of letting this fact be obscured by the ambition to demonstrate the delusion that they share the same tonal structure. The core of the "basic" idea is the initial upper neighbour-note motion; the "contrasting" idea essentially brings a rising triad. It is hard to think of a pianist wanting to iron out this difference in order to show what the "basic" and "contrasting" passages have in common.

Ex. 3 does not imply that the two "ideas" are altogether unrelated, but it suggests that the affinity between them rather resides close to the musical surface. Whether you start at the upbeat g^1 in m. 4 or at the a^1 beginning m. 5, the "contrasting" idea brings a series of neighbour-note motions, whereas the most striking feature of the "basic" idea is its initial neighbour-note motif. It should be observed that this correspondence mediates between the two opposed ideas by achieving a balance in terms of perceived tempo: while the note-to-note speed is halved in the "contrasting" idea, the motivic pace is doubled. In other words, Beethoven provided for some unity beyond the Schenkerian agenda.

JS's deep-layer graph is even more misleading than her foreground representation; cf. Ex. 2B. Turning first to the clearly bisected antecedent presented in mm. 1–8, the graph welds together what should be separated in performance, and it is also manipulative. There is in fact no c^2 connecting the two d^2's – the foreground in Ex. 2A (questionably) features a c^1 issuing into b♮ – and there is no d^2-over-g start of the "contrasting idea" – it starts over b♮ and d^2 turns up only two bars later, still balancing over b♮. Beethoven's antecedent is made up of two phrases, starting in G minor and G major, and falling and rising to the fifth-degree notes d and d^2, respectively. Since the very point of Beethoven's mm. 1–8 is the exposition of two quite different ideas, the second phrase cannot really provide an upper-neighbour-note-heralded half-cadence on behalf of the first phrase as shown in Ex. 2B. What you hear, and what a pianist wanting to expose

contrasts will demonstrate, are two four-bar units, both closing provisionally in the dominant.

As regards the consequent mm. 9–16, one cannot but make the observation that, just as the antecedent ends at d^2 over the dominant, the second phrase of the largely identical consequent closes at $b\flat^1$ over the relative major, i.e. at the first degree in terms of the local harmonic context. But the entire section, obviously adopting B♭-major as its tonic from m. 16 on, is shown in Exs. 2 A/B as retaining the abandoned G-minor fifth degree over the B♭-major six-four chord even as late as in m. 25; likewise, the G-minor third degree still occurs over the final B♭-major tonic in m. 26. Is that what we should hear, what the pianist should somehow convey?

The root-supported G-minor d^1 in m. 1, the first-inversion G-major d^2 in m. 6, the root-supported D-major d^2 in m. 8, the second-inversion B♭-major d^2 in m. 15, the root-supported B♭-major d^1 in m. 23, and the six-four-chord B♭-major d^2 in m. 25 are tonally different, and they are not associated in virtue of any surface similarity. The perseverance of the G-minor fifth-degree is greatly exaggerated in Exs. 2 A/B, and it is as crucial for tonal unity in Schenkerian terms as it is inconsequential for interpretation. Schenkerian analysts suppress modulations; musicians do not.

Turning to the "closing statement", it might be objected that the mm. 16–23 "ascent" displayed in JS's reduction is only a third, and that although a member of the pitch class D is reached, this happens in the harmonic context of the relative major; cf. Ex. 2 A/B. Within a Schenkerian universe it may be held for a fact that "D" (somehow) keeps its original fifth-degree position in the tonal plan of the whole piece no matter what happens, but the fact remains that the shared "idea" that JS wants to identify is a local phenomenon. Therefore and much to the detriment of the "hidden repetition" in view, the sub-surface "ascent" from $b\flat^1$ in m. 16 via c^3 in m. 19 to d^1 in m. 23 is in fact a first-to-third-degree motion. And the upper neigh-

bour-note element of the "closing statement", e♭^{1} in m. 24, is not a sixth degree in a minor context, but a fourth degree in a major one.[5]

The analytic validity of the "closing statement" is very strained for other reasons as well. The would-be shared structural motion, reading b♭^{1}–c^3–d^1–e♭^{1}–d^2, takes place within a huge rising-then-falling gesture, making the subsurface similarity with the two preceding specimens of the "hidden idea" very hard to grasp and impossible express – if this is what the reduction enjoins the pianist to do. JS's ascent departs from the root-supported, unaccented b♭^{1} in m. 16, which disagrees with the structural importance accorded to the downbeat d^1 of the corresponding fanfare motif in m. 1. It would make better musical sense to hear the first B♭-major fanfare motif as a preliminary gesture heading for f^2 being overruled by a second, more affirmative attempt reaching b♭^{2} in m. 18, from where an "ascent" of the "closing statement" might have issued.

It seems that if one wants to devise a reduction that appeals to a musician, it is necessary to take account of the quite obvious fact that the "closing statement" is abruptly and prematurely divided. Already after two impetuous fanfare motifs the smooth eighth-note motion from the "contrasting idea" unexpectedly takes over. What Beethoven has demonstratively abandoned, the pianist should not continue, nor should analysts if they want to convince pianists (or anybody else).

In this light, mm. 18–26 emerge as a motion from the (B♭-major) third-degree d^3 down to the first-degree b♭^{1}, a descent mediated by a motion made up of a series of F-major-compatible falling triads and rising stepwise motions – the hastening of the contrary-motion bass indicates when the sequence is about to end; cf. Ex. 4. The passage mm. 17–22 brings an extended organ-point dominant, and this is in the first place what makes this third "idea" different from the previous ones.

[5] Ascending fifths (or thirds), with or without appended upper neighbour-note motions, may be too common coins to represent ideas in common, especially when appearing in structurally quite diverse forms, as is the case here.

The point of JS's demonstration of hidden parallelisms is obviously to support her metaphorical description of the bagatelle as being about "rivals competing for pre-eminence". This may be a quite apt formula for the form and content of the work, and a view that is not seriously challenged by all these sceptical remarks since it is attested by other, more straightforward observations. But why must the opposing ideas, the rivals, be related at any price? The reason seems to be that Schenkerian analysis, unlike interpretation, is strongly predicated on the idea of unity.

From an interpretational point of view, JS's ambition to show that there is a three-member hidden parallelism in the first section amounts to a redundant, even impeding analytic exercise. As the bagatelle unfolds, it is not difficult to discover the opposing ideas and to tell which one of them that for the moment has gained the upper hand, and no strained sub-surface similarities are needed to identify the basic conflict in the music. In short, if you want to highlight the opposed qualities of the "basic", "consequent", and "closing-statement" ideas, just play along; you will do a better job without "knowing" that these ideas are essentially the same since the truth of the matter is rather that they are quite different.

Formal ambiguities

According to Janet Schmalfeldt, the Bagatelle Op. 126, No. 2 exemplifies what Schenker would have called *Knüpftechnik*. The melodic cadence motif d^2–c^2–a^1(–$b\flat^1$) in m. 25, perhaps deriving from m. 18/19, immediately and obviously recurs, now starting from f^1, in the left-hand bridge in m. 26b. According to JS, it is then employed no less than seven times in the melody of the following relative-major section; cf. Ex. 5. This use of the cadence motif is quite well hidden, however, so it is doubtful whether a listener will hear these recurrences, and (needless to say) it seems to be a very bad idea to try to play the music so as to bring them out.

Be that as it may, the real complexity (and interpretative challenge) of the B♭-major section of the bagatelle is to be found in the formal domain. It is not only (as JS observes) the second, seven-bar formal unit mm. 35–41 that is irregular; so is also the first, eight-bar one. Its melody is made up of phrases of either 4+4 or 5+3 bars (or 5+4 bars, taking account of the overlap in m. 35) while the accompaniment features a regular 4+4 configuration. The second unit brings 5+2 or 3+4 bars in the right hand, played off against 3+4 bars in the left.

JS's alignment of the two formal units, showing "where a contraction from eight to seven measures can be most easily demonstrated to occur" (p. 12), leaves room for a counterpart to m. 31 between mm. 38 and 39. But this seems to be too simplified an account to capture the heart of the matter, if not to say a downright wrong description. Since the way we understand the segmentation of the musical flow will influence how we play – and the other way around – this problem merits a further discussion.

Considering the melody, both units can be heard as starting with open-ended phrases that are extended to five bars, so m. 31 is in a way present as m. 39; if we turn to the accompaniment, a variant of m. 31 is there as m. 38 which also supplies a fresh internal start. On the other hand, the accompaniment of the second unit evidently lacks the connecting motion that went with the start of the long f^2 in the treble of the first unit. Thus, as far as the left hand is concerned, a counterpart to m. 30 seems to be missing between mm. 37 and 38. But in virtue of its falling inflection the right-hand melody of m. 39 appears to correspond to either m. 31 or m. 32, and therefore the missing bar in the second unit appears to be something like m. 31 or m. 32 to be inserted either between mm. 38 and 39, or between mm. 39 and 40, respectively. But even this is a simplified account.

Considering the falling left-hand motion, m. 31 replicates m. 27. For this reason, the second melodic phrase may be thought of as having a regular four-bar size. The recurrence of the bass motion starting in m. 31 tends to sever this bar from the initial four-bar phrase and to make it function as a start in spite of the tied note; the falling melodic inflection in m. 31 emerges as both an ending and a stealthy beginning. Proceeding to m. 32, heading a three-bar melodic sub-unit, it corresponds either to mm. 27–28 in terms of melodic content, or only to m. 28 considering the left-hand subdominant chord.

Due to its dominant harmony and its $b♭^1$–a^1 inflection, m. 34 so clearly parallels m. 29 that m. 33 (despite the harmonic difference) may be taken to correspond to m. 28, and that (notwithstanding the half cadence brought by m. 34) one is tempted to prolong the seemingly curtailed second phrase with an appended extra bar corresponding to m. 30, but set in the tonic. The latter effect is partly due to the fact that the bass of m. 28 emerges as stretched to double size in mm. 32–33; in harmonic terms, the chromatic rise from $e♭$ to $e♮$ means that a connecting applied dominant is inserted between the subdominant and the dominant.

The start of the third melodic phrase sounds very abrupt due to its unexpected D-major seventh-chord harmonization and its right-hand appoggiatura seemingly introducing a new right-hand voice. If any bar is missing in this section of the bagatelle, it is a bar of unknown content to be inserted before m. 35. And yet there is continuity: a rising chromatic line in the bass starting in m. 32 from $e♭$ and pursued up to g in m. 35, as well as the $b♭^1$–a^1, c^2–$b♭^1$ sequence in the right hand linking together m. 34 and m. 35. The c^2–$b♭^1$ resolution in the alto voice, if supported by a $B♭$-major tonic chord, would have made up an apt (but trite) conclusion of the perhaps curtailed phrase. Hence, the additional, seemingly new, voice in m. 35 is after all not the alto, but the soprano starting the third phrase with a long note – just as was the case in the first phrase in m. 27.

The apparently premature, modulating bass motion in m. 38 (cf. mm. 30–31) makes the melody in mm. 38–39 ambiguous – the long f^2 emerges

as both a conclusion and a beginning – and may seem to normalize the fourth phrase to four bars, turning mm. 38–39 into a counterpart to mm. 31–32. But this normalizing reading leaves the melodic correspondence between the five-bar phrases mm. 27–31 and 35–39 out of account; retrospectively, one is prone to think that mm. 35–37 is a three-bar phrase. The two phrases of the first unit may after all have had a 3+5 bar construction. Considering finally the fourth phrase as a short two-bar constituent, m. 41 is reminiscent of m. 34 – both bars suggest half-cadences making us envisage B♭-major and C-minor continuations, respectively, follow-up bars that never turn up.

This is certainly excellent composition as well as an elusive musical process defying simple description. It is fortunate that there is a repeat, allowing the pianist to probe the multiple formal possibilities of this section once again, and letting the listeners discover and enjoy another perspective of the material.

Rhythmic ambiguities

As a result of the irregular construction of this section, there is another complication that JS comments on in her discussion – that of accents above the measure level.[6] She holds that the too early, measure-seven arrival of the cadence in m. 41 "yields a strong bar of silence" in m. 42, "followed by a weak bar to which the head motif of the basic idea drives as it begins to test its strength". (p. 12)

But both statements must be qualified. As the above discussion has shown, there is no acute sense that m. 41 has arrived too early since the last phrase, however complex the passage may be, is either two or three

[6] It is all but clear what cues musicians take account of when establishing high-level metre, what cues they in turn use to convey this metric structure, and how far up in the musical hierarchy we may speak of metric accents. But it is reasonable to assume that pairs of 2/4 bars in this brisk tempo may be heard in terms of two superordinate beats.

bars. In either case the half-cadence to G major with its sense of being an applied dominant to C minor turns m. 42 into a strong bar.[7] But the situation is deceptive: the C-minor outlet expected on the first beat of m. 42 fails to appear, and a G-major fanfare turns up on the second beat. As a result m. 43 emerges as a strong bar (beat) – the preceding bar lacked the substance to carry an accent, and m. 43 certainly brings the downbeat to which the upbeat fanfare motif thrusts, just as m. 1 of the bagatelle was unmistakably a strong bar. G major has not been left, and the next impulse, released from the fanfare appearing on the second beat in the following weak bar, deceptively brings an accented, "wrong-register" neighbour-note a♭[1] in m. 45, understood as a strong bar.

A series of fanfares in mm. 42–49, played with the final notes of the fanfare motifs located to weak bars, would be entirely inappropriate. This means that already m. 42, for a short moment heard as strong, will as soon as the fanfare motif is identified be understood as weak. Otherwise put, this means that m. 43 will emerge as even more accented than m. 42. In any case the metric conflict is very quickly resolved. But a most important metric turning point occurs in mm. 49–50. Since m. 50 must also be accented, two strong bars are juxtaposed, which implies that the second accent has to outdo the first.

The preceding B♭-major section brings several ambiguities of accentuation that merit close study since they indicate subtle rhythmic distinctions, highly pertinent for interpretation.

In the first formal unit, mm. 31–33 are equivocal. Due to the tied f[2] the accent in the right hand is postponed until m. 32 whereas the obvious start of a new unit in the left hand makes for an accent in m. 31. The con-

[7] In Ex. 5 are used the symbols for metric accent and rhythmic grouping introduced by Grosvenor Cooper and Leonard B. Meyer in *The Rhythmic Structure of Music*, Chicago University Press 1960. Although their approach for some reason or other does not seem to enjoy a high reputation among many theorists, it is both handy and productive – the book is still in print.

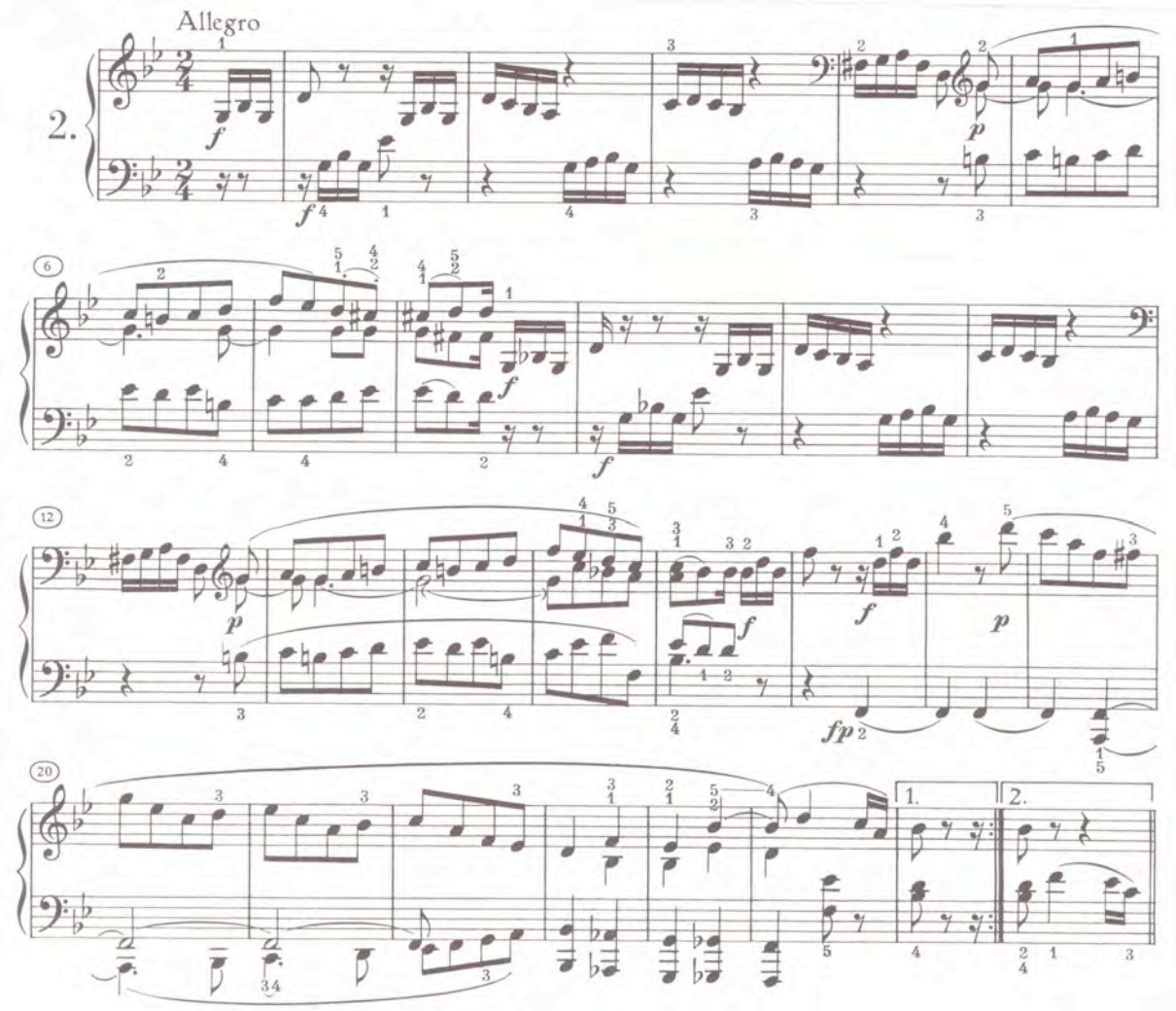
flict is resolved in the applied-dominant bar 33, where the left hand, heading for the dominant in m. 34, will emerge as weak.

Bar 35 is again equivocal: it may seem strong since it starts with an applied-dominant appoggiatura, and weak since the bass betrays a transitional character. To the extent that m. 35 is understood as strong, m. 34, featuring a dominant harmony (to be thwarted), might in retrospect be interpreted as weak, unless a juxtaposition of two accented bars is considered to be an interesting feature to bring out. Bar 35 leads towards m. 36, which is likely to be taken as weak since it issues into the appoggiatura dominant in m. 37. Bar 38 is understood as strong due to the starting impulse in the left hand and the weak ending of the melody in m. 39.

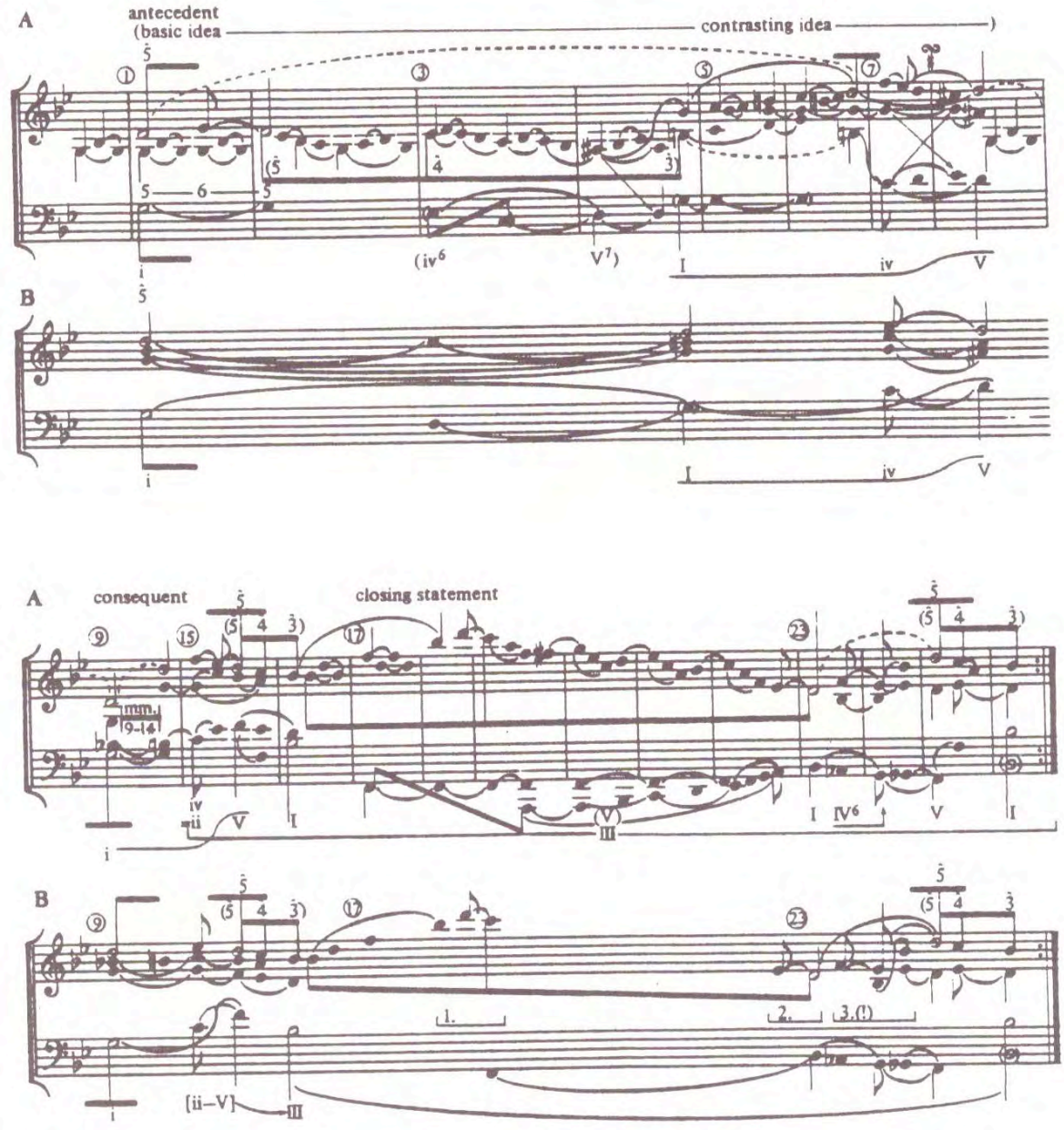
It has been demonstrated that a thorough study of rhythm and metre may be an important source of understanding that musicians devoting themselves to analysis should not neglect. Although not at the core of Schenkerian analysis, rhythm and metre reflect the interplay between most elements of the musical design, and they make up aspects of the music that can be subtly and yet decisively influenced by the musician.

Interpreting another bagatelle

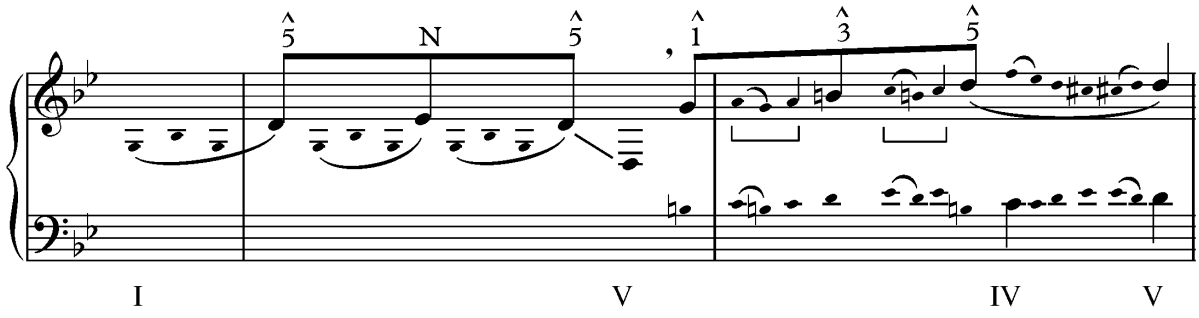
Ex. 1



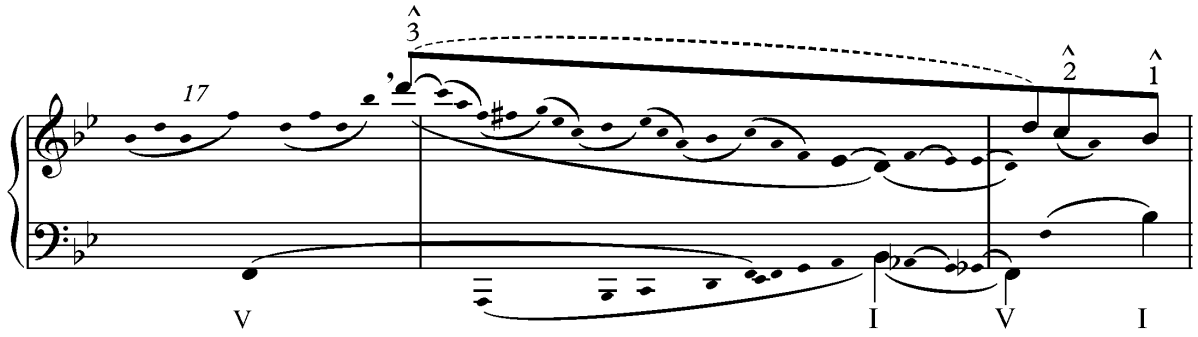
Ex. 2 A/B


A
antecedent
(basic idea
contrasting idea
(iv6
V7)
I
iv
V
B
I
iv
V
A
consequent
closing statement
mm.
9-14
iv
ii
V
I
(V)
III
I
IV6
V
I
B
1.
2.
3.(!)
[ii–V]
III

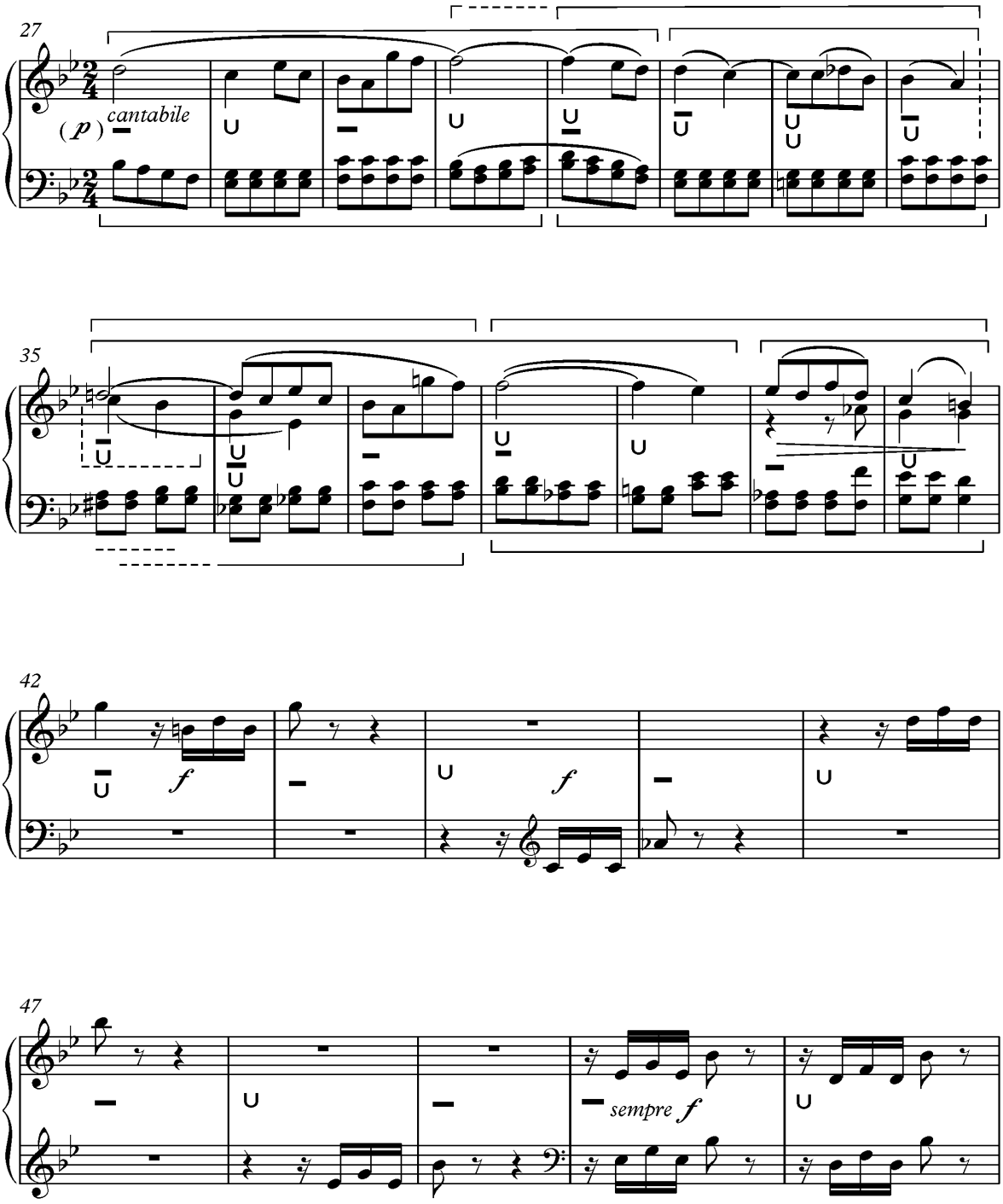
Ex. 3



Ex. 4



Ex. 5



Bengt Edlund

Navigating in Moonlight

Dedicated to my teacher Gustaf Lundqvist

In this essay I will try to say something about the interpretation of the first movement of Beethoven's Piano Sonata Op. 14, No. 2. I will be very concrete, since I think it pays to examine closely the music one is going to play, and yet I hope that by implication my remarks will sometimes rise to matters of principle. Even when dealing with patterns and content in a particular work, one has to rely on analytic methods or aesthetic perspectives of some generality. Besides, interpretation is also a question of applied psychology: the performer has a cognitive advantage over the listener, and especially over the first-time listener. Whereas the former knows and guides, the latter does not know (or does not know what the musician knows) and is guided.

I have not studied the "Moonlight Sonata" with anyone, nor have I read anything specific about it or about how it should be interpreted – and you will not learn how to play it by reading this text, although from time to time I will put my observations in a normative way. Thus, without necessarily being original, the ideas to be advanced are my own, and yet (as is customary) I claim that they somehow derive from the composer, that I keep to the spirit of the work although I might occasionally violate its letter. If you are a musical servant, you certainly want to be a Jeeves.

There is a problem to be solved right from the start. The tempo indication reads *Adagio* while the time signature is *alla breve* although the pervading triplet figuration works as a constant reminder of the fact that there are always four pulses in each bar. It happens that this movement is played very (i.e. too) slow, so the paradoxical question that should be asked is how fast you can play this piece and yet convey an impression that the music is slow. It seems that it is crucially important to play so as to suggest that there two beats per bar even if the quarter-note pace is fairly slow. But how can you prevent the listener from having a sense of 4/4 time? Avoiding emphases on every right-hand g♯ in the first bar (and so on) is self-evident, but to emphasize every second g♯ would seem quite pedantic.

But there is something that can be done, and it involves the voice-leading in the first four bars, reaching a gentle climax and turning-point in the second part of m. 3. This introductory section features three meaningful strands. The bass line takes care of itself, and from m. 3 on it supports the desirable *alla breve* quality. There is also a tenor voice that deserves to be brought out in a discrete way: always played be the right-hand thumb, it eventually sinks down to e. (One has to be very careful in m. 5 so as not to suggest a continuation up to g♯!) This interior line cannot very well just turn up with the a in m. 3, it should be prepared by slight emphases on the very first g♯ and then on the third g♯ in m. 2 – the result will be a gradually emerging, quite slow *alla breve* strand. What about the third voice? No effort should be wasted on bringing out the soprano line leading down to c♯^{1}:

the notes occur after the beats and emphasizing them would result in a rhythmic complexity ruining the simplicity of the introduction. From a tonal point of view, this motion down to the tonic note is self-evident so it will be heard anyway, and if highlighted it will signal a premature close of the music.

Since the first four bars are introductory, it would be a mistake to charge the bass and tenor strands with any insistent expression; one has succeeded if every listener takes notice of these lines as if they were beautiful objects of nature but are uncertain of whether the pianist wants them to be heard. Nor would it be desirable to make it very evident that the introduction is an introduction; hence, one should avoid any obvious rounding-off *ritardando* in m. 4. But it is possible to linger somewhat on the e beginning m. 5 so as to suggest a demarcation from what follows.

The score also demands that the entire movement is to be played *delicatissimamente* and *senza sordino*, i.e. with the right pedal being constantly pressed down. But however much you strive to achieve a delicate touch, you cannot (nor could they on their fortepianos) comply with the latter request. But the exaggeration clarifies the message: the sustaining pedal should be used generously so as to create a veiled, resounding sonority. The necessary changes should be few and late, and when suitable one might stay on the keys a little longer than notated in order to preserve certain notes from one chord to the next.

Piano teachers usually make a fuss about having their pupils execute the rhythmic conflict in m. 5 correctly – three against four in the same hand is a difficulty that is there to be mastered. It is of course excellent if one is able to keep mental track of an eighth-note signal that controls the sixteenth-note while letting the triplet motion run unaffected, but otherwise exact durational proportioning according to notation is not an end in itself. Our understanding of rhythmic configurations is a matter of categorical perception, and hence there is considerable tolerance as to the exact values. Dotted rhythms are thus subject to what we may call "categorical produc-

tion": they should be conceived of correctly, but (like other rhythmic patterns) they can and should be given a durational profile that suits the tempo, the character of the music, and the specific expression. And this rhythmic freedom is of course not reduced just because a configuration happens to be difficult to play.

The solution of the amateurs – they tend to insert the sixteenth-note right between the last triplet note and the following accent – is to be condemned, not primarily because it disagrees with the notation, but since it does not sound well – the dotting becomes sharper than the melodic diction can take. An approximate execution, letting simply the sixteenth-note enter slightly after the triplet note, is acceptable since it gives the passage a good quality. As a consequence of this manner of execution it might happen that the last triplet note, and hence the last beat of the bar, becomes somewhat lengthened. But why not – the sixteenth-note as well as the fourth beat are anacrustic.

The unmediated shift from E major to E minor in mm. 9/10 must be brought to attention in some way, and it seems that there are three options. It would be possible to direct attention to it by means of a slight *crescendo-diminuendo* effect, but this involves the risk of too many dynamic inflections within the passage at large. You have to play *crescendo* in m. 11 in order to support the otherwise inconspicuous start of the descending line in the bass and to reach an emphasis on the G♮[1]/g♮ beginning m. 12 – it is just a C-major chord but these notes will eventually emerge as a suspension. Alternatively, one could head for the g♮ in m. 10 by letting let the g♯'s in m. 9 emerge gradually – or by giving some anacrustic emphasis to the third or fourth g♯'. This option has the disadvantage of suggesting a subsidiary voice that anticipates and thus takes away the effect of the melodic entry on g♯[1]. The movement is basically a monologue, and concurrent voices should be subdued. The best solution appears to be to set off the temporary darkening brought by the shift to minor by playing m. 10 *subito ppp*. In m. 12 one might give increasing emphasis to the g♮'s so as to remind the listener of the

fact that the upper-voice g♮[1] gradually turns into a dissonance – the tenor voice can then be used to reinforce the melody up to the cadence in m. 15.

Bars 13–14 bring two problems that must be dealt with appropriately. Both bars begin with the same six-four chord, and the slur connecting the two minor subdominant chords with the first six-four chord means that the passage mm. 12–14 features three consecutive beginning-accented groups – a quite possible but somewhat dull rhythmic sequence. On the other hand, there is no indication showing where the culmination of the phrase should be, but you cannot avoid making up your mind: do you want the first or the second six-four chord to emerge as the core of the phrase? The latter alternative entails that the culmination occurs too close to the cadence, and it seems less convincing since the complex suspension in m. 12 weighs more than the two interspersed subdominants in m. 13. My solution to both problems, a solution that runs contrary to Beethoven's slurring,[1] is to demarcate the E-minor chords from the preceding six-four chord by giving them a "negative emphasis". i.e. by delaying them somewhat and playing them softly. Rendered in this way they will be connected as upbeats to the second six-four chord emerging as less important than the first. The end-accented grouping will recur in mm. 14/15 if (as is quite natural) the f♯[1] of the dominant chord is allowed to function as an upbeat; as a consequence, the preceding six-four chord emerges as a goal rather than as the start of an appoggiatura.

Whereas the change of pedal between major and minor in mm. 9/10 must be clear-cut, it would be an artistic mistake not to temporarily blend the harmonies in m. 15 when B minor is exchanged for B major. Mm. 16 and 18 offer further opportunities to blur the sound; there is a supplementary melodic fragment in the bass proceeding in octaves, but it is still possible to have

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[1] Slurs in music composed during the transition period from downbeat to upbeat phrasing are hard to come to terms with. But interpretation is not about stylistic generalities but a matter of individual passages in specific works, and it involves taking responsibility for music that you think you have understood. It is better to play with conviction than to play correctly something you don't subscribe to.

the same pedal for the first three beats if one subdues the lower left-hand notes. The right-hand a♯^{1} should preferably emerge as both an afterbeat and an upbeat – both c♯^{2} and a♯^{1} are neighbour-notes to b^1. The passage consists of two identic two-bar phrases, and Beethoven does not indicate any difference between them when it comes to performance. Yet it seems advis-able to play them differently, and considering what follows it appears to be a good idea to play louder the second time, and if this option is chosen, there is no reason to subdue the low note of the left-hand octaves.

The note b^1 is repeated three times in mm. 19–20 while the harmony moves from stability to tension. From a formal point view the passage involves overlapping – the first b^1 is both a start and a beginning, and the new phrase may be taken to enter prematurely on the first beat. This is a deviation from the metric order so far established by the music and change that the pianist should underscore. A bold way to handle this situation is to play in a way that suggests that the overlapping is postponed until the first beat of m. 20, or to play as if there were no phrase shift at all – in the latter case the result would be a single melodic unit of abnormal length extending from m. 16 to m. 23 and reaching its culmination in mm. 19–20 featuring an anapest overlapped by a trochee. This effect might be accomplished by a continuous *crescendo* from m. 18 into m. 20 followed by a *diminuendo* for the descending melodic curve. In order to achieve a greater sonority the melody can be played with octave reinforcement from m. 19. Another way to suggest continuity in mm. 19–20 is to hold back the dynamics when the note b^1 is repeated, but this option presupposes that the subsequent motion downwards is boosted by an increase in loudness. A suitable moment for emphasis is the G-major chord in m. 21; one should not forgo an opportunity to squeeze the cockles of the heart when a Neapolitan sonority turns up.

In mm. 22–23 the melody has reached a very deep register but if you play very softly you can still afford to blur the sound. I cannot deny myself the pleasure of touching C♯$_1$ with the left-hand little finger, cf. m. 14 – after all, now we have this key. (But touch it very lightly in order not to upset the guardians of the text.)

In order to give support for a sonorous entry of the melody at c♯2 in m. 23, the preceding triad figurations should be played *crescendo*, but one must take care not to give an impression that there is a rising melody from f♯. An increase in loudness is also called for because the listener should be aware of the fact that m. 23 is going to develop differently from m. 5 and 15 – the additional expansion upwards on the third beat loses much of its effect if it comes as a surprise. As to the following bars it is reasonable to assume that Beethoven asks for a quite substantial *crescendo* – the left-hand upbeat in m. 26 repeats the thick chord. But in m. 27 the melody is quickly subdued, and it ends abrupty at c♯2 over a diminished seventh-chord. It is of utmost importance that one respects the fact that there is no extra stem on the b♯1 at the downbeat of m. 28. This note must be very inconspicuous so as to prevent the listeners from taking it for a trite conclusion of the phrase or understanding it as belonging to the following motif, which starts only on the second beat. This applies also to the e beginning m. 30: notwithstanding that it shares register with the notes of the preceding motif, it belongs to the accompaniment.[2]

These matters deserve to be penetrated in some detail. Bar 28 brings a shift in the right-hand figuration that must be counteracted so as not to disrupt the pianist's conception of the rhythmic structure. So far in the piece the melody notes have generally been accompanied by their lower octaves played by the thumb, but now this support is taken away. As a result the triplets seem to have an anacrustic organization – because that is how they are felt in the hand: after b♯1 a rising triad starts from the thumb up to the little finger, and so on. But metrically the triplets in m. 28 should of course be understood as the ones in m. 29, featuring downbeat rising triplets

[2] Bad fingerings make me intolerant. The one recommended in the Henle edition is presumably intended to suggest that the triplet unit starts regularly on the low accented note in spite of the large skip – which is fine – but it is extremely awkward, so awkward that it might result in an anacrustic triplet starting from e1, thus producing what should be avoided. Why not play 1-5-2-4?

starting from the thumb. To make oneself feel and hear in a consistent way throughout the passage is primarily a problem for the pianist. As to the listeners, one cannot very well prevent them from hearing anacrustic triplet groups in mm. 28, 30, and 31 because of the large skips between the melody notes and the following accompaniment note, but if the pianist thinks correctly, it is possible that he/she will play in a way that puts the listeners on the right track.[3]

You don't need to shift the pedal in mm. 28 and 29 if you are very careful with g♯[1] and g♯. It is hard to make sense of Beethoven's strange (or just misplaced?) dynamic indications in this passage – convention bids that the top note of the motifs should be the loudest. It seems natural to play mm. 28–31 quite softly – letting the passage emerge as a static preparation accumulating tension for the following expansion – and to render the low-register copies of the motif as distant echoes.

It is remarkable that Beethoven did not prescribe a *crescendo* up to the peak in mm. 35/36, but virtually all pianists play louder anyway, and one may read the *decrescendo* mark in m. 40 as a confirmation that this a warranted decision. But the *decrescendo* might at first seem to be too late. The fact of the matter seems to be this. Whereas one should not start the *diminuendo* immediately after the peak – there must be sound enough to lead all the way into the cadence – one certainly cannot go on playing *crescendo* until the *decrescendo* indication – the result would be excessively loud. It seems that a sensible solution is to cease *playing* louder after the registral peak and then to let the transfer to lower registers automatically produce a further dynamic increase; the abrupt melodic gesture a–d♯–c♯–B♯ in mm. 37–38 discloses an agitation that demands a full sonority. (Thus, the registral peak should not coincide with the dynamic one.) Later on, and possibly contrary to Beethoven's intention, the change to d♮–c♯–B♯ in mm. 39–40 might be underscored by a suddenly reduced loudness. If this idea is adopted, the cadence should preferably regain some force – the warm sonor-

[3] On the right track? Why not allow for a subtle contrast in terms of anacrustic triplets in

ity of the A-major chord in m. 40 deserves a slight emphasis. As to the cadence, there are several inherent voices that can be brought out, but it seems advisable to confine oneself to a discrete tenor counterpoint to the bass, a motion that completes the melody left at B♯.

The passage mm. 32–37 is characterized by a metric conflict between the triplets and the inherent motion proceeding in duplets. Especially in mm. 35–37, where the metric reference points are sparse, some listeners might slide over into hearing the music in terms of two-note units. This would bring a sense of apparent hastening of the tempo that might go well with the absence of the melody and the registral expansion, but one should counteract this tendency by slight accents supporting the regular triplets.[4] Every new bar/harmony in mm. 32–35 has a slur of its own, but these slurs can be considered redundant and should not give rise to any undue demarcation between the bars. To achieve a continuously growing sound one should rather try to blur the harmonic shifts be means of late pedal shifts.

Whether the *crescendo* in m. 48 should be understood as an increase in loudness up to *piano*, or as an increase followed by a *subito piano* is hard to decide, and besides you may suggest a *crescendo* already in m. 46, calling attention to the fact that the music enters the relative-major key by a brighter sound quality. The passage offers a further opportunity for dynamic expression that it would be a pity to forgo. Bars 48–50 are similar to mm. 25–27, but there is crucial difference: d♮^{2} turns up instead of d♯^{2}. But even apart from this association there is something quite moving in the way the melody loses the thred, as it were, presenting the unexpected turn d♮^{2}–b♯^{1}. (Retrospectively, it forebodes the next phrase.) A♯ *subito pianissimo*

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this passage? Because m. 29 is not compatible with such a way of playing or listening.

[4] If one chooses to let the latent duple metre dominate this passage, the peak of the curve, involving a reversal from rising to falling duplets, must be played with great rhythmic clarity. On the other hand, if regular triplets prevail, the very top note d♯^{3} occurs at an unprivileged metric position just before the main accent.

effect is called for here, heightening again the impact of a Neapolitan chord but this time by means of a negative emphasis.

Hence, m. 51 begins very softly, and in order to further enhance the difference between this passage and the parallel B-major one in the "exposition" it seems to be a good idea the play the second two-bar phrase even softer than the first: without any conspicuously interfoliating left-hand motion, without any local *crescendo/diminuendo*, and so selective in touch that you can keep the pedal down for two bars. Varying parallel passages is often rewarding, and mm. 51–54 invite to it: although just two semitones above B major, C♯ major has a much greater transparency, and to my ears (susceptible as they are to key characteristics) this sonority offers other possibilities than the harsher quality of mm. 15–18.

If you arrive at m. 55 with the utmost restraint, the second half of the bar must resume the initiative that the melody was about to lose. Contrary to the otherwise corresponding situation in m. 19, there is no overlapping involved in m. 55: a new phrase begins at $c\sharp^2$ with an extended middle-of-the-bar upbeat, and this impulse is what the following passage demands. To explain this, we need to take a closer look at mm. 55–59 – arguably the most complex and ambiguous passage in the movement.

From the harmonic point of view m. 56 is made up of an accented seventh-chord followed by its weak-beat resolution, and this pattern recurs in the next bar featuring two similar, contracted appoggiatura/resolution units. This means that one is prone to understand the melody in mm. 56–57 as a falling and accelerating chain of repeated notes grouped to form trochees. But seventh-chords to be resolved usually occur as upbeats giving rise to iambs; hence, the melodic trochees are destabilized by metrically displaced iambs. And yet, for all its inherent tension, this reading may emerges as somewhat static. It is also less convincing in m. 55, by retroactive implication the first link of the chain: the chords do not lend themselves to a double-size trochee. But the F♯-minor chord on the third beat connects better with the B-major seventh-chord on the following main downbeat, as the double slurs in the left hand may be taken to recommend (a

corresponding right-hand slur would have clarified the situation even more). This means that there is a falling iambic step c♯^{2}–b♮^{1} in the melody, a group to be followed by three faster ones leading the melody down to f♯^{1}.

For several reasons the latter rhythmic organization may emerge as more attractive than the trochaic one. The active anacrustic groups urge the melody downwards, and the hastening of the pace is more convincing – one might linger somewhat on the fourth beat of m. 56 to make the quickening even smoother. Since the chain of iambs demands to be played *crescendo*, this reading matches very well with the idea of playing the preceding passage extremely soft. (The trochaic, repeated-note interpretation, on the other hand, rather suggests a *diminuendo* which means that you have to be fairly loud at the beginning of m. 55.) Finally, the trochees (the displaced iambs) deriving from the harmonic patterning bring a strong sense of continuity to the passage by supplying overlapping groups linking the iambs together.

As already mentioned, the idea to form this passage as a series of falling iambs gaining momentum after a hesitating start agrees with the slurs in mm. 55/56, but then there are no slurs indicating upbeat grouping, and m. 57 features a whole-bar left-hand slur showing a circular double neighbour-note motion that is neither trochaic, nor of course iambic. The following *crescendo* leading up to (but presumably not including) the six-four chord is compatible with a trochaic, receding interpretation of the preceding bars. If you have played the melodic descent with gradually increasing dynamics, on the other hand, it seems necessary to start a *diminuendo* in m. 58.

A further peculiarity of this passage should be mentioned: the first, slow iamb c♯^{2}–b♮^{1} is accompanied by a rising sixth in the bass, but then this powerful contrary motion is replaced by falling thirds producing a rather bland two-voice counterpoint. Would Beethoven have pursued the progression with three further rising sixths in the left hand, had the keys been available? Those who dare to do so can transpose the left-hand upbeats one octave down – the sonority will grow so as to make any additional *crescendo* superfluous. But now Jeeves has perhaps exceeded his authority?

Bar 59 can take a mediating tenor-note f♯, but the following e must be subdued so as not to compete with the G♯ in the left hand. Otherwise m. 60 begins in a way that make the listener expect that the soprano will bring an entry at g♯^{1} just as it did in mm. 5 and 42. Hence, it would be possible to let the fourth-beat G♯ come as a surprise, but a close look in the score discloses that Beethoven (probably) had something else in mind. It is a notational necessity, but the G♯ on the first beat has a separate stem suggesting that this note is designed to introduce the organ-point making for suspense all the way up to m. 66. Thus, it seems that this additional voice should be clearly announced from its very start.

The two-bar units mm. 62–63 and 64–65 are virtually identic, and if the relegation of the hairpin marks to the left hand in the second phrase is not merely a notational artefact, Beethoven seems to have prescribed, or recommended, an interpretational difference. The dynamic indications aside, it is preferable to play the repeat in a less active way, and this can simply be done by abstaining from any intentional right-hand dynamic expansion – due to the pedal the sonority will grow by itself. However, there is a more important difference to be made. In order to avoid a too obvious closing motion to c♯^{1} in m. 64, one might suppress the leading-note and give some emphasis to the complementary interior-voice descent from a to e. The second time the balance between the strands should of course be reversed by bringing out the motion from b♯ up to the tonic note.

The concluding figurations (that may be demarcated from the downbeat in m. 66 by a very slight delay) contains two triadic descents – one from e^1, and one from e – converging on C♯. You have to choose, but in any case you should play delicately enough to be able to sustain the pedal until the very end. If the sonority becomes to thick, you had better wait until after the penultimate chord.

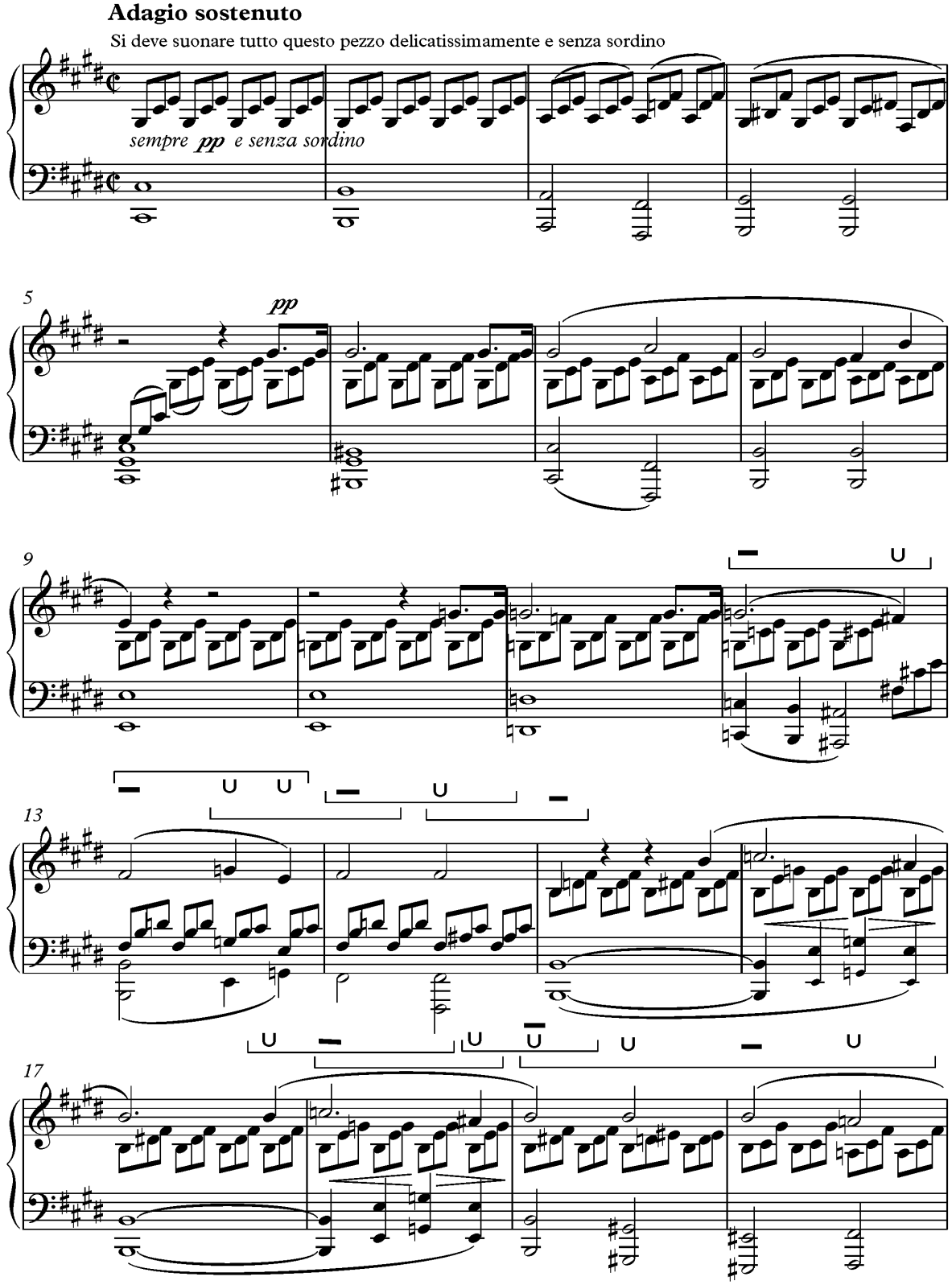
The philosopher Thomas Carson Mark has argued in a remarkable essay that it is the addition of the interpretative element that makes the differ-

ence between a mere exemplification of a music work and a performance of it.[5] I hope that my thoughts on interpretation – plans for a castle in the air – have shed some light on what interpretation might involve. Mark also holds that interpretations of music works in themselves make up separate works of art. Perhaps I have also been able substantiate this idea by calling attention to the element of independence in the musician's intentions and judgements.

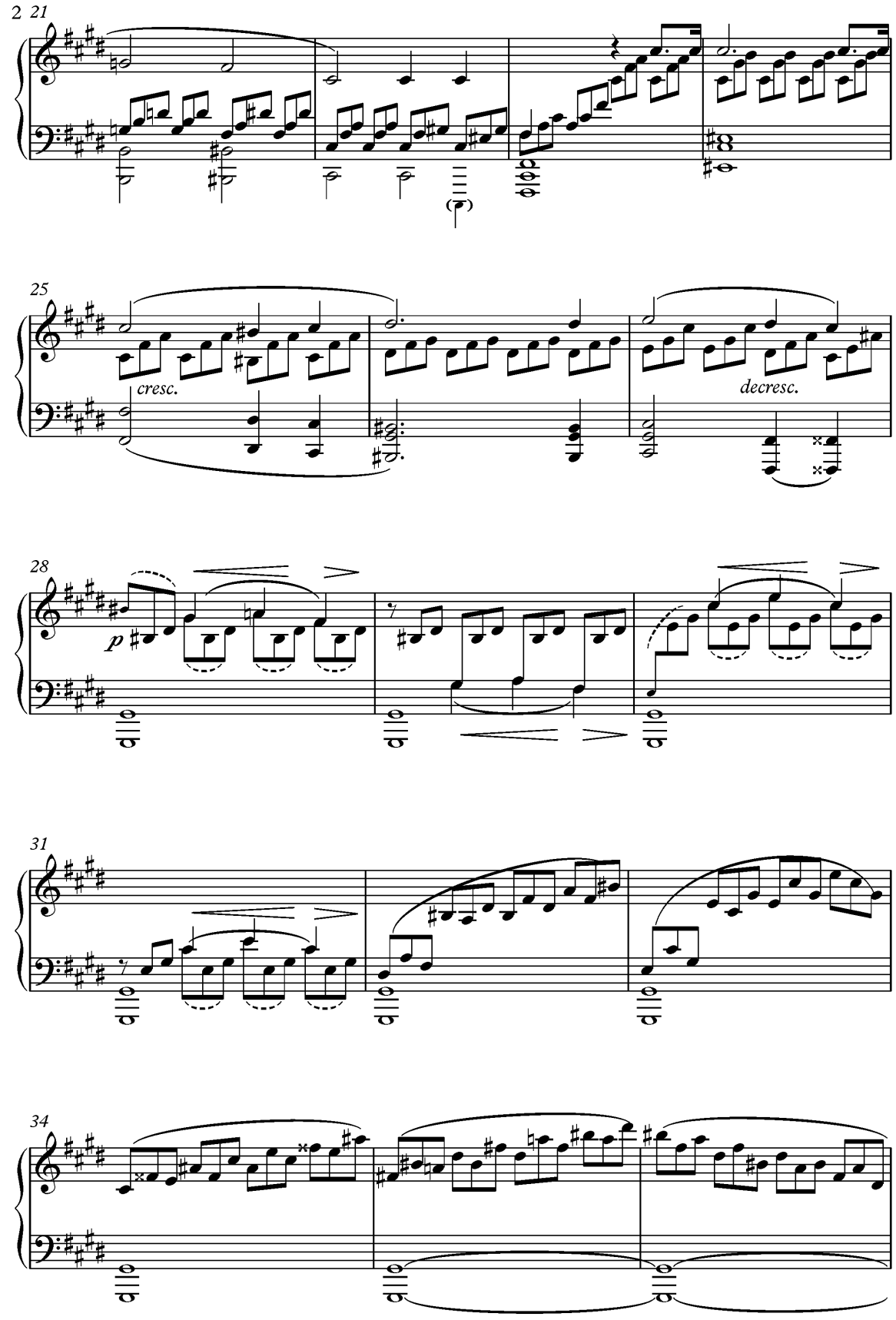
[5] Mark, Thomas Carson, "Philosophy of Piano Playing: Reflections on the Concept of Performance", *Philosophy and Phenomenological Research* 41 (1980/81), 299–324

Navigating in moonlight

Ex. 1



Ex. 1 (cont.)



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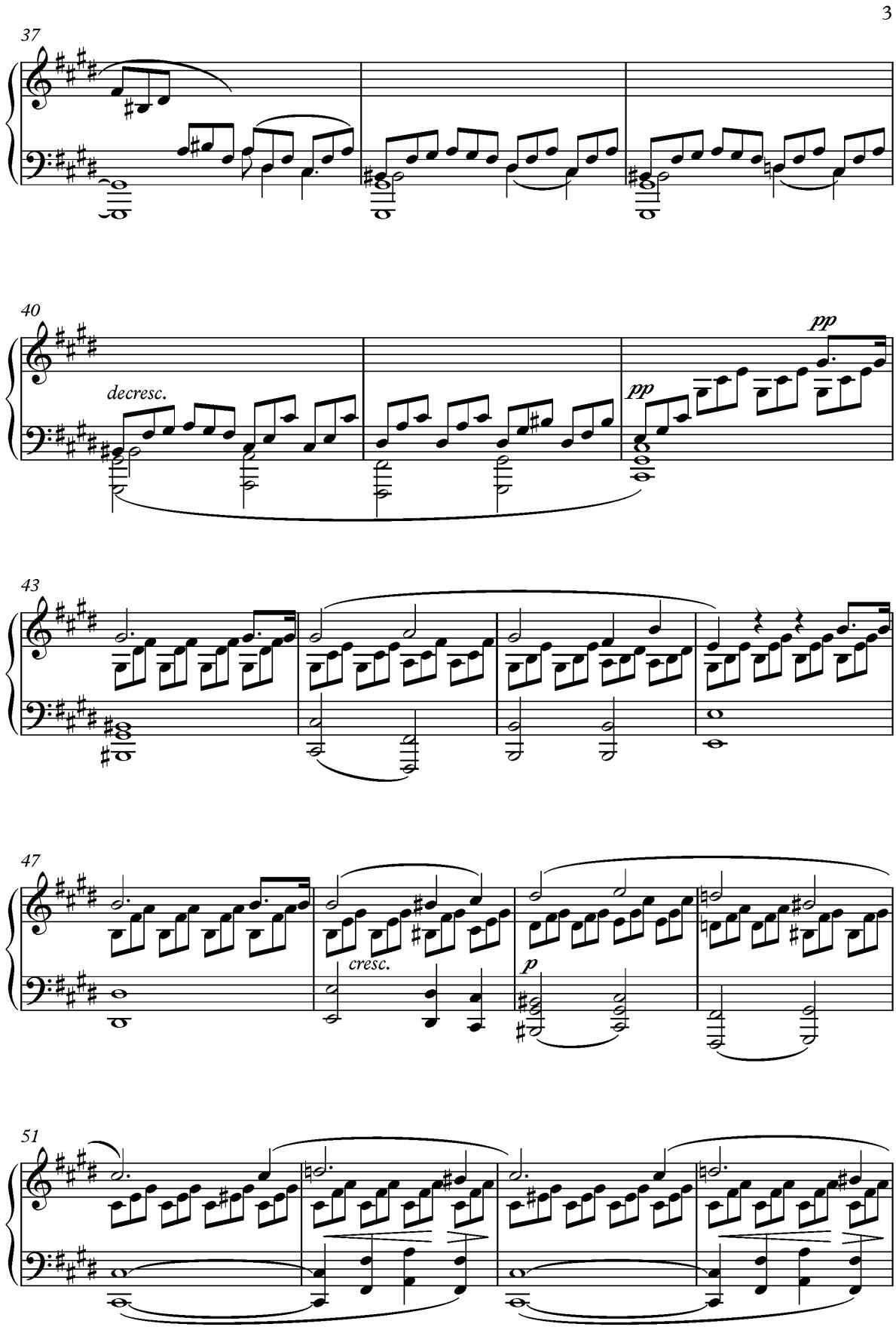

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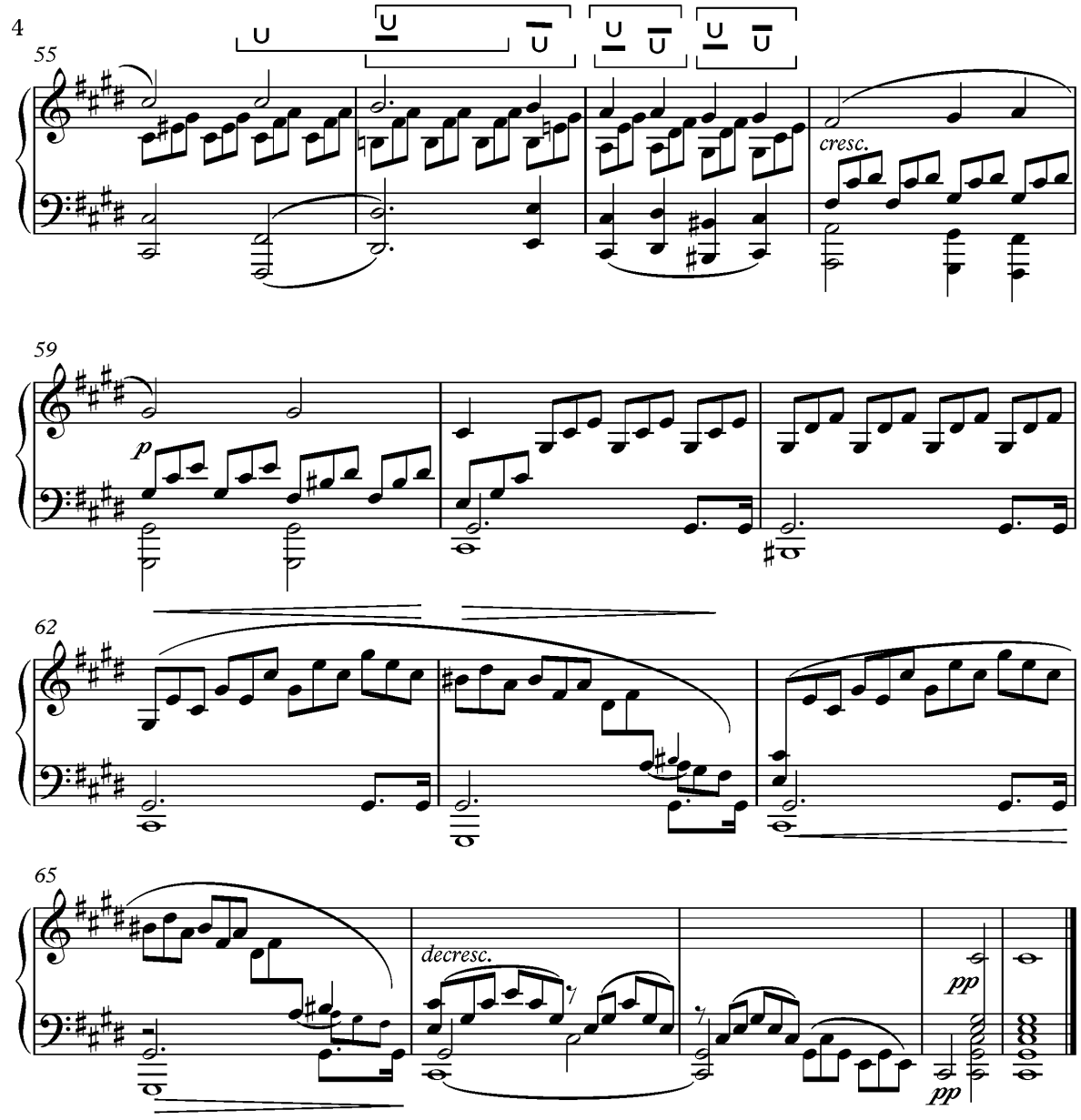
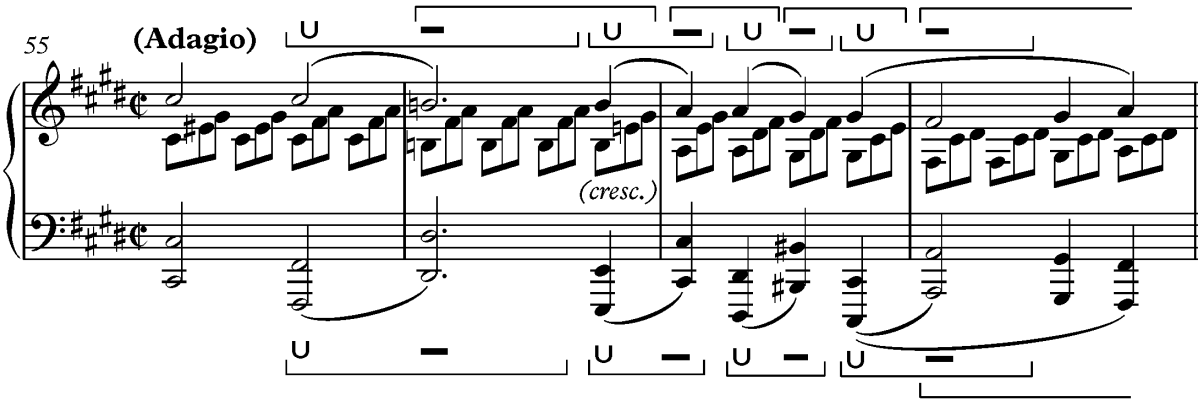


Ex. 2



Bengt Edlund

Interpreting Syrinx

From traditions to *Urtext*

In an article in *Flute Talk*, Roy E. Ernst and Douglass M. Green with little reserve quote Marcel Moyse's rather adventurous account of the composition of *Syrinx* and of what happened to the original copy.[1] According to Moyse, Debussy's manuscript "lacked even a bar line or phrase marking". These markings were added to the manuscript by Moyse himself when preparing the first performance of the piece; the bar-lines then turned up some fifteen years later when it was published. In effect, Moyse says that the current edition of the work is corrupt: important inscriptions do not stem from the composer.

But in the following issue of *Flute Talk*, Jean-Pierre Rampal dismisses Moyse's account.[2] He refers to the "long French tradition", according to which *Syrinx* was first played by Louis Fleury who kept the manuscript until the piece was published. And Rampal says nothing to the effect that Debussy's manuscript was incomplete with respect to interpretative signs and bar-lines.

Since then, further research has settled the controversy as to the proper reading of *Syrinx*. A manuscript that in all probability stems from the composer's pen has been retrieved and published by Anders Ljungar-Chapelon,

[1] Roy E. Ernst and Douglass M. Green, "Performance Guide: Interpreting *Syrinx*", *Flute Talk*, February 1991, 13–18

[2] "Jean-Pierre Rampal on *Syrinx*", *Flute Talk*, March 1991, 12–13

an edition doing away with the uncertainties as regards both text and context of *Syrinx*.[3]

Some remarks on interpretation

But the main issue of the present text on *Syrinx* is not musical philology, but a kind of reasoning, very frequent among musicians and to be found also in the article by Ernst and Green: "the markings, especially bar lines and phrase markings, are open to a wider variety of interpretation than if they were Debussy's own".[4]

The current ideology among present-day musicians attaches great importance to the musical text as given by the composer, including its various "markings", but this attitude of loyal submission is not beyond debate and qualification. Over the last two centuries the composers have provided more and more "markings" in addition to the basic pitch and time symbols. Although they perhaps did not want to preclude other interpretative possibilities, these signs have generally been read as normative, which means that the composers have to some extent taken over the role of the musicians.

When considering such markings within their musical contexts, it seems that they are sometimes necessary elements of the notation in virtue of defining the musical structure; in other cases they derive from stylistic conventions or specify the execution of certain musical details. While it is of course the prerogative of composers to inscribe structural signs, their interpretational markings cannot very well be accorded the same normative authority. Composers take down such signs as (the first) actual or virtual interpreters of their pieces, and there cannot reasonably be any strict obli-

[3] Edition Autographus Musicus, Stockholm 1991. The Universal *Urtext* edition from 1996 (*Rote Reihe* UT 50173) is based on the manuscript found by Anders Ljungar-Chapelon.

[4] As we now know, some of the markings in the widely spread edition conform to those in Debussy's score while others do not.

gation for other (later) musicians to imitate the performances indicated in the scores. The duty of a creative musician is rather to distinguish structural markings from interpretative ones, i.e. to distinguish normative signs from signs that might be regarded as proposals. Interpretative hints (or commands!) from composers (and from other people having musical insights) are certainly of great interest, but there is no reason to generally assume that the composers necessarily had the best, let alone the only permissible, ideas as to the interpretation of their music.[5]

The problem with interpretative markings – and especially if they are accorded normative significance – is that they restrict the creative imagination of the musicians, and that they do away with some of the ambiguity that may reside in musical structures. It might be argued that this withholding of inherent richness is disadvantageous, and particularly that frequently played masterpieces are likely to suffer most from a reduced interpretative variability.[6]

Interpretative markings are not there to be unquestioningly obeyed – they must be understood and then evaluated with respect to the musical context. Carefully grounded decisions, for which the musician takes full responsibility, are at the core of interpretation, and in this never-ending process, tradition – whether inscribed as "text" by the composers, or deriving from other sources and mediated in less explicit ways – is but one of the factors to be considered.

In what follows, some structural details of *Syrinx* as well as its overall design will be described in order to give a background for a discussion of interpretational issues. As a consequence of the standpoint just explained the interpretational signs, whether deriving from Debussy or from the

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[5] This is of course not to say that musicians (and others) should not consult *Urtext* editions. If such editions are available, it is imperative that they are used as primary sources when studying the music.

[6] A more detailed and comprehensive discussion of these issues, fundamental to musical interpretation, is to be found in Bengt Edlund, "*Sonate, que te fais-je?* Towards a theory of interpretation", ch. 2 in *Wits and Interpretation*, Berlin 2023, Peter Lang Verlag, and also in *The Journal of Aesthetic Education* 31(1997), 23–40.

current (and partly corrupt) edition, will not be accorded decisive importance for the suggestions as to how the piece may be played. Instead of referring to "authoritative" prescriptions, the interpretative ideas will be based on structural observations.

Some structural observations and a reductive account

The analysis to follow will be restricted to observations pertinent for interpretation; cf. Ex. 1. *Syrinx* has been much studied and played so there is no need to account for all of its details.[7]

Due to the obvious recurrences of the theme in mm. 9 and 26, *Syrinx* invites to be understood as a ternary form featuring a developmental middle section starting in m. 9 and a coda, beginning in m. 31 and reminiscent of both the development and the theme. But the piece hides further formal ambiguities. Should the enchanting three-bar "escape", starting suddenly on the third beat of m. 5, be understood as an independent formal unit? There is no doubt a subdivision within the section mm. 9–25, but does the second sub-section start in m. 16, in m. 14, or does it break out already in m. 13?

The reason why the passage mm. 6–8 escapes the rest of the piece is not just the calmness of the long notes: the sudden rising line in m. 5 presents a harmonic change, an F♭-major chord with an added major sixth. But the passage is connected to what follows by its final descending fourth, issuing from the climactic $e^{3}♭$ and leading back to the central note $b♭^{2}$; the fourth $e♭^{2}$–$b♭^{1}$ is then used as a turning point also in mm. 11, 12, and 21.

[7] A selection of writings that contribute significantly to our understanding of various aspects of this piece should be mentioned. Robert Cogan and Pozzi Escot, *Sonic Design: The Nature of Sound and Music*, Englewood Cliffs 1976, pp. 92–101; Irène Deliège, "Le parallélisme, support d'une analyse auditive de la musique: vers un modèle des parcours cognitifs de l'information musicale. Application à Syrinx de Claude Debussy", *Analyse Musicale* (1987)1, 73–79; Ulrich Mahlert, "Die 'göttliche Arabeske'. Zu Debussys 'Syrinx'", *Archiv für Musikwissenschaft* 43(1986)3, 181–200; Jean-Jacques Nattiez, *Fondements d'une sémiologie de la musique*, Paris 1967 (third part, second chapter, 4).

There is a kinship between the filled-in descending-fourth motif starting from g♭² in the theme and the important appoggiatura motif in mm. 15–19. Retrospectively, this affinity stands out quite clearly in mm. 30–31 where the two motifs issuing from the same pitch are closely juxtaposed. The appoggiatura motif might be described as a connective, upbeat variant of the open-ended falling-fourth scale fragment in the theme. (In many performances the g♭²–f²–e♮²–d♭² descent is played in ways that suggest a connecting upbeat).

Due to the frequent use of these motifs the listener will recognize them and use them as a basis for expectations. Having heard an appoggiatura-like falling semitone followed by a further descending semitone, the listener is prone to expect a falling minor third (or an interval equivalent to it), and after a falling semitone and then a minor third, he/she is prepared for another falling interval, perhaps followed by a rising motion.[8]

The fact that the descending chromatic theme from m. 1 finally and demonstratively yields to a falling whole-tone scale in mm. 34–35 is almost invariably pointed out in analyses of *Syrinx*, and this observation, explaining the sense of resolution felt in the coda, is indeed fundamental for understanding the piece. This fact may also be described as a final change from the whole-tone scale fragment b♭²–a♭²–g♭²–e♮², emerging at accented positions in m. 1, to the complementary and complete whole-tone set b♮¹–a♮¹–g♮¹–f¹–e♭¹–d♭¹ closing the piece.[9]

Nobody is likely to miss that the pitch-classes B♭ and D♭ are both frequent and prominent in *Syrinx*, and that they open up and repeatedly confirm a major sixth (b♭²–d♭² or b♭¹–d♭¹) as the primary tonal space of the piece. With the pitch-class C♭ prominent in mm. 5–7, and with A♮ (B♭♭), E♭, D♮, and final-

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[8] For a theory of melodic implications, cf. Leonard B. Meyer, *Explaining Music*, Chicago 1973

[9] Carol K. Brown, "Varèse's Explication of Debussy's *Syrinx* in *Density 21.5* and an analysis of Varèse's Composition. A Secret Model Revealed", *The Music Review* 43(1982), 121–134; for another analysis of Varèse's flute piece, cf. Bengt Edlund, "Probing Density 21.5", *Music Research Forum* 11(1996)1, 48–69.

ly C emerging in mm. 13–19, it seems that the non-expositional sections of the piece are about the introduction of neighbour-notes. The B♭/D♭ space is finally expanded to an augmented sixth when the note b♮^{1} is exposed in the coda, a decisive change that is accomplished by a slow rise from d♭^{1} that eventually by-passes and surpasses b♭^{1}, and that is followed by the final serene whole-tone variant of the theme – a tonal transformation that in retrospect emerges as anticipated in m. 32.

The appoggiatura motif in m. 14 might be heard as implying d^{1}♭, the lower pole of the tonal space. But instead the music gets stuck on e^{1}♭, the diatonic upper neighbour-note of d♭^{1} and a pitch-class that has repeatedly demonstrated its devilish tritone relationship with a♮^{2}/a♮^{1}, the chromatic lower neighbour-note of the upper tonal pole b♭^{1}. After d♮^{1} (chromatic upper neighbour of d♭^{1}) has been reached in m. 16 by means of a transposition, the appoggiatura motif in m. 18 by the same token implies c^{1} (chromatic lower neighbour of d♭^{1}) launching a gesture stretching upwards to b♭♭^{1}, the enharmonic lower neighbour of b♭^{1}. The expansive rising-octave-then-rising-ninth leaps and the falling-fifth-then-falling-fourth motions in mm. 17–21 emerge as moves to regain the upper tonal pole of b♭^{1}. As to the lower tonal pole, the music alternates between d♭^{1} and d♮^{1} – the latter note is heard as late as at the end of m. 22.

The tonal processes just described can be summarized as a two-voice long-range progression – a progression that in turn undermines, confirms, and finally transcends the initial B♭/D♭ frame, and that discloses the tonal tendency underlying the music; cf. the reductive graphs Ex. 2 and Ex. 3. (It is exhilarating to make a reduction of a piece lying safely outside Schenker's "tonal" empire, to analyse without a prescribed result.)

Suggestions for interpretation

Considering finally some aspects of interpretation, a number of passages

will be commented upon, passages involving crucial decisions as to the formal and expressive properties of the music.

The first set of interpretative options concerns the theme. The pairs of short notes give rise to forward-pushing anapaests. But a performer may want to counteract this inherent upbeat tendency – indeed, this is what Debussy's slurs indicate. To achieve a more restrained and relaxed dactylic touch, several means are at disposal: a slight dynamic emphasis on the long notes, a somewhat less sharp durational differentiation, perhaps a minimal moment of silence after the short notes. If the first two motifs are rendered as anapaests rather than as dactyls, the falling-fourth motif on the third beat is likely to emerge as an anapaest as well, providing a link up to b♭^{2} in spite of the rising-sixth leap. And if this happens, it is almost inevitable that the final gesture in m. 2, issuing from and returning to b♭^{2}, sounds not as a new, abortive start, but as finishing the melodic line begun in m. 1.

The same alternatives apply in m. 4. Either the falling line begun in m. 3 finally veers off to b♮^{1}, or the first beat of m. 4 comes up with a new phrase with an unexpected and far-reaching potential. In any case, the initial motif in m. 4 is clearly a mutation, and its result, the b♮^{1} – foreboding by chance, as it were, the outcome of the entire piece – should be conspicuous and yet unobtrusive. After a moment of hesitation, or perhaps perplexity, this note is left and raised first to c^2 and then to d♭^{2} by means of the same motif that started the bar, but now emerging as smooth, connective anapaests.

Bar 5 begins as did m. 4, but this time the aberrant b♮^{1} may turn up with more confidence – it has already been introduced, it is slurred so as to be the final downbeat of a rhythmic group, and its tonal importance is underscored by the enharmonic re-interpretation into c♭^{2}. It is a challenge for flutists to suggest, immediately or gradually, this enharmonic shift.

The ensuing rising figure may or may not depict Pan jumping over a log, but it should not be rapid or airy to the point of loosing its internal secondary metric accent. The high e♭^{3} is ambiguous since it is first likely to be heard as the seventh degree in F♭ major, and then (after the b♭^{2} has been

played) to be understood as the first degree of a transient E♭ tonality. Perhaps flutists have subtle means to clarify this tonal re-interpretation while playing the long e♭^{3}? Alternatively, exchanging a retrospective effect for a sense of anticipation, the shift in tonality from F♭ to E♭ may perhaps be suggested already when playing the long c♭^{3}, turning a fifth degree into a sixth degree.

The repeated statement of the theme in m. 10 ends with a rising motion, and this situation offers two distinct options for the player. The difference may emerge only when it actually occurs towards the end of the bar, or the mutation may be anticipated so as to let the listener suspect that something new is about to turn up – the initial motif in m. 10 (or its transposed copy issuing from a♭^{1}) can be played so as to announce or seem to cause the change.

The appoggiatura motif in m. 11 is probably heard with the triplet formulation from m. 4 in mind, and therefore the d♭^{2} may seem to be added to the motif, stretching the metre and making for an opportunity to provide a moment of sensuous delay. The similar rapid passage in m. 12 subtly undermines the metre. Having heard the slow model in mm. 10/11, straddling the bar line, the listener is prone to again locate the appoggiatura motif to a strong beat, which will make the first four rapid notes of m. 12 appear as the final, added part of an extended third beat of the preceding bar. But this latent metric irregularity can also be conceived of in another way: the bar lines may seem to occur before the long notes of the second beats in mm. 11 and 12. As a result, mm. 10–12 will appear to be divided into an extended 4/4 bar, followed by an eventually quite precipitate 3/4 bar, and then by a short 2/2 bar.

Bar 13 quite unexpectedly starts with a♮^{2}, a very important note in the tonal process of the piece. This lower neighbour-note to b^{2}♭ may just occur, or it can be prepared by making the triplet upbeat conspicuous – if so, this crucial turning point will seem to be produced voluntarily and with some effort.

In the next two bars, featuring the appoggiatura motif repeatedly leading to e♭¹, the last two notes of m. 14, bringing a lagging-duplet non-appoggiatura variant of the triplet motif, suggest a sense of rhythmic ambiguity. They can be played so as to clearly form a trochee, introducing a grouping difference between mm. 14 and 15 – if preceded by a trochee, the following appoggiatura motifs (however inherently anapaestic) will turn out as dactyls. Alternatively, taking account of the functional equivalence with the preceding appoggiatura motif, the slow f♮¹–f♭¹ motion may (although it starts on a downbeat) also be rendered as the leisurely extended upbeat part of an anapaest.

Due to the previous retard, the appoggiatura motif beginning m. 16 is likely to emerge as a dactyl. But it seems preferable to allude to the model in m. 4 (leading to b♭¹) and play it as an anapaest leading to c¹-instead-of-b♭. Thus, the implied low b♭ is not realized (it falls beyond the compass of the flute), and avoided is also the middle b♭¹ which the following rising gesture may be taken to grope for. In the long-range tonal process, the b♭♭¹-instead-of-b♭¹ revives the unresolved lower neighbour-note a♮²/a♮¹ introduced in m. 13.

The transposed appoggiatura motif in m. 17 succeeds in reinstating d♭¹. The ensuing octave leap might be taken to bring relaxation, but it seems to make better long-range sense if it is played against the grain so as to necessitate further efforts. M. 18 (identical with m. 16) is followed by a bar, that starts as did m. 17 but eventually comes up with a decisive change: the ninth leap up to e♭². This motion is charged with tension; it may be played as just a local expansion, but it seems to be more compelling to let this overshooting note emerge as if it were caused by the preceding, somewhat empty rise to d♭² in m. 17 and by a renewed effort in mm. 18–19. Hence, mm. 18–19 are not truly parallel to mm. 16–17: they have another function, and must be given a greater momentum.

The exposed e²♭ falls swiftly and with some assurance a fifth down to a♭¹ in m. 20. In what seems to be a second attempt, e♭² returns in m. 21, but this

time it falls searchingly down a fourth to a slightly too-early offbeat b♭1. Just as the rising octave and ninth intervals, the falling fifth and fourth should be played so to correspond to each other in a meaningful way – the straightforward fifth misses the target, the fourth eventually finds the way back to b♭1.

In mm. 25–28, the two statements of the theme are left hanging in the air by rhythmic means. The b♭2's enter one beat too early, an anticipation that the listener is unaware of – unless the flutist gives cues indicating the barline position and the forthcoming start of the falling line. The interpolation in m. 27 heightens the sense of suspense, and it is highly and yet subtly ambiguous. This appoggiatura motif invites to be understood as just an embellishment of the starting note of the theme, but it may also stand for a frustrated continuation of the melody, or an emphatic affirmation of the b♭2. Or perhaps a sense of correction – is there a way of playing the initial b♭2 in m. 27, which actually occurs in due time at the first beat, so as to suggest that it enters in the wrong moment?

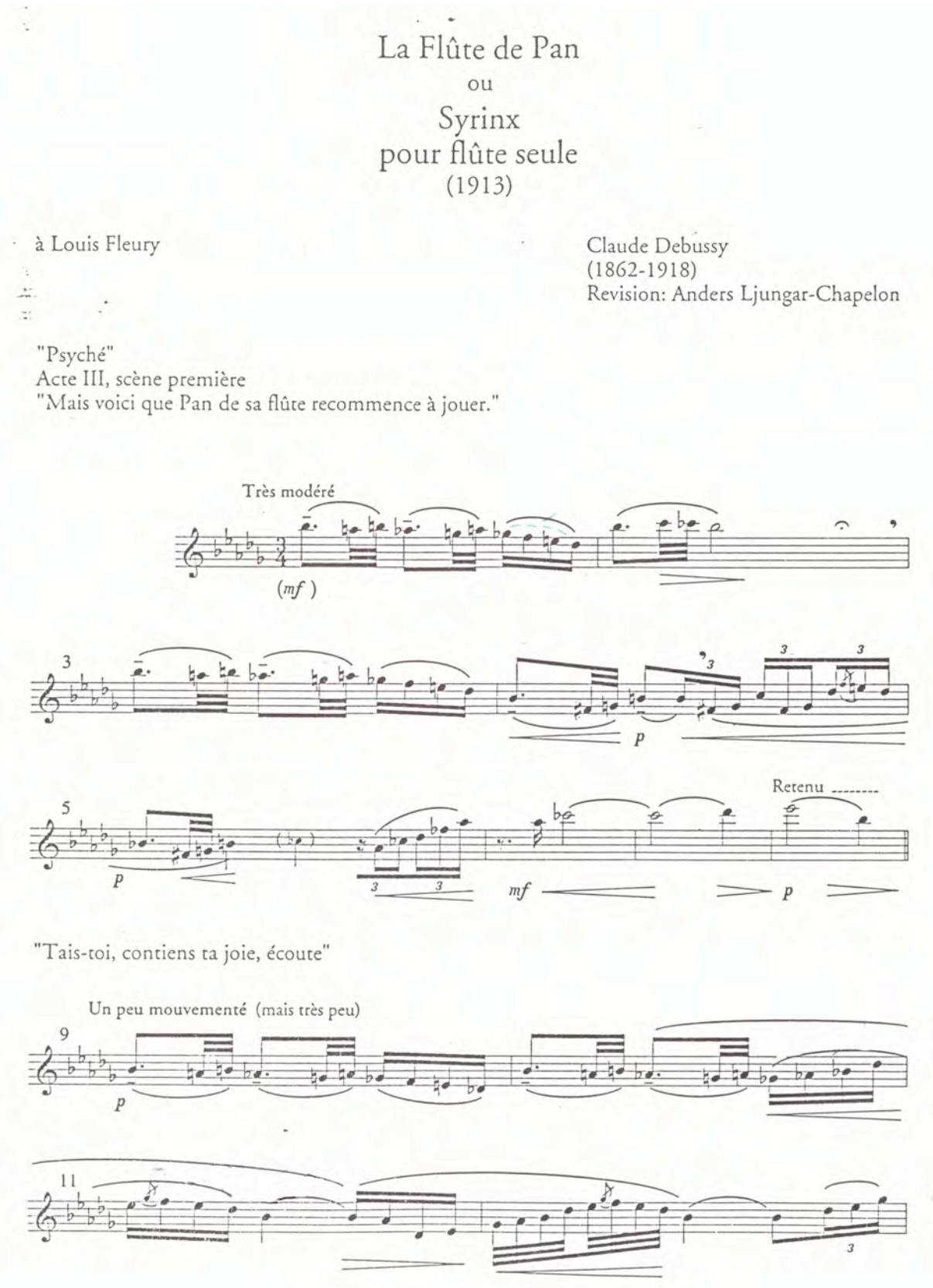
Turning to mm. 29–30, the smoothly gliding transformation of the theme may be played in two ways. The second statement can be rendered softer and slower, giving the passage as a whole a receding and also connecting character. On the other hand, if played exactly in the same way, the two statements will accumulate tension in way that announces the seemingly delayed start of the coda.

When beginning the coda, it is essential that the previous motion from b♭1 downwards is clearly replaced by an imagined sense of motion from d♭1 upwards. Being a varied replica of the preceding falling-fourth motif, the appoggiatura motif in m. 31 implies its own d♭1 point of departure, a pull that must be overcome. The following motion a♮1–g♮1 opens towards a new tonal domain, and the crucial b♮1 then brings the final confirmation and resolution. But when? Underpinned by realistic notions of Pan breathing his last or not, the first-beat stress sign in m. 34 to be seen in the current edition is hard to come to terms with – the *diminuendo* sign in the new, re-

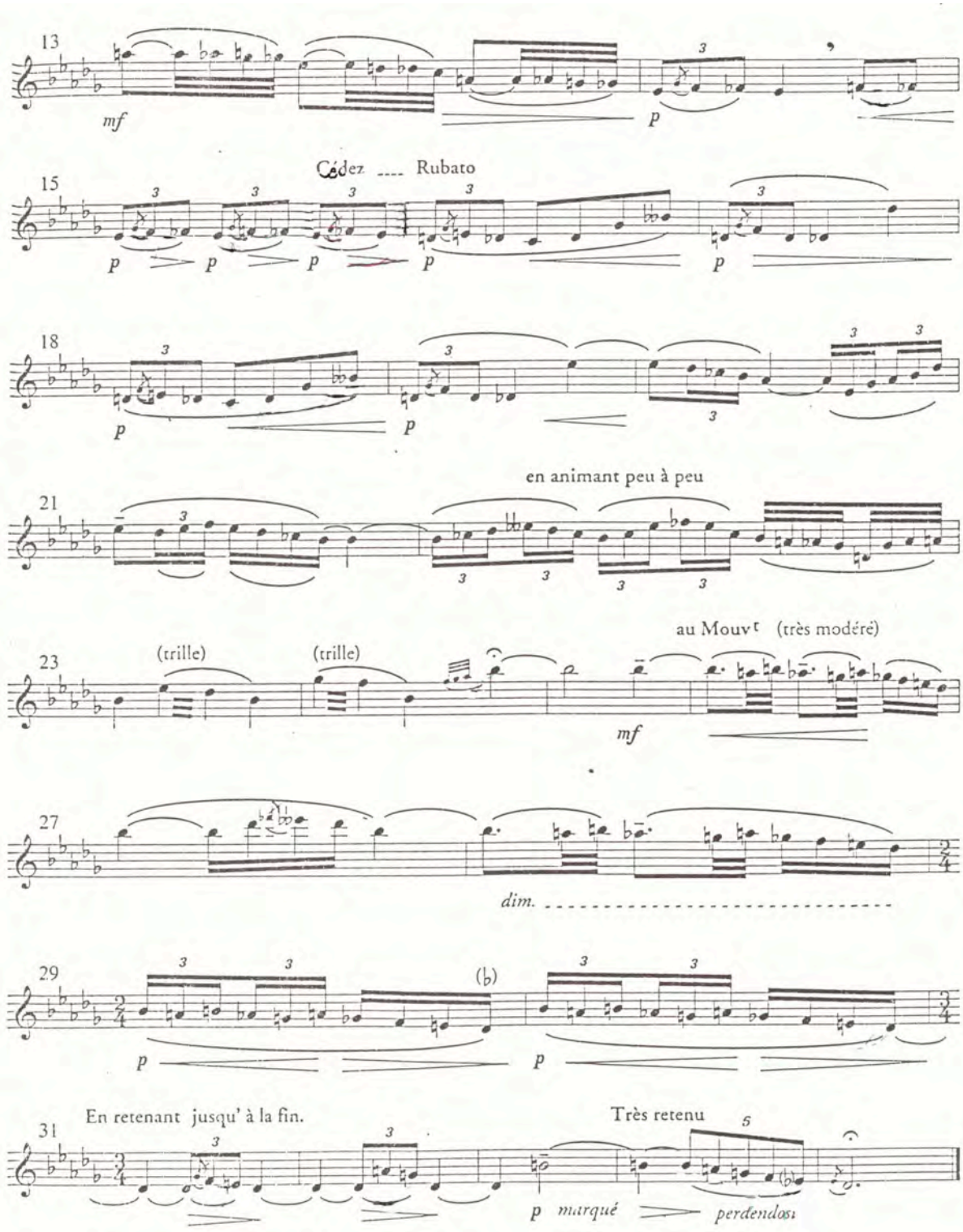
vised edition is certainly preferable. In the very last bar, it is important that the appoggiatura fragment retains some of its original rhythmic quality no matter the *ritardando* and the loss of energy.[10]

[10] I am much indebted to the distinguished flutist Anders Ljungar-Chapelon for inspiring discussions.

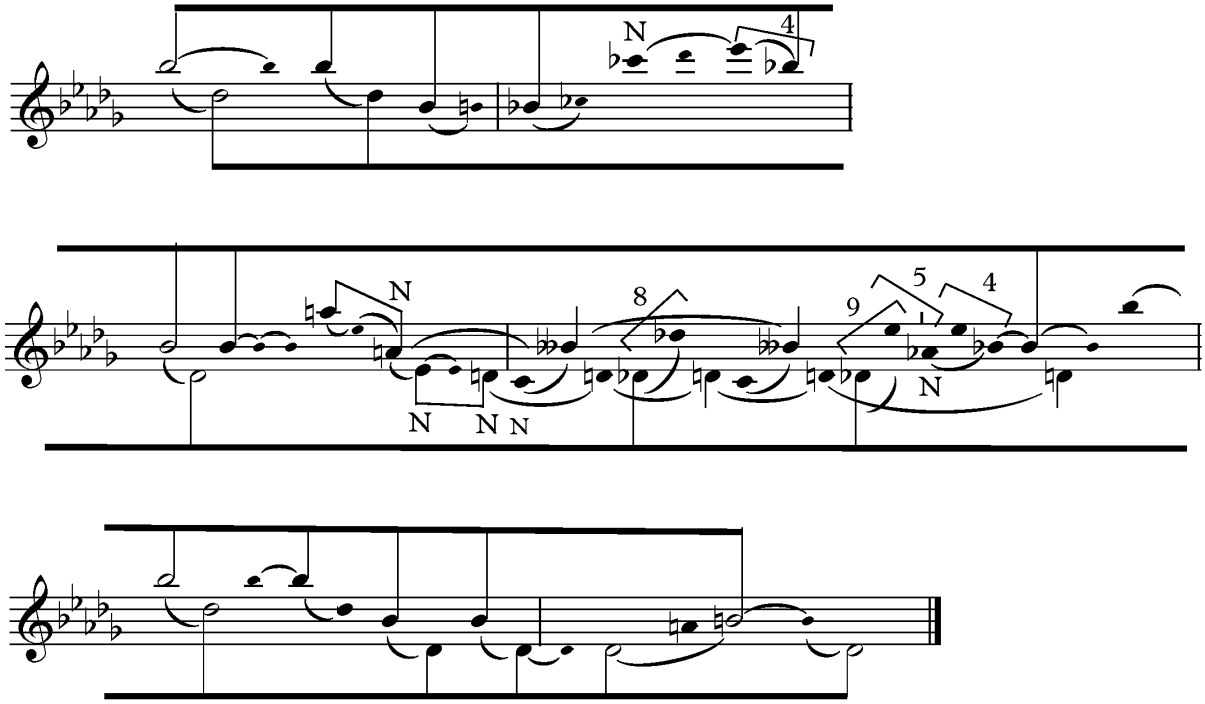
Ex. 1


La Flûte de Pan
ou
Syrinx
pour flûte seule
(1913)
à Louis Fleury
Claude Debussy
(1862-1918)
Revision: Anders Ljungar-Chapelon
"Psyché"
Acte III, scène première
"Mais voici que Pan de sa flûte recommence à jouer."
Très modéré
(mf)
p
Retenu
mf
p
"Tais-toi, contiens ta joie, écoute"
Un peu mouvementé (mais très peu)
p

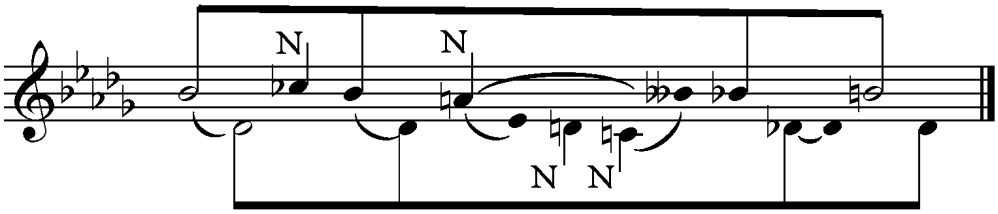
Ex. 1 (cont.)


13
mf
p
Cédez ---- Rubato
15
p
18
en animant peu à peu
21
au Mouvt (très modéré)
23
(trille)
(trille)
mf
27
dim.
29
(♭)
31
En retenant jusqu' à la fin.
Très retenu
p marqué
perdendosi

Ex. 2



Ex. 3



Bengt Edlund

Approaching the Irresistible and Preparing the Scaring

Approaching the irresistible

Many performances of Chopin's A♭-major Polonaise Op. 53 suffer from a potential weakness in its formal layout. There is a risk that the extended calm episode from m. 129 to m. 150 emerges as a *longueur*, as an interlude where the sense of tension dissipates. Yet, all listeners having heard this famous polonaise know that the main section is about to return, and this is even what a first-time listener is likely to expect – it seems inevitable that the magnificent theme from the beginning will turn up again.

What can a pianist do to keep up the tension? That he/she is supposed to do so is obvious if one takes account of the message brought by Chopin's markings in the score. The *sforzato* D's in mm. 130 and 134, the *sforzato* F_1's in mm. 138 and 142, and the two *sforzato* descents F–E♭–D♭–C in mm. 143–147 – descents that are then echoed as f–e♭–d♭–c in mm. 147–150 – all serve this purpose. And so do the insisting dotted rhythms in m. 132, the urging sextuplets in m. 140, and the irregular accent signs asking the pianist to bring out the note c^2 in mm. 143–151. The *diminuendo* and then *smorzando* indications holding back the latent energy in mm. 145–150 also contribute to the sense of suspense, as does the monotony of the melody itself from m. 129 up to m. 151.

There is a further, quite important but all too often neglected aspect of the structure that forebodes the change to come: a regularly appearing event signifying a restlessness that can be used with great effect to undermine the sense of stasis, and hence to boost the listeners' expectations. From m. 143 up to m. 150 the pianist may bring out the syncopated octaves c/c^1; cf. Ex. 1. Indeed, this drone, this brooding signal betraying that the inactivity is in fact a state of pent-up energy, can very well set in much earlier so as to affect the entire section. In mm. 129–135 d/d^1 turns up regularly as the second eighth-note in the left hand; in mm. 137–142 this syncopated event is transposed to f/f^1.

But mm. 129–150 must also be introduced and left in a way that maintains and increases tension, respectively.

There are performances of the polonaise in which m. 120 is used to withdraw from the eventually quite tumultuous middle section. According to Chopin's *crescendo* sign this is wrong – and what's more and worse – it is also a bad idea. The first beat of m. 121 cannot very well be the loudest event of the polonaise in physical terms, but it should arguably be the most intense. And there is nothing in the score telling you to appreciably calm down during the following passage, nor is there any musical reason for doing so – there are many full chords demanding a big sound. The cooling down should be postponed until m. 128.

The entry of the main theme in m. 155 is frequently preceded not only by a *crescendo* from m. 151 on as prescribed in the score, but also by a grand *ritardando* starting, say, two bars later. This is no doubt the standard way of preparing for *fortissimo* recurrences of main themes, and in this case the preparation often issues into two quite slow and quite heavy third-beat eighth-notes in m. 154. But this pomp-and-circumstance strategy is perhaps not always the optimal one when approaching a strongly expected, inevitable moment of return.

Let's imagine that the theme starting in m. 155 is a magnetic rock, irresistibly attracting everything approaching it. This idea may be suggested by first showing the attraction, then the resistance to it, and finally the moment of giving in to the attractor – if something is irresistible, you cannot resist it.[1] This means that the *crescendo* should go with an *accelerando* up to the first beat of m. 153. The following four beats are then to be played *ritardando* – dotted rhythms are very suitable when it comes to suggesting a sense of checking and resistance. The falling eighth-notes of the third beat in m. 154, finally, have to be rendered very loud and strictly *à tempo*, or be played with a precipitate *accelerando*: before the torrent comes, the barrage must break; cf. Ex. 2.

This way of approaching a strongly expected return or culmination can of course be applied to other similar passages. The vehemence associated with an *à tempo* upbeat is, for instance, most appropriate in mm. 45–46 of Chopin's C-minor Etude Op. 25, No. 12. Here the *ritardando* should preferably issue into two precipitate quarter-note groups played strictly in the tempo to be restored.[2]

Preparing the scaring

Chopin sometimes provided his pieces with strange endings challenging listeners as well as pianists. One case in point is the convulsions, menacing and majestic at the same time, that close the Etude Op. 25, Nr. 5. Another one, and the one to be discussed here, is the ominous and dramatic recitative that suddenly turns up and brings the Nocturne Op. 32, Nr. 1 to a most unexpected end; cf. Ex. 3.

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[1] Magnetism? I am of course talking of the ketchup effect.

[2] Another case in point is the passage leading up to the final, culminating theme in Debussy's *L'isle joyeuse*. The sense of ecstasy is considerably heightened if the pressure forwards issues into a four-note, no-matter-what-happens *à-tempo* upbeat.

The shock in m. 62 is the self-evident point of departure for the remarks to follow: the left-hand rhythm may aptly be described as Fate knocking on the door. The question is whether this sound comes from the outside world or from the inside of the musical *persona*. A number of disturbances occurring throughout the nocturne indicates that the second alternative applies, and it appears that it is essential to bring them out if you want to suggest that Fate knocks from the inside.

The most obvious disturbances are caused by the four *stretto* phrase endings in mm. 6, 18, 35, and 56 – or interruptions, rather, since the music just disappears after the non-closing first-inversion C♯-minor sonorities; cf. Ex. 4. What Chopin demands, i.e. to refrain from rounding off the phrase and to sever it from what follows, runs against the grain and is therefore hard to deliver. We are prone to start the *accelerando* too early and to slow down somewhat on the fourth beat, thus reducing the worrying sense of an inexplicable interruption. Given our ingrained habit of rounding off things, it may be enough in m. 6 to just play the two last beats strictly in time – that will seem *stretto*. In the following passages one might gradually exaggerate this gesture of anxiety by perceptibly hastening the pace and by prolonging the following silence, until in m. 56 the abrupt cessation of the music becomes quite scaring.

Another set of disturbances is to be found in mm. 27, 29, 48, and 50; cf. Ex. 5. Whether your edition bears *forte* markings in these bars or not, it is a good idea to play them as sonorous alto-register outbursts of protest or desperation so as to make for a strong dynamic contrast to the following *piano* or *pianissimo* entries. It is impossible to determine with certainty whether the *forte* signs (if any) are placed over the initial bass note or under the first melody note, but it is preferable to read them as referring to the right hand.

The third kind of disturbance emerges if you compare mm. 8–11 on the one hand, and mm. 31–34 and 52–55 on the other; cf. Ex. 6 a/b. It is not just a matter of transposition, difference between major- and minor-like

modes, and sharper dissonances: the melody is different and *diminuendo* signs are added. The tenor-register motions are very important, but in the latter, more poignant passages it seems that the quasi-syncopated soprano entries on e^2 should be brought out. Otherwise put, the hairpin signs should be taken to refer to the right hand.

In addition there are other "disturbances" in the nocturne that should be mentioned although they cannot very well influence in any substantial way how you play the music. But they are crucially important for how you conceive of the work.

The worrying thing is hidden in the second theme. The second phrase from *Dies Irae* is present, not far beyond the surface in mm. 21–22 and 42–43, and in mm. 25–26 and 46–47; cf. Ex. 7. This allusion emerges more clearly if you repeat the $c\sharp^2$ in mm. 21 and 42 according to the variant of m. 42 occurring in the German first edition of the nocturne. Turning to mm. 23–24 and 44–45, they may bring allusions as well, namely to the first phrase of the dreadful chant. And having these reminiscences in mind, the four-note *Dies Irae* motif seems to be present in the main theme of the nocturne; cf. Ex. 8.

These reminiscences of the ominous melody may seem far-fetched, but it has been shown that quite a few of Chopin's works bring allusions to or feature affinities with the chant from the *Requiem*.[3] The B-major Nocturne may be a matter of life and death, and its strange ending is therefore quite appropriate. Reversing the argument, the weird final recitative corroborates the hidden symbolic content of its themes and lends meaning to the disturbances.

[3] Take a look at the A-minor and B-minor Preludes for obvious instances; cf. Bengt Edlund, "Allusions and affinities. Tracing an ominous motif", ch. 1 in *Chopin. The Preludes and Beyond*, Frankfurt 2013, Peter Lang Verlag.

Let's return to the gruesome end of the nocturne and the Fate-knocking-on-the-door in m. 62; cf. Ex. 3.

How can you suggest that the knocking comes from the *persona's* inside? Well, there is a mediation across the bar-line: the falling left-hand thirds in m. 61 lead to the lowest notes of the right-hand *arpeggio* chord, introducing d♮1 instead of d♯1. If you play the broken chord slowly, you can make the listeners hear that the deceptive, darkening harmonic turn from F♯ major to G major contains a B-major/B-minor contrast – a quite chilling change that may seem to trigger the knocking. But this works only if you postpone the left-hand entry until you have played the right-hand top note.

Withholding the left-hand knocking is advantageous for another reason as well: it exposes the rhythm as the only thing that happens and makes it possible to play it strictly in time, i.e. with no delay at the first note. Fate is known to knock quite regularly, without any sign of hesitation. The E♯1 is there only to give resonance to the knocking E♯'s. Given this deep fundament, the sustained right-hand chord, and a grand grand-piano, you can play m. 62 without pedal. When Fate knocks, it is clearly audible. The rhythm should sound as a hushed, and yet very close, Morse signal.

The Three D_1's

To play the three low D_1's closing Chopin's D-minor Prelude with the fist or in some other violent, non-standard way is no doubt a post-Pleyel device. But in our grand times it might nevertheless be a good idea – if you have played the prelude so dramatically that this is the least you can do when finishing it off.

But there is a risk that you get some unwanted notes into the bargain, and this applies even if you use your left hand to silently press down the

neighbour keys – which is difficult to do properly while plunging down along the keyboard with the right hand.

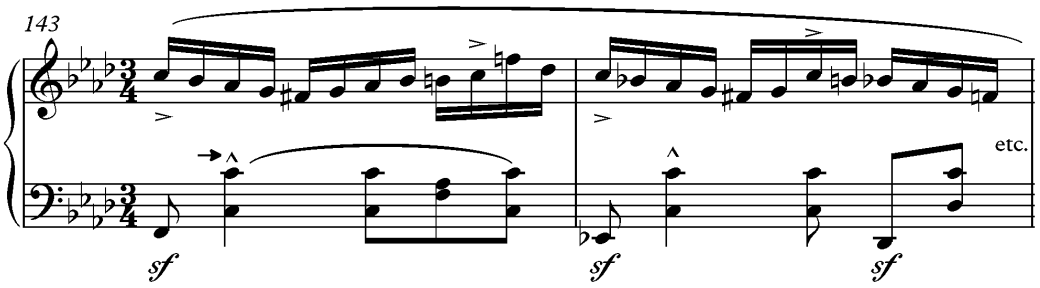
Why don't we, piano-playing mammals, solve the problem, not by in-activating the surrounding keys, but by pre-selecting the key we want?

So, while your right hand is on its way, put your left-hand thumb at the surface of the D_1 key – support the hand by placing the other fingers at the wooden block at the very left of the keyboard. Use the right-hand fist for the first D_1, hammering down on your left-hand thumb. Let the key and the thumb return to the initial position and strike again with the fist, and once more for the last D_1.

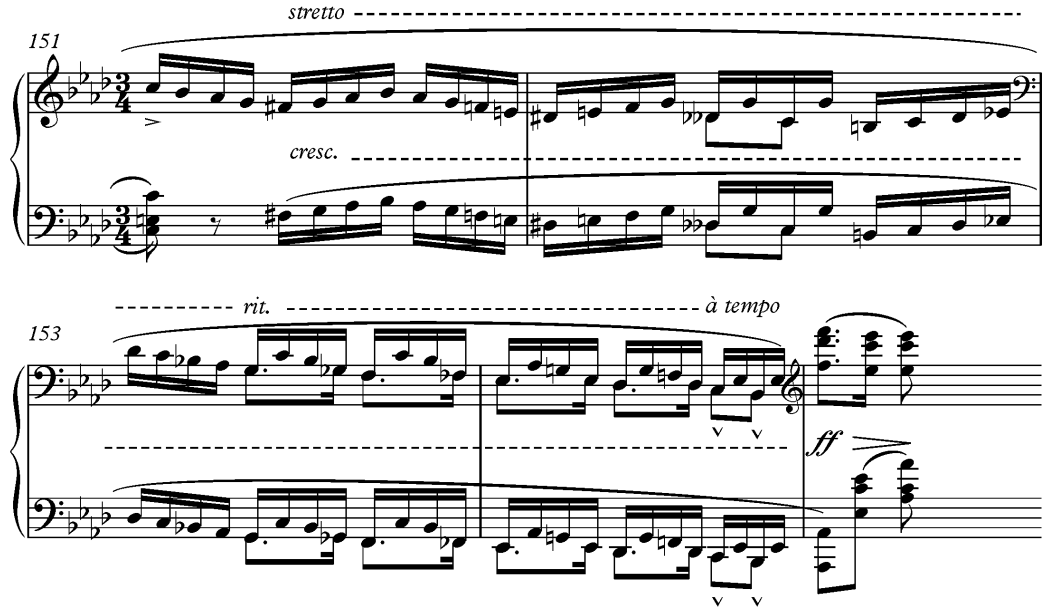
If it hurts, you have been too loud.

Approaching the irresistible and preparing the scaring

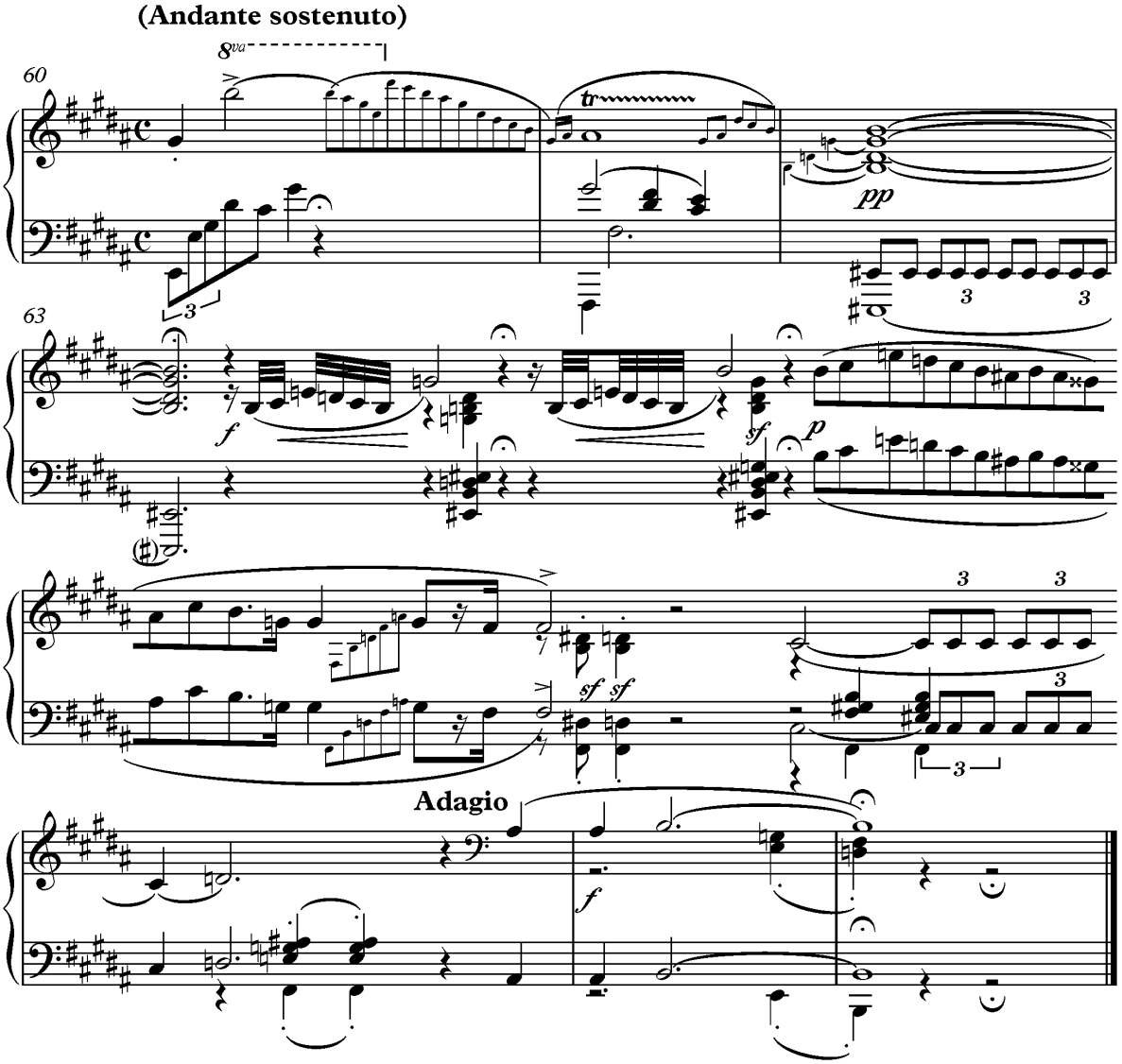
Ex. 1



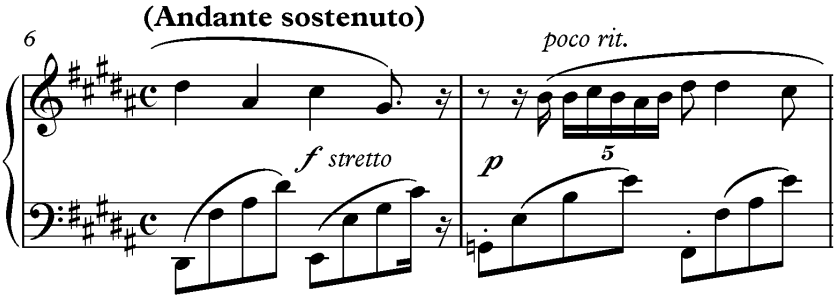
Ex. 2



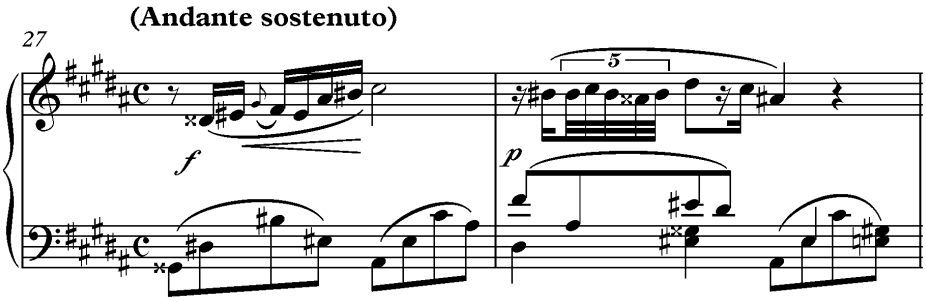
Ex. 3



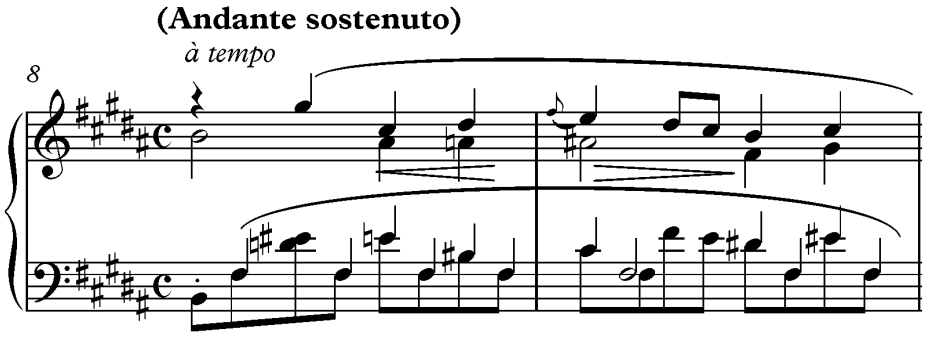
Ex. 4

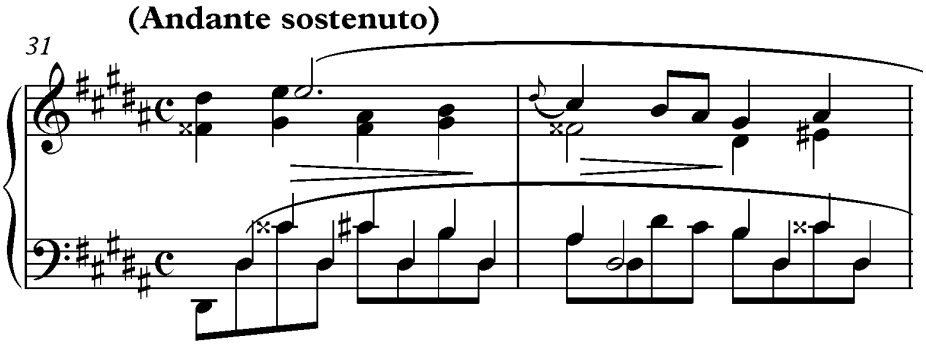


Ex. 5

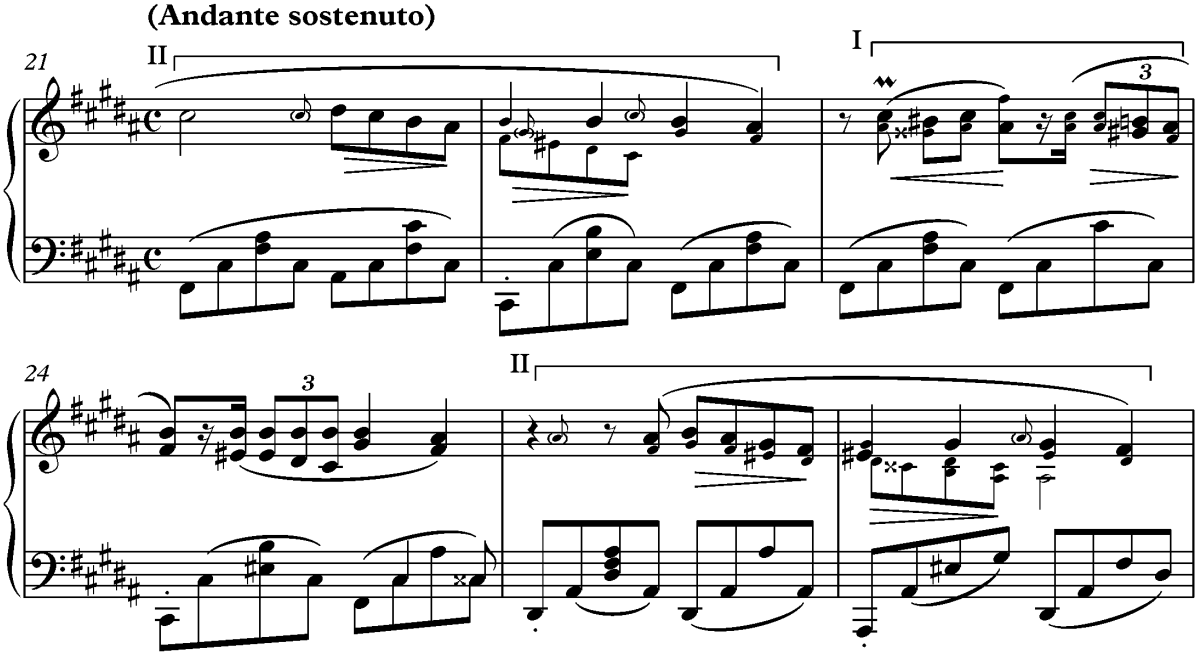


Ex. 6 a/b

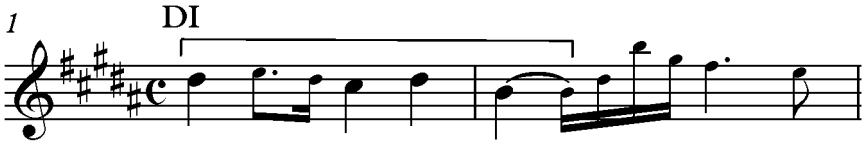




Ex. 7



Ex. 8



Bengt Edlund

Musical Dialogue in a Classical Piano Sonata

Impersonation and dialogue in music

It is a commonplace that music matters because it emerges as animate; music is of profound human interest because it sometimes seems to behave like we do. No wonder, then, that we are prone to impersonate music when listening to it or playing it. Depending on the properties of the music in question and on the disposition of the individual listener or musician, this impersonation may take on various forms.

Some music lends itself to be understood in terms of a quasi-dramatic sequence of events in which various structural entities take part as protagonists. Sometimes the music rather invites to being thought of as an evolving subject, as representing a fictive musical *persona*, whose character and inner development we get to know; the music is taken to depict states of mind passing through someone's consciousness.[1]

The latter kind of impersonation may also assume another form: the musical structure itself may be heard and conceived of as an organism, abstract and yet having a kind of quasi-human consciousness and sense of purpose. The various musical events do not only fit in with each other, they seem to be actively generated from within the music. The music emerges as a being with its own intentions as well as the consistency

[1] The latter view is, it seems, taken by Donald Callen in "The Sentiment in Musical Sensitivity", *The Journal of Aestetics and Art Criticism* 40 (1981/82), 381–393.

required to bring them about, it appears to be a living substance providing the necessary and sufficient causes for its own process of change, its sense of continuation.

This kind of personification is in fact common to the point of being almost inevitable. When describing music, we frequently use expressions like "and then the music proceeds to the dominant, accumulates tension, recedes to the point from where it started", etc.. This may seem to be just examples of figurative speech, but on second thoughts most of us are willing to concede that "music" in expressions of this kind amounts to more than a convenient formal subject – it does refer to a substance experienced as being active, animate.

Finally, and approaching the subject of this study, we sometimes have a strong impression that the music speaks, or that it consists of a sequence of utterances – and if we apprehend music in this way, we adopt a long tradition. Musical phrases may often be aptly described as having an understandable, characteristic, and emotionally meaningful diction. And in many cases it does not seem overly metaphorical to capture the essence of a musical passage with words like "talk" or "conversation", and to resort to reporting verbs when trying to catch the content and attitude suggested by such human intercourse. Music can be conceived of as a monologue of one "speaker"; in other cases the listener is bent to imagine different protagonists engaged in a musical dialogue (or multilogue).

It is evident that the musical structure to an appreciable extent determines the mode of personification to which it may lend itself. If the music lacks sufficient consistency, for instance, it will hardly emerge as a conscious intra-musical subject taking form before the listener's ears.[2] And if speech-like properties are not very prominent or entirely absent in the music, nobody is likely to understand it in terms of human utterances. Turning to the distinction between monologue and dialogue, there are a

[2] Cf. Jerrold Levinson, "Truth in Music", *The Journal of Aesthetics and Art Criticism* 40(1981/82), 131–144.

number of properties making us identify more than one speaker: structural interplay involving voices, motifs, or formal units, and of course the use of different instruments. Needless to say, there are many multi-voice works that are predominantly heard as monologues, just as there may be elements of dialogue even in mono-linear solo works.[3]

It is important to realize that musical passages are often indeterminate or ambiguous with respect to personification. More than one mode of impersonation may present itself to the musician or the listener, and whether we apprehend a piece of music as, say, an evolving *persona* or a speech-like dialogue, may ultimately depend on the properties of the performance.

To a considerable extent musical interpretation is a matter of selecting options for and then expressing musical continuation; and if this is not to be accomplished gratuitously, the musical structure must be carefully studied.[4] Among the things to be considered when devising an interpretation, the indeterminacy as to personification and hence the freedom to choose mode of impersonation is a quite important one. It makes a difference whether the structure is conceived of in terms of a sentient musical subject or in terms of a sequence of utterances in a dialogue – if the music is thought of as a dialogue, the scope for contrasts may be quite wide.

This brings us to the aesthetic aspects of apprehending music as a non-verbal dialogue. Obvious musical dialogues have a number of structural properties – elements of imitation, antithetic phrases, and the like – predisposing the music to be heard in this way. Furthermore, and adapting one of Jerrold Levinson's notions of musical truth for the present purpose, it seems that the utterances in a genuine musical dialogue must be cha-

[3] For an attempt to understand the Allemande of Bach's Suite for solo flute BWV 1013 as a dialogue, cf. Bengt Edlund, "Monologue as conversation", in Varia 1.

[4] Cf. Bengt Edlund**,** "Prelude to the art of continuation" and "Interpretation as continuation", ch. 12 and 13 in *Wits and Interpretation,* Berlin 2023, Peter Lang Verlag

racterized by human attitudes that, when joined to form a sequence, make up a meaningful, psychologically credible, conversation. Sometimes these attitudes are unmistakably inherent in the music whereas in other cases they are potential qualities that must be underscored and conveyed by the musicians in order to emerge.

Using the concept of 'dialogue' as a governing idea for an interpretation is an artistic strategy that can be misused. It must be kept in mind that suggesting a sense of dialogue may sometimes require distinct cues in the performance, and this means that an extravagant or inappropriate use of the dialogue mode might be inimical to long-term musical growth. Some pieces can take many and obvious interpretative interventions suggestive of a dialogue while others are quite vulnerable. It seems that the dialogue mode of conceiving musical structure depends on the "structural pace" of the music. Assigning different phrases (and the like) to different speakers means increasing the musical information. It is reasonable to assume that pieces in slow/moderate tempos or characterized by fairly sparse structural shifts can take more exchanges than fast pieces or pieces with dense shifts; excessive fragmentation should be avoided.

The artistic gains from bringing out exchanges of musical utterances must therefore be judged from case to case, and there is for each and any piece a limit beyond which the efforts to express a sense of dialogue turn excessive and mannered. On the other hand, some music may benefit from touches of informality and elements of surprise, from the kind of vitality that we associate with a spirited dialogue.

Turning to performance, the cues suggesting exchanges in a dialogue may often be the same as those used when expressing phrase structure. Reflecting the musician's understanding of the musical structure, cues suggestive of shifts within, say, an evolving musical subject will emerge as more or less predictable to musically informed and sensitive listeners, and for this reason they are not likely to stand out. Bringing out a sense of dia-

logue, on the other hand, will in many cases appear as a series of deliberate interferences, as a manner of playing that demonstratively renders a certain passage according to a specific idea, that of distributing "lines" to participants in a fictive dialogue. Yet and needless to say, identifying cues indicating a sense of dialogue, and distinguishing them from cues reflecting an interpretation in terms of a musical *persona*, is a very delicate task.

In other words, cues indicative of a dialogue are matters of degree that must be identified against the background of the cues that would be appropriate when playing without any intention to suggest a musical dialogue. Searching for cues of the former kind is therefore associated with a dual risk: that of exaggerating the importance of what you hear, and that of missing what there is to be heard. The core of the problem is that what you are bound to hear is structure *and* performance, and that you must be wary of confusing them. The more convincing a reading in terms of a dialogue emerges from an analytic point of view, the more difficult it is to establish whether the dialogue is actually expressed in a certain performance, and to identify the means used. If the inherent sense of a dialogue is obvious, one might "discover" cues for dialogue in virtually all performances of the music in question although no such cues are present, although the musician(s) had no intentions to render the music as a dialogue.

Aural detection of cues suggestive of a dialogue is to an appreciable extent guided by expectations as to what cues that are likely to turn up, by your experience of making and listening to music, and probably also by your general knowledge of cues used in linguistic conversations. This means, for instance, that when searching for cues expressing a dialogue, cues bringing out imitations or a sense of complementation are likely to be noticed along with temporal and dynamic inflections suggesting a sense of breaking in, giving way, or resuming.

Reading Mozart's Piano Sonata K. 333 as a dialogue

Apprehending the first movement of Mozart's B♭-major Sonata K. 333 as a dialogue may at first appear quite far-fetched; cf. Ex. 1.[5] Like so many other Classical pieces, it features a spirited melody with modest contrapuntal complements, but on the other hand the periods, phrases, and motifs arranged according to principles of addition, balance, contrast, development, etc., do allow of elements of dialogic exchange. You just have to imagine how this movement might be arranged for a string quartet or an orchestra: the opportunities for inventive instrumentation are many and obvious. But it must be made clear that the dialogue mode of impersonation remains just an interpretative option when rendering the sometimes quite impulsive sequences of musical events.

Confining the analysis to the exposition, the music will be divided into sections according to its formal demarcations. When trying to understand the musical process as a dialogue, reasonable patterns of exchange at two or three levels of resolution will be proposed, beginning with the least detailed level featuring few exchanges and then proceeding to more dense patterns of conversation. The points of exchange established at the more sparse higher levels are generally retained at the lower ones.

The participants in the dialogues will be named X and Y – when three rather than two participants seem to be involved, Z is temporarily added to the cast. A few significant additional motifs or strands turning up in other voices than the top one are marked with C. It should be pointed out that X and Y do not necessarily refer to the same two speakers throughout. Unlike in a linguistic conversation featuring two identified

[5] For a companion study of a work readily lending itself to be understood and played as a dialogue, Brahms's Violin Sonata Op. 100; cf. Bengt Edlund, "Musical Dialogue in a Romantic Violin Sonata" ch. 14 in *Wits and Interpretation, Berlin 2023,* Peter Lang Verlag

participants, the distribution of melodic material between X and Y should be understood as indicating the alternation between different protagonists in a musical dialogue.

The first-theme section

Considering first mm. 1–10, Y may take over at the six-note upbeat to the consequent in m. 4, starting earlier and being more urgent than the four-note upbeat beginning the antecedent. But there are further reasons for an exchange at this point: the insistently repeated, thwarted half-bar fragments in mm. 5 and 7, and the fact that the consequent, gradually turning more brilliant, after an excursion into a higher register is quite demonstratively brought to its end in m. 10.

Hence, the arguments for an exchange in the middle of m. 4 partly derive from future events in a way that might appear irrelevant for the actual situation in m. 4. But musicians may take advantage of having full knowledge not only of the impact of a certain, immediately forthcoming event, but of the entire text. And in everyday conversations the speakers do not just know the point of what they are going to say – usually they supply paralinguistic cues indicating the character of their message from early on – but they can often guess what the other person will say. Besides, even if conceived of as a dialogue, music is an abstract art that may dispense with quasi-dramatic realism, and therefore the musician is free to choose whether or not to start a certain unit in a manner that reveals its future tendency.

Thus, the consequent starting in the middle of m. 4 may be assigned to a new participant because it will eventually get insistent and close the period in a quite conspicuous way, and this forthcoming fact can either be announced already by the manner in which the upbeat in m. 4 is played, or be gradually disclosed. But if the latter option is chosen, the listener is

not likely to (even) retroactively understand this upbeat as a moment of exchange in a conversation.

The next level of dialogue emanates from the obvious division of mm. 1–10 into two-bar units. Y and then X again may take over in the middle of mm. 2 and 4 in virtue of the impulses given by the upbeats, starting earlier and more insistently than the very first upbeat. As to the entry of Y, this exchange is further supported by the fact that there will be a sense of rising decisiveness in the fourth phrase, making up a contrast to the irresolute quality of the second phrase with its concluding falling motif. Turning to the two-bar Y unit starting in m. 6, it rivals its predecessor allotted to X in urgency. The fifth unit is a high-register addition that eventually brings resolution, and it may therefore be taken to emanate from yet another participant, Z.

As to the exact point of the shifts, there are several alternatives. The exchanges in mm. 6 and 8 may take place at the main downbeats and emerge as sudden intrusions of Y and Z, respectively. But the former shift can also be localized to the middle of the bar so as to imitate the six-note upbeat in m. 4; increasing the urgency of the exchange, it may even be moved forward to the first e♯^{2} in m. 6, giving rise to an upbeat comprising eight notes.

Turning finally to still smaller units, the differences in character between the paired one-bar phrases in mm. 1–4 make for exchanges in the middle of each bar. The second and fourth phrases may also be assigned to different musical speakers due to their inherent qualities of, say, evasiveness and assertion, respectively. In mm. 5 and 7 there are no phrase shifts, but immediately repeated, incisive motifs which can be understood as intrusions. These shifts can be handled in several ways. The moment of exchange may either be regularly located to the third-beat d^{2}'s in m. 5 and m. 7 so as to bring out the element of imitation – in m. 5 the exchange can be transferred to the upbeat b♭^{1} – or be moved forward to the first beats of mm. 5 and 7. Since the latter option means that the so far normal points of

shift have been delayed by intruding iterations from a new participant Z, the entries of Y occur only at the beginning of mm. 6 and 8. Another way of describing this would be to say that the phrases of X have been drastically curtailed.

An interpretation of this kind exploits the difference in rhythmic character between the antecedent and the consequent – the gentle amphibrach grouping is suddenly abandoned at the start of m. 5 by the incisive syncopation introducing an inverted dactyl. This rhythmic change may suggest that the a new participant, Z, breaks in at the start of m. 5, making way for a further pattern of dialogue at the highest level.

The next passage (mm. 11–14) may, due to its low-register start, be regarded as an interjection in a large-scale dialogue. Turning to its internal make-up, only one exchange occurs, but Y has three plausible points of inception. The second phrase, extended to comprise two extra bars, brings a modulation, and the metric and tonal expansion to come can be announced right from the start at b♭^{1} in m. 11 by letting in another participant disclosing its far-reaching intentions. But Y may also be introduced at f^1, the appoggiatura producing the crucial note e♮^{1}; coinciding with the moment of modulation, an exchange at this point will give the impression that Y represents a new tonality, abruptly replacing the old. Finally, Y may set in only when the phrase is actually prolonged, i.e. at g^1, but Y should be felt by the pianist as replacing X during the e♮^{1}.

The following eight-bar section up to m. 22 takes place in a quite high register, a fact that may indicate a new participant in the conversation, and it is bisected by the textural contrast suddenly introduced in m. 18. This moment is well suited to signal the entry of another speaker since the prevailing rhythmic grouping with long upbeats is resolutely supplanted, indeed interrupted by short downbeat groups, and since it is also the starting-point for a left-hand counterpoint in parallel tenths.

At the middle level of demarcation, the third upbeat motif starting in m. 16 is distinguished from the two preceding ones by the fact that it leads forward to something new, and it may therefore be assigned to a new participant. In mm. 18 and 20 the right-hand figurations may be taken to signal an exchange.

Turning finally to the most detailed dialogue pattern, the very short f^2's ending the phrases in mm. 15 and 16 may give the impression that these phrases are truncated by the following upbeats. The passage mm. 15–17, made up of an original statement plus two urgent repeats of it, can therefore be allotted to three participants. Mm. 19 and 21 bring textural contrasts to their predecessors, but their initial $b\flat^2$'s rather belong to the rising lines started in mm. 18 and 20. Hence, Y may either set in impulsively at the bar-lines or smoothly at the following upbeats. The first option means that X is interrupted by Y at the beginning of m. 19. In m. 21 the sense of interruption is weakened since it is now expected that an interjection will turn up at this point. The second option brings an equally acute impression that Y is interrupted by X in m. 20, and this abrupt shift demands to be repeated at the beginning of m. 22, where a new speaker, swiftly closing the discussion, may be heard.

The second-theme section

In the eight-bar antecedent of the second theme, Y may enter at the three-note upbeat to m. 27, exploiting the midway contrast.

On the next level of dissection both four-bar units feature a bar of repeated syncopated motifs, a rhythmic difference that supports an element of dialogue in the melody; the interjections of Y may or may not include the upbeats. An upbeat start in m. 24 offers rhythmic variety in a context of beginning-accented groups, whereas a downbeat start in m. 29 curtails

the third member of a descending sequence of phrases and brings a strong sense of local discontinuity.

But there are further, non-bisecting options. In mm. 23–26 a metrically irregular pattern of exchange presents itself: Y may also start at the second syncopated motif in m. 25, quickly bringing the melody to a conclusion. As to mm. 27–30, the falling sequence of phrases may be treated as a dialogue. The antecedent seems to be finished by the interrupting downbeat entry of a new dialogue participant, whose rapid rising figure is immediately balanced by a connecting left-hand repartee. The relationship between these two motions is, it seems, to some extent retrospective: even if the right-hand figure was not understood as an interjection, the left-hand passage certainly is, and it needs a preceding statement to which it can make up the answer.

The first four bars of the consequent bring a variant that allows of a dialogue pattern not met with so far. In m. 33 the melody seems to split into two fragmentary strands, clinching each other in a very dense exchange.[6] The tension may be resolved either at the last eighth-note of m. 33 to the effect that the top line gets the upper hand, or at the first note of m. 34, marking the entry of a new participant cutting off the competition – an idea that might also apply to the parallel passage m. 26. As a further option, the intruding interjections can be taken to belong to a lower strand eventually leading to f^1 in m. 34. The left hand, in mm. 33–34 as well as in mm. 25–26, can also be interpreted as an independent counterpoint making for a sense of simultaneous dialogue.

The final part of the consequent mm. 35–38 cannot be divided, unless one lets the appoggiatura in m. 35 suddenly put an end to the second-theme section. Additional interest is supplied by the left-hand counterpoint.

[6] If the tempo is not too fast, and if the pianist's articulation makes for it, one may also hear the notes of m. 33 as one melodic line in spite of the leaps.

The third-theme section

The next section to be considered, mm. 38–49, is made up of three sub-sections. Disregarding the introductory bar, presenting the accompaniment, and the overlaps, their lengths are 4, 3, and 4 bars, respectively, and since the last two of them are related to each other, the sub-sections may be assigned to the participants X, Ya and Yb.

If any further division within mm. 39–42 is called for, the second halves of mm. 40 and 42 to be played *forte* can be conceived of and rendered as interjections or even as disturbances. Turning to the sub-section mm. 43–45, the left-hand chromatic motifs emerge as rejoinders in a dialogue with the right hand. The corresponding right-hand fragments in mm. 46–48 do not seem to engage in such a conversation due to the lack of melodic interest in the left-hand chords as well as in the right-hand octave skips.

An exchange may be based on the difference between the large skip in m. 43 and the *legato* minor-second step in m. 44; then another participant enters, coming up with a standard closing formula. The pattern is essentially the same in the third sub-section, but here the two semitone motions of X are followed by rising/falling octave skips belonging to Y, slowly continuing the descending motion.

Disregarding again the overlaps, bars 50–58 consist of two essentially similar 4+5 bar units. The fact that the second unit is set one octave higher makes an exchange natural. Both units begin with three identical motifs, of which only the third issues into further passage-work, a difference that may suggest a take-over by a more determined participant. If a denser exchange is warranted, already the second motif might be assigned to Y.

Particularly in mm. 54–55, where there is full rhythmic correspondence with the concurrent motifs in the left hand, the sense of a dialogue in

terms of a series of statements in each hand is weakened in favour of a conversation featuring simultaneous utterances in contrary motion. The second half of m. 53 brings a standard closing formula after the abrupt ending of the rapid figuration, a fact that might motivate the entry of Z.

The last five bars of the exposition form a short imitative coda. The left-hand melodies enter first, and due to the immediate mimicking it seems as if the left hand puts the right hand on the track. The second of these phrases is set an octave lower, an obvious cue for an exchange. The last three notes in the right hand, again a standard closing formula, are separated in time and register, and may be left to a new participant.

Performance cues possibly suggestive of a dialogue

The following 25 recordings were examined.[7] The letter **H** signifies performances on the hammer-clavier, and the final figures in each entry indicate the tempo as measured over the first four bars.

Badura-Skoda 1978 (Eurodisc 300341) 139
Balsam 1963 (Oiseau Lyre OL 258) 126
Barenboim 1 1963 (Music Guild M 40) 119
Barenboim 2 1985 (HMV 157-2703273) 125
Bilson 1980 **H** (Nonesuch 78004) 133
Boegner 1967 (Erato STU 70343) 126
Brendel 1975 (Philips) 125
Casadesus 1956 (Columbia ML 5149) 139
Eschenbach 1 1964 (DGG LPM 18949) 135
Eschenbach 2 1971 (DGG 2720031) 133
Gieseking 1953 (HMV 1C 197-03136) 135
Gould 1989 (CBS M2YK 45613) 188 (!)
Haebler 1968 (Philips LY 802827) 128

[7] The Swedish Broadcasting Corporation made them available for study, a courtesy for which I am much indebted.

Horowitz 1987 (DGG 423287-2) 122

Kraus 1975 (Odyssey Y3 33224) 135

deLarrocha 1989 (RCA RD 60407) 125

Leonhardt 1973 **H** (Philips 6575002) 128

Leygraf 1984 (Sveriges Radio SRLP 1394) 122

Matthews 1959 (Vanguard VRS 1037) 148

Pires 1989 (DGG 427768-2) 139

Riefling 1987 (Aurora ARCD 1927) 128

Rosen 1969 H (Counterpoint CPTS 53000) 139

Schiff 1980 (Decca 417149-2) 143

Uchida 1984 (Philips 412616-2) 130

Zacharias 1984 (EMI CDC 7-49037-2) 135

Cues indicating the dialogue option of impersonation were sought for in the recordings. This means that performance traits, rather seeming to pertain to the formal make-up of the music or to the musical process, were disregarded, and conversely that traits, suggesting discontinuities corresponding to the hypothetical points of exchange identified in the analysis, were noted. This sounds plain and easy, but it wasn't. It should be pointed out that the observations refer to the renderings of the exposition as played the first time – the repeat was not considered.[8]

Starting with the main theme mm. 1–10, having the most elaborate structure in terms of options for exchange, a number of cues possibly indicative of a dialogue are to be found in the recordings – the most consistent trait being the *forte* in mm. 6 and 8, giving these bars a sense of sudden outbursts of energy. But it is more informative to account for the four performances that most systematically seem to disclose a reading in terms of a dialogue.

[8] The differences that may obtain between renditions of recurring or similar passages in the same performance deserve to be studied, but it is a subject falling outside the present investigation. It appeared, however, that the opportunities for interpretative variety in recurrent and parallel passages were little used in these recordings.

Whereas Pires plays the first four phrases *piano-forte-piano-forte*, the regular alternation is abandoned in the consequent. It is started *forte*, but then the structure appears to be distributed to different speakers by means of sudden dynamic contrasts in a more irregular way: *piano* in the middle of m. 5, *forte* in m. 6, *piano* at the beginning of m. 7, and finally *forte* on the third beat of this bar. Matthew's recording also suggests a regular pattern of exchanges by alternating between *piano* and *forte* phrases up to the end of m. 4; but in the consequent and starting at the downbeat of m. 5, the *piano-forte* contrasts are co-ordinated with the bar-lines, not with the phrases. Kraus restricts the dialogue mode to the antecedent; reversing Pires's dynamic sequence she plays *forte-piano-forte-piano*. Horowitz highlights the sixteenth-note passages in mm. 6 and 8 by playing them *forte*, and treats the second and third phrases in a very idiosyncratic way, perhaps suggestive of extremely frequent exchanges – his tempo is quite slow. The second phrase is played *crescendo* up to the bar-line and then *subito piano,* and after having started the third phrase *piano,* the closing inflection in m. 3 is played *forte*.

Four pianists seem to give the lower-octave restatement of the initial idea to another participant by playing it softer than the end of the preceding section; then they indicate a further shift by rendering the next, extended phrase loudly. Brendel's hushed and resonant sound quality in the low-register entry of the initial idea is quite conspicuous, and so is Matthew's somewhat forced, swift descent at the end of m. 11. In five recordings the second phrase is brought out by playing it softly; Boegner saves the *piano* until the start of the sixteenth-note passage. The following high-register entry is given a new character by means of conspicuously soft dynamics by three pianists – Schiff, on the other hand, makes it prominent by a sudden *forte*. Pires, distinguishing in turn between *piano*, *mezzoforte*, and *forte* entries, suggests two exchanges within the iterative passage mm. 14–17.

Turning to the second theme, the Y_1 option in m. 24 seems to be indicated by Horowitz's sudden *forte*, and at the beginning of m. 26 his sudden *piano* gives the impression of a further exchange. In Brendel's recording a *subito piano* at the beginning of m. 25 may signal a take-over. Three pianists seem to bring out that mm. 27–30 are uttered by another speaker: Badura-Skoda and Horowitz play the initial three upbeat notes loudly, Riefling delays them. The syncopated motifs in m. 29 are clearly separated from the upbeat in the preceding bar in Horowitz's recording, but this is probably not a matter of melodic diction – the bass motion is brought out as a counterpoint.

Bar 33 elicits several distinct interpretations. In some performances the dialogue element is brought out by prominent f^2's and subordinate g^1–a^1 motions, a way of playing that makes for soprano continuity; in others the rising alto impulses are emphasized, suggesting a sense of intrusion. Kraus lets the left hand join the alto, which gives rise to a quite dominating counterpoint to the stand-still top voice, while Horowitz and Riefling restrict the counterpoint to the left-hand part – Horowitz pursues the line very clearly up to f^1 in m. 34. Four pianists eschew the dialogue option altogether, fusing the soprano and alto strands into a single line.

Two pianists (Barenboim 2 and Kraus) play the second *forte* parts of mm. 40 and 42 in a quite massive way suggesting not so much another speaker as some kind of intrusion of an outer force. The conventional cadences in mm. 45, 49, and 53 are played loudly by several pianists, conveying an impression that the sections are finished off by a new, additional voice; Eschenbach 2 features an *accelerando* cadence in m. 49 to the same effect. The second part of m. 54 is in some recordings played softer than the identical surrounding motifs, suggesting an imitative exchange.

The counterpoint lines are often rendered so as to bring in an additional,

left-hand "speaker". In mm. 18 and 20 the rising left-hand motions are suddenly emphasized by many of the pianists. (Horowitz plays the section mm. 15–22 in an idiosyncratic way: the left hand is treated as a counterpoint voice proceeding in quarter-notes.) Almost all pianists play the left-hand figuration in m. 30 as an interjection, and several of them also expose the preceding right-hand passage in a manner that both suggests the entry of a new participant and supplies the necessary causing complement to the ensuing left-hand repartee. The left-hand lines in mm. 35–36, 43–44, 54–55, and (less clearly) 50–51 are frequently rendered so as to stand out as independent utterances against the right-hand material. The left/right hand imitations in mm. 59 and 61 come to the fore in all recordings but one.

Conclusions

As far as the intentions of the pianists can be established by listening to their performances, few (if any) of them seem to have adopted the dialogue option as a guiding idea.[9] On the other hand, virtually all of them sometimes interfered in ways suggestive of a dialogue when playing certain passages. Some opportunities for a dialogue proposed in the analysis were not used by any pianist, and a number of recordings featured very few cues indicating a dialogue.

It must be kept in mind that the dialogue exchanges identified in the analysis are more or less conjectural, that an interpretation venturing to express all (or many) of them would sound quite fragmented, and that this

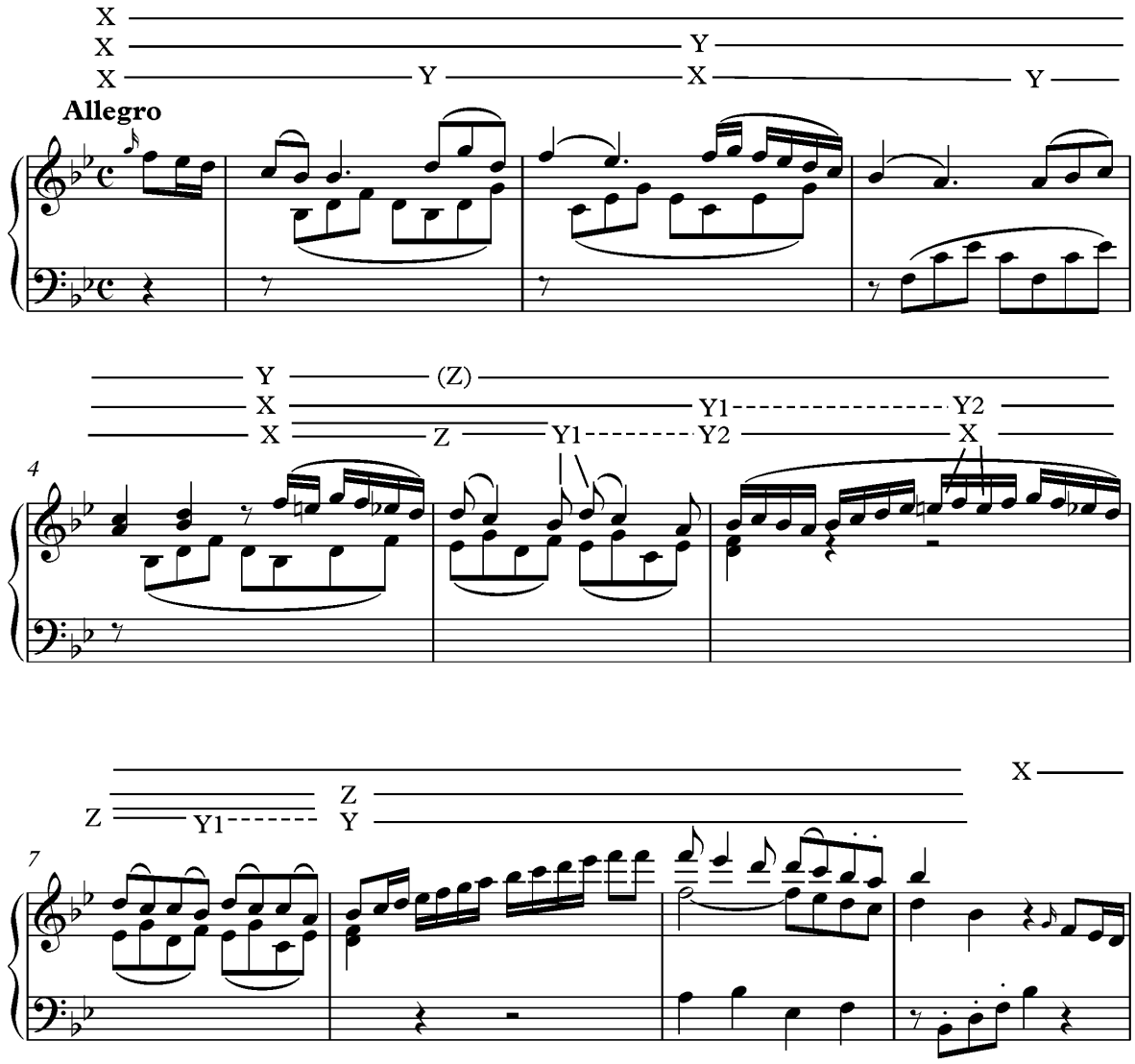
[9] If Jerrold Levinson is correct – and so it appears – it may, given that you know a musician's musical intentions, be possible to guess what cues he/she will use, whereas you cannot with any certainty make inferences from performances to underlying interpretational ideas; cf. Jerrold Levinson, "Performative vs. Critical Interpretation of Music", pp. 33–60 in Michael Krausz (ed.), *The Interpretation of Music. Philosophical Essays*, Oxford 1993, Clarendon Press.

movement is certainly not conversational in a way that makes it imperative for pianists to render it as a dialogue. Turning the matter around, in defence of the analysis proposed – and in defence of much analysis in general – it may be held that it draws attention to traits that would otherwise be neglected.

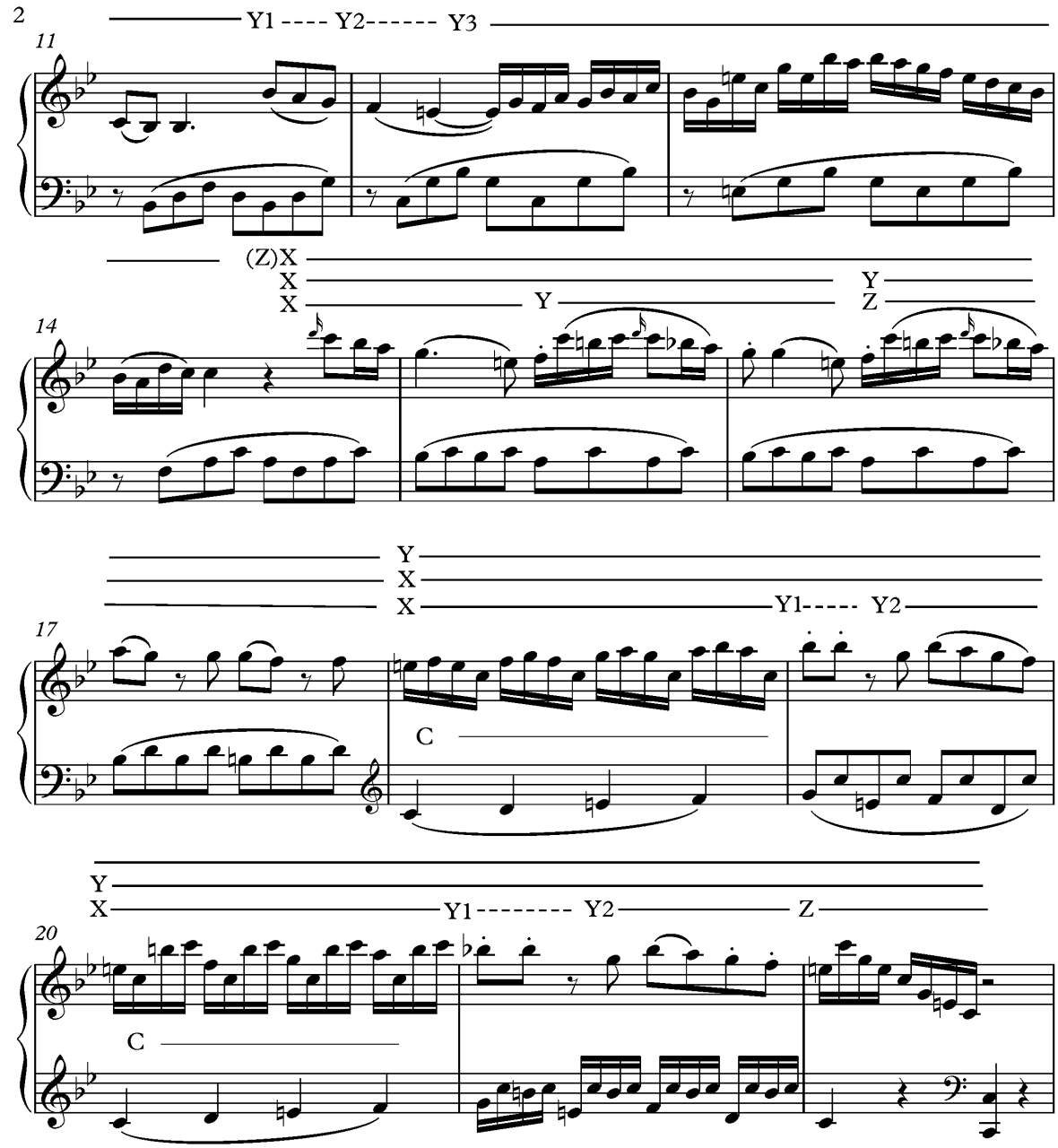
Elements of dialogue (or of impersonation in general) are no doubt important facets of music appreciation and interpretation, but the dialogue mode of conceiving music must be applied with discernment. It appears that a study of the element of dialogue in music may improve our critical understanding of music, as well as contribute to our growth as musicians, helping us to discover and convey musical meaning.

Musical dialogue in a Classical piano sonata

Ex. 1



Ex. 1 (cont.)



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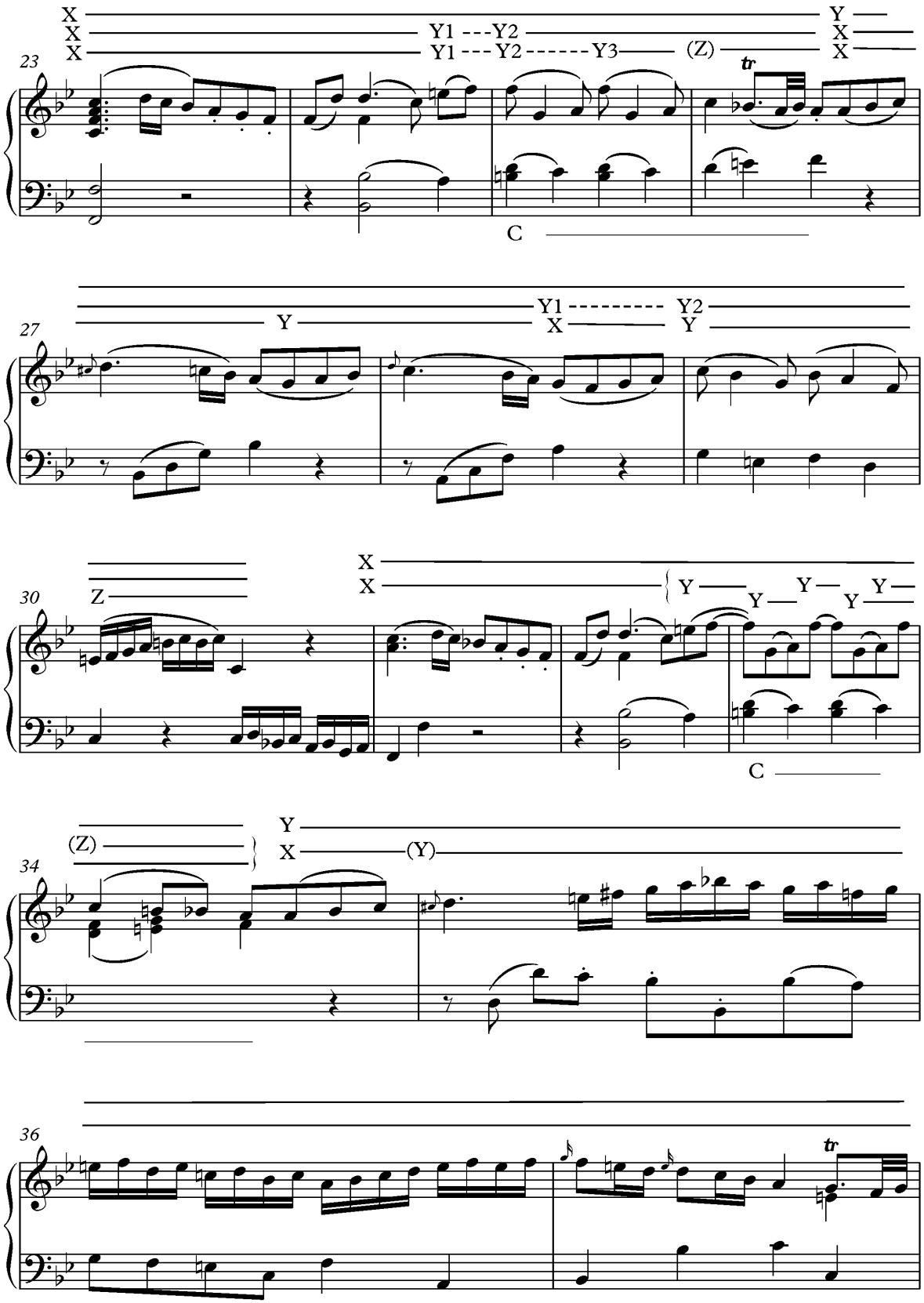
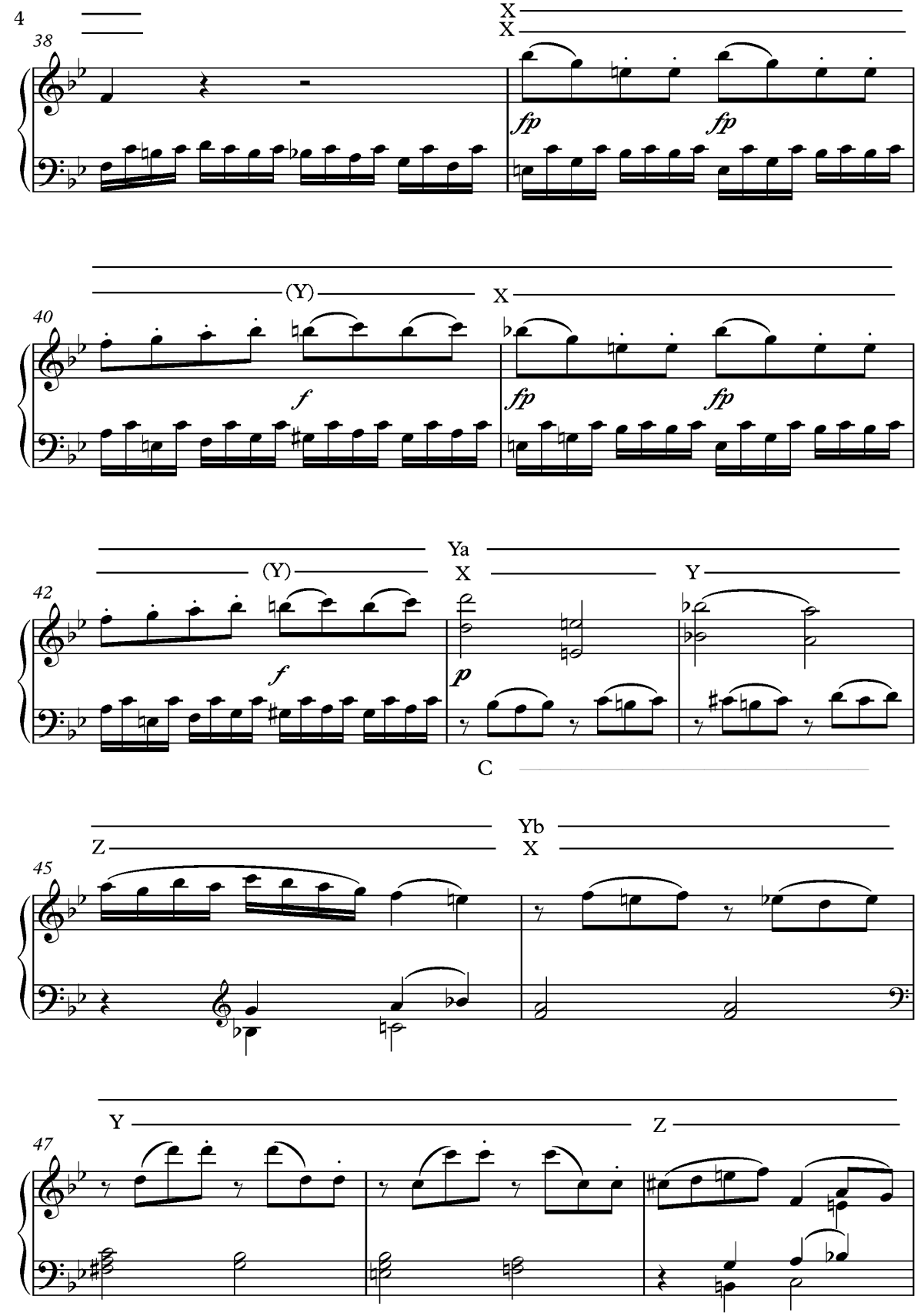
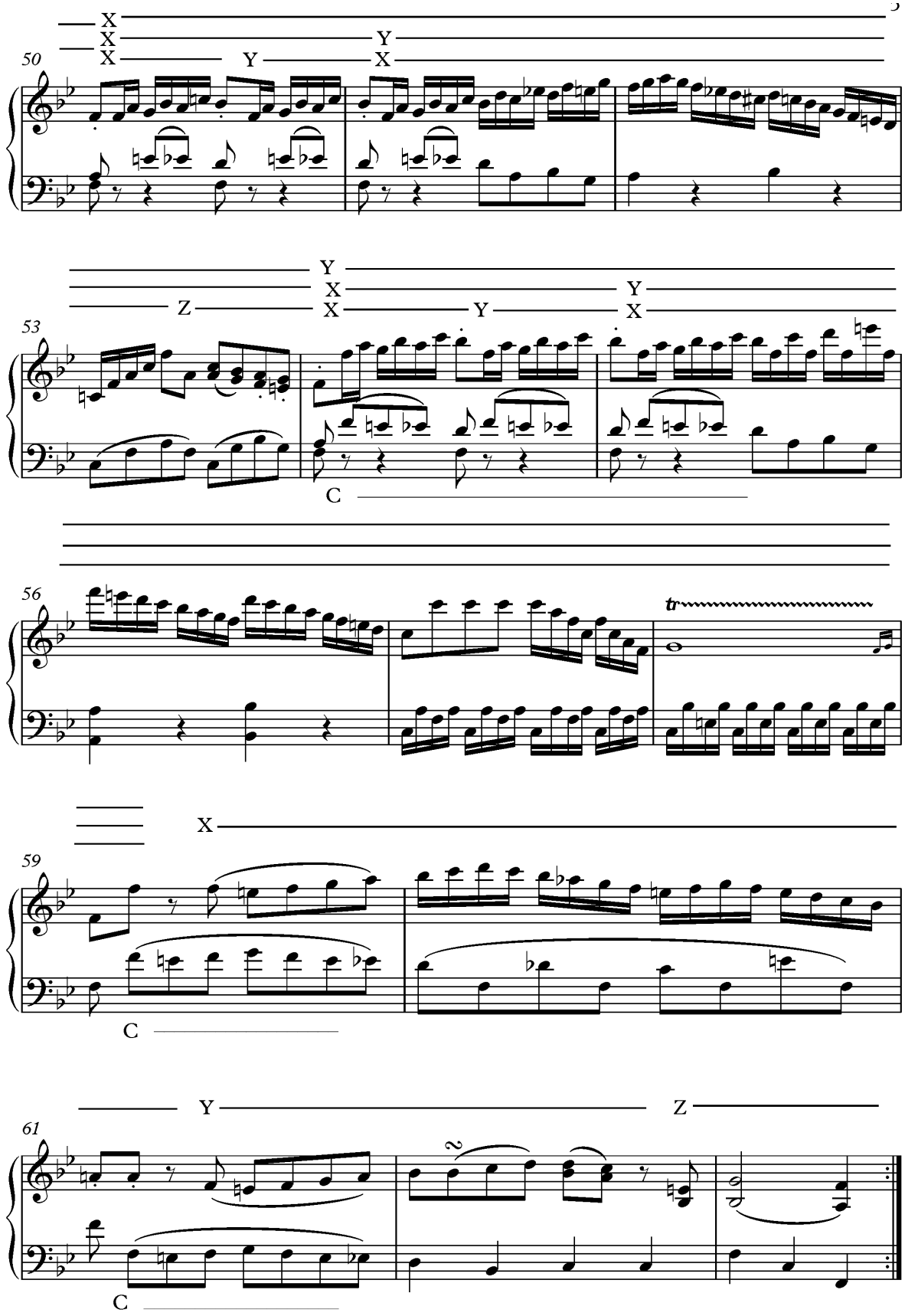

23
X
X
X
Y1 --- Y2
Y1 --- Y2 ------ Y3
(Z)
Y
X
X
tr
C
27
Y1 --------- Y2
Y
X
Y
30
Z
X
X
Y
Y
Y
Y
C
34
(Z)
Y
X
(Y)
36
tr

Ex. 1 (cont.)



Ex. 1 (cont.)



Bengt Edlund

Monologue as Conversation

> "Die gegenstände des Vortrages sind die Stärcke und Schwäche der Töne, ihr Druck, Schnellen, Ziehen, Stoßen, Beben, Brechen, Halten, Schleppen und Fortgehen. Wer die Dinge entweder gar nicht oder zu unrechten Zeit gebrauchet, der hat einen schlechten Vortrag."[1]

> "The human voice is obviously varied by all the stronger passions; now when our ear discerns any resemblance between the air of a tune, whether sung or played upon an instrument, either in its time, or key, or any other circumstance, to the sound of the human voice in any passion, we shall be touched by it in a very sensible manner, and have melancholy, joy, gravity, thoughtfulness excited in us by a sort of *sympathy* or *contagion."* [2]

Music as speech

The first citation enumerates various devices that musicians must make use of in order to do justice to any piece of music; the second is but one of many reminding us of the fact that music, even instrumental music, is an art that speaks, that moves us. The point of departure for this essay, and presumably an opinion that nobody contests, is that some latitude of interpretation may be a prerequisite for giving the impression that the music speaks. Speech – at least if it is to be moving – presupposes animation.

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[1] Carl Philipp Emmanuel Bach, *"Versuch über die wahre Art, das Clavier zu spielen",* 2nd edition 1759; citation from *Erster Teil, III. Hauptstück, 3§*

Both citations stem from the eighteenth century and so does the piece that we will devote ourselves to, but the ideas expressed with these words were not new, and they still apply. The interferences mentioned by C. P. E. Bach still belong to the vehicles of expression, and music has not ceased to strive to be a human utterance. Therefore it is neither out of place to look for opportunities to play music of diverse kinds according to patterns of speech – be it monologue, dialogue, or multilogue – nor to listen for cues indicating that a musical conversation takes place.

Turning to the Allemande of J. S. Bach's Partita BWV 1013 for transverse flute, it does not at first glance invite to be understood as a conversation at all; cf. Ex. 1. An unbroken string of sixteenth notes is displayed on the pages, a ceaseless stream that, possessed by its own momentum, seems to reject interpretational interferences as well as the idea of separate musical utterances. Indeed, it appears that this music denies what is vital for speakers and flutists alike, the right to breathe.[3]

But breathe we must, and it turns out that lack of oxygen is a most powerful ally to musical interpretation. The stream of sixteenth-notes must, and should for good musical reasons, be interrupted at suitable points to get a snatch of air, and so non-human uniformity gives way to a flexibility that both helps to define the musical form and allows of a rich content by releasing an element of vivid interchange of musical ideas.

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[2] Francis Hutcheson, *"Inquiry Concerning Beauty, Order, Harmony, Design",* 1725; citation according to the edition by Peter Kivy (The Hague 1973), p. 81

[3] This partita, and particularly the Allemande, has sometimes been considered sublime, and complex to the point of being unattainable by human flutists. Granted that Bach's power of musical imagination was certainly unparalleled not only in the solo flute music of his time, the Allemande exemplifies the German style as opposed to the French – the latter being an idiom characterized by manageable short phrases and seeming more familiar to us nowadays. And the Allemande from BWV 1013, however sublime and complex it may be, did not and does not present insurmountable technical problems for accomplished flutists, nor is it unique as to its kind – there is a body of late-Baroque, more or less etude-like pieces for unaccompanied flute. I owe this inside information to the distinguished flutist Anders Ljungar-Chapelon.

The purpose of this essay is to elucidate the concept of animated speech in music by exploring in detail the various patterns of conversation that might be inherent in this Allemande, however much a monologue it seems to be. To this end the possible musical punctuations in Bach's text will be studied in order to find out what changes of pertinence for a sense of dialogue these demarcations seem to suggest. Then, complementing this tentative description of the structure and content of the Allemande in terms of utterances in a dialogue, a number of recordings will be examined, locating the respirations as well as searching for other relevant traits in the performances, be it dynamic nuances or inflections in the temporal domain.[4]

This will be made without resorting to the doctrines of musical rhetoric prevailing at Bach's time. Far from being a criticism of "historically informed" performance practice and its relevance, this methodological choice is a consequence of the conviction that the basic, most intuitive elements of that rhetoric are still alive today as current tradition and tacit knowledge. The essentials of Baroque expressivity are accessible to, and can be rendered and identified by, modern listeners and players, provided that they have perceptive minds and a zest for musical initiative.

J. S. Bach's Allemande for solo flute

The double repeat in mm. 19/21 divides the Allemande into two parts sharing essentially the same musical substance. The second part includes a four-bar coda set off from the rest of the piece by its unmistakable two-voice texture. From m. 43 the voices are engaged in an interplay of overlapping and partly truncated melodic fragments until the tonic is established in two registers by means of stepwise descents from the fifth degree – traits that cannot but make for a sense of dialogue.

[4] For a further studies on the element of dialogue in music, cf. **Bengt Edlund,** "Musical dialogue in a Romantic violin sonata", ch. 14 in *Wits and Interpretation*, Berlin 2023 Peter Lang Verlag, and "Musical dialogue in a Classical Piano Sonata" in Varia 1

Turning from the outer form of the Allemande to its substance, a number of musical ideas are presented and then repeated, transformed, developed, or expanded in an apparently free succession. These ideas or materials are marked in Ex. 1 by capital letters and by slurs indicating demarcations – units starting from unaccented notes are to be found over the staff, units beginning on downbeats below it. It should be observed that these slurs do not refer to articulation.[5] Bach's score features no interpretational marks whatsoever, and the added slurs merely keep together notes that for various reasons appear to form coherent units.

The material signified by **A** takes on the function of a theme. It appears five times, and it introduces the keys making up the large-scale tonal layout of the piece. The A units are composed of repeated half-bar motifs, and the motifs have an anacrustic organization.

In virtue of the obvious and quite regular shifts of the implied harmonies, the **B** material consists of four-note downbeat motifs, but the low accented notes also tend to form a separate register, leaving the upper three notes to function as upbeats with or without ensuing downbeats. These motifs may be heard as pairs made up of a rising call and a falling response, but it should be observed that when the B material is heard again in mm. 33–34, the change with respect to register brings a transformation: now one tends to hear dominant-to-tonic pairs. The B material is characterized by a motion consisting of a rising seventh followed by two falling steps, a configuration occurring on every weak beat. This **x** motif strongly suggests that there will be a further descending step reaching a tonally stable note – an implication that is sometimes realized, sometimes not – and it is frequently used as a connecting gesture elsewhere in the piece. Since the x motif turns up on the second and fourth beats in mm. (15)–16, this passage is taken to belong to the B material.

[5] Excepting a few short units held together by *legato* playing, detached articulation prevails throughout in the recordings to be discussed.

In m. 4 another pattern occurs, formed by three figures featuring a rising skip/leap plus a rising semitone motion; the sequence is rounded off by a connective motif x on the fourth beat. This **C** material allows of both downbeat and upbeat grouping, and the musical process is open-ended, especially in mm. 35–36. The occurrence of motif x on the fourth beat makes mm. 38–39, tending towards downbeat grouping, belong to the family of C passages.

The **D** material consists of rising-and-falling or only rising triad-like figurations of half-bar size. The falling gestures are finished by descending-scale **y** motifs, strongly implicative of complete falling-fifth motions. Closely related to the x motif, the y motif also occurs with connecting function elsewhere in the piece. The original D material in mm. 5–6 is organized as a series of phrases with falling seven-note upbeats, but if one takes account of the harmonic shifts, downbeat phrases come to the fore. This applies also to the D-like portion mm. 31–33. In mm. 7–8 a minimal upbeat particle occurs that turns out to be ambiguous: melodically the rising gestures appear to be introduced by falling steps, but for harmonic reasons the first note of these descending seconds belongs to the preceding rising figure, and therefore the steps seem to connect to the rise in spite of the shift as to register.

The material called **E** occurs just once (in m. 14) and tends towards downbeat sub-units of half-bar (or perhaps quarter-bar) size. But since the low notes on the second and fourth beats may otherwise emerge as too isolated, there is also a sense of short upbeats.

The **F** passages, appearing immediately before the midway cadence and the coda, consist of sequences of four-note descending motions turning the chromatic descent of the low strand into a series of swift falling seconds. The F material might also be heard as a sequence of four-note downbeat figures lending a dragging character to the lower-line descent.

The most obvious way to punctuate the Allemande would be to mark major shifts of material for attention. Such large-scale points of demarcation are indicated by the wedges below the staves. It appears that an interpretation entirely guided by these sparse punctuations (and by others bringing out

smaller units) would amount to an ordered, "tectonic" presentation of the music, to a performance suggestive of an undisturbed monologue rather than of a conversation.

In order to evoke a sense of musical dialogue in an essentially monolinear work, a number of suitable structural shifts must be exploited in a fairly conspicuous manner. It seems that dialogues in speech as well as in music are characterized by certain discontinuities, by cues telling you that the initiative has been taken over by another participant in the conversation. Turning to the Allemande, some of the traits described above might, if brought out in a performance, give the impression that the stream of sixteenth-notes is distributed to different, alternating musical speakers.

More specifically, it appears that shifts from downbeat to upbeat grouping may be rendered so as to suggest the discontinuity and the element of disturbance needed to give an illusion of a take-over. Shifts in the opposite direction, i.e. from upbeat to downbeat grouping, can also be used, but are perhaps less effective since the sense of a too early, intruding entry is less acute. The connective x and y motifs may be employed to indicate a sense of dialogue if they are exposed as upbeats, anticipating the regular, downbeat introduction of new materials. And turning to larger, tectonic shifts, repeats or recurrences of material can be used to evoke the impression of a takeover from one speaker to another.

Possible cues for a sense of dialogue

Analytic observations aside, how do flutists play this piece? Thirteen recordings of the Allemande have been studied.[6] When listening to these interpretations, the repeats were disregarded and m. 19b replaced m. 19a. Recordings in which the Baroque transverse flute is used are marked with **T**,

[6] I am most grateful for the opportunity to study these recordings from the collection of the Swedish Broadcasting Corporation.

and the tempo as measured over the first seven complete quarter-notes is given for each performance.

von Bahr (Bis CD 21) 72 (vB)
Brüggen **T** (RCA Victor GD 71964-2) 62 ! (Br)
Grafenauer (Philips 422061-2) 81 (Gr)
Hünteler **T** (Philips 410406-1) 72 (H)
Kuijken **T** (Harmonia mundi RD 77026) 72 (K)
Lardé (Valois MB 450) 70 (Lé)
Larrieu (Philips 422944-2) 89 (L)
Nicolet (DGG Archiv 427113-2) 91 (N)
Preston **T** (CRD 1015) 84 (Pr)
Rampal 1 (Telefunken AWT 9402-C) 96 ! (R1)
Rampal 2 (Erato ECD 55020) 89 (R2)
Thiwång (Malmö Audio Production R 8608) 61 ! (Th)
Wiesler (STEF Iceland STSK 002) 73 (W)

The findings as to obvious aspects of punctuation are given above and below the staves in the score; cf. the respiration signs and the fermatas, showing conspicuously prolonged notes, and the abbreviations referring to the flutists. There are also some other marks describing details of execution that seem to represent changes in character and that may be understood as cues for a sense of dialogue.

It turns out that there is a quite good fit between respirations and prolonged notes on the one hand, and the formal demarcations (mm. 4, 5, 7, 9, 12, 17, 20, 23, 25, 28, 31, 33, 35, 39, 40, 41, 43, and 45) on the other. All dividing interferences are inserted after the primary downbeats, giving rise to formal units starting with upbeats. But in the present context it is the internal articulations deviating from or exceeding this general pattern of demarcations that are of crucial interest.

The A material is generally rendered as a series of anacrustic groups, and this impression is strongly reinforced by the habit of nearly all flutists to linger somewhat on the accented notes, especially if they are followed by

skips.[7] In two recordings (Preston and Thiwång) groups issuing from the accents seem to emerge, but this does not suggest much of a contrast. But when starting each part of the piece, Thiwång and especially Lardé adopt the idea of a responding, echoing second phrase, and also mm. 3 and 22 are played softer than the preceding bars. These dynamic contrasts between recurring figurations clearly suggest a sense of dialogue.

Brüggen, Hünteler, and Preston render the B material, especially mm. 2–3 and 21–22, in a way that (within the prevailing end-accented rhythmic patterning) joins the second and third groups, giving rise to a compound unit surrounded by short upbeat groups – an organization that may heard as a kind of dialogue. After a long first note in m. 4, Rampal 1 plays a series of quite patent upbeat groups – a feature making for the impression of a new speaker. Preston, on the other hand, clearly renders the first three groups of this bar as beginning-accented; then he provides an upbeat to the D section in m. 5 by exposing the x motif as a new idea.

Excepting Rampal 1, retaining the prevailing anacrustic patterning in mm. 5–6 by offering seven-note upbeats also in mm. 7–8, all other flutists render the falling steps in mm. 7–8 as local, one-note upbeats – this makes up a contrast to mm. 5–6 but is not heard in terms of a dialogue. Exchanges are brought to the fore by Preston, who already treats the rising steps f^2–g^2 and g^1–a^1 in m. 6 as short upbeats, letting the forthcoming rhythmic patterning invade the original D material. In mm. 6/7 Brüggen interrupts the y motif, which means that the first, F-major rising triad is heard as starting with a downbeat; the following triad figurations are preceded by one-note upbeats.

Wiesler's respiration after the first note of m. 11 conforms to the prevailing pattern, but it also signals that the following figuration will be qualitatively different from the previous ones. But this is done in a way that suggests an external change rather than a shift in a conversation. Larrieu's

[7] This is not just a characteristic of the A material, but a trait imprinting most of the performances throughout. The interpretation of Brüggen, for instance, is dominated by patent upbeat groups preceded by conspicuously lengthened accented notes.

respiration in the middle of m. 13 seems to stand for an intruding early start of the E section; Wiesler gives emphasis to the y motif to introduce this section.

Whereas five flutists announce the change in rhythmic grouping felt in most recordings in mm. 13/14 by means of breathing at the bar-line, three players attach the first note of m. 14 to the preceding figuration, smoothing out the difference. Hünteler's playing is extraordinary: he postpones the shift until the fourth note of m. 14 so as to pursue the preceding phrase to its very end. Then he plays sixteenth-note *legato* upbeats to each beat throughout the E passage. While a respiration after the third beat in m. 15 coincides with the actual start of the new material, the later demarcation option using the x motif – which then recurs twice until the $d\sharp^2$ in m. 17 is reached – has a more on-going quality. Grafenauer and Preston emphasize all three x motifs in mm. 15–16, a manner of playing that brings a sense of new voices entering into the discourse.

Kuijken takes care to render mm. 17–18 in a firm, contrasting manner, interrupting the x motif at the bar-line so as to suggest a new start. Three flutists mark off the closing formula in m. 19 by introducing it with the x motif. In m. 19b Grafenauer plays the connecting figuration down to e^1 as a quiet addition to the cadence – and so do Kuijken and Brüggen as well but without inserting a respiration before it. Nicolet, on the other hand, uses this figuration to start the second part of the piece, an anticipation that suggests a conversational take-over at the highest formal level.

The respirations before the second note in mm. 27 and 30 give rise to demarcations signalling that these bars will lead out of the stasis established by the two preceding A bars. In Brüggen's rendering of mm. 31–32, the falling and then rising gestures are separated so as to suggest an opposing alternation. Several flutists (among them Grafenauer and Larrieu) play mm. 33–34 as three dominant-to-tonic pairs imitating each other. In m. 34 Preston uses the last x motif to signal an early, intruding start of the new section.

Rampal 2 and Wiesler dramatize the three-note upbeat to the long descending scale in m. 36 by marking it off with a respiration, and although they do not insert any such short silence, Larrieu, Nicolet, and Rampal 1 clearly bring the same idea. This way of playing suggests a way out of a situation (m. 35) that apparently has reached a deadlock. Five flutists lengthen the first note of the scale, underscoring the sudden change of motion. Grafenauer's early respiration in m. 37 brings an extended, fifteen-note anacrucis to the following section, whereas Brüggen's respiration before the second beat highlights the start of the rising scale. (This scale opposes the falling scale in m. 36, which he does not mark for consciousness, however.) von Bahr plays the end of m. 37 *ritardando* lending relief to the new material and the downbeat grouping in m. 38.

Bars 38–39 may form a two-bar contrasting episode featuring downbeat grouping – this is the case in Kuijken's and Larrieu's recordings, and also in Nicolet's rendering despite his patently end-accented, *tenuto* x motif in m. 38. Some flutists introduce upbeat grouping in m. 39, either by bringing out to the connecting x motif or by inserting a respiration after the first note of the bar – Wiesler plays anacrustic groups already from m. 38 on. Bar 39 offers another example of Preston's strategy to use the x motif to break with a preceding downbeat grouping. In the second half of m. 40 von Bahr separates the D-minor varied copy from the A-minor model, a cumulative idea that may seem to suggest a sense of dialogue, and at the end of this bar Kuijken once again curtails the y motif in order to bring a downbeat start for the F material. Nicolet's early respiration in m. 42 is unexpected but adds weight to the cadence by expanding it to comprise seven notes.

The coda is clearly a two-voice texture due to the widely separated registers, and all flutists bring out the dialogue between the intertwined lines – except Rampal 2 who seems to give priority to the upper strand only. Hünteler's and Larrieu's respirations in m. 44 increase the tension and bring out both the transposed recurrence and a take-over within the coda.

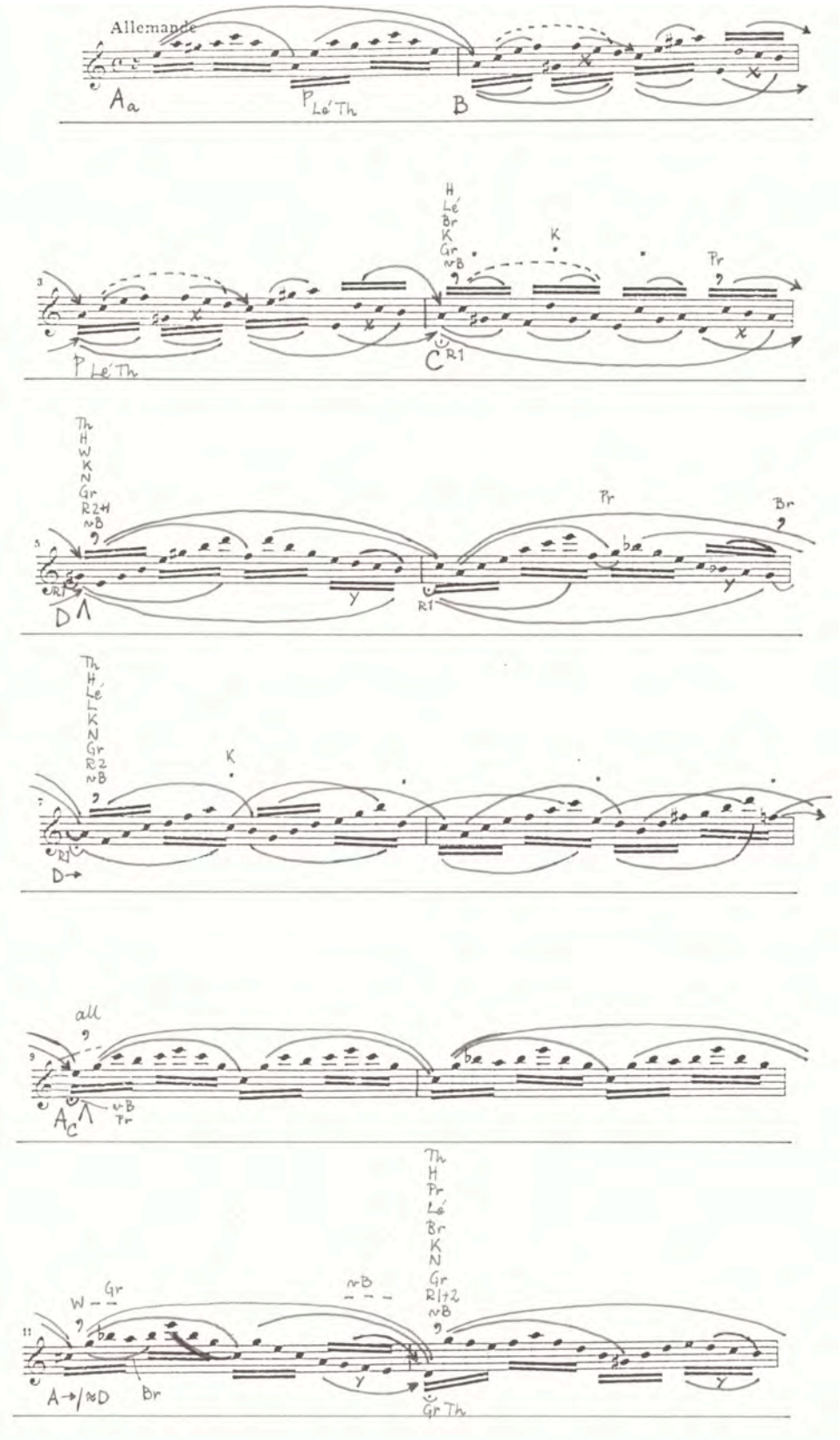
Summarizing these observations, some details in the recordings appeared to

express a sense of dialogue in a fairly obvious manner. Quite a few further traits – to be found mainly at structurally given points of demarcation – were also suggestive of a musical dialogue: the way of rendering the structural shifts seemed to indicate, could be taken to represent, a take-over by another participant in an imaginary musical conversation. In several of these cases, however, the impression of an exchange might have been strengthened, had the sense of shift inherent in the structure been rendered more conspicuous, had the cues potentially indicating a new speaker been exploited more emphatically.[8]

[8] This paper was prepared for two seminars with Anders Ljungar-Chapelon's flute class at the Malmö College of Music.

Monologue as conversation

Ex. 1



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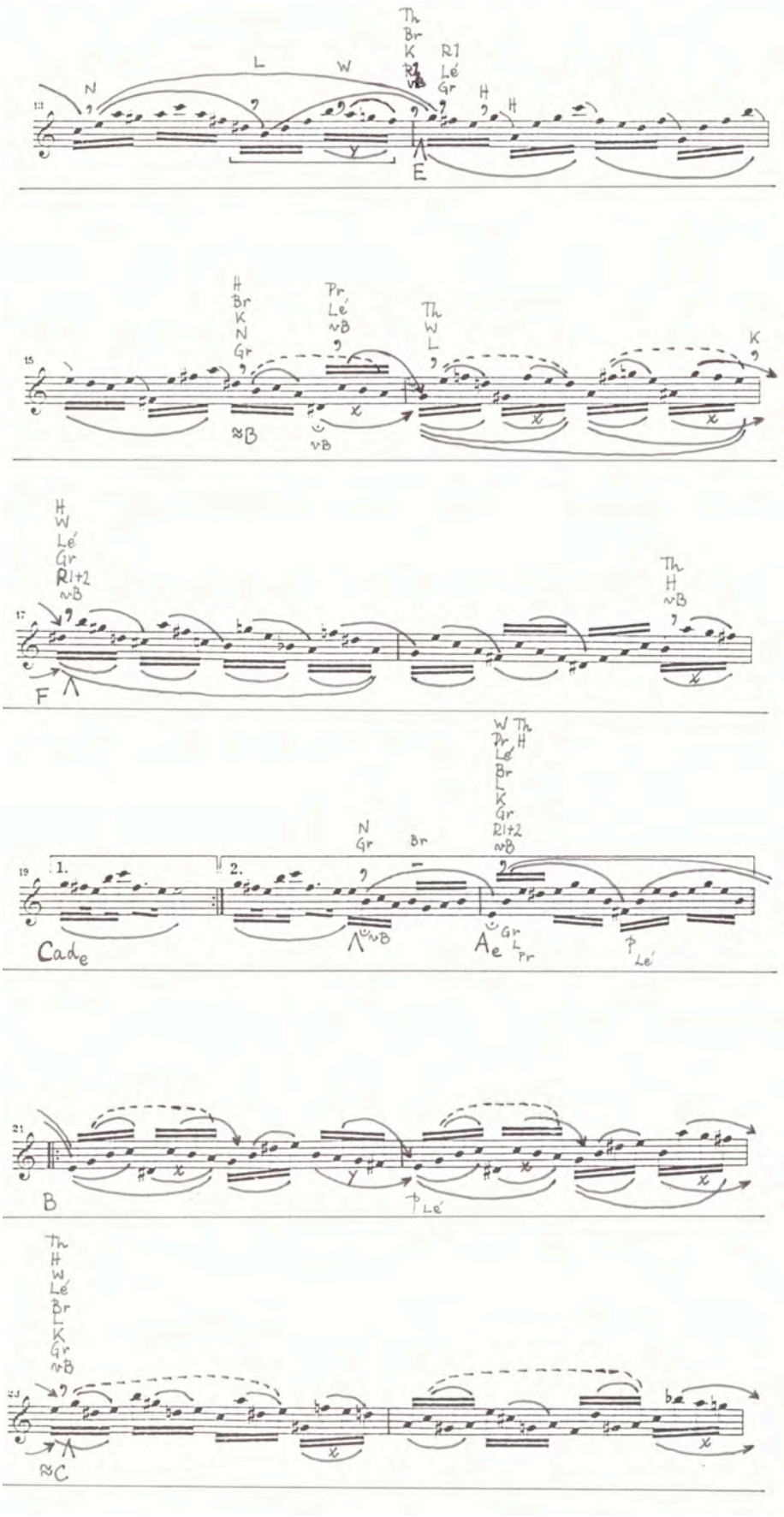
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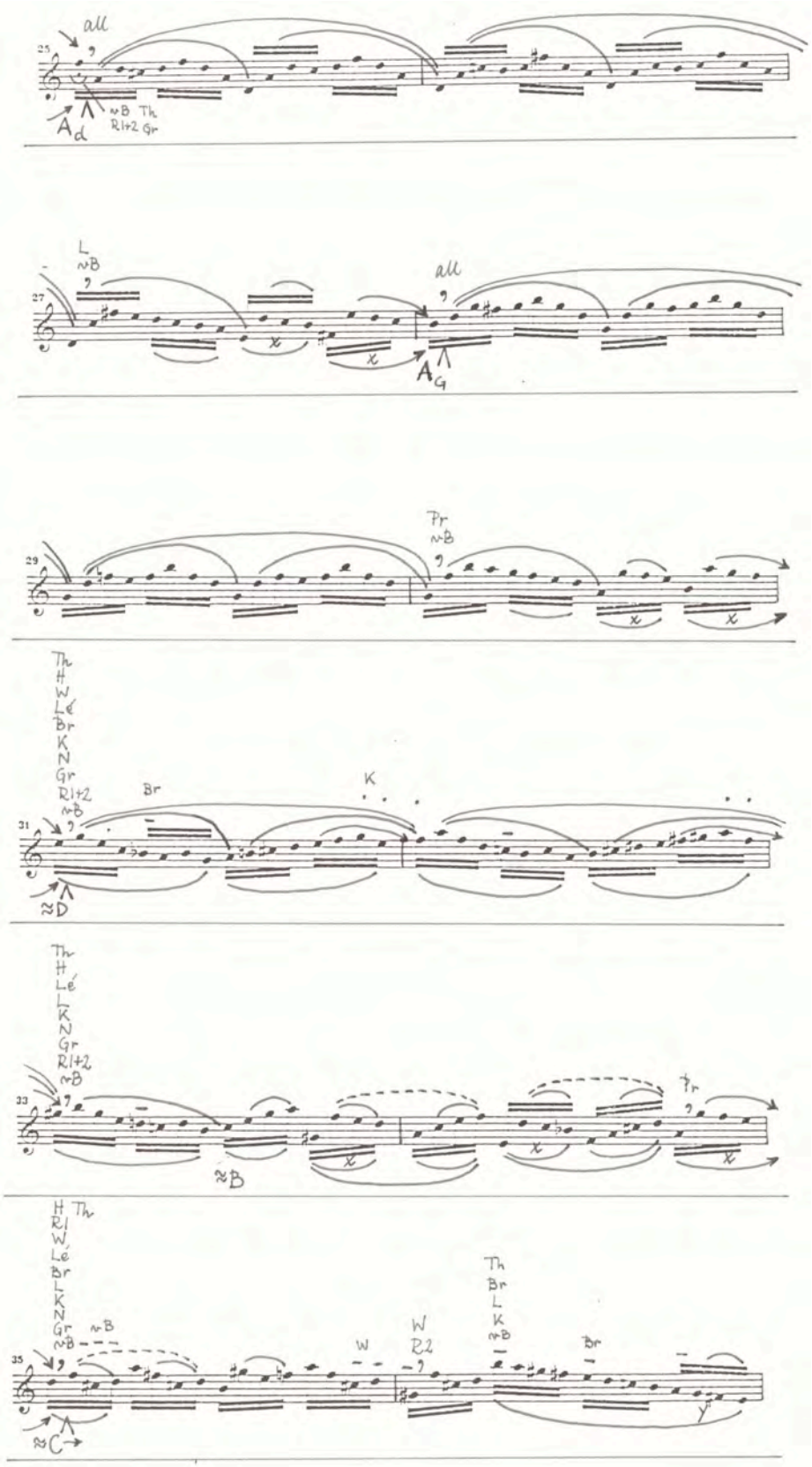
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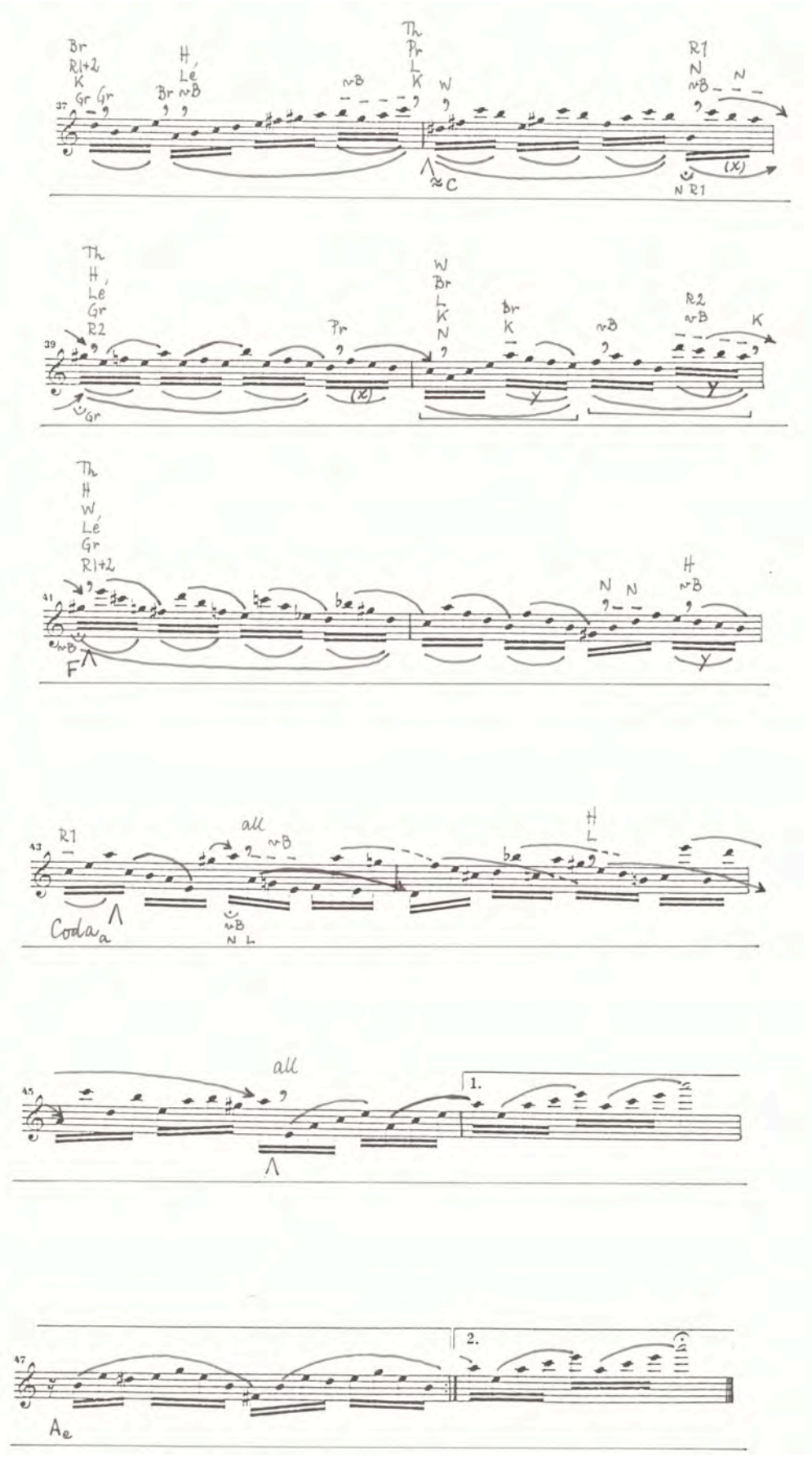
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Bengt Edlund

Directions and Compliance. The Development

The short development section of the first movement of Beethoven's Piano Sonata Op. 110 is likely to have struck many an analyst and pianist as odd. Is it an enigmatic example of crude concentration or a regression into monotony? These sixteen bars are repetitive to the point of exhaustion, but when studied closely an intriguing series of units distinguished by minute deviations come to the fore. The section as a whole is quite static, and therefore it appears to demand interferences from the pianist in order to release any momentum it might have. Or perhaps the music requires to be left undisturbed? In short, this development presents an interpretative challenge.[1]

The development will first be subjected to a thorough analysis. The analytic observations will then be followed up by an empirical study of a number of recordings in order to find out how pianists in fact deal with the music.

Analytic observations

It is difficult to establish the length of the "sixteen-bar" development since mm. 38–39 are ambiguous as to their formal function. (Ex. 1) Having but

[1] This essay makes up a part of, and a complement to Bengt Edlund, "Directions and Compliance", ch. 3 in *Wits and Interpretation*, Berlin 2023, Peter Lang Verlag, where two other passages of the first movement of the Sonata Op. 110 are studied.

little musical substance, they may be understood as merely a transition leading to the resumed activity in m. 40. But m. 38 is also the goal of a rising cadenza-like transition, and considering the development as a whole, the step e♭^{3}–d♭^{3} in mm. 38–39 attaches to the ensuing, long-range falling motion from c^3 to c^2 that issues into the recapitulation. The fact that the *crescendo* mark is placed already at the end of m. 39 may be taken to indicate that this bar (or perhaps only its last beat) is to form an upbeat to m. 40, leaving it to m. 38 to close the exposition.

The recapitulation begins in m. 56, of course, but it does so by a statement of the thematic two-bar phrase permeating the rest of the development – a continuity that makes for a very smooth, unobtrusive transition between the development and the recapitulation.

The development features no less than eight statements of the two-bar phrase. These statements are arranged in pairs forming a sequence of falling thirds; the points of departure are c^3, a♭^{2}, f^2, and d♭^{2}, respectively. But the first of these four-bar units is clearly set off from the others – in m. 44 the chordal accompaniment (propulsive due to its rapidly repeated thirds) is replaced by undulating scale figurations, and the melodic and harmonic organization in mm. 40–43 differs from that in mm. 44–47, 48–51, and 52–55. Counteracting this demarcation there is also in mm. 40–45 another, overlapping right-hand sequence. Starting from c^3, b♭^{2}, and a♭^{2}, the two-bar phrase appears three times along the scale, and this sequence is tightly tied together: the even-numbered bars continue from the note where the melody was left in the odd-numbered bars. This pattern is abandoned in m. 46, being virtually identical with m. 44 as far as the right hand is concerned.

In addition, or essentially, mm. 40–43 form a closed, circular four-bar unit subtly militating against the obvious organization in two-bar phrases. In m. 43 the melody returns to the c^3–a♭^{2} motion of m. 40, and the melody of the four bars may be described as a bisected double neighbour-note motion – the first phrase leads from c^3 up to d♭^{3} whereas the second starts on b♭^{2} and returns to c^3. From the harmonic point of view a corresponding, and yet

slightly different symmetry emerges: two C-major applied-dominant bars are suspended between unstable second-inversion F-minor chords. The first of these dominants has an opening quality; the second strives towards closure. The subdivision of this passage into two-bar units is undermined by the incessant left-hand chords and the *crescendo*.

The following "F-minor" unit (mm. 44–47) brings an altogether different organization. In the second statement of the phrase, the rising fourth is exchanged for a rising second, a change that – due to the falling resolution of the inner-voice suspension $d♭^2$–c^2 and the root A♭ in the bass – gives rise to a new applied dominant. This makes for a disturbance of the symmetry. Whereas the enclosed C-major dominant in m. 45 both opens from F minor and, due to the left-hand scale figuration, leads back to it, the A♭-major dominant emerging in m. 47 strongly demands D♭ major; this bar turns into an upbeat to m. 48, an impression that is further underscored by the connecting middle-voice motion.

The "D♭-major" unit (mm. 48–51) deviates in some important respects from its predecessor. Bar 50 begins with a dissonance, which in the prevailing D♭-major local context should resolve upwards. But on the second beat the bass motion has established B♭ as the harmonic root, and consequently the resolution bends downwards to $b♭^1$. A furtive, premature modulation from D♭ major to B♭ minor has taken place, and therefore the F-major applied dominant in m. 51 confirms rather than effects the modulation. Although the ensuing four bars make up the B♭-minor unit of the metrically uniform sequential design, the B♭-minor stage has in fact already started. Bar 51 (and then m. 53) differs from m. 49 in as far as the relaxing chord on the second beat has lost its firmness – the right-hand F-major chord emerges only on the third beat. The c^2 brings what will soon turn out to be a false, rising resolution from $b♭^1$ to c^2; the melody reads $e♭^2$–c^2, and the falling resolution from $b♭^1$ to $a♮^1$ only occurs on the third beat.

Turning to the "B♭-minor" unit (mm. 52–55), the $d♭^2$ in m. 52 introduces a new stage in the long-range upper-line sequence, but it does not bring a fresh key to go with it: as pointed out above, B♭ minor has already been

introduced in m. 50, featuring almost the same bass figuration as m. 52. Bar 53 then parallels m. 51, but the F-major sonority is slightly undermined by the fact that the bass figuration brings B♭1 on the second beat as a competing root against the F's of the first and third beats. B♭ minor is unmistakably stated for the third time at the beginning of m. 54, but then the harmonic root gets out of focus in the bass figuration. In fact, except for the slightly dissonant f1 and the A♮ the harmonic content of this bar is compatible with the decisive E♭-major dominant introduced in m. 55, where e♭1 arrives as a resolution on the first beat, and where the new root is discreetly confirmed in off-beat positions in the left-hand figuration. The top-voice interval between mm. 54–55 is a third leading back to d♭2; as a result the melodic motion seems arrested. Considering the whole four-bar unit, however, this change makes up a link in the descent of the upper line. Being gradually diminished from a fourth to a third and then to a chromatically filled-in and rhythmically augmented second, the sequence of rising intervals bring out a falling target-note connection e♭2–d♭2–c2, finishing and deflecting the large-scale descending-third sequence, and closing with a final statement of the two-bar phrase at c2, i.e. with the main theme, in m. 56.[2]

It appears from the above description that the apparently rigid patterning in terms of four-bar units is gradually obscured towards the end of the twelve-bar sequence as a result of the overlapping similarities (mm. 47/49, 50/52/54, and 51/53) and the increasing harmonic immobility – mm. 50–55 tend to form a static, eventually cadencing six-bar unit featuring B♭ minor for five bars. The sense of continuity is highlighted by the alto-register f1 introduced in m. 50 and kept until it is redefined during m. 54 as a suspension bound to yield to e♭1.

[2] Thus, the end of the development suggests a motion e♭2–d♭2–c2 leading to the recapitulation, a connection that parallels the e3–d♭3–c3 transition in mm. 38–40 bringing the starting point of the development.

Since m. 47 and (to some extent) m. 51 feature modulating applied dominants, mm. 48 and 52 may emerge more as withdrawing harmonic arrivals than as firm points of departure, which cannot but obscure the sense of a long-range sequence of falling thirds. Furthermore, due to the rather short sound of high-pitched piano tones, the first melody note in the even-numbered bars may lose contact with the following note – unless, of course, the pianist takes care to stress the downbeat note in order to preserve the initial falling inflection of the thematic phrase. Measures 51 and 53 feature awkward detail already mentioned: if the right-hand voices are just slightly out of proper dynamic balance, the listeners are apt to hear the c^2 on the second beat as a rising resolution rather than as the falling-third conclusion of the thematic phrase – the true resolution note is the third-beat $a\flat^2$.

The passage mm. 44–55 may be understood as a dialogue in four different ways. Basically it is of course a series of statements of a thematic phrase in the right hand accompanied by independent scale figurations in the left. But the right-hand two-bar phrases in even-numbered bars may also be contrasted against the left-hand scales in odd-numbered bars. Considering the left-hand part alone, the passage invites to being heard as a series of high-register utterances being immediately, perhaps somewhat crossly, answered in a lower register. Finally, if taken to form pairs, the right-hand phrases give rise to another type of dialogue in which the second phrase, featuring a smaller interval across the bar-line, seems to answer the first phrase. These options for dialogue are interdependent, and it turns out that the balance between the hands is crucial when it comes to directing the listener's attention to any of these patterns of exchange.

Particularly when the durations are long, the high-pitched notes of the right-hand melody get rather thin whereas the chains of sixteenth-notes in the left hand are rich in resonance. If the motions in the bass are made prominent during the initial long notes of the right-hand phrases, this is bound to detract some attention from the crucially important falling inflec-

tions in the treble. Hence (?) Beethoven prescribes (advises) the pianists not to use any *crescendo*/*diminuendo* dynamics in the even-numbered bars – otherwise a quite natural way of playing.[3] The final half-note of the right-hand phrases in odd-numbered bars are expected and thus less vulnerable to left-hand domination. The conclusion of these observations is that it is quite difficult to play and to hear a simultaneous dialogue on equal terms between the right and left hand, and that it is a more feasible option to play so as to simply bring out "even-numbered" right-hand statements followed by "odd-numbered" left-hand interjections.

Turning to the-left-hand-alone option, a sense of dialogue cannot arise if the rising/falling figurations in the even-numbered bars are subdued – if no conspicuous statements are heard, there cannot very well be any deep-register answers – and therefore it seems that this kind of dialogue can only be accomplished at the expense of the upper thematic line. Conversely, it appears that there are two prerequisites for conveying a right-hand-alone dialogue: the bass figurations must be sufficiently subdued, and the right-hand phrases must emerge as sufficiently different from each other – lining up similar utterances is not enough to create a sense of dialogue. The most obvious way to establish a right-hand dialogue is to play mm. 46–47 and 50–51 softer than the preceding pairs of bars.

It remains to study the bass figurations of mm. 44–55 in order to identify some traits of possible pertinence for interpretation. Excepting mm. 49 and 51 – featuring a rising scale and (essentially) two rising fourths, respectively – the normal pattern consists of ascents followed by descents. The top notes (cf. the arrows in Ex. 1) of these rising/falling gestures either fall on the third beat or symmetrically on the seventh sixteenth-note; in latter case the apex note is never the root of the chord. The harmonic roots (cf. the asterisks) are most often prominent, occurring on the first and/or the second

[3] Or perhaps he just wanted us to play the left hand in even-numbered and odd-numbered bars differently in order to avoid monotony.

beat and sometimes on the third beat as well. In mm. 47 and 50 the second beats come up with roots that effect harmonic shifts (cf. the dots).

In three cases, mm. 45, 49, and 50, the ascending motions start with repeated semitone steps, insistently pointing towards the second beat; the immediate re-occurrence of this motif in m. 50 is unexpected. Bar 45 deviates from the others since it contains a rising triad. As already mentioned, even-numbered bars lack *crescendo/diminuendo* markings; the alignment of these signs in the odd-numbered bars is not altogether consistent.[4]

The study of recordings

The following 29 recordings were examined – performances on the hammer–clavier are marked with **H**. To give an idea of the tempos, a metronome figure (calculated for mm. 44–47) is added after each entry.[5]

Arrau 1987 (Philips 422067-2) 54
Ashkenazy 1980 (Decca MCPS 417152-2) 63
Backhaus 1967 (Decca SXL 6300) 77
Badura-Skoda 1980 **H** (Astrée AS 49) 58
Barenboim 1 1969 (HMV HQS 1181) 49
Barenboim 2 1984 (DGG 413772-2) 54
Binns 1981 **H** (Oiseau Lyre D 185 D3) 57
Bishop 1974 (Philips 6500764) 51
Brendel 1 1966 (Vox VBX 417) 71
Brendel 2 1974 (Philips 6768004) 65
Brendel 3 1983 (Philips 412789-2) 65
Browning 1967 (RCA Victor LSC 2963) 58

[4] Whether this (rather myopic) observation is to be considered important or not, depends on whether one thinks that the sources of the *Urtext* edition can reasonably bear such close reading; it cannot be taken for granted that these variances are intentional.

[5] Practically all recordings stem from the collection of the Swedish Broadcasting Corporation, Stockholm. The author is very grateful for the courtesy of making them available for study.

Demus 1 1966 **H** (Harmonia mundi HMS 30833) 59
Demus 2 1984 **H** (Fono FSM 123015) 58
Eschenbach 1979 (HMV 153-03628) 49
Földes 1968 (DGG LPM 18636) 68
Gilels 1985 (DGG 419174-2) 54
Gulda 1968 (Amadeo ASY 906444) 69
Gould 1956 (CBS M3K 39036) 57
Kempff 1964 (DGG LPM 18945) 62
Nat 1954 (Disque français DF 730.013) 71
Pollini 1975 (DGG 2530645) 68
Richter-Haaser 1959 (Columbia 33 CX 1666) 53
Rosen 1 1966 (Epic LC 3900) 56
Rosen 2 1971 (CBS M 30941) 56
Schnabel 1932 (HMV COLH 63) 68
Serkin 1 1972 (CBS M 31239) 59
Serkin 2 1987 (DGG 427498-2) 62
Siki 1959 (Columbia 33 CX 1185) 63

Turning first to the short passage mm. 38–39, it is played in various ways, presumably reflecting different ideas as to its formal function. Fourteen pianists make a *ritardando*, and ten of them combine it with a *diminuendo* – ways of playing that suggest a transitional function. Gould clarifies this even more by stressing the start of the thematic phrase in m. 40, and so does Pollini, although he makes for more continuity by playing strictly in tempo. Binns, Kempff, and Schnabel keep to the same pace while observing the *diminuendo*. Földes, Gilels, Nat, and Siki refrain from the *diminuendo* as well – these interpretations certainly made the transition unobtrusive, yet they did not give the impression that mm. 38–39 belong to the development. (To patently convey this, the two bars must probably be preceded by a *ritardando*/*diminuendo* and then be resumed in a resolute way – an interpretation not found in any of the recordings.)

But several pianists render m. 39 so as to be formally ambiguous. With or without *ritardando* and *diminuendo* seven pianists stress the last quarter-note, turning it into an upbeat to m. 40. Four pianists set off m. 39 in ways

that gives the entire bar an anacrustic function, suggesting the start of the development. Thus Demus 1 plays m. 39 *crescendo* whereas Gulda underscores his *crescendo* by a clear return to the main tempo. Serkin 2, avoiding any *ritardando*, puts m. 39 into relief by inserting a short rest before it and by playing it *subito piano*; Backhaus, on the other hand, makes a *ritardando* but highlights m. 39 by means of a *subito forte*.

Proceeding to mm. 40–43, the crucial features are how these bars are attached to m. 44 and the internal relationship between the two phrases.

Fourteen recordings exhibit a seamless attachment: there are no *crescendo* or *diminuendo* effects, and no ever so short demarcating silences. On the other hand, nine pianists insert a noticeable dividing rest at the bar-line; Arrau, Gould, Nat, and Pollini make a *diminuendo* at the end of m. 43, and in Eschenbach's and Browning's recordings a *ritardando* is added to the *diminuendo*, making for a quite clear demarcation. In Serkin 2 the new section is set off by a suddenly raised tempo.[6]

Ten pianists render these four bars with an extended crescendo while Nat rather seems to do the opposite. Ashkenazy and Gulda combine the increase in dynamics with an overall *accelerando*, and Brendel 1 exhibits a pronounced increase in tempo. Four pianists maintain an even level in dynamics as well as in tempo. All these performances made for internal cohesion, and so did some others by means of specific cues to that effect. In addition to their increase in speed, Bishop and Brendel 3 add a *crescendo*, setting in during the right-hand half-note in m. 41, and keeping to a steady pace Rosen 2 does the same. In Rosen 1 and Serkin 2 this effect is used in the second phrase as well – while supplying a link to what follows, this way of playing also gave the impression of a parallelism between the two phrases, which in turn suggested a sense of separation. Some pianists clearly demarcate the phrases from each other. Within an overall *accelerando*

[6] Recalling the sudden, hushed dynamics in m. 39 of this recording, one may suspect that these traits are non-intentional, i.e. due to editing cuts. Generally, it cannot be excluded that there are more (seemingly noteworthy) features in these recordings that are artefacts.

Browning gives each phrase its own *crescendo*; Kempff brings out the second phrase by a *crescendo/diminuendo* whereas Pollini sets off the first by a *diminuendo* in m. 41. Gould demonstratively separates the phrases by playing each of them *crescendo/diminuendo* as well as *accelerando/ritardando*; Demus 2 inserts short rests at the bar-lines.

Bar 44–55 make up a bewildering picture of internal similarities and differences subsumed under a long-term tonal process, and the performance details observed in the recordings are too numerous to permit a complete account and a bar-by-bar approach.

In the analysis of this passage four options of dialogue were presented, but it was generally a most delicate task to distinguish elements of dialogue in the recordings. (Depending on my mental set, I could often hear either alternating right/left-hand dialogues or a series left-hand exchanges, and sometimes simultaneous crosstalk as well.) Fifteen of the pianists use left-hand *crescendo/diminuendo* (or other dynamic shifts) in the odd-numbered bars only, making it possible to hear a right/left-hand dialogue, while nine recordings feature such dynamic changes also in the even-numbered bars.

Listening closely to these dynamic waves, it could be noticed that they were most often adjusted so as to resemble each other. The intensity in the even-numbered bars practically always peaked at the highest pitch – Schnabel and Kempff, however, sometimes play louder at the beginning – and turning to the odd-numbered bars, the dynamic peaks were often adjusted so as to coincide with the highest pitch. These attempts at imitation contributed to a sense of left-hand dialogue in terms of register. The rising seconds beginning the figurations in mm. 45, 49, and 50 are most often brought out clearly in the recordings. As regards the right-hand dialogue option involving pairs of two-bar phrases, this idea apparently inspired Badura-Skoda: he plays mm. 46–47, 50–51, and 54–55 much softer, gently echoing the preceding statements.

Turning to aspects of higher-level coherence, the encompassing descending-third sequence comes to the fore in most of the recordings by means of

prominent right-hand starts at a♭²–f²–d♭² in mm. 44, 48, and 52, but it also happened that these essential notes were difficult to hear due to intruding left-hand activity. Bar 47 with its middle-voice bridge is sometimes highlighted in ways making for a strong connection with the tonicized D♭-major chord in m. 48; these renderings tended to obscure the regular descending-third progression. The first two chords of m. 47 are quite prominent in some recordings. In some cases the downbeat in m. 48 is somewhat delayed and preceded by a *crescendo*; in other performances the connecting alto voice leading to the f¹ in m. 48 comes clearly to the fore. Ashkenazy, on the other hand, makes for a smooth connection by playing the alto line very softly.

From m. 50 on the music gets ever more static, which seemed to be reflected in some recordings by a gradual decrease in loudness. In other performances the bass figurations turned more prominent – or tended to disappear, hidden in a mist of pedal (Brendel 1, Serkin 2). The long alto organ-point on f¹, beginning in m. 50, is brought out by many pianists when this note is struck again as a syncopation in m. 51 or m. 52 – or on both these opportunities, in which case the two prominent f¹'s could not but be associated with the soprano's first-beat d♭², giving rise to a yodelling rising/falling pseudo-motif (Gould). One pianist, Eschenbach, clearly resolves the f¹ to e♭¹ in m. 55, while Pollini emphasizes the e♭¹ without supplying the reason. In Rosen 2 and Schnabel the entire right-hand E♭⁷ chord is highlighted by the force invested in the motif producing its top note.

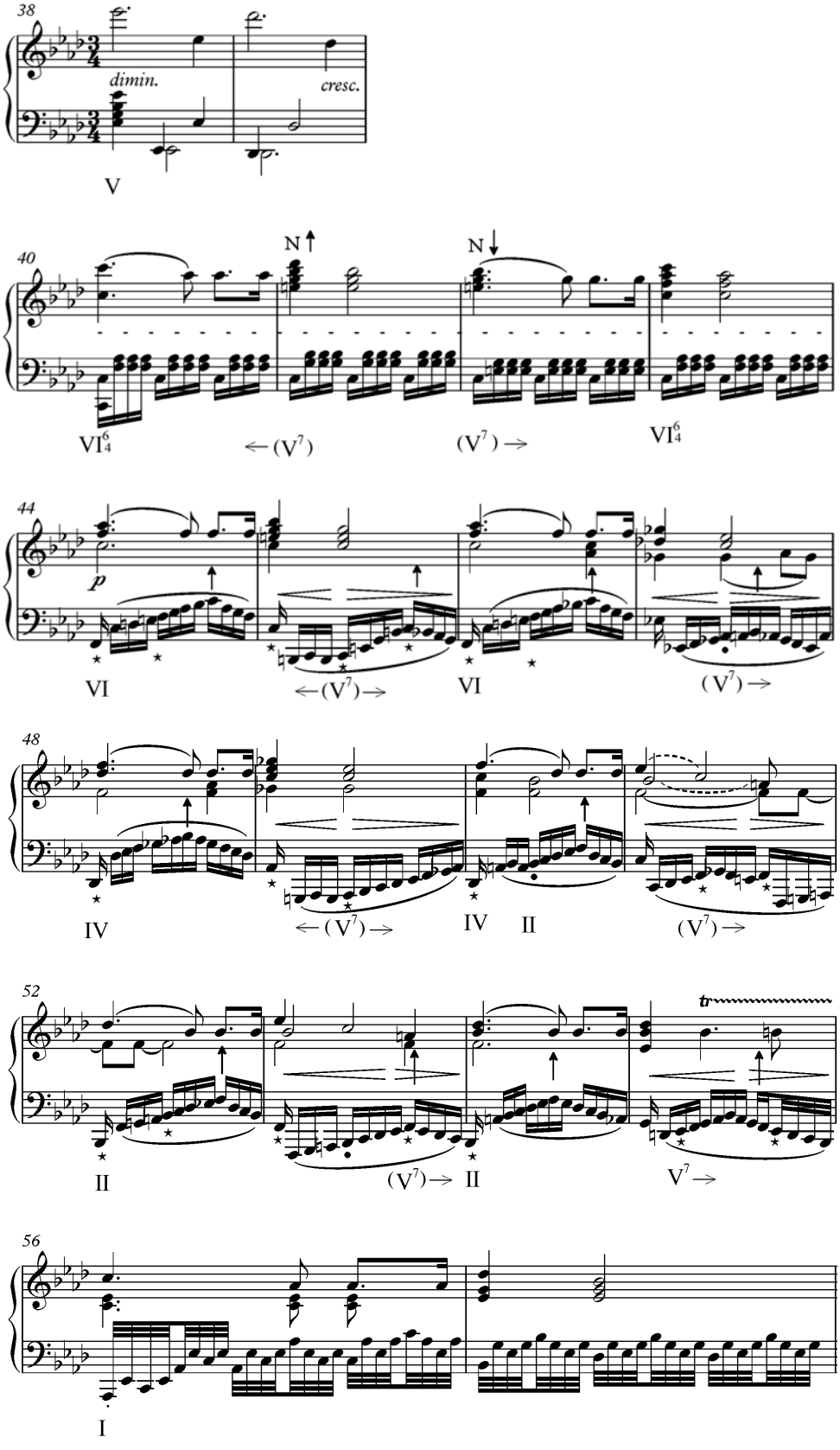
All pianists make a *ritardando* in m. 55, although in some recordings it is slight to the point of being imperceptible, letting the listener glide into the recapitulation (Backhaus, Badura-Skoda, Kempff, Siki). Others make quite pronounced retards (Arrau, Demus 1 and 2, Eschenbach, Rosen 1, Schnabel), and some pianists slow down already in m. 54 (Barenboim 1, Binns, Bishop, Brendel 2 and 3, Browning); especially Bishop and Browning reduce the dynamics as well.

In no less than nineteen of the recordings the listener is likely to get a wrong idea of the voice leading in mm. 51 and 53. However much I tried to

hear these bars according to the score, i.e. to distinguish first the thematic falling third e♭²–c² and then the falling resolution to a♮¹, the impression was rather that of a rising second b♭¹–c². As if deliberately neglecting the text in order to achieve variety, Brendel's recordings consistently and clearly seemed to suggest a broad anacrustic gesture c²–a♮¹–f¹ in these bars.

Directions and compliance. The development

Ex. 1



Bengt Edlund

Proprioceptive Patterns in Music

Proprioceptive patterns

That music is the art of sound is a statement that few of us are likely to deny and yet this commonplace is far from the only and whole truth. For prior to, or following upon, its presentation in sound, music may be recorded by means of symbols on paper. The notation allows you to study the structure synoptically, which means that the music is deprived of time, of its irreversible driving force and its very medium of existence. Admittedly, the musical flow may be restored if the score is read by someone who is capable of imagining the music, but reading remains a potentially deceptive way of studying music – you see things that you cannot hear, and *vice versa*.

But music is accessible along still another route. Although we tend to forget this fact in our era of passive music consumption, music is there just as much to be played or sung as it is to be listened to. Playing or singing music includes listening to it, of course, but the core of music making is that you control the process, and that you feel the music through your body. The latter observation means that music also speaks to us through the senses of touch and proprioception, i.e. the often neglected inward sense informing you about the positions and movements of your joints and muscles.

The whole truth, then, is that music is not only an art that is heard, it is also an art that is seen and felt.

The present study is devoted to the proprioceptive patterns that are inherent in the motions associated with music performance. However private they may seem, these motions are very important. As far as music analysis aspires at giving an account of all aspects of structure and meaning in a music work, and to the extent that performing music is acknowledged as an activity on a par with listening to it, the experience of a piece of music through the body producing it must be included as a legitimate and integral source of insight when it comes to its description – and yet proprioceptive matters have been gravely neglected by music analysts. Taking account of proprioceptive patterns is indispensable if one wants to account for musical structure, understand interpretation, or teach excellence in performance.[1]

The proprioceptive patterns (whether agreeing with the visual or aural patterning of the musical structure or not) are of course crucially dependent on the instrument: its construction and the way it is played amount to a set of basic conditions, offering opportunities as well as introducing limitations. But the proprioceptive qualities of a certain passage also depend on the particular manner of execution that for some reason or other is chosen by the musician – as well as on the key of the music. That the proprioceptive properties of a piece of music, and hence a most important element of its essence for the player or singer, may change radically as a result of transposition, is self-evident to all musicians but not duly acknowledged in the musicological discourse. The current, but mistaken view is that (apart from changes in timbre) music is not affected by transpositions since the frequency ratios between the tones remain the same.

Generally speaking, the proprioceptive patterns tend to be intimately linked to the technical units that make up the musician's motor program,

[1] Cf. Bengt Edlund, "A Comprehensive Approach to Musical Idiomatics", ch. 6 in *Wits and Interpretation*, Berlin 2023, Peter Lang Verlag, and "The Phenomenology of Fingering", ch. 7 in *Chopin. The Preludes and Beyond*, Frankfurt 2013, Peter Lang Verlag, also published in Poniatowska, Irena (ed.), *Chopin and His Work in the Context of Culture*, Vol. II, Warszawa 2003, Polska Akademia Chopinowska; pp. 88–105.

and hence they are deeply integrated into the cognitive representation of the musical structure as it emerges for the player. The composers (being often accomplished performers or having deep insights in the art of performance) are usually keen not only to devise auditory structures that are coherent and orderly, but also to ensure that these structures exhibit corresponding proprioceptive qualities: a truly excellent work of music should also be "idiomatic". And the musicians, using all their craftsmanship and creativity, strive to optimize their motor programs by arranging and imagining the structures to be performed so as to emerge as orderly, regular, and perhaps symmetric. They try to devise proprioceptive patterns that are convenient and that seem to match the musical structure – the patterns may either support the interpretational idea they have in mind or suggest another rewarding organization of the musical substance.

Many playing motions are strongly associated with how the music is articulated, and some of them, for instance bowing and breathing patterns, belong to the basic means of musical articulation. Other motions influence how the tones are connected in less direct ways; while a certain fingering may be compatible with various articulations, it may fit best with (or even induce) a particular articulation of the music. The crucial association between motions and musical articulation is widely acknowledged among musicians and makes up a much discussed matter, but this study will mainly be devoted to another aspect of the proprioceptive patterns, a basic aspect that has largely been neglected in music analysis: the bodily sensations associated with the motions necessarily involved when playing any sequence of notes on an instrument.[2]

The proprioceptive conditions of piano playing

[2] The study of playing patterns and their relationship to interpretation has of course historic/stylistic ramifications. The key systems of woodwind instruments, for instance, have changed over the centuries, and so have the ideas as to proper keyboard fingering. The following account will be restricted to present-day instruments and current practices.

In order to give an idea of what musical proprioception involves, and to provide a point of reference when discussing other instruments, the conditions of piano playing – known to, or at least readily understandable for, most people – will be presented in some detail.

If you hold out your *hands* in front of you with the palms directed downwards, the symmetry is evident: the thumbs point inwards, the right hand is mirrored by the left. But the keyboard of the piano has a lateral layout with the bass to the left and the treble to the right. This clash between biological symmetry and artificial lateralization causes much of the peculiar character of piano playing. If you want to play the same melody with the left hand as you just played with the right, you must reverse the finger sequence, which causes an entirely different proprioceptive experience; if you let one hand exactly imitate the actions of the other, the melody will be inversed and musically quite different. Beyond awareness for proficient pianists, this paradox is very confusing for beginners.[3]

But whereas the hands are symmetric, the *hand* is not. However excellent a pianist you are, your fingers are likely to retain some of their anatomically given peculiarities: the slow thumb having its own mode of striking the keys, the strong and nimble index and middle fingers, the not entirely independent and somewhat weaker ring-finger, and the little finger which may be somewhat too short. And roll down your fingers on the keys (or just on a table) from the little finger to the thumb, and then from the thumb to the little finger! You cannot but notice the constitutively given difference in ease, speed, and regularity; you have to consciously control the finger motions when doing the latter motion.

Furthermore, while your *hands* look symmetric when held in front of you, they are not alike from a neural point of view. Since most of us have brains with a dominant left hemisphere, our right hands tend to be somewhat more alert, and this difference has in turn determined the lateralization of the

[3] Due to the vertical arrangement of the strings on the harp, the symmetry between the hands is not a problem.

keyboard as well as influenced how the composers have written piano music. High-pitched tones are apt to move quickly whereas the greater (physical as well as perceptual) inertia of low-pitched tones tends to make fast deep-register passages sound thick and indistinct. No wonder, then, that the keyboard was once constructed so as to let the right hand take care of the melodies, leaving the bass fundament to the left, and that rapid passages turn up more frequently in right-hand parts.

Excepting some genuinely contrapuntal music, the keyboard literature is characterized by the fact that right- and left-hand idiomatic are different. The net effect of the manual demands of the repertoire is to increase the constitutional differences between the hands almost to the point of specialization – the dexterity (!) of the right hand is complemented by the accuracy of the left when it comes to wide leaps, often required in accompaniments. The aim of much basic piano training, for instance when practicing etudes composed so as to force the left hand to do right-hand job, and *vice versa*, is to level out the constitutional and induced differences, to give the hands the same technical competence. Human hands skilled at playing the piano are, although still made of flesh and blood, a kind of artefacts, shaped by the layout of the keyboard, by the idiomatic properties of the piano literature, and by many years of youthful practice.

As any accomplished pianist can tell, the *fingering* alternatives are numerous, and (whether planned beforehand or invented in the moment) a certain fingering is chosen either because it presents a convenient, orderly sequence of motions, or because it fits the musical structure of the passage. And no matter their technical convenience, fingerings inevitably project their motor patterns onto the tonal substance, a fact that determines their usefulness and value.

Fingerings have an inherent musical meaning, and since they influence the interpretation, they (or rather their effect) may even be heard.[4] A simple example may illustrate this point. A rising right-hand C-major scale can be

[4] For a further discussion of these matters, cf. Bengt Edlund, "The phenomenology of fingering"

played with the current fingering 123 12345, but it may also be executed by means of two 1234 chunks suggesting a division of the scale into two identical, disjunct tetrachords, and subtly bringing out the fourth, subdominant degree as a secondary point of tonal gravity.

Finally, a quick glance at a piano *keyboard* will disclose that passages will rarely retain their proprioceptive identity when transposed to another *key*, i.e. to another set of keys on the keyboard. The irregular distribution of white and black keys means that the same sequence of intervals will get a more or less different white/black "topography", and hence another proprioceptive character, when being transposed. Moreover, transpositions are usually associated with changes in fingering, a fact that of course even more attenuates the relationship between structural identity and manual similarity.[5]

There is, for instance, a radical proprioceptive difference between the C-major and B♭-major triads. In C major the thumb starts/ends the rising/falling root-position constituents of the figuration, thus giving emphasis to the tonic notes. In B♭ major, there is a mismatch between the root-positions and the fingering pattern, a fact that slightly undermines the B♭-major-tonic quality for the pianist. For another illustration of the effect of the white/black topography of the keyboard we may turn to the chromatic scale, which no matter its equidistant steps and uniform musical motion emerges as irregularly divided into groups of two and three notes when using the standard fingering. Six-note whole-tone scales are not convenient for five-fingered pianists.

[5] Turning again to the harp for a comparison, the transposition of major scales (and diatonic material in general) does not entail any changes as far as the fingering is concerned – the harp has seven strings per octave, strings that are retuned to produce the required diatonic pitch collection by means of seven pedals. On the other hand, due to the various pedal combinations that must be quickly activated, music with frequent modulations may be virtually impossible to play – that is why two harps are often seen in the orchestra.

An inquiry into proprioceptive patterning

To show how the playing patterns, and the regularities that may emerge, turn out on various instruments, and to study how the patterns correlate with musical structures, four short examples were studied with respect to how they are to be (or might be) played. A strategic sample of instruments was selected – the piano, the violin, the double-bass, the guitar, the trumpet, the trombone, the flute, the clarinet, the organ, and the human voice – and expert musicians were used as informants.[6]

The examples were a two-octave rising/falling major scale, a two-octave rising/falling root-position triad arpeggio, and two conventional sequences built upon the scale and the triad, respectively. The scale and the arpeggio feature octave transpositions of the same material, as well as upward motion followed by downward, whereas the sequences involve transposed iterations of identical or closely similar musical motifs, which may be read either as downbeat or as upbeat rhythmic configurations. Hence, all examples exhibit some kind of structural regularity, but to what extent will this aural (and visual) order survive the playing conditions associated with the peculiarities of the various instruments and the chosen (or inevitable) way of execution, and turn up as regularities also in the proprioceptive domain?

The musicians/informants were asked to carefully write down all actions required to execute the various examples and also to specify alternative playing patterns in addition to the one first entering their minds, alter-

[6] No individual musicologist knows the technical peculiarities of all instruments well enough, and therefore comparative work in the field of musical idiomatic must always be a teamwork. I am much indebted to my non-pianist informants for their patience and interest – Anders Frostin (violin), Kristina Mårtensson (double-bass), Antonio Rodrigues (guitar), Roger Andersson (trumpet), Leif Andersson (trombone), Anders Ljungar-Chapelon (flute), Christophe Liabäck (clarinet), Janåke Larson (organ), and Evy Bråhammar (soprano). I was in fact given far more know-how than could be used in this survey.

natives that may be suitable for special purposes – the tempo is evidently a most important consideration when deciding how to play a passage. On many of these instruments different ways of execution are also associated with differences with respect to loudness, timbre, or intonation. The musicians were also encouraged to transpose the examples to other keys requiring substantially different playing patterns – easier or more difficult, more or less orderly – and to take down in detail how these transposed versions of the material should be played.

Turning to the ensuing selective presentation of the results of the inquiry, the pianist's (i.e. my own) report can be accounted for without further introductory comments. Keeping the previous presentation of the constraints as well as the freedom associated with piano playing in mind as an example of the potential complexities of proprioceptive patterning, the presentations of the conditions for making music on the other instruments can be less detailed. To save space, the report to follow will mainly deal with the first, ascending parts of the four examples. Generally speaking, the same fingerings etc. appear on the way down, but for technical reasons this correspondence sometimes fails to show up.

Proprioceptive vs. musical patterns

The rising C-major scale demonstrates the fact that the position shifts in the right and left hand are not co-ordinated when playing parallel scales on the *piano*; Ex. 1.[7] The A♭-major scale is idiomatically less satisfactory since it begins with a no-thumb right-hand group and is topped by a single

[7] The right- and left-hand fingerings are given above and below the examples, respectively. Horizontal brackets show groups of finger motions (and by extension groups of notes) that belong together due to the hand positions.

middle-finger motion in the left hand.[8] The B♭-major triad can be played with several fingerings, and yet it remains awkward.

While the upward and downward fingerings in scales and triads are generally the same, the manual feeling is distinctively changed when the motion is reversed since (talking of the right hand) subpositioning of the thumb is exchanged for superpositioning of the middle or ring finger. Apart from the fact that the arm position must be adjusted, the keyboard allows of proprioceptive identity when the material is transposed by an octave.

Turning to the melodic sequence built on the triad, the two examples show that the same motif tends to have different fingerings when played in different keys, and also when occurring on different scale steps within the same key. It is also apparent that pianists to some extent can express either the downbeat neighbour-note or the upbeat leading-note motif inherent in the sequences by choosing appropriate fingerings.

When playing the *violin*, the hands have entirely different functions. The left hand is engaged in intonation along the neck of the instrument: higher notes are played by pressing down the string with the fingers from the index finger to the little finger, by moving to higher hand positions on the same string, and/or by changing to the next string, tuned a fifth higher. Excepting the lowest and the topmost registers, this means that the same note can be produced in different ways: the player chooses string/position so as to achieve the proper timbre, and selects string/position/fingering so as to arrive at good patterns with respect to both the hand/finger motions and the bow motions, and to how the patterns fit with the musical structure. The notes g, d^1, a^1, and e^2 can be played with loose strings. Notes may also be played as flageolets (harmonics), i.e. as partial notes selected by lightly touching the string at certain points, dividing it into portions oscillating

[8] The technical convenience does not depend on the number of accidentals in a simple way, i.e. on the number of black keys involved in the scale. The B-major scale is actually the easiest scale to play since the thumbs always strike nearby white keys.

separately. A further duty of the left hand is to supply a proper amount of vibrato.

The violinist's right arm holds the bow and (saying nothing of all other bowing niceties) activates the strings with a carefully chosen sequence of down and/or up motions and angle adjustments in order to touch the proper string. Regular down/up movements of the bow may give rise to a sense of proprioceptive symmetry, but the motion starting from the frog of the bow is potentially more powerful and suitable for playing tones that are to have harsh attacks. The bowing motions give rise to a second and quite complex patterning superimposed on the music, patterns that will be left out of account here although they are most conspicuous for the player.

To sum up, violin playing means co-ordinating two kinds of motions, involving the left-hand fingers and the right arm, respectively, that are entirely different as to their nature and function, and that the player has to arrange in ways that are both convenient and artistically productive.

Due to the size of the instrument, the inertia of its strings, and the fact that these strings are tuned in fourths instead of fifths, *double-bass* technique emerges as an extremely modified violin technique. The long distances along the neck necessitate more frequent changes of hand position and different fingering patterns. The ring finger and little finger usually work together (which of these fingers that actually shortens the string depends on the musical context and on the training of the player), and the thumb is often used to stretch the positions or when playing harmonics.

Guitar playing makes up another contrast to the proprioceptive peculiarities of the violin. Again the left hand shortens the strings, but the six strings along the fretted neck are tuned in fourths with one interspersed major third. The right hand, plucking the strings, is also engaged in fingerwork: most often the thumb plays on the three lower strings (being physically the upper ones); the little finger is virtually never used.

Starting with the violin C-major scale, it appears that it is possible to devise various fingerings with more or less recurring groups of finger motions, but there is no octave identity from the proprioceptive point of

view, and no equivalence between rising and falling motion since the changes of position are distributed in a different way; Ex. 2.[9] These observations are valid also for scales on the double-bass and the guitar (cf. Ex. 3), although in the former case the fingering sequences are rather fragmentary due to frequent changes of string and hand position.

The fingering patterns of the rising triads exhibit little order. On the other hand, and as is shown by the examples of the first sequence as played on the violin, the fingering may reflect musical equivalence by means of proprioceptive similarity – the fingering expresses the neighbour-note aspect. Transpositions are associated with substantial differences as to proprioceptive patterning on all these instruments.

Playing on brass and woodwind instruments generally include motions of lips, tongue, and diaphragm. Lip adjustments influence tone quality and intonation, and are crucial for over-blowing, whereas the tongue is used for articulation: by using (or not using) suitable explosive consonants the starting attack can be controlled (or entirely suppressed). The breathing pattern, finally, reflects the phrasing of larger musical units.

The *trumpet* is essentially played with the three middle fingers of the right hand, lengthening the tube to produce six further, progressively lower notes by depressing the valves one at the time or in combinations. The peculiar, but very practical arrangement of the valves on the instrument ruins the prospects of achieving a straightforward correlation between finger movements and melodic motion: starting with the index finger, the valves lower the pitch by two, one, and three semitones. All notes above the fundamental register are reached by means of over-blowing, recursively raising the pitch

[9] When taking down fingerings on the violin and double-bass, the fingers are numbered 1–4, beginning with the index finger; + refers to the thumb. The figure 0 means loose string, and a small circle refers to harmonics. Turning to the guitar, the positions/frets are given by encircled Arabic numerals, and the strings, beginning from the lowest one, are indicated by Roman numerals; the letters refer to the fingers to be used.

from which the chromatic lowering achieved by the valves departs. Since the intervals in the series of partial tones get ever smaller, the higher registers overlap each other, which means that the same note can be played with various valve combinations. When playing, the sequence of finger combinations is intimately related to, traversed by, the changes of over-blowing register brought about by the lips. Some intervals may, for instance, be played without any change of the fingers, and the "natural" notes do not require any depressed valves at all.

On the *trombone* the three valves are replaced by a slide that can be lengthened to six further, lowering positions. Again, in higher registers the same note can be played with different slide positions, a fact that – combined of course with the concomitant lip adjustments to produce the proper over-blowing register – may be used to modify the otherwise more or less jerky motion patterns of the right arm operating the slide.

Apart from the fundamental difference between small finger/valve motions and large slide motions effected by the arm, there are obvious similarities between trumpet and trombone playing patterns; Exs. 4 and 5.[10] None of these brass instruments exhibit octave identity when it comes to proprioceptive patterning, and the way down the scales or triads tends to be different from the way upwards due to the distribution of the over-blowing shifts. Transposition means considerable changes of proprioceptive pattern: some scales, and particularly some triads, involve less finger/arm actions than others since the tones are to various extent achieved by the lips controlling the over-blowing mode.[11]

[10] The notation of trumpet fingering is somewhat confusing in as far as the valves are not numbered according to the extra tubing length activated. The slide positions on the trombone are indicated by the Arabic numerals 1–7; the letter V refers to an extra valve, lowering the pitch by a fourth. The over-blowing registers are specified by Roman numerals.

[11] Being transposing instruments, C-major in the examples actually corresponds to B♭ major.

As to the sequences, the prospects of reflecting the same motif with a recurrent, identical or similar proprioceptive pattern are fairly good, especially on the trombone.

Woodwind instruments are played by means of a system of key-operated holes that chromatically raise the pitch by shortening the acoustically effective part of the pipe, and the player's hands co-operate to produce the notes. All left-hand fingers are used whereas the right-hand thumb only supports the instrument. The two-hand finger combinations corresponding to the various notes are quite intricate, and by choosing the over-blowing mode the notes in higher registers may be played with different finger combinations, alternatives that are associated with differences in timbre and/or intonation.

Apart from the basic difference with regard to the manner of tone production, the *flute* over-blows in the octave, whereas over-blowing on the *clarinet* (facilitated by opening a special hole) yields octave plus fifth. This means that the clarinet has a more complex system of holes/keys, and that clarinet playing involves more alternative fingerings and more gliding thumb or little-finger motions between adjacent keys. Hence, flute and clarinet fingerings tend to be quite different.

The fingering patterns of the flute exhibit traces of octave identity; turning to the clarinet, which does not over-blow in the octave, no such correspondences can be expected; Ex. Exs. 6 and 7.[12] Especially on the flute, descending scales are generally associated with pressing down the fingers while ascending scales involve lifting the fingers; in proprioceptive terms there is a certain "negative" symmetry. Transposition always brings radical

[12] It is troublesome to give a detailed account of the intricate fingering combinations of woodwind instruments. In the present examples the initial finger combination is taken down completely: the fingers are numbered 1–5 from the thumb to the little finger, and left- and right-hand configurations are shown to the left and right of the vertical line, respectively. The combinations for the ensuing notes are given as changes only: additional fingers that are to be pressed down are signified by (+) and fingers already depressed that are to be lifted are indicated by (–). The clarinet is a transposing instrument.

fingering changes on both the flute and the clarinet. The key system implies that some intervals can be played with just one or a few finger motions, whereas other intervals require substantial changes – several fingers have to be pressed down while several others must be lifted. Due to the complexity of the two-hand interactions producing the various notes, the chances of finding similar motion patterns corresponding to recurring motifs are very slight.

Basically, the *organ pedals* are played with right/left foot alternation, using the tip of the foot.[13] But to make the right/left scheme more flexible and (when needed) to preserve *legato* articulation, one can also twist the foot between tip and heel, slide with the tips, and change foot or change from tip to heel (and *vice versa*) while holding a key depressed. For reasons of convenience one avoids playing the rightmost keys of the two-and-a-half octave keyboard with the left foot, and the other way around. Tempo and desired articulation are very important considerations when devising the movement pattern for a passage.

The first way of execution given in Ex. 8 – the patterns feature frequent shifts between tip and heel, as well as slides between keys and exchanges on depressed keys – brings a proprioceptive feeling of *legato* and is suitable for

[13] Among other instruments played by right/left alternation one finds many of the percussion instruments, such as the mallet instruments, played in a quite flexible manner with two sticks in each hand, and most drums, played with strict hand alternation. An interesting case is the African *mbira* (or *sansa*), a small idiophone with some twenty metal reeds, played by the right and left thumbs. Whereas in western notated music more or less convenient structures are prescribed by the composers, who depend on musicians coping with these structures, *mbira* music making (and much other improvised music around the world) involves immediate selection of traditionally given figurations that tend to be highly idiomatic. The *mbira* is constructed so as to facilitate rapid playing of intricate figurations: there is usually one optimally ordered, complete set of reeds for each thumb, a "double-*qwerty*" arrangement that both allows of melodic freedom and makes it possible to maintain strict right/left alternation.

legato passages, if the tempo so allows.[14] The patterns on the way down tend to be somewhat different from those used in upward direction, and whereas octave transpositions may to some extent be identical in terms of playing motions, other transpositions are bound to give rise to quite different patterns. Turning finally to the sequences, recurring motifs can only in some cases be played with the same pattern.

When you *sing*, there are certainly also motions and proprioceptive sensations. Rising intervals, implying increased effort, are very different from the relaxing falling intervals, their "negatively" symmetric counterparts, and large intervals present a challenge to both vocal cords and tonal imagination. Singing is characterized by more or less distinct register shifts – registers that are different as to the manner of tone production, and between which the perceived locus of the tones in the body appears to change. Apart from the pronunciation required by the text, the voice production is supported if the singer lets the tone be tainted by the vowel quality that is optimal for the pitch to be sung.

The proprioceptive sensations associated with singing are likely to be less intersubjective than those involved in instrumental playing. To some extent the proprioceptive differences depend on technical training or personal habits, but more important is the fact that professional male and female singers use different techniques of tone production. Hence it might be assumed that male and female singers do not experience the same proprioceptive sensations.

That the way down a scale or a triad is very different from the taxing way upwards is obvious, and so is the fact that octave transpositions, and generally all transpositions by large intervals, are associated with quite perceptible differences in proprioceptive feeling. The soprano informant preferred a vowel shift for a few relatively high notes in the scale, and also a shift from the prevailing vowel quality when singing the top note in the D-major triad,

[14] The upper symbols in each row refer to the tip and heel of the right foot while the lower symbols indicate the use of the left foot.

introducing a flute-like register. Turning to the sequences, a register shift must be smoothed out in favour of a gradual change from chest to head register during the entire ascent.

Conclusions

Of the instruments studied, only the piano offers full proprioceptive identity in octave transpositions, although some such constancy is also found when playing the flute. All instruments (including the singing voice allowing of a continuous variation of pitch) are characterized by the fact that transposition to different keys implies more or less radical changes as to the proprioceptive patterning. Upward and downward motions are to various degrees and for various reasons proprioceptively different on all instruments. Depending on the constraints introduced by the instrument and on the technical creativity of the player, motifs recurring on different pitch levels may to some extent be reflected by means of identical or similar motion patterns.

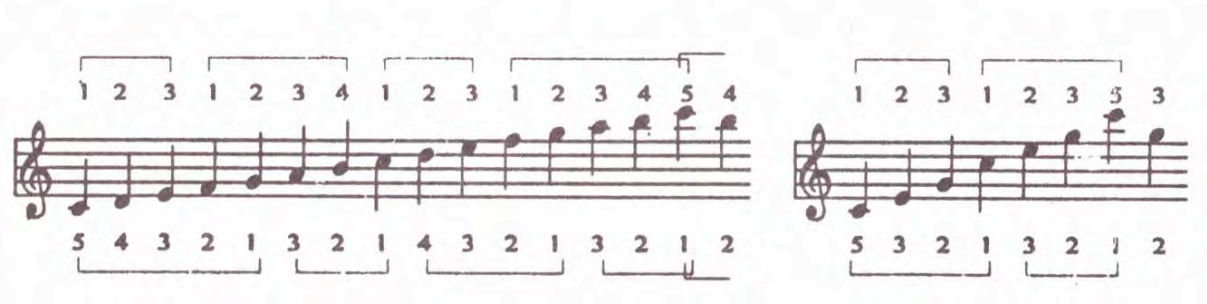
The investigation indicates that octave transposition and transposition between keys, as well as inversed motion and iteration of identical or closely similar melodic motifs tend to have few and imperfect correspondences in the proprioceptive domain. To a great extent, then, the fingers, hands, arms, feet, lips, tongues, and throats of musicians deal with other structures than their ears and eyes. Since music ultimately resides in the mind, musicians certainly have a very complex representation of it.

To all these proprioceptive differences, a further, physical one should be added. Playing, say, the piano or the violin involves motions that in various ways obviously shadow, that even may be said to represent, what is going on musically. In a way, then, the musician shares the music's kinetic qualities, and by extension his/her proprioceptive experience of it, with the listeners. In contrast, when playing the trumpet or the clarinet, the motions asso-

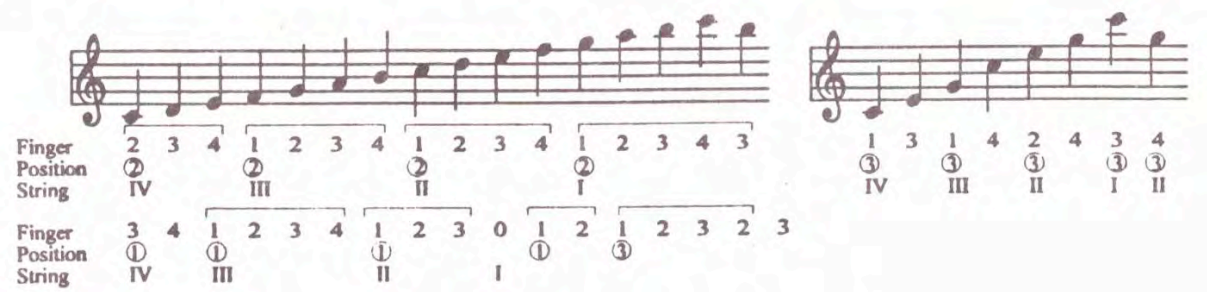
ciated with the execution of the music are quite small. The structure of the music is barely reflected in any overt action, and (excepting some fellow players) the listeners' mirror neurons are not excited to form a representation of what it means to play the music.

Proprioceptive patterns in music

Ex. 1



Ex. 2



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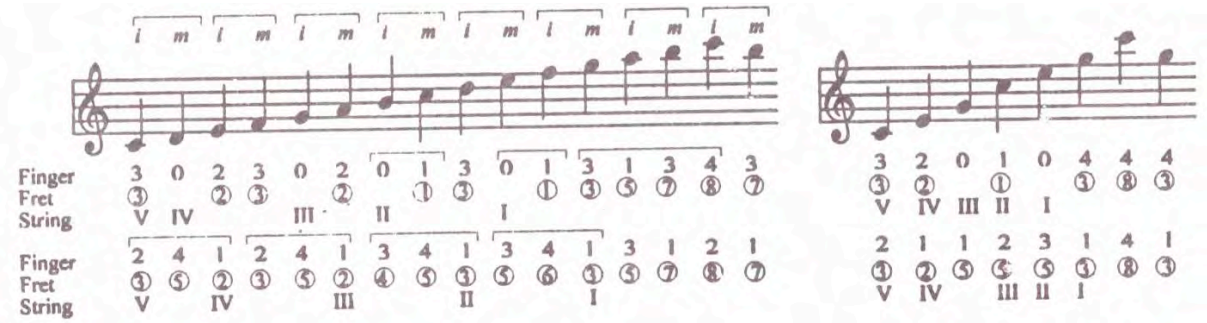

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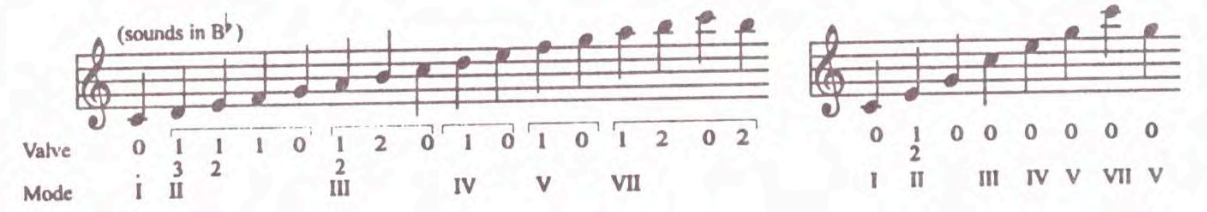

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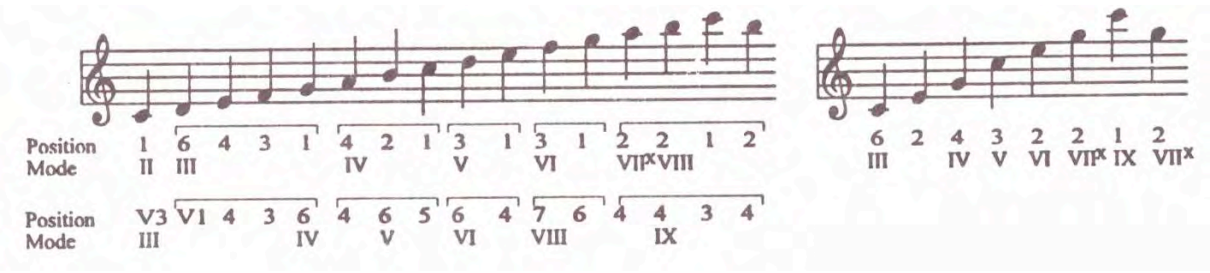

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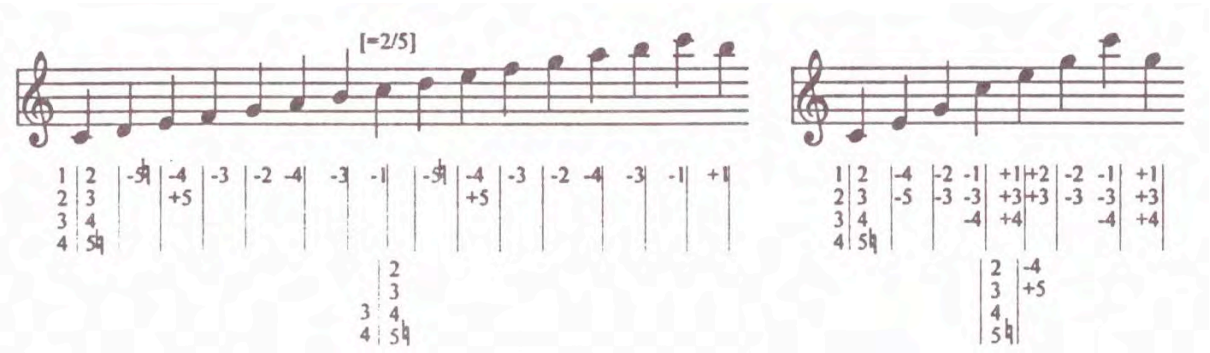

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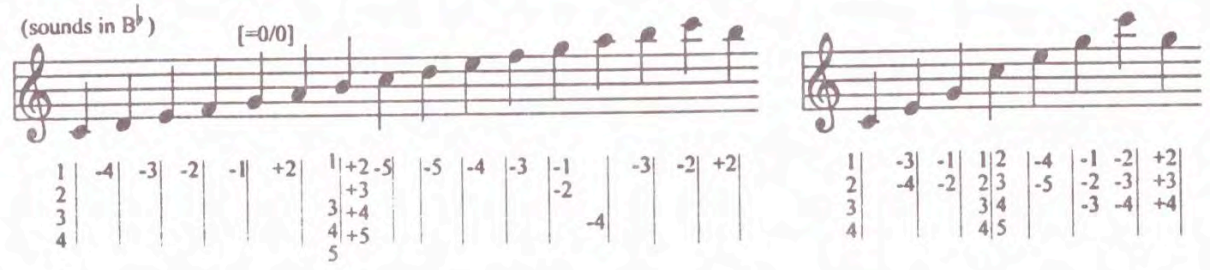
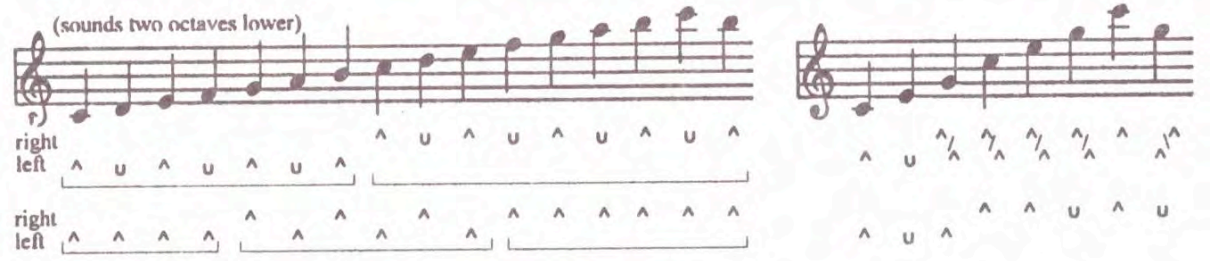


Ex. 8



Bengt Edlund

Musical Conception of Abstract Film. The Case of Viking Eggeling's *Diagonal Symphony*

Introduction

The idea of the *Gesamtkunstwerk* and the belief in the kinship of the arts were passed on from late Romanticism to some of the modernist movements in the first decades of the twentieth century. Artists and filmmakers wished to accomplish a fusion that transferred the achievements of non-figurative art to the film, swayed by the constraints of realistic storytelling. But abstract film needed principles that could organize its visual flow, and some theorists thought that music, the most abstract of the arts, could be of avail.

This paper will present an analysis in musical terms of Viking Eggeling's abstract film *Diagonal Symphony*, and it will be shown that Eggeling relied on the most widely used formal pattern of classical music, the sonata form, to mould his only film, and also that he employed a number of other musical devices to lend interest and coherence to its details. But the account will start with a short biographical sketch and with some pertinent general information on the film. These sections draw on studies made by Louise O'Konor and Gösta Werner, respectively.[1]

[1] Louise O'Konor, *Viking Eggeling 1880-1925: Artist and Film-maker, Life and Work* (Diss. Stockholm 1971), and Gösta Werner & Bengt Edlund, *Viking Eggeling. Diagonalsymfonin: Spjutspets i återvändsgränd* (Lund 1997). This book includes a CD with Eggeling's film.

Biographical information

Viking Eggeling was born in Lund on the 21st of October 1880. His father was a musician and music teacher, his mother was the daughter of a composer, and the family ran a music shop – no wonder that they made music in the home, and that Eggeling got a solid musical education.

In 1897 Eggeling was sent to Flensburg in Germany to undergo a commercial training. He then continued to Italy, working as a business clerk in Milano.

By and by he became interested in art, moved to Ascona in Switzerland and started as a painter. His artistic leanings were at first cubist and vaguely futurist, but gradually he turned to non-figurative art.

Having some contact with the dadaist circle in Zürich, Eggeling got acquainted with Hans Richter, a dynamic maker of experimental films, and became more and more obsessed with the idea of creating abstract film. In 1919 Eggeling and Richter moved to Berlin where they lived in the house of Richter's parents, and where they had some opportunities to work in UFA's film studios.

Theoretically, Eggeling struggled to lay down principles suitable for lending form and structure to an otherwise elusive flow of non-figurative pictures. Practically, he drew sketches on paper scrolls for two abstract films – *Horizontal-Vertical Orchestra* (which was never realized) and *Diagonal Symphony*.

Eventually he had a severe conflict with Hans Richter but managed to start making his *Diagonal Symphony* in 1923, assisted by Erna Niemeyer, his fiancée at the time. After a year she left him (she was later to be married to Hans Richter) and Eggeling had to finish the film on his own.

Diagonal Symphony had two premières. The first, informal one took place on the 4th of November 1924, at a time when the film was not yet in its final shape. After further improvements, it was finally shown officially on the 3rd

of May 1925. By then Eggeling was admitted to hospital, suffering from blood poisoning; he died on the 19th of May.

Eggeling was very enthusiastic about his film, envisaging that it would be acknowledged as an epoch-making achievement. From our privileged hindsight point of view we might agree. His aspirations were justified, but very few people cared about his film, and it was soon forgotten. There is something tragic about this poor and worn-out avant-garde artist and his crowning effort.

Some notes on the film and its edition

The original copy of the film is lost, and *Diagonal Symphony* has survived in a copy owned by Hans Richter, from which all extant (and slightly different) copies apparently derive. None of the various available copies are first-generation copies of Richter's copy – this is disclosed by the fact that some of the thinner lines in the pictures are about to disappear.

Unfortunately, the film has a few defects – at some places a number of frames seem to be missing. But these small gaps do not amount to a corrupt version of Eggeling's work. According to the musical analysis of the pictorial flow that will be presented, the carefully planned structure of the film is essentially intact, and this goes for its form at large as well as for virtually all of its details. In a few cases one may for reasons of parallelism and symmetry suspect that short pictorial sequences are missing. Some other sequences seem to be too short or are slightly discontinuous.

There are several explanations for these minor defects. Apart from the fact that films crack and have to be spliced, which may cost a frame or two, a number of small imperfections (showing no traces of splicing) reflect the fact that it was extremely difficult to make the film, and that Eggeling had neither the time, nor the strength to bring his film to full perfection. Furthermore, if people (including Richter himself) later on needed illustrations

for their writings on abstract film making, Richter simply used a pair of scissors on the only surviving copy of Eggeling's film to supply what was needed. Some illustrations apparently correspond to frames that seem to be missing in the film.

All pictures upon which the film is based are drawn by Eggeling by means of a pair of compasses and a ruler, using black ink on white paper. Thus, what we see when watching the film is the negative: white figures against a black background, which is in fact visually much more satisfactory. Eggeling's pictures have a compelling quality of austere, otherworldly signs.

The gradual appearance or vanishing away of pictorial elements was accomplished by means of tinfoil screens, which were moved so as to gradually uncover or cover the drawings or parts of them.

The authentic speed to be used when showing the film cannot be established with certainty – anything between 16 to 25 frames per second is possible. Trials have indicated that 18 frames per second may be the optimal speed.

Nor can we know for certain whether any music was played when *Diagonal Symphony* had its official première, or indeed whether Eggeling wanted his film to be accompanied by any music at all. It is evident from reports in the press that the other experimental films shown on the same occasion had accompanying music. But no music is mentioned when it comes to Eggeling's film, and it is unlikely that he had the time or could afford to provide any specific music. His own writings on abstract film are quite general, and neither Erna Niemeyer, nor Hans Richter have commented on this particular issue – or, for that matter, given us any information about Eggeling's principles for the visual structure of his film.

There have been several more or less successful later attempts to compose music for *Diagonal Symphony* or to adapt pre-existent music to it. As the analysis will show, such efforts are redundant – there *is* already music in the film. And unless the music is composed so as to correspond to the visual

events in an exact and meaningful way, playing music along with the film is likely to introduce disturbing, even contradicting impressions.

Eggeling and inter-art aesthetics

The interrelationships between the arts were highly topical in the avant-garde aesthetics of Eggeling's time. Turning to abstract film in particular, an urgent problem had to be solved: it had no "language" that could make the flow of gradually or suddenly changing non-figurative visual events coherent and comprehensible. But music, being essentially an abstract art, had for centuries developed overall forms and syntactic conventions securing clear large-scale design as well as convincing local continuity. It was therefore a quite natural move to look for assistance from music when trying to bring visual order in abstract film – and this goes especially for Eggeling, considering his musical training.

His writings on this subject are very general, however, and also quite fragmentary. He wanted to achieve what he called a "thorough-bass" for non-figurative film, but did not get closer to it than establishing a basic "alphabet of opposites", which turns out to be largely irrelevant, or at any rate very difficult to apply, when turning to his *Diagonal Symphony*.

What is a "diagonal symphony"?

It is surprising that the analytic descriptions of the film hitherto made have neglected the musical implications of its title, although this is where the analysis must start.

The first word "diagonal" is plain enough and is to be understood quite literally as referring to a visual constraint operating throughout the film. Everything that is shown and happens in the film is oriented and takes place diagonally, at angles diverging from the horizontal and vertical axes.

But what about "symphony"? In a very basic and quite vague sense this word means "sounding together", and Eggeling might just have wanted to suggest that this is what the various pictorial elements do in his film, figuratively speaking. More specifically, "symphony" in common parlance refers to an orchestral piece in several, usually four, movements. But there are no signs of distinct movements in Eggeling's film.

However, if you look at the film as an attentive listener, a formal pattern known from instrumental music will emerge as unmistakably present: the so-called "sonata form", characterized by its thematic layout and particularly used in the first movements of symphonies, sonatas, string quartets, etc. The sonata form is also characterized by certain ways of modulating between different keys, but this aspect will be left aside since it does not seem to have any analogue in the film. Eggeling might just as well have called his film "Diagonal Sonata", but the word "symphony" has grander connotations.

The fact that the film exhibits a "first-movement form" should not be taken to imply that *Diagonal Symphony* is unfinished, that Eggeling intended to make a full, four-movement visual symphony. There is nothing to suggest that he entertained such plans.

In practice, then, Eggeling solved the problem of achieving coherence within abstract film, not by using a new visual "logic" especially devised for moving non-figurative pictures, but by resorting to firmly established musical conventions – as we will see, he also used other musical patterns in addition to the sonata-form.

An analysis of the *Diagonal Symphony* in terms of the sonata form

What do we expect to hear when we listen to a piece of music written in sonata form? After the introduction, if any, we encounter the first main section, the exposition, presenting the principal thematic ideas. The themes

are (generally speaking) at least two, and they usually have different character, infusing a sense of dualism into the music. Then comes a more complex section, the development, in which the previously presented material (and perhaps some additional new ideas) is treated in various ways. After this we have the recapitulation, closing the circle by returning to the material of the exposition, and restating it in a more or less varied way. The movement may be finished off by a sometimes quite elaborate, relaxing or culminating coda. The sonata form (or sonata principle) is far from rigorous, however – nothing precludes that expositions and recapitulations contain passages of developmental character.

Diagonal Symphony has no introduction, but it clearly starts with an exposition, presenting two distinctly different principal "themes" or main visual figures (as well as a number of related, supplementary ideas) together with some developmental passages; the second figure is introduced rather late in the process. Eggeling's symphony also features a long and complex development, issuing from a statement of the first figure, a varied and shortened recapitulation, and finally an eventful coda, almost attaining the status of a second development.

In order to grasp the musical structure of the film at a more detailed level, it is necessary to analyse the two thematic figures so as to identify a number of ubiquitous "motifs" as well as more occasional, auxiliary ones. The study indicates that these pictorial constituents can be derived from each other – a fact that agrees very well with the thematic/motivic transformation techniques used in musical composition – and that they form two groups, headed by the first and second thematic figures, respectively.

Thus we have two sets of visual ideas, characterized by angular and rounded shapes, respectively, which obviously correspond to the first and second themes in the sonata form and their culturally established connotations. (There is a lot of gendered mumbo jumbo in the traditional theory of the sonata form.) The visual structure of the film is pervaded by a constant dialectic between these opposites, but it is worth observing that there is a

tendency towards mediation of the thematic polarity throughout the film – the final picture is a powerful combination of angular and rounded elements. However abstract, Eggeling's visual symphony brings – just as many aural symphonies – an overall narrative aspect.

The thematic work that is characteristic of developmental sections within musical sonata forms is reflected in an exemplary way. The visual figures are cited, varied, and juxtaposed in ever-new ways. And for the various developmental portions of the film, Eggeling has drawn complex pictures combining a number of visual motifs, making it possible to change the elements within the pictures simultaneously and independently, recalling the multilayered structures found in contrapuntal music.

In addition there are a number of other devices disclosing that Eggeling devoted himself to visual planning in musical terms. A most important feature in the film is the many sequences that are formed as symmetric oppositions or alternations between pictures oriented towards the left or right. Whether one associates this trait with distinct voices involved in a musical dialogue, with pitch inversions of motifs, or with harmonic shifts between, say, tonic and dominant, it reveals a strong affinity to various kinds of imitation in music.

And if you watch the film attentively, you cannot but notice quasi-musical relationships between adjacent (and sometimes distant) visual sequences. These passages may be related in terms of increasing/decreasing size or duration of the figures, or due to fact that certain pictorial elements have grown or waned in terms of number or graphic force. These devices recall dynamic effects such as *forte*/*piano* contrasts or *crescendos*/*diminuendos*, or rhythmic augmentations/diminutions, or replenishment/attenuation of pitch content. There are even a few sequences in the film that are formed as retrogrades of preceding models – a device that can be traced back as far as to renaissance music.

It seems, then, that Eggeling at last carried out in practice what he did not

accomplish as a film theorist. While his writings on the principles of abstract film making amount to little more than suggestive proposals, difficult to interpret, his *Diagonal Symphony* does in fact merge moving pictures and musical form into a work of art with a compelling structure in virtue of what happens on the screen. But the film makes up a paradox in as far as the visual events in Eggeling's avant-garde film are organized by means of old, well-tried patterns of aural art. His film was an indeed an achievement, poorly understood by his contemporaries, but acknowledged by the few of later times as a renowned minor classic.

All this being said, an illustration is due.

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Varia 1

The texts included in Varia 1 are related to the four volumes published by Peter Lang Verlag, and particularly to Wits and Interpretation (Berlin 2023).

The volume brings a full report on an experimental investigation studying the rela-tionship between notated rhythm/meter and performance in Bach melodies, and essays discussing three important aspects of musical structure – anticipation, symmetry, and proprioceptive properties. Interpretational issues make up the core in analyses of works by Beethoven, Debussy, Chopin, Mozart, and Bach. The final chapter traces the musical form of a pioneer work of abstract film.

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