Musical Memory and Musical Analysis:
Strategies for the Memorization of Selected Tonal Piano Compositions

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Submitted in fulfilment of the requirements for the degree

MAGISTER MUSICAE

in the

Department of Music

in the

Faculty of Humanities

at the

University of the Free State, Bloemfontein

Submission date: November 2008

Supervisor: Prof. N.G.J. Viljoen

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Anchen Froneman **Date**

Acknowledgements

I hereby acknowledge the valuable support provided by the following individuals and institutions:

- My supervisor, Prof Nicol Viljoen for his competent guidance and profound musical insights. Your support is much appreciated.
- Prof Martina Viljoen for her valuable academic and methodological advice.
- The language editing performed by Dr. Ian Drennan.
- Colleagues and friends at the Department of Music for their understanding and support.
- My family and friends for their motivation and patience.
- My mother and father for their continuous encouragement, understanding, and endless love. You are my inspiration.
- For the strength I found in the words of my Everlasting Father:

> The Lord will guide you continually, and satisfy your needs in parched places, and make your bones strong, and you shall be like a watered garden, like a spring of water, whose waters never fail.
>
> -Isaiah 58: 11

TABLE OF CONTENTS

Page

Acknowledgements **i**

CHAPTER 1: Introduction **1**

1.1 Background to the study 1

1.2 Objectives of the study 3

1.3 Hypothesis 4

1.4 Value of the study 5

1.5 Research design and methodology 5

CHAPTER 2: Human memory **6**

2.1 Definitions of memory 6

2.2 Types of memory 7
2.2.1 Sensory memory 7
2.2.2 Short-term memory or working memory 7
2.2.3 Long-term memory 8

2.2.4 Declarative or non-declarative memory 9

2.2.5 Other types of memory 10

2.3 Processes of memory 10
2.3.1 Encoding 10
2.3.2 Storage 11
2.3.3 Retrieval 13

2.4 Memory and the brain 14
2.4.1 Brain/mind principles 14

2.5 Conclusion 17

CHAPTER 3: Musical memory 19

3.1 Defining musical memory 19

3.2 Types of memory used in musical memorization 20
3.2.1 Visual memory 20
3.2.2 Aural memory 20
3.2.3 Hand memory 21
3.2.4 Analytical memory 21

3.3 Musical Memory: Concepts and processes 22
3.3.1 The encoding or learning process 23
3.3.2 Storage as a musical memory process 24
3.3.3 Musical Memory: The process of retrieval 25

3.4 Why memorize? 26

3.5 The influence of human memory 27

CHAPTER 4: Musical Analysis 29

4.1 Musical analysis and related terms 29

4.2 Formal or structural analysis 30
4.2.1. Schenkerian analysis 32

CHAPTER 5: Four analytical case studies on memorization 38

5.1 Analytical strategies 38

5.2 Minuet in F, KV5: WA Mozart 41

5.3 Aria from the Goldberg Variations: J.S. Bach 48

5.4 Mazurka, Op. 17 no. 4: F Chopin 58

5.5 Sonate in F minor, Op 57, First Movement: L van Beethoven 69

CHAPTER 6: Conclusion 81

Bibliography 86

Appendix A: Minuet in F (Full score) **95**

Appendix B: Aria from Goldberg Variations (Full score) **96**

Appendix C: Mazurka, Op. 17 no. 4 (Full score) **97**

Appendix D: Sonate, Op. 57/I (Full score) **100**

ABSTRACT 114

Keywords 115

OPSOMMING 116

Sleutelterme 117

LIST OF FIGURES

Page

CHAPTER 2

Figure 2.1 *The linear stage theory of processing* 12

CHAPTER 4

Figure 4.2: Different forms of the *Ursatz* 33

CHAPTER 5

5.2 Minuet in F, KV5: W.A. Mozart

Figure 5.2.1: Measures 1 – 4 42
Figure 5.2.2: Measures 5 – 10 44
Figure 5.2.3: Measures 11 – 14 46
Figure 5.2.4: Measures 15 – 22 47

5.3 Aria from The Goldberg Variations: J.S. Bach

Figure 5.3.1: Fundamental Bass 48
Figure 5.3.2: Measures 1 – 8 49
Figure 5.3.3: Left hand reduction of measures 1 – 4 50
Figure 5.3.4: Voice-leading reduction of measures 1-4 51
Figure 5.3.5: Compound melody of measure 4 51
Figure 5.3.6: Measures 9 – 16 52
Figure 5.3.7: Measures 17 – 24 55
Figure 5.3.8: Measures 25 – 32 56

5.4 Mazurka in A minor, Op. 17 No. 4: F Chopin

Figure 5.4.1: Measures 1 – 4 59
Figure 5.4.2: Measures 5 – 8 60
Figure 5.4.3: Harmonic reduction of measures 1 – 8 61
Figure 5.4.4: Diatonic passing chords of measures 1 - 12 62
Figure 5.4.5: Measures 9 – 12 63

Figure 5.4.6: Measures 37 - 44 64
Figure 5.4.7: Measures 61 – 68 65
Figure 5.4.8: Measures 85 – 96 66
Figure 5.4.9: Coda 67

5.5 Sonata in F minor, Op. 57, First movement: L van Beethoven

Figure 5.5.1: Measures 1 – 8 70
Figure 5.5.2: Measures 9 – 16 71
Figure 5.5.3: Two-part arpeggio of measure 14 72
Figure 5.5.4: Measures 16 – 24 72
Figure 5.5.5: Measures 24 – 34 73
Figure 5.5.6: Measures 35 to 46 75
Figure 5.5.7: Measure 47 – 50 75
Figure 5.5.8: Harmonic reduction of measure 51 – 54 76
Figure 5.5.9: Measures 51 – 54 77
Figure 5.5.10: Measure 59 - 65 77

CHAPTER 1

Introduction

1.1 Background to the study

In the field of professional musical performance it is universally expected of soloists to memorize works for such occasions in public – especially in the case of the solo pianist. This expectation by the general public can probably be attributed to the tradition of playing initiated by Franz Liszt and Clara Schumann in the 19th century. Since then the tradition has become firmly established leading to an increase in the prominence of musical memorization. The fact that memorization is frequently necessitated by the technical difficulty of the work to be performed (Chang 2004), may explain why the tradition was started by Liszt. The relevant literature on the subject also claims that the comprehensive process of memorization provides the performer with greater musical insight and freedom of interpretation (Jordan-Anders 1995: 8). Therefore memorization has come to play a primary role in both performance and instrumental instruction.

Dunsby (2001: 379) highlights this prominence by expressing the significance of the memory system for musical purposes:

> It is impossible to escape from the fact that, without the practice and use of memory, music is literally unthinkable… Since music is a temporal phenomenon, it relies completely on our ability to store and relate musical 'information'.

Henson (1977: 15) calls attention to this phenomenon by stating that "memory is most important in all aspects of music." Likewise, Serafine (1988: 69) also accentuates the temporality of music with the view that the principle characteristic of music is "movement in time". This characteristic of music causes every musician to rely on memory in order to execute even the simplest musical activity. The task facing performing artists is, however, a very demanding one, since the reproduction of an entire work can be an extremely difficult undertaking resulting in the process almost becoming an art in itself. However, the uncertainty associated with memorization has always been a limitation

(Granger 1977: 29), which places an even greater emphasis on the necessity for effective memorization techniques.

Many publications on this subject have appeared during the past century, all acknowledging the complexity of memorization and explaining the desirability of applying different types of memory. Generally, existing literature advocates the involvement of the senses of hearing, touch, sight, supported by analysis as aids to memorization. It would appear that these procedures were passed on from one generation to the next, without any questioning of their effectiveness. Such a statement by no means suggests that the procedures are ineffective. Rather, it questions the general point of departure taken regarding them. Discovering the "art" within any field of endeavour requires a certain amount of investigation. Conspicuously absent in these publications is the acknowledgement of and an adequate reference to the capabilities of human memory as the foundation of memorization. Allthough the complextities of the processes within human memory system are not yet fully understood, there is nevertheless a wealth of research available in this regard. It is therefore essential that one use the available research to increase one's knowledge concerning human memory and to apply it to the development of more effective and reliable procedures or strategies for memorization.

The research on musical memory has revealed another gap in the existing literature on the subject. The following statement by Henson (1977: 15) stresses the importance of analysis for memorization:

> For all musicians the store of auditory imagery required for creative work and informed listening depends on intact, efficient memory processes. Sensorimotor and visual memories are particularly necessary for performance, but these are reinforced by theoretical skill in formal and harmonic analysis and by knowledge of composer style.

This statement, however, exemplifies what appears to be the conventional attitude towards analysis. Although the importance of analysis or the use of theoretical knowledge is usually emphasized, detailed examples of how these analyses should be applied are absent. There are the usual generalizations about "understanding the music" (Bryant 1999: 28) and "understanding the form and harmonic structure" (Sandor 1981: 195), etc. These principles are all valuable, but in pedagogical situations it is especially important to identify specific processes or strategies. This entails applying theoretical principles in innovative ways to define, explain and interpret the musical structure of a composition.

1. 2 Objectives of the study

The aim of the present study is to formulate analytical strategies for increasing the effectiveness and reliability of musical memorization. Consequently, the processes of memory and analysis will be investigated in order to establish similarities within the functioning of both. This approach necessitates an introductory exploration of current research on human memory. The existing literature presents a wealth of information that can positively influence a performer's understanding of and attitude towards memorization. It underlines the fact that musicians make use of both conscious and unconscious mental processes, including attention, perception, understanding, concentration and memory. Among the mnemonic devices available in this regard, the notion of *hierarchy* is of particular significance (Newell 2000).

Brower (1993: 17) explains perceptual hierarchy as follows:

> When we perceive an aesthetic object, we do so on many different levels. If the object is a painting, we may view it first from a distance to take in its overall form, symmetry, and color composition. Moving closer, we may allow first one aspect and then another to come into focus, until we are able to observe the smallest detail. We may then retreat to a more distant perspective, allowing our apprehension of the whole to be enhanced by our greater familiarity with its parts. In order to perceive patterns at each level, we must be able to change our perceptual horizon, broadening it to take in relationships among widely spaced objects or events, or narrowing it to focus on the intricacies of more detailed patterns.

When this perceptual process (as Brower describes it) is applied to music, it will be called analysis. This assumption is reinforced by Bent's statement that "musical structures may be resolved into relatively simpler constituent elements with specific tonal functions" (Bent 2001: 526).

The notion of analysis as a reductive system may be associated closely with the ideas of Heinrich Schenker, one of the most influential theorists in the history of Western music (Drabkin 2002: 913). The essence of Schenkerian analysis is the concept of hierarchical levels, the starting point of which is to be found in what he called 'melodic diminutions'. Although this study is not based on any 'orthodox' application of Schenkerian analysis, it draws on his notion of tonal music as a system of *internal coherence* which allows the analyst to understand its distinguishing features, transformation of ideas, and the logic of its motivic activity (Pankhurst 2001), thus revealing how the work is "composed" (Burkhart 1983: 95).

1.3 Hypothesis

The study hypothesises that specific focus areas and principles of analysis, combined with musical organization and logic, will complement and promote the functioning of the system of musical memorization. In this regard, it is the belief that basic Schenkerian analytical principles and procedures may be equated to the human memory system, since they share similar characteristics. Furthermore, it is the belief that Schenkerian principles can assist in complementing specific mental processes that are part of memorization. To substantiate the hypothesis, a set of analytical strategies comprising classifications and interpretations of musical material within an informal Schenkerian analytical orientation, and focusing on musical design and logic, will be applied to four tonal piano compositions. It is envisaged that these strategies and their analytical orientation, combined with musical organization, will not only show a clear and tangible relationship between analysis and memorization, but will also contribute potentially to the retention of musical material and the memorization of musical compositions.

1.4 Value of the research

The outcomes of this study will have an enriching effect on both musical performance and musical comprehension. In combining theoretical knowledge with practical application, the study will also have great pedagogical value and benefits. The findings of the study will not be limited to specialised areas of musical scholarship, but can be utilised by any musician who wishes to complement his or her musical performances with sound analytical thinking, interpretation and reasoning for the sake of effective and reliable memorization.

1.5 Research design and research methodology

The methods used in this study will complement its research objectives. The first phase of the research comprises an investigation of current literature on human memory, musical memory and musical analysis. These findings will be documented in chapters 2-4. Chapter 2 will provide a systematic explication of the workings of human memory, while chapter 3 will focus on the findings of current literature on musical memory. Chapter 4 will give attention to musical analysis, more specifically, the principles of Schenkerian analysis.

In the second phase of the research, a comprehensive analytical strategy for memorization will be formulated and implemented in the form of four analytical case studies, each involving a particular tonal piano composition or part thereof (chapter 5). The findings of the case studies, as well as conclusions arrived at from the research, will be presented in chapter 6.

CHAPTER 2

Human Memory: Principles and Processes

2.1 Definitions of memory

According to Spear and Riccio (1994: 11) the term *memory* usually implies a process of memory recall and thus some "activity for promoting accessibility to that learning when it finally must be used." In other words, the use of the term implies the procedure whereby information is gained and processed so that it can be stored and retrieved from the memory system.

The term is, however, used differently in various contexts. Memory is firstly used with reference to the process that leads to the recall of memory. Sometimes this means only the sequence of operations that begins after learning is established and continues until a specific memory is required. In other cases memory is used to encompass both the learning itself and the act of remembering (Spear and Riccio 1994: 11). The term may sometimes also refer to an individual's internal representation of an episode of learning that occurred. One may conclude that memory is used in the contexts either of representation or process. This ambiguity in the use of the term *memory* has established other important terms. They include *memory storage* that refers to the initial acquisition of new material, while *memory retrieval* refers to the access and expression of that material (Newell: 2000). *Forgetting* conveys the failure to remember and enables one to jettison part of the tremendous amount of information that one processes every day but that the brain decides it will not require in the future (Dubuc: 2002). *Retention* is the residue of what has been learned.

In defining memory, it is important to acknowledge its relation to other human cognitive processes. According to Norman and Bobrow (1976: 114) the phenomena of attention, perception, learning, memory, and cognition are interrelated, and the explanation for one set of phenomena helps to elucidate the others. As a result people commonly have a tendency to understand events in terms of their similarity to and difference from other events, which reveals an analogical or metaphorical use of memory structures.

2.2 Types of Memory

2.2.1 Sensory Memory

Memory can be first and foremost be categorized as sensory memory, short-term memory, working memory and long-term memory (Dubuc 2002, Orangi: 1994). Sensory memory is the initial recording of sensory information in the memory system and comprises input from the senses, thus from the eyes, ears, nose, tongue and haptic channels or touch (Stanley & Tobun: 2003). From the perspective of the memorization of music it is the eyes and ears that essentially provide information. Auditory memory, also termed echoic memory, is that part of sensory memory that receives sound stimulation from the surrounding environment. Visual memory is also referred to as iconic memory (Dubuc 2002). Sensory memory has a large capacity but the shortest duration, lasting only 250 milliseconds (Coone & Fisher: 2003).

2.2.2 Short-term or working memory

Short-term memory permits the temporary storage of the information supplied by the senses and stores information just long enough to be useful (Ranpura 2000). As a consequence, short-term memory has a very limited capacity and storage can easily be disrupted (Stanley & Tobun: 2003). Information is transferred from sensory memory to short-term memory by the attention span. Therefore certain stimuli are filtered and only those of interest are temporarily stored in the short-term memory.

Recent research has revealed that short-term memory performs more functions than merely temporary storage. Consequently the term short-term memory was deemed inadequate and it was renamed working memory since it has been suggested that short-term memory is only a constituent element of working memory. Working memory is thus an extension of short-term memory as it involves higher cognitive processes (Dubuc: 2002). Working memory therefore comprises both long-term memory and sensory memory - sensory memory providing immediate external information from the environment and long-term memory information about objects, experiences, procedures, facts, concepts etc. (Coone & Fisher: 2003). This in turn implies that the information provided by the senses is stored just long enough in the short-term memory to be either recognized as general knowledge or be labeled as material that can be placed within an existing frame of reference. Norman and Bobrow (1976: 119) assume that past experience creates a vast repertoire of structural frames or *schemata* that can be used to characterize the prepositional knowledge of any experience. The challenge for perceptual processes is the determination of the appropriate *schemata* and how to match the present occurrences within the framework provided for them.

Seen from such a perspective, this may be the most important type of memory for musical memorization, as the initial process mainly comprises the identification and recognition of musical concepts and theoretical knowledge stored within the long-term memory. Working memory is, however, believed to have a limited capacity, the most accepted theory on the capacity of working memory proposing the magic number 7 +/-2 which means that its capacity is limited to an average of 7 chunks[1] with a variation of plus or minus two (Huitt: 2003).

2.2.3 Long-term memory

Long-term memory retains knowledge for an indefinite period of time and has a large unproven capacity (Newell: 2000). Scientific and psychological studies have revealed that the amounts that can be stored in the brain are vast, because of the complexity and scale of its neurons. The decay of information stored in the long-term memory occurs over a very long period of time. Some suggest that we never lose any memories but only the ability to locate the pathways to them

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[1] Chunks refer to items with one unrelated item taking up a chunk and a series of related items or items with meaning attached also taking up one chunk (Coone & Fisher 2000).

(Coone & Fisher: 2003). This probably explains why some pianists who have retained this ability can play such an extensive repertoire from memory.

Several types of information are represented in long-term memory, including such things as facts and events, motor and perceptual skills, the knowledge of physical laws and systems of mathematics, a spatial model of the world around us, attitudes and beliefs about oneself and others, etc. (Stanley & Tobun: 2003). According to Dubuc (2002) the result is "the persistence both of autobiographical data and of general knowledge". This information is more or less well organized in a number of ways, and varies in its accessibility as a function of several factors.

The factors determining the accessibility of the information in long-term memory include things such as the conditions that existed at the time the information was stored, the proximity of its latest use, its degree of inter-relationship with other knowledge and its degree of uniqueness relative to other information (Dubuc: 2002). This emphasizes the importance of the utilization of well-defined memorization techniques and strategies. In addition, this approach should take into account the variety of organizational methods employed by the memory system. Long-term memory is also called preconscious and unconscious memory in Freudian terms (Huitt: 2003). Preconscious means that the information is relatively easily recalled (although it may take several minutes or even hours), while unconscious refers to data that is not available during normal consciousness.

2.2.4 Declarative or non-declarative memory

Memories may also be categorized as being declarative or non-declarative. Declarative memory can also be termed explicit memory, which contains memories of facts and events that can be consciously recalled and verbally described (Ranpura 2000). Memories of facts are also known as semantic memories, while those of events are called episodic memories (Coone & Fischer: 2003). Semantic memory consists of meaningful facts about situations in general, an example being the fact that December is the last month of the year or that Rome is the capital of Italy or that there are two semitones in a major scale (Stanley & Tobun: 2003). Most theoretical knowledge about musical concepts and their organization might therefore be labeled as semantic memory. On the other hand non-declarative, or implicit memory, is associated with the execution of certain skills. This type of memory is also important because playing the piano or any other instrument can be regarded principally as a skill. The performances are executed automatically, and there is usually no conscious recollection of how it was learned (Ranpura: 2000). There is therefore a differentiation between specific personal memory of individual incidents and a generalized knowledge of the world (Stanley & Tobun: 2003).

2.2.5 Other types of memory

Other types of memory may also be categorized. Event memory is described as the storage of sensory and motor events. Associative memory refers to the temporal relations between ideas (Dubuc: 2002). Representational memory stores information about events, and is also an example of episodic memory. Abstract memory contains information regarding knowledge about the interaction of events in representational memory (Alnut & Radley 2003). The type of memory that recalls events in one’s life is termed autobiographical memory (Dubuc 2002).

2.3 Processes of Memory

2.3.1 Encoding

There are three basic processes of memory that indicate how memories are formed, how they are retained and how they are recalled. The first, encoding, is an active process that requires the selection of material from which memories have to be formed. Memories may be affected by the amount or type of attention devoted to the task of encoding the material (Dubuc: 2002). Various levels of processing are said to occur. The theory regarding these levels is important as it emphasizes the idea that the deeper the level of processing, the more permanent the memory (Newell: 2000). Shallow encoding emphasizes the structure, while the deep process emphasizes the meaning attached to it. In this regard, analysis may be well suited as an encoding device as it not only initially identifies the main structure of a composition, but also interprets both content and meaning.

Schacter's theory (1995) compares well with the previous one. Schacter identified two kinds of encoding, namely shallow and elaborative encoding. The shallow version is characterized by a repetitive process that stores the information in the short-term- or working memory. In turn, elaborative encoding stores information in the long-term memory as associations are formed via linkage with information already present in the long-term memory. These associations create a meaningful context. This theory as advanced by Schacter, thus provides additional support for the application of analysis as an aid to memorization.

2.3.2 Storage

The second process is the storage of information within the memory system. Various theories have been developed over the past years to explain storage. The most widely accepted model states that there is a three-stage sequence in memory storage, namely sensory, short-term, and long-term storage (Norman & Bobrow 1975: 115). According to this model sensory storage retains the sensory image for only a fraction of a second, just long enough to develop a perception, while short-term memory lasts for about one minute (Dubuc: 2002). The transfer of information to short term memory is affected by the level of attention, that is, the interest shown in the information. The presence of patterning also affects it, because individuals are likely to pay more attention to information if it fits into a known pattern (Huitt 2003). Therefore short-term memory will continue for as long as rehearsal continues, but can increase its capacity by organizing the material (Dubuc 2002). As stated previously, short-term memory is currently more commonly referred to as working memory. Long-term memory is regarded as being permanent, meaning that while nothing is forgotten, it is only the means of retrieving it that is.

The commonly held view of human cognitive processing states that it proceeds in a linear, sequential fashion (Norman & Bobrow 1975: 117). See figure 2.1.

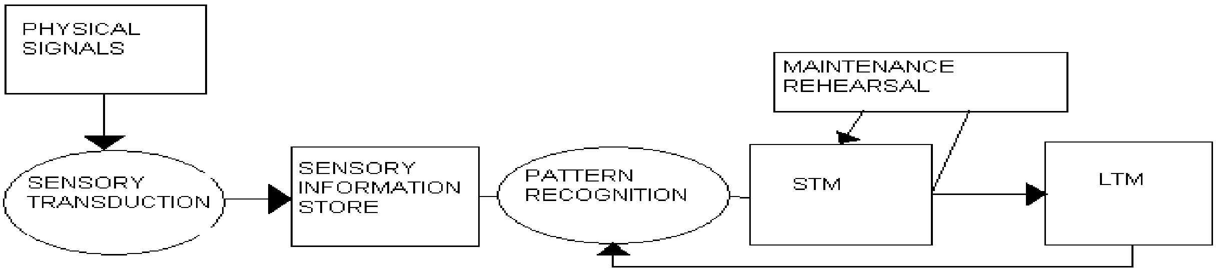

Figure 2.1 The linear stage theory of processing (Norman & Bobrow 1975: 117)

How, then, is material in the short-term memory transformed into long-term retention? Various explanations have been proposed. The first is the serial position effect that states that it is influenced by the primacy and recency of material. This means that primary material gets more rehearsal, but, at the end the material is still available in the short-term memory (Newell: 2000). Rehearsal has a maintenance function, although elaborative rehearsal is more likely to cause the shift to long-term memory (Ranpura: 2000). The memory system is therefore contextual. According to Dubuc (2002) "you always memorize the context along with the information that you are learning, by recalling this context you can very often, by a series of associations, recall the information itself". Once again, this statement by Dubuc provides a strong motivation for the application of analysis[2] - the type of analysis that is associated with providing musical context.

Another theory is based on the work of Craig and Lockhard and is labeled the levels-of-processing theory (Huitt: 2003). According to this theory information is processed through its continuous elaboration (Newell: 2000). Thus, in paying attention, the initial perception is labeled, and when it is elaborated additional meaning is attached. This is important because analysis (as will be established at a later stage) also encompasses the principles of elaboration and connection. According to Huitt (2003) the following model is dominant in recent research on cognitive psychology and is also consistent with brain research:

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[2] The nature of this analysis will be discussed in Chapter 4.

> The connectionistic model by Rumelhart and McClelland emphasizes the fact that information is stored in multiple locations throughout the brain in the form of networks of connections. It is consistent with the levels-of-processing approach in that the more connections to a single idea or concept, the more likely it is to be remembered.

2.3.3 Retrieval

Retrieval involves the recovery or extraction of stored information from the memory system. Memory retrieval is not a random process but requires cues that can assist with retrieval. These may include contextual cues involved in the process of reinstating acquired material, or in the creation of the same emotional state that was present at the acquisition phase (Newell 2000). Some errors in recall are a result of failure to remember the origins of memories. Retrieval can be either the recall or recognition of previously encoded subjects. It is mostly, however, easier to recognize material rather than to recall it (Dubuc 2002). The levels-of-processing theory has provided some research that attests to the fact that we "know" more than we can readily recall.

An incapability to remember may arise from problems with encoding, storage, retrieval or any combination of these. There are various theories about forgetting that include defective initial encoding as a result of ineffective attention during the acquisition phase, decay or fading of memories or because of interference. According to Carol (2005) forgetting may be attributed to weak encoding or lack of retrieval cues. The things that we tend to forget because we do not wish to remember them are what Freud called motivated forgetting (Newell 2000).

2.4 Memory and brain principles

Common perceptions about the working of human memory are the result of research done mainly by cognitive psychologists and clinical neuro-psychologists. Neuro-psychology is the study of the effect of brain damage on cognition, emotions and behavior, while cognitive psychology studies intellectual processes. These two directions of research are, however, interdependent. The purpose of the discussion about brain/mind principles and human cognition is to access and compare research results from other interactive disciplines.

2.4.1 Brain/mind principles

It is important to address learning principles by accessing the vast amount of research available on this subject. Caine and Caine (2003 –2005) recently formulated 12 brain/mind learning principles, which incorporate research on the brain and on learning from a variety of disciplines. These include information gained from neuroscience, cognitive psychology, stress theory and creativity (Chipongian 1999 – 2005). The 12 principles are as follows:

1. The brain is a living system
2. The brain/mind is social
3. The search for meaning is innate
4. The search for meaning occurs through patterning
5. Emotions are critical to patterning
6. Every brain simultaneously perceives and creates parts and a whole
7. Learning involves both focused attention and peripheral perception
8. Learning always involves conscious and unconscious processes
9. We have at least two ways of organizing memory
10. Learning is developmental
11. Complex learning is enhanced by challenge and inhibited by threat associated with a sense of helplessness or fatigue.
12. Every brain is uniquely organized. (Caine & Caine: 2003 – 2005)

The objective of these principles is "to serve as a foundation for thinking about learning" (Caine & Caine: 2003 – 2005). As has already been established in the present chapter, learning and memory share the same principles and processes. Therefore one might assume that the Caines' brain/mind principles might provide one with an array of insights into learning and memory. The principles encapture, as it were, the true nature and working of the human brain gleaned from a wide variety of research disciplines. This, in turn, also enhances their compatibility with various disciplines. Although all the principles enrich the thinking process, only the principles directly relevant to this study will be discussed.

According to Caine and Caine's (2003 – 2005) first principle, a system is a collection of parts that function as a whole. The brain fits this description very well since certain parts of the brain ensure the functioning of various human activities that work in harmony to ensure human survival. A living system has certain qualities that ensure its continued existence. Some of these attributes are compatibility, adaptability, resilience and the ability to protect itself. Consequently, the most important feature of the brain according to the first principle is its capacity to simultaneously function on many levels and in many ways. This feature of the brain makes it possible for musicians to perform music, the artist managing physical, intellectual and emotional aspects for the duration of the performance. It is also important from the perspective of musical memorization, since the brain has to focus on temporal activities - thus concurrently on an immediate, a past and an upcoming activity. Although this study concentrates on the analytical process, an important consideration is noting the processes in the brain in respect of musical performance, given the fact that memorization plays such an important part in it. Consequently, the impact of memorization on performance will be mentioned whenever applicable.

The third principle states that it is basic to human nature to make sense of what happens in our lives, of how the way in which we conduct the search for meaning changes throughout our lives and varies from event to event. Every human being is born with the necessary equipment for these processes. Caine and Caine (2003 – 2005) assert that, "The brain needs and automatically registers the familiar while simultaneously searching for and responding to novel stimuli." Huitt (2003) calls this process a "two-way flow of information" and regards it as a dynamic process that is used to construct meaning about the environment and the human being's relation to it. There are said to be two facets to this search for meaning. On the one hand, the search is scientific and therefore deals with facts and common knowledge. On the other hand, the search is artistic, because the brain creates connections and expresses meanings (Caine & Caine 2003 – 2005). It is easier to understand and remember once meaning can be attached to information or events. This principle therefore corresponds to the theories of Huitt (2003), Dubuc (2002) and the connectionistic model of Rumelhart and McClelland.

The fourth principle expands the third by concluding that the process of patterning creates meaning. In doing so the brain creates meaning by a process of categorization, that is, by finding similarities and differences and by comparing or isolating these. Humans are equipped to form maps of these categories in order to retrace them. According to Caine and Caine (2003 – 2005) "patterning is grounded in the physiology. Groups of brain cells combine into neural networks that fire in the same ways consistently. Learning is required when an entrenched pattern is challenged or disrupted and new answers are needed." Patterning is often difficult to change, one of the reasons for that being explained by applying the fifth principle which emphasizes the emotional commitment to patterns.

Caine and Caine state that there are ultimately two separate but simultaneous tendencies in all of us for organizing information. The one tendency is to reduce information into parts or groups, while the other is the tendency to work with information as a whole. The processing of information is a complex procedure. The brain/mind is designed, however, to perceive both separateness and interconnectedness. These tendencies in organizing information support the use of Heinrich Schenker's theoretical concepts as important analytical devices for memorization. According to Huitt (2003) the brain "has been genetically prepared to process and organize information in specific ways". It makes use of both inductive and deductive reasoning[3]. Associated with this is the seventh principle, according to which learning involves both focused attention and peripheral perception. These aspects assist the brain in absorbing not only information of which it is directly aware, but also information that lies beyond the immediate focus of attention. One may then assume that the brain/mind continuously selects which stimuli to attend to immediately and what to ignore.

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[3] Inductive reasoning means proceeding from specific instances to a general conclusion, while deductive reasoning means the reverse, namely proceeding from the general principle to specific examples.

In the light of the previous two principles the eighth principle is also significant for it is commonly known that the brain functions by applying both conscious and unconscious processing. What is not commonly known is that many of our insights are a result of continuous unconscious processing (Huitt: 2003). This is important for complex learning, since individuals need to become aware of such processes. In the principle relating to memory, Caine and Caine (2003 – 2005) use O'Keefe and Nadel's model that deals with the difference between what they call static and dynamic memories. Dynamic memories are those that are formed and used from moment to moment, while static memories comprise information stored for later use. The combination of these two approaches is useful for meaningful learning, since meaningful and meaningless information are stored differently.

The last three principles enumerated by Caine and Caine are not directly applicable to this study; however a few comments can be made in this regard. Learning is developmental, and the brain retains a high level of plasticity up to an age of 18. Therefore it seems to be important to cultivate good learning principles from an early age. It is also important to create an atmosphere of relaxed alertness and to seek challenges along the way to improve the level of learning. As every human being is unique, every brain/mind is also unique, although made up of the same type of system and functions.

2.5 Conclusion

The most important conclusion following from the information presented in this chapter is that memory processing is both interrelated and to a large extent interdependent with other intellectual and conscious processes, learning principles and conscious thought-processing being the most significant of these. As the creation of memories in the long-term memory is a continuous process, it is important to emphasize the activities whereby memories are formed. The primary activity may be associated with the level of attention or interest shown in information provided by the senses at the initial encoding stage. As mentioned previously, an interest in the information would be more likely to occur if it corresponded to a known pattern. This stresses the importance of working-memory for the musician, as artists make use of both knowledge and skills in performing their music. In doing so, they engage both declarative and non-declarative memories, as well as conscious and unconscious processes. One may therefore conclude that the brain functions on many levels simultaneously.

Memories are stored in the long-term memory if the information is placed within a meaningful context and if it is frequently rehearsed. "Rehearsed", in this sense, does not imply the mere repetition of the given material, but rather its continuous elaboration and reinterpretation. Through this process a greater number of similarities and differences will be identified. Consequently, the information will be organized in ways that create various frameworks. As a result even more cues will be provided whereby the information can be retrieved. That, in turn, will lead to a deeper understanding of the material, thus enabling the easier storage and retrieval of information.

An attempt was made in the present chapter to deepen the understanding of and expand common knowledge about the working of the brain and consequently the human memory system. The following chapter will focus on current ideas and beliefs about the processes and the activities cultivated by musicians, and primarily by pianists, to enhance musical memory.

CHAPTER 3

Musical Memory

3.1 Defining musical memory

Musical memory, in the context of this study, focuses primarily on memory relevant to performing artists. Accordingly, it encompasses all the processes and concepts of memory, from the very first glance at a score up to an actual memorized performance of a composition. This type of memory can therefore be defined as the memory of music.

As described in the previous chapter memory and cognition are interrelated and interdependent brain processes. Thus, the description of the memorization of music will be based on cognitive perception. According to Serafine (1998: 69) "musical thought may be defined as human cognitive activity that results in the posing of artworks embodying finite and organized sets of temporal events." This definition embraces two important characteristics associated with the memorization of music. As discussed in the first chapter, the temporality of music necessitates musicians to rely on memory for executing even the simplest musical tasks. This continuous movement or changes in sound events, however, is organized in a specific way. For memorization purposes, it should be clear that musicians must identify the nature of the sounds, as well as the way in which they are organized. Therefore, although sound may be the medium by means of which the temporal events are organized, sound, by itself, does not define music. It is, however, an important characteristic of music since the emphasis is on an "aural-cognitive" activity.

Musical thought is essentially the result of some or other activity that may include composing, listening or performing. Such activities are based on a common set of fundamental musical-cognitive processes. According to Serafine (1998:71) composition refers to the more or less intentional organizing of sound events, while listening is an active process of organizing and interpreting temporal events. As a consequence, performance tends to encompass both listening and composing activities. The decoding of notation and the coordination of muscular activity are two important activities associated with performance.

3.2 Types of memory used in musical memorization

Musical memory relies basically on working memory, which (as previously explained) employs both sensory memory and long-term memory to provide information. In turn, sensory memory and long-term memory can be subdivided into four types of memory that commonly play a role in the memorization of music.

3.2.1 Visual memory

Visual memory consists of both photographic and keyboard memory. This means that the artist visualizes the printed score or the movements on the keyboard (Newman 1974: 133; Bryant 1999: 29; Granger 1977: 29). According to literature on the subject this kind of approach has certain advantages, the first being that it facilitates sight-reading and the second, the ability to practice without a keyboard (Chang: 2004). The main disadvantage, however, is that visual memory is difficult to retain over long periods of time and that the process, by which music is read visually, is a comparatively slow one (Chang: 2004). Therefore it is not advisable to rely on photographic memory as the main basis for memorization. Keyboard memory, that is, the memory of hand motions and the succession of keys, is somewhat more reliable than a photographic memory of the score because there is no need for the transfer of visual notes to those of the keyboard.

3.2.2 Aural memory

Aural or phonographic memory is also called music memory (Chang: 2004) because it is based on aurally perceived music. Aural memory is an aid to the performer’s memory because it gives them a sense of motion thus enabling them to “hear” what comes next (Newman 1974: 133). The auditory awareness of music might be regarded as the most direct form of perception as music is created via the organization of sound. Consequently, when reproducing music, the performer, besides having an aural image of the music, also needs to be conceptually aware of it (Bryant 1999:29; Granger 1977: 29). In general all musicians possess a good level of musical memory, especially those who experience a strong emotional association with their music.

3.2.3 Hand memory

The third type of memory is called tactile or hand memory (Newman 1974: 134). According to Chang (2004) it consists of two components:

> …a reflex hand motion that comes from touching the keys and a reflex in the brain from the sound of the piano. Both serve as cues for your hand to move in a programmed way.

Hand memory forms a large part of the initial memory, since it is activated by repeated practice (Bryant 1999: 29; Granger 1977: 29). Repetitive practice activates reflexes that cause the hands to continue playing without one having to remember each and every note. Because of this it is a useful type of memory for the purpose of executing rapid passagework. The fact that hand memory is merely a conditioned response, however, causes it to be an unreliable form of memory. But, once established, it is the most difficult type of memory to erase or change as it is a neurological pattern created by the brain. Hand memory is therefore largely formed by subconscious processes and hardly involves any cognitive activity which is essentially why it is regarded as unpredictable and consequently unreliable.

3.2.4 Analytical memory

The first three types of musical memory can be categorized primarily as sensory memory, because they receive information primarily via the senses. The fourth type of memory, called intellectual or analytical memory, can be categorized as working memory, because it relies on information supplied both by the senses and long-term memory. According to Granger (1977: 29) all memory is essentially analytical. This analytical aspect may be either a conscious or a sub-conscious activity. It also explains why most pianists generally recognize patterns such as scales or the Alberti-bass, although these patterns are usually transformed into tactile memory through visual memory. Intellectual memory usually results from a conscious intellectual knowledge of the music (Newman 1974: 134). Conscious work results in a better understanding of the music and is considered to be the key to all memory work (Bryant 1999: 28). This, however, does not only apply to formal musical analysis, but also to concepts such as style and character (Bryant 1999: 28).

Tactile, visual, aural and analytical memory rely heavily on associative memory to link information from all four types in order to create better results (Bryant 1999: 29; Jordan-Andrews 1995: 8). It is generally accepted that the best way to memorize is to combine the four types of memory, because the one reinforces the other (Bryant 1999: 29; Chang 2004; Granger 1977: 29; Jordan-Andrews 1995: 8; Sandor 1981: 195). The reason for this can probably be found in the complexity of musical performances, since the process involved incorporates intellectual, physical and emotional aspects.

One may therefore conclude that musical performance also relies on specific kinds of long-term memory. As previously mentioned, explicit or episodic memories are important since each performance may be regarded as an individual event. The importance here is that most performers attempt to recreate experiences and events from previous practice sessions. Therefore one may talk of representational or event memory. Additionally, artists can also be said to rely on semantic memory because they rely on information that is factual. Furthermore, it is important to add that musicians sometimes unconsciously react to stimuli, in which case they rely quite extensively on implicit memory.

3.3 Musical Memory: Concepts and processes

The processes of musical memory do not differ from those relating to general memory in other areas. They also include ways incorporating them into the long-term memory. The aim of the present discussion is to explain various ways of encoding, storage and retrieval as part of the musical memory process. According to Brower (1993:21) "studies of memory and temporal perceptions suggest that there are important changes in the way duration is perceived over time. Memory combines mechanisms that store perceptual information in different ways and for varying lengths of time". As mentioned earlier in the chapter (section 3.1), performers devote their time mainly to the decoding of notation and the coordination of muscular activity. Since performance encompasses both aural and visual activity, in this study the emphasis will be on the decoding of the music[4] within a very specific analytical orientation.

It has already been established that memory is essentially the result of cognitive activity. Therefore it is important to return to the way in which music is cognitively perceived. Serafine (1988:72) defines musical thought, as "the activity of thinking temporally with sounds both simultaneous and successive." The fact that musical thought is defined as an activity means essentially that it is an event and a process. This also means that it may be divided into smaller events and processes, these in turn then being possibly linked once again to form larger units. Such units can be compared and relationships revealing similarity and difference can be formed. Thus, it is possible to trace certain patterns of repetition, variation and development in music which consists of different (usually simultaneous) ways in which musical elements are organized and developed.

3.3.1 The encoding or learning process

Chang (2004) believes that "there is no question that the only truly effective way to memorize is to know music theory and to memorize using a detailed musical analysis in order to obtain a deep understanding of music". Although there are differing opinions about when to memorize a piece of music, most writers on musical memory conclude that it is better to start memorizing when learning the piece initially (Newman 1974: 135; Bryant 1999: 29; Lewis 1999; Obenshain 1993: 43). This may chiefly be attributed to the fact that the encoding process is essentially also a learning process.

The first step taken when learning a new piece is analyzing the formal structure (Bryant 1999: 29; Obenshain 1993: 43). For example, should a piece be in sonata form, one firstly analyzes large sections such as the exposition, development and recapitulation. Each of these sections can be subdivided (for example) into the first theme, bridge passage and second theme. They, in turn, can be further subdivided into phrases and motives. Once this is established the student/artist will have a firm understanding of the piece's progress, its tonal design as well as possible corresponding material.

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[4] Music in this context does not only include the mere examination of the score or notation, but a specifically focused intellectual pursuit which combines both conceptual and perceptual experiences.

According to Obenshain (1993: 43) the actual memorizing process begins with the division of these sections into easy and difficult units. Here, difficult may be understood to mean technically difficult, or difficult to remember. It is considered more beneficial to start memorizing difficult sections first (Chang: 2004; Obenshain: 1993:43). A phrase may be further divided into bars, but when learning them it is useful to follow the continuity rule. Analyzing harmonic and contrapuntal movements may establish good fingerings (Bryant 1999: 29). A major factor in acquiring good tactile memory is the use of dependable fingerings with a great deal of attention being given to the correct ones during the repetition of phrases or note patterns (Bryant 1999: 29). It is also useful to practice the hands separately (Brown 1995:11). All practice should be slowly to allow the mind to process the information (Lewis 1999).

It is wise to establish all forms of memory before tackling the next section. Its analysis will augment tactile memory, visual memory and aural memory and be of great assistance in the encoding process. Breaking down phrases into harmonic progressions and playing them in harmonic blocks aids all the senses (Bryant 1999: 29; Brown 1995: 12; Ford 1996: 24). Analyzing therefore does not signify the simple deconstruction of the score into recognizable components; on the contrary, its purpose is to gain an insight into the structure (Chang: 2004). Bryant (1999:29) regards analysis coupled with a high level of concentration as the prime factor to be considered when committing music to memory. All in all, musical memory will be rendered more reliable by applying descriptions and associations to all its types.

3.3.2 Storage as a musical memory process

The storage of encoded material can be entrenched by rechecking, reinforcement and maintenance. Although one needs to repeat passages to reinforce memory, one also needs to approach each repetition from another angle. Reinforcing means that material will benefit from having to be relearned after it has been forgotten. According to Chang (2004) "a forgotten memory, when regained, is always better remembered." Therefore to forget may also be useful within this context.

The most important way to maintain and reinforce memory is by playing slowly (Ford 1996: 24). Playing slowly prevents one from relying purely on hand memory because it enables one to think about every note as well as those preceding and following it (Brown 1995: 12). Because slow playing changes the aural perception of the music, it facilitates easier mental and aural engagement thus enabling one to check on its every aspect. Lewis (1999) explains this phenomenon:

> …slow speed disrupts all the "finger memories" and any other quasi-memory techniques because the hands do not move as they are trained to and the ear does not hear what it is anxious to hear.

Another way to test memory is to begin playing a piece at any arbitrary place in the score, thus testing the understanding of its structure (Bryant 1999: 30). Most educators advise students to play the music through in their minds or to "think it through" (Brown 1995: 12; Bryant 1999: 31; Ford 1996: 25). Some even recommend counting or singing it through (Bryant 1999: 29), as slips will draw attention to spots that are insecure. This is usually a good test for the reliability of internal memory.

3.3.3 Musical Memory: The process of retrieval

The retrieval of memory is made by providing cues for recalling material. As previously stated, these cues themselves can be either recalled or recognized. It is easier to recognize cues and therefore some artists never play without scores, even though they have memorized the music. These cues can be structural, contextual or emotional. In music it is therefore important to comprehend not only the form, but also the tonal and rhythmic structure of the music, as they provide information from which cues can be extracted. The material will therefore be more easily retrieved if it was encoded and stored by means of context-dependent descriptions or associations. It is also important to enter a specific emotional state for playing.

The importance of every detail in the playing-through of pieces should be emphasized as they support critical listening. That, in turn, places the emphasis on musical structure rather than on the mere playing of notes. It helps both to prevent playing automatically and maintain concentration, since any performance is a test of the degree and span of concentration. Musicians need a high level of concentration for the adequate retrieval of memory (Bryant 1999: 31).

3.4 Why memorize?

Performing without the music score originated from the era when keyboard players were required to improvise their music, either with or occasionally without figured bass notation. Playing from memory is a performance tradition that began with Clara Schumann and more importantly Franz Liszt (Granger 1977: 29). One need only glance at a Liszt composition to see why he did so. Playing his music from memory is very often a technical necessity (Granger 1977: 29; Newman 1974: 132), especially because of the extreme technical demands made on performers and his use of the whole range of the piano. This is supported by Chang's statement (2004) that one learns technically difficult pieces faster by memorizing them.

Memorizing music is one way to ensure that pieces are learned more thoroughly (Newman 1974: 132) and that a deeper understanding of the music is established (Granger 1977: 29; Jordan-Andrews 1995: 11). This is important for students, because proper memorization ensures that the music is learned correctly and effectively. Memorization, however, does not only offer technical advantages, but also artistic ones. Playing from memory enables the performers to concentrate solely on their performance and interpretation, and has the added advantage of convenience because note reading and page turning tend to distract one's attention from the music itself (Newman 1974: 133).

Advantages that specialist sources commonly tend not to acknowledge, however, are the intellectual benefits. Memorization aids critical thinking and consummates understanding of the music. The process of preserving information internally develops perceptual, conceptual and creative intellectual capabilities that lead one to experience the music on a deeper intellectual level.

The conclusion may be drawn that memorization clearly has its advantages, although non-memorizers will be able to point out certain disadvantages, the commonest being that it tends to increase performance anxiety (Granger 1977: 29). Although the concern about this disadvantage is acknowledged, the emphasis here is placed on memorization as a learning tool. A well-prepared performance using the score would also have included a considerable degree of memory work, the score merely providing cues for recognition. Emphasis is therefore on how the processes and principles of memory may be employed to aid performance.

3.5 The influence of human memory

At the beginning of the present chapter Serafine was quoted as stating that music is a set of organized temporal sound events. To understand and reproduce music, it is necessary to grasp the construction of its various components. One may therefore assume that most of the ideas on musical memory correspond quite well to the described processes of human memory in general. That most sources to date have emphasized the attention given to structure and detail as constituting an important aspect of the initial encoding process is corroborating evidence of this assumption. More confirmation is found in the idea that all the types of musical memory need to be applied to enhance and promote memorization. This also corresponds well with the idea that both continuous elaborative rehearsal and inner processing maintain and reinforce memory. Further proof is to be found in the general prominence of associations since they buttress the memory by providing additional frameworks and cues for the retrieval of information. Everything discussed thus far has stressed the use of working memory since it has been seen that perception and cognition are closely related to the memory and the learning process.

One may now ask how frameworks, associations, cues, components and overall structure of music are to be identified? From the information provided in this chapter, one may conclude that analysis is a tool for distinguishing and describing relationships within music, and that these relationships deepen the understanding of the events. Granger (1977:29) supports this point by stating that all memory is essentially analytical. Analysis may be perceived as the process by which the content and thus the components and structure of music are recognized. It may also be described as an activity encompassing musical perception, taking as "starting-point the music itself (Bent 2001: 526)". Having established the importance of analysis for the comprehension and memorization of music, the next chapter will describe various types of analysis and their processes.

CHAPTER 4

Musical Analysis

4.1 Musical analysis and related terms

The Shorter Oxford English dictionary[5] defines analysis as the "resolution of anything complex into its simplest elements". In relation to the description by Bent used in the first chapter, musical analysis or, rather, formal or structural analysis for the purpose of this study, may therefore be defined as the examination of the music itself – thus, the process of identifying the components and the overall musical structure as well as its functions. According to Bent (2001: 526) musical structure "may stand for part of a work, a work in its entirety, a group or even a repertory of works, in written or oral tradition".

The value of analysis, especially for memorization, may be set forth by the following distinction between analysis and description by Dubiel (2000):

> … there are two characteristics that analysis is supposed to have and description to lack: analysis tells you more that you could find out by listening, description does not; and analysis tells you why things happen, description does not.

If this statement is true, analysis may enable the musician to trace the function and meaning of musical events in a work; and if the information from the previous two chapters is taken into account, this is precisely why analysis is an ideal memorization device. The distinction between analysis and description may be uncalled for, as description or observation will always be the starting point for analysis. The fundamental nature of analysis may be descriptive, as analysis describes the function and content of the music[6].

In emphasizing the importance of musical perception for analysis, Bent (2001: 526) writes as follows: "Underlying all aspects of analysis as an activity is the fundamental point of contact between mind and musical sound, namely musical perception." Pearsall (1999: 233) defines perception as "an act of intelligence whereby an individual imposes meaning to the world". According to Cross (1998) the nature of musical perception should be of paramount concern to music analysts, based as it is on those particular senses so important for musicians' perception, namely aural, visual or tactile depending on the type of activity at any particular moment.

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[5] Third Edition, 1973

[6] This might have been the substantiation for the 'descriptive analysis' White (1976: 13) had developed. This system will be discussed later on in this chapter.

4.2. Formal or structural analysis

According to Cook (1987: 116) "formal analysis means any kind of analysis that involves coding music into symbols and deducing the musical structure from the pattern those symbols make". It may also be seen as the tool one uses to examine any musical structure. Solomon (2002) explains it as follows:

> Thus, formal analysis should include an examination of the harmonic structure, the melodic structure, motives, rhythm, variation techniques and especially the relationships between small and large scale structures.

It therefore follows that besides the use of subject-appropriate symbols some coded verbal description of the formal analysis also needs to be included.

Since the essential need for formal/structural analysis has become clear, it is therefore also important to determine the general purpose of this type of analysis. According to White (1976: 1) "one of the chief purposes of musical analysis, if not the essential purpose, is to give the musician a systematic method with which to approach questions of musical style". For this reason most analytical courses on offer are often concerned with harmonic and contrapuntal devices from the 18th and 19th century. This type of analysis is concerned with the five musical elements of rhythm, melody, harmony, form and sound (White 1975: 14; La Rue 1970: 10).

White (1976: 13) divides the concept of analysis into micro-analysis, middle-analysis and macro-analysis. He describes it as follows:

> Microanalysis includes detailed melodic, harmonic, and rhythmic analysis; form and texture at the smallest level; and small details of orchestration and timbre. Middle-analysis deals with relationships between phrases and other medium-sized units and virtually anything that falls into neither the very large nor the very small categories. Macro-analysis begins with descriptions of things such as the instrumental or vocal medium and the total time duration, and proceeds to the less obvious such as the disposition of large events within this time span and broad harmonic, textural, and rhythmic considerations.

Structural analysis can therefore be seen as a combination of these features. According to both White (1976: 14) and La Rue (1970: 2) general classifications and subdivisions may produce some overlapping. Successful analysis requires dissection and selection, as well as insight and overview (La Rue 1970: 4). Cook (1987: 16) has defined two analytical acts; "the act of omission and the act of relation". There are various techniques by which this can be achieved. To analyze voice-leading, for example, one may use figured bass, Roman letter analysis or Fuxian counterpoint. According to Cook (1987: 25) only Fuxian counterpoint enables one to place a specific chord into context and therefore establish its relation and function. The act of omission can be described as a selective or reductive process.

The following discussion will focus on the main principles and concepts of Schenkerian analysis as it is regarded as the most comprehensive form of structural analysis and an analytical orientation believed to be most suited for the purpose of the present study. As will be seen in the discussion, Schenkerian analysis exemplifies processes that may aid effective memorization and retention. Probably the most important of these can be regarded as an elaborative-associative process that extends from surface activities to those of large-scale importance.

4.2.1. Schenkerian analysis[7]

Heinrich Schenker (1868 – 1935) is commonly regarded as one of the most influential theorists in the history of Western music. Although he obtained a doctoral degree in law from the University of Vienna, he continued with music studies at the Vienna Conservatory (Drabkin 2002: 913). Throughout his lifetime he devoted much of his time to a variety of musical activities as composer, pianist, writer, teacher, editor and archivist (Dunsby & Whittall 1988: 29). His widely accepted influence and importance, however, may be attributed to the theory of tonal music that he had developed in the late 19th and early 20th century. The theory that he had invented, however, was by no means "new". Schenker made use of ideas developed by his predecessors, as Dunsby and Whittall (1988: 23) assert:

> Reductive notation in the form of seventeenth- and eighteenth-century thoroughbass, and generative practice from the same period, the art of elaboration or 'diminution', which he studied in the virtually inseparable fields of composition teaching (Bernhard and Fux), ornamentation and improvisation (C.P.E Bach), were to Schenker the historical antecedents that he drew together in a symbolic concordance of remarkable clarity and scope.

Schenker's system of analysis was primarily designed for the performer as it attempted to cultivate an understanding of a work as a complex organic whole (Bent 2001: 553). His theory was developed over a period of more than 30 years and expounded in his *Neue muskalische Theorien und Phantasien,* comprising *Harmonielehre* (1906), *Kontrapunkt* (1910, 1922) and the posthumously published *Der freie Satz* (1935) (Bent 2001: 548).

Schenker wrote in *Der freie Satz* that "music is never comparable to mathematics or architecture, but only to language, a kind of tonal language" (Pankhurst 2001). Schenker's theory was restricted to tonal music for its foundation rests on the belief that a work of music is an extention (in time) of its tonic triad (Drabkin 2002: 816; Bent 2001: 548). Cook (1987: 41) wrote that "Schenkerian analysis consists of inter-relating the actual foreground lines of the music – which may be continuous or discontinuous, direct or meandering, chromatic or diatonic, and which may shift between registers – with the imaginary voices of the background, which are by definition continuous, directed, diatonic and do not shift registers".

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[7] The term Schenkerian analysis is used because it includes not only the method initially developed by Heinrich Schenker, but also the developments by his successors for example Felix Salzer and Ernst Oster.

The tonic triad, called the 'chord of nature', is established by a piece of musical 'fundamental structure' known as the *Ursats.* Bent (2001: 548) explains it the following way:

> The *Ursatz* is made up of a linear descent to the root of the triad – the 'fundamental line' (*Urlinie)* – accompanied by an 'arpeggiation' in the bass *(Bassbrechung)*, from the tonic to the dominant and back to the tonic. In its simplest form of the *Ursatz* the linear descent begins with the 3rd of the tonic triad, and each note in it is accompanied by one chord in the bass.

The following figure explains the different forms of the *Ursatz:*

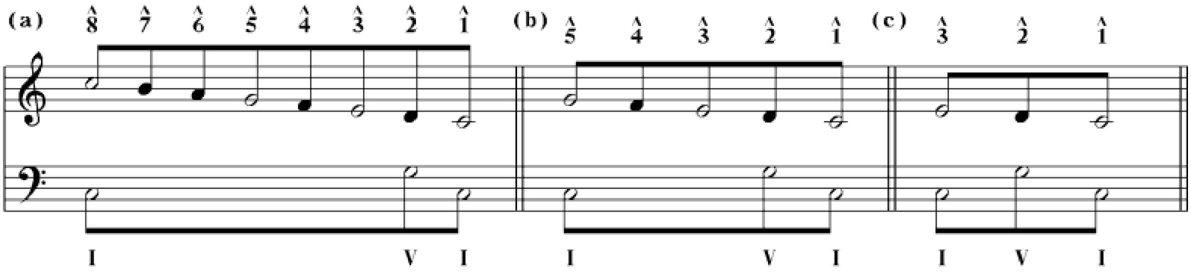

Figure 4.2: Different forms of the *Ursatz*

The fundamental structure also forms the 'background' (*Hintergrund)* of a work. It implies that the basic structure of any tonal piece of music is strictly diatonic and consequently all chromatic elements are regarded as passing or prolongations of the diatonic steps (Bent 2001: 552). The background also establishes the concept of hierarchical levels. This is the essence of Schenker's analysis. The background can be elaborated into the 'middleground' that, in turn, can be expanded into the foreground. In his analyses these layers were called *Schichten.*

While the background reveals the fundamental structure, the foreground "contains elements of the contrapuntal design that are immediately perceptible, eliminating only ornamentation and note repetition from the surface of the work" (Bent 2001: 521). The middleground layers contain 'deeper' structural features than the foreground that are less important than those of the background. The scope and complexity of the middleground depends on the size and nature of a composition (Drabkin 2002: 818). The existence of these layers in the analysis establishes the two methods whereby these can be achieved. The first is composing-out (*Auskomponierung*[8]) where the *Ursatz* is transformed through continuous elaboration until the foreground is achieved. The second is reduction whereby the foreground is reduced to the main components of the piece until only the *Ursatz* exists.

The basis of this reductive process is found in what Schenker called melodic *diminutions.* Derived from the Italian word *diminuimento,* this term generally refers to "the process by which an interval formed by notes of longer value is expressed in notes of smaller value" (Forte & Gilbert 1982: 7). According to Forte and Gilbert (1982: 7) diminutions, in Schenkerian terms, are elements of embellishment comprising mainly the *passing note,* the *neighbor note,* the *consonant skip* and the *arpeggiation.*

Prolongation is basically a process of elaboration. According to Forte and Gilbert (1982: 142) prolongation refers to the ways in which a musical component – a note (melodic prolongation) or a chord (harmonic prolongation) – remains in effect without being literally represented at every moment. In turn, Drabkin (2002: 821) suggests that *prolongation* is "the creation of content by stretching out the constituent elements (representing specific musical events) in a given layer". Forte and Gilbert (1982: 144) identified the following three types of melodic prolongation:

1. Motion *from* a given note, normally a *descending* diatonic scale segment or arpeggiation (where the prolongation *follows* the note that is prolonged);

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[8] This term literally means "composing-out" (Drabkin 2002: 821)

2. Motion *to* a given note, normally an *ascending* diatonic scale segment or arpeggiation (where the prolongation *precedes* the note that is prolonged);
3. Motion *about* a given note, most frequently by means of upper and/or lower neighboring tones (which in turn prolonged themselves).

The process of *Auskomponierung* or 'composing-out' can achieve this. In terms of the explanation for diminution, *Auskomponierung* can also be regarded as a type of diminution. Schenker uses a variety of prolongation techniques in his theory.

The first appearance of prolongation can be found in what Schenker called a *Zug*, most commonly translated as a linear progression. The primary example of a linear progression can be found in the fundamental line as it joins two notes of the same chord. Schenker qualified this progression by the interval they embraced, for example a third-progression is called a *Terzzug* (Bent 2001: 552). The intervals most frequently used are those of the third, fifth and sixth. Other forms of linear-progressions may also be found.

Prolongation can also be achieved by the repetition of motives or figures. Repetition in this sense, however, does not imply only that a motive or figure is literally repeated throughout a piece of music, but mostly implies that motives or figures are repeated in the deeper layers of the music. Such repetitions are important elements of structural coherence and design. The simplest form of repetition can be found in the interruption of the fundamental line, termed a *Unterbrechung* (Bent 2001: 552). According to this process the *Urlinie* is interrupted at step 2 of the scale on the dominant harmony, necessitating a new beginning. This plays an important part in defining the form of a work because it implies the antecedent and consequent phrase structure. The interrupted 3-2 || 2-1 is the basic Schenkerian pattern for sonata form and for any form which involves a structural cadence in the dominant (Cook 1987: 53). Schenkerian analysis implies a close collaboration between tonal structure and form, "because the part acquires its aesthetic meaning from its relation with the whole and that the main sphere in which this happens is that of directed tonal motion (Cook 1987: 64)”.

Register also plays an important part as a prolongational technique in Schenkerian analysis. The transfer of register makes it possible to trace a voice-leading figure which appears to be discontinued in a particular register but then turns out to have been transferred to another register. According to Forte and Gilbert (1982: 123) “*register* transfer denotes change of octave or the placement of a note in a different octave (including a return to its original register from some other register)”. The linking process that is commonly known as ‘coupling’ or *Koppelung* (Drabkin 2002: 830) is the register transfer of a note of the fundamental line (Cook 1987:46).

Schenkerian analysis also introduces the concept of compound melody, which can be associated with the concepts of diminution and voice leading. Compound melody conveys two or more voices over a longer span of music. The principle technique for showing compound melody can be found in what Schenker termed the unfolding. The simplest definition of the unfolding “involves the making of a vertical interval (comprising two potential voices) into a horizontal one within a single melodic line” (Viljoen 1989: 90).

Schenkerian analysis is thus characterized as showing organicism and unity in music. According to Pankhurst (2001) these characteristics are apparent because of the fact that the theory endeavors to show growth as well as internal coherence. This explains why the layers should not be viewed individually. Viewing it as a whole shows both the growth and development of the music. Only then it is possible to see the distinguishing features, transformation of ideas and other motivic comparisons. The theory therefore also enables analysts to make certain assumptions about formal and contrapuntal design.

In concluding this discussion and in view of the case studies that follow, it is important to emphasize that the Schenkerian ideas will only be applied informally for greater accessibility and that detailed knowledge of the system is therefore not required. For instance, no reference will therefore be made to the *Ursatz* due to its highly specialized nature. Also, formal graphic analytical notation will not be used for similar reasons. However, this overview of Schenkerian analysis was given to provide insight into its general methodology and applications. For the purposes of both analysis and memorization, Schenkerian analysis offers a better understanding of tonal structure in terms of context, large- and small-scale events and their relation to one another. It also assists in determining the meaning and significance of elements within a composition, as well as in articulating compositional design and logic. The Schenkerian orientation in the analytical case studies will provide clarity in terms of tonal structure, design, structural levels, prolongations, harmonic and voice-leading content, motivic figures resulting from diminutions, and motivic repetitions or parallelisms on various levels of structure. The use of these focus points is an endeavor to elucidate the principles of context and coherence.

CHAPTER 5

Four analytical case studies on memorization

5.1 Analytical strategies

In this chapter a selection of tonal piano works will be examined with a view to musical memorization. This particular aim requires specific analytical strategies which are intertwined with compositional design and procedures, as well as appropriate analytical techniques to ensure optimal results. As for compositional design and procedures, it is further necessary to make use of traditional formal methods of analysis in an innovative way, that is, not merely for the purpose of classification, but specifically as a means to demonstrate comprehensive compositional planning and logic. Seen from the perspective of analysis, the analytical interpretation of musical structure, content and coherence is not merely made to highlight these aspects in the works under discussion, but, more particularly, to bring them in line with an awareness of their role in the process of musical memorization. The objective is therefore not analysis for the sake of analysis, but rather to use analysis as a tool for musical memorization.

The analytical strategies outlined and illustrated below are attempts to find common ground between the processes of musical memory and music composition. Although it is a comprehensive approach to musical memorization, it can never be claimed to be an all-embracing one, or the only strategy in dealing with the problem of memorization. Firstly, the music selected for the analytical case studies consists of tonal compositions from a specific period, limited to works for solo piano. This selection was made to complement the specific analytical orientation of the study and for reasons of musical and pedagogical convenience – the works in question being either miniature compositions or musical extracts. Secondly, music from the 20th and 21st centuries exhibiting different tonal orientations from those presented here, will need different or alternative analytical methodologies, approaches and strategies for their effective memorization.

Since the emphasis in the following analytical case studies is primarily on tonal voice-leading structure, the elements of duration, rhythm, articulation and dynamics will not be taken into consideration. Although meaningful and logical musical patterns and relationships can be established in rhythm and articulation, a comprehensive account of these details in a composition would exceed the boundaries of the present study. Also, dynamic details are not taken into account, since they cannot always be logically connected or related to underlying structural content. Finally, muscular memory will also not be considered, since it falls outside the parameters of the study.

The following four strategies may be identified which are both interactive and interdependent:

- The first strategy employs analytical classification. This means the identification of the material that is used to construct a piece of music.
- The second strategy reveals the compositional design. After the classification process has been completed, the analytical process is introduced entailing a more detailed analysis of each part of the musical structure which then leads to the third strategy.
- The third strategy deals with compositional logic. Since every composition is unique in its design and logic, it is important, finally, to identify the specific compositional processes and procedures of each individual work.
- The final strategy, analytical interpretation, is essential in this regard. Through the interpretation process, meaning is attached to the components of a composition, and reasons are provided for their application and function. These are essential prerequisites for music memorization, since they are inextricably linked to the principles of memory.

Looking at these four strategies as a comprehensive methodology for musical memorization, the classification process first identifies basic thematic, harmonic and formal content as well as larger structures, which become the starting point for the determination of compositional design. This, in turn, requires a comprehensive knowledge of the relationship between the whole of a composition and its details. Only in this way may compositional design be fully uncovered.

The procedure up to this point may be regarded as common analytical practice. Revealing compositional logic may be said to be the principle condition for analytical interpretation as it requires an explanation for the application, arrangement, function and rationale of every detail in a composition. It is finally through analytical interpretation that the process of musical association, so crucial for musical memorization, can be brought into play. This involves the identification of repetitions, variations, deviations, connections, relationships, and correlations in the material and structural organization of a composition.

In terms of the interaction and interdependence of these strategies, it can therefore be deduced that there is both a chain reaction and a system of cross-references in their application. Classification will always be the point of departure for compositional design which leads to compositional logic that, in turn, relies on analytical interpretation. A classified element or feature will have a logical application and function within the compositional design via its proper analytical interpretation. Throughout, processes of musical coherence, interactions and interrelationships can be identified in a piece of music which form the essential ingredients for musical association, retention and memorization.

The analytical discussions which follow therefore have the purpose of describing the tonal processes of each of the selected compositions in order to lead the reader to a better understanding and retention of their unique compositional features. Furthermore, the discussions are designed to enable the reader to become part of the compositional process of a piece via the analytical "recreation" of its material. In so doing, the memorizing process is made one with creative thinking and the processing of material in a composition.

The compositions selected here lend themselves particularly well to the application of the analytical strategies formulated above. That is mainly due to their clear organizational logic and musical coherence, and their relatively short durations and compact structures. In addition, the selection is restricted to tonal piano music from the 18th and 19th centuries with less demanding tonal and textural content. This is done in order to acquire sufficient material from the chosen analytical orientation without having to deal with unnecessarily difficult analytical interpretations or decisions which may be brought about by complex tonal and textural organizations. As already indicated, the use of 20th and 21st-century examples has not been considered here, both for reasons of tonal-structural incompatibility and the specialised nature of contemporary compositions which would require a separate investigation. Finally, in order to emphasize the pedagogical value of the analytical strategies, the compositions selected have varying levels of musical difficulty and have therefore been sequenced accordingly.

5.2 Minuet in F, KV 5: WA Mozart[9]

In the analytical strategy applying to Mozart's Minuet in F, KV.5, the emphasis will be on its form and phrase structure, as well as detailed tonal content, and thematic material. The information gathered from this exploration will be interpreted to highlight the minuet's own unique compositional design and logic so as to effectively aid its memorization process. Where necessary, commentary will be given on the relationship between compositional content and principles of musical memory.

The minuet comprises 22 measures and has a binary AB form structure. The significance of this formal classification lies in the specific ways in which thematic and tonal content may be related to it. There is also an interesting relationship between thematic and tonal content, and the shaping of the piece's somewhat unusual phrase structure.

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[9] Full score of Mozart's Minuet in Appendix A

Section A consists of two phrases with an overall tonal motion from I to V. The first phrase comprises measures 1-4 and has a closed tonal structure in F, while the second phrase is six measures long (measures 5-10) and links the tonic F with the dominant C which is tonicised. Section B also comprises two phrases, the first again four measures (measures 11-14) and the second 8 measures in length (measures 15-22). Here, the tonal movement is from I to V in the first phrase, and from V to I in the second phrase with tonal closure in F. With the exception of measure 11, the tonal movement of this minuet corresponds to that of typical binary pieces of the period, that is, a motion from I to V for section A, and from V back to I in section B. This is a valuable stylistic reference for memorization purposes. The exception, however, the brief return to tonic F in measure 11, with a chromatic seventh (*e-flat*) causing it to function as an applied dominant of B-flat (IV of F), is a notable and therefore memorable deviation. This overall formal and tonal layout of the minuet therefore provides the memorizer with a framework from which its subsequent tonal and thematic content may be traced.

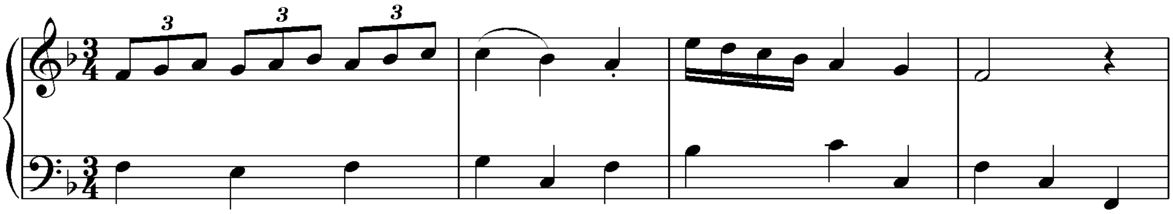

Figure 5.2.1: Measures 1 – 4

Coming to the more detailed harmonic and voice-leading content of the minuet, the closed tonal progression in the first phrase of section A (measures 1-4) comprises I (measure 1) -IV (measure 3) -V (measure 3) -I (measure 4). Nesting within this harmonic framework, measures 1-2 present another closed progression I-II-V-I. II occurs in measure 2, although judging from the two-part simultaneity in the first two beats of the measure, it seems to suggest V for both beats. However, more careful interpretation of the voice leading at this point reveals that *g* in the bass represents II. Assigning II to *g* renders the upper voice *c* above it as a suspended fourth whose resolution to the third *b-flat* does take place. However, through rhythmic displacement, there is a misalignment in the voice leading whereby the *g* is no longer present at the point of resolution from *c* to *b-flat*, since it has already moved to the dominant *c*. A realignment of the voice leading would therefore clearly show a 4-3 suspension above *g* in the bass, followed by the outline of a V7 on *c*. This is an important instance of accurate harmonic classification achieved through correct voice-leading interpretation, resulting in a better, and accordingly a more memorable tonal logic.

Completing the harmonic details of measures 1-4, the tonic in measure 1 is embellished by V6, while the motion from IV to V in measure 3 is delayed by a suspension of the cadential dominant, so frequent an occurrence at cadence points, in this case through a 6-5 motion in the upper voice.

Melodically, measures 1-4 consist of ascending and descending thirds. In measure 1 there is a sequential motion of three ascending filled-in third figures. Simultaneously, the first note of each of the ascending third figures reveals a subsurface third (*f-g-a)* coinciding with each of the notes in the bass line and paralleling the first *f-g-a* surface figure on the first beat of measure 1. In measure 2, the melody moves down a third from *c* to *a* over the already mentioned II-V-I harmonic structure. This motion in quarter notes, corresponding, like the subsurface third of measure 1, to the underlying bass motion, can be interpreted as an inversion of the ascending third figures of measure 1. The four-note motion from *e* to *b-flat* on the first beat of measure 3 may be regarded as a third line within the underlying subdominant harmony with the initial *e* functioning as an appoggiatura. This is followed by another descending third (*a-g-f*) within the cadential close of measures 3-4.

In measures 5-6 the tonal movement shows a surprising start V/V, that is, a chromatic supertonic harmony within the main F major tonality of the minuet, moving to dominant C. Measures 7-8 are an exact repetition of the previous two measures. The melody of measure 5 consists of three alternating broken thirds which may be related to the filled-in third motions of measures 1-4. The *b-natural* as part of the V/V harmony initially appears as a shock element, but both through its repetition as part of the oscillating thirds and of the applied dominant harmony, as well as being the raised fourth scale degree of *f*, its role as the leading tone of *c* becomes evident. This is also the first indication that the dominant *c*, which is to follow in measure 6, is about to be tonicised. The top part of the melodic motion in measure 6 reveals another ascending third (*c-d-e*) which is mirrored in the bass, resulting in a voice exchange figure with the upper voice. The preceding bass motion of measure 5 also reveals a descending third figure (*g-f-e*) as part of the passing bass motion from V/V to V6 (I6 of C). In measures 9-10 the tonicisation of C is finally confirmed by the closing harmonic progression II6-V-I. This coincides with broken thirds in the melody (measure 9) derived from the alternating third figures of measures 5 and 7, and consisting of three consecutive thirds (*f-d, e-c* and *d-b*). By means of this motion, a two-part compound melody is created (*f-e-d* in the upper part, and *d-c-b* in the lower part of the melody). Again the derivation from the opening third figures is obvious.

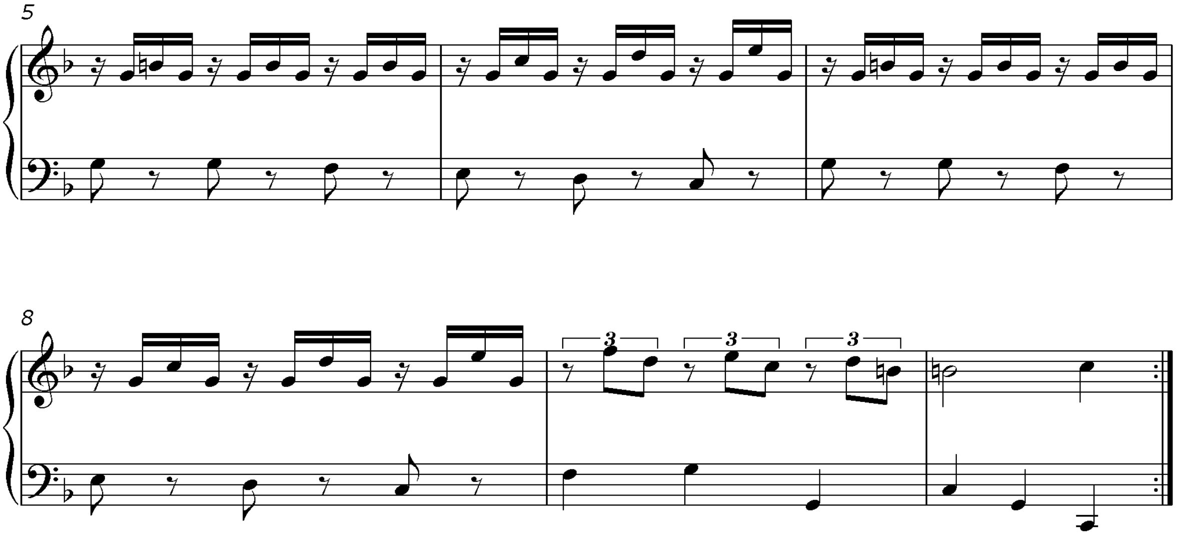

Figure 5.2.2: Measures 5 - 10

As for the odd six-measure length of the second phrase compared to the four-measure length of the first phrase, the reason for this, as has already been pointed out, is the repetition of the content of measures 5-6 in 7-8. The rationale behind this repetition is perhaps difficult to explain from a structural point of view, since it is entirely possible to omit measures 7-8 from the second phrase to produce two complementary four-measure phrases. However, it is believed that the repeated measures may have been included by Mozart for better expressive balance. Since measures 5-6 not only introduce a new surface texture, but also a surprising tonal shift to C major, the repeated measures seem to act as a stabilizing factor for both the new tonal area and the contrasting surface texture.

An added bonus of course is that the repeated measures result in two fewer measures having to be memorized, a natural convenience for any musical memorization task, with the exception of transposed repeated passages where the different tonal area has to be taken into account. Providing adequate explanations for certain strategies in the compositional design is an important tool in understanding the logic behind such strategies which, in turn, ensure their better retention.

Two final observations can be made in the analysis of section A. First, it is interesting to draw attention to three indirect note successions in the melody of measures 8-10 (*e*, the penultimate note of measure 8, *b-natural*, the final note of measure 9, and *c*, the final note of measure 10). This three-note subsurface pattern will reappear on the melodic surface during the first four measures of section B. Second, there is an exact correspondence in the bass motions of measures 3-4 and 9-10. Both sets of measures involve S-D-T harmonic-function classes in closing their respective tonal areas (*f* for measures 3-4 and *c* for measures 9-10).

Section B, for the most part, consists of the same material as section A. The first phrase (measures 11-14) is an ascending harmonic and melodic sequential passage, measures 11-12 being repeated a tone higher in measures 13-14. Measure 11 starts again with ascending third figures derived from measure 1, but this time filling in a major/minor seventh on *f*, functioning as V7/IV (B-flat). Measure 12 offers the resolution to IV and consists of another voice exchange (as in measures 6 and 8) between the two voices of the minuet. However, only the bass voice has a filled-in ascending third (*b-flat* to *d*), whereas the upper voice has an incomplete neighbour note (*a*) between its motion from *d* to *b-flat*. It is this motion (*d-a-b-flat*) and its subsequent sequential repetition (*e-b-natural-c*) in measure 14 that is derived from the subsurface pattern *e-b-natural-c* of measures 8-10.

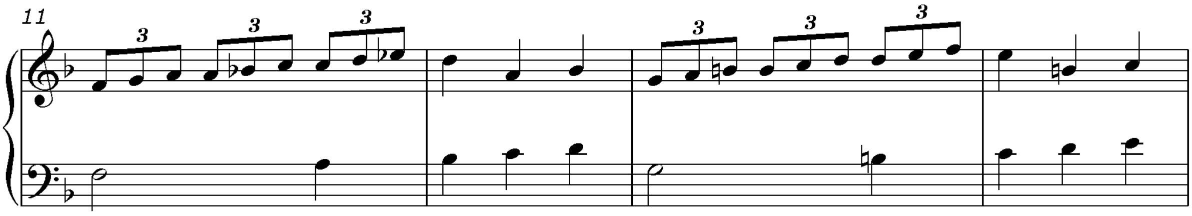

Figure 5.2.3: Measures 11 - 14

Measures 13-14 repeat the content of measures 11-12 a tone higher as stated above, the resulting harmonic motion then proceeding from V7/V to V. With the harmonic motion in both portions of the sequence pattern from measures 11-14 in fifths, together with the voice exchanges of measures 12 and 14, it is not difficult to recognize that there is a very real connection between the harmonic and voice-leading motions of these measures and those of measure 5-6. Even the bass lines of measures 11-12 and 13-14 may in some way be equated with the upper-voice motions of measures 5-6 and 7-8. The seemingly new material of measures 11-14 can in fact be traced to the material of measures 5-8. It is no wonder therefore, that, apart from the logic of design, the reappearance of the content of measures 5-8 immediately following measure 14 within the main tonality of F seems to be a natural consequence of the previous four measures.

The second phrase of section B (measures 15-22) starts, as indicated above, with a repetition of measures 5-8 in measures 15-18, the exception being that the passage is in F instead of C, and that the corresponding repetition of measures 15-16 in 17-18 is an octave higher. This change in register may be attributed to the fact that the music starts in the lower register in measure 15 as a consequence of the rising sequence pattern of measures 11-14 which necessitated a contrasting register for the immediately following material. If this had not been taken into account in the compositional design, the result would have been a too monotonous situation in terms of register. The return to the higher register in measure 17 simply restores the upper register of the minuet.

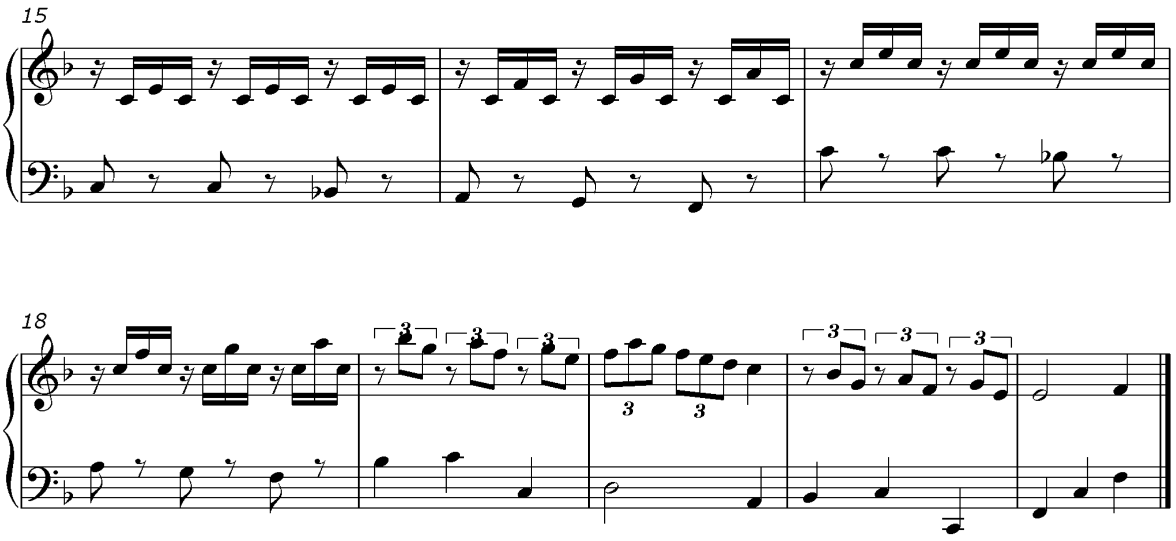

Figure 5.2.4: Measures 15 – 22

When one compares the second phrases of both form sections, it is clear that the second phrase of section B reprises that of section A, including the closing cadence. However, in section B, the final cadence does not appear in the analogous measure (measure 20) which would have made both form sections equal in length. Instead of ending the minuet in measure 20 in the upper register, Mozart surprisingly writes a deceptive cadence with a descending melodic motion of a sixth from *a* to *c* in measure 20 which brings the voice leading down to the region of the lower registers. This linking melodic motion may also be associated with the opening third figure of the minuet as its intervallic inversion. The additional final two measures of the minuet (measures 21-22) are subsequently the repeat of measures 9-10 in the tonic key. The return to the lower register at the conclusion of the minuet ensures that its voice leading ends in the register in which it began. Therefore, a reason for extending the second phrase of section B by two measures is to ensure register balance.

In summary, the content and design of Mozart's Minuet, KV.5 may be characterized by certain individual features apart from the stereotypical binary form construct. The most important of these are the use of the interval of a third, either filled in or in broken form, as central in the melodic design of the piece. A related design element is the voice exchanges which with third figures in contrary motion. A further feature is the use of suspensions at the cadences, particularly in suspending cadential dominants. Another melodic suspension figure not discussed in the analysis above, is a 7/8 figure found in the closing melodic gestures of measures 10 and 22, the final measures of sections A and B, respectively. Register is also an important element in the compositional design and logic.

In closing this analytical strategy for the memorization of KV.5, three more aspects deserve mentioning. The first is the use of triplet figures associated with the main melodic feature of the minuet, the ascending thirds. The second is the use of a two-part voice-leading texture throughout the piece, with the exception of implied three-part textures due to compound melodic activities in measures 5-9, 15-19 and 21. Finally, the bass motions at the cadences in measures 3-4, 9-10, 19-20 and 21-22, that is, octave leaps on the cadential dominants and 8-5-1 figures on the concluding tonics, are not only consistent, but also idiomatic. It is also important to take into account the value of a thorough knowledge of stylistic and idiomatic traits associated with a particular piece of music as additional aids to memorization.

5.3 Aria from The Goldberg Variations: J.S. Bach[10]

The analytical strategy for the Aria from Bach's Goldberg Variations will focus on a detailed account of harmonic and especially melodic content as derived from its ground-bass structure. In terms of thematic content, the emphasis will be on specific melodic/motivic features as part of a process of melodic development which is a dominant feature of the Aria's thematic design.

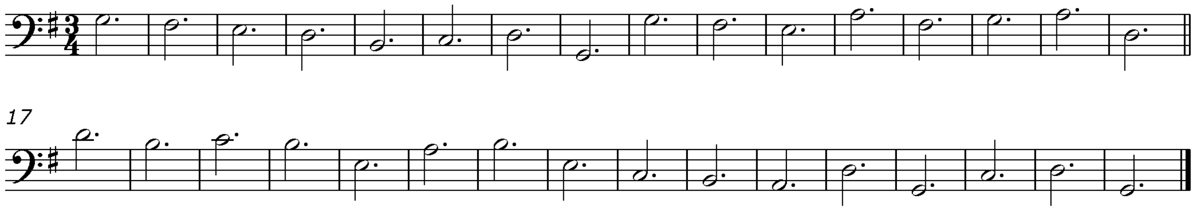

Figure 5.3.1: Fundamental Bass

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[10] Full score of the Aria in Appendix B

The Aria has a binary AB period structure, each period consisting of 16 measures, thus presenting two symmetrical periods. Each period is further subdivided into two eight-measure phrases. As can be seen from the ground bass (figure 5.3.1), all the phrases are clearly articulated by perfect authentic cadences presented through two sets of identical scale degree patterns in the ground bass (3-4-5-1 for measures 5-8 and 13-16, and 1-4-5-1 for measures 21-24 and 29-32). Measures 9–12 and 25–29 also show similar bass contours (1-7-6-2 and 4-3-2-5, respectively). The ground bass is also unusual in that it is frequently embellished melodically so that some parts lie beneath the musical surface. The additional surface harmonies resulting from these melodic embellishments can therefore be interpreted more accurately and effectively in their relation to the underlying directional harmonies presented in the ground bass. Examples of this are found, for instance, in measures 6, 10, 11 and 12 of the first period.

The overall tonal movement in the first period is from tonic to dominant, although the first eight measure phrase has a closed tonal structure in the tonic. In the first phrase of the second period the dominant leads to the relative minor before returning to the original G major tonality in the second phrase.

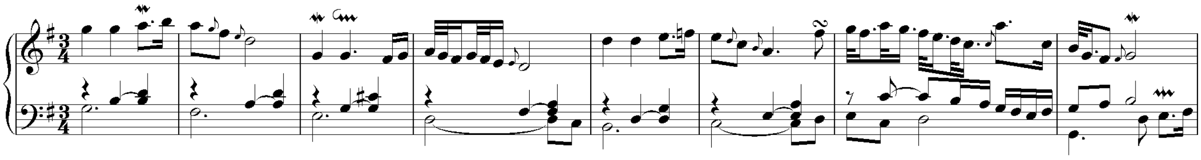

Figure 5.3.2: Measures 1 - 8

As already indicated, measures 1-8 have a closed tonal structure in the tonic key. There is, however a temporary motion to dominant in measure 4 created by the descending fourth motion in the bass. This tonal profile for measures 1-8 can be interpreted as a tonal parallelism for the overall tonal structure of the Aria, since there is a motion from I to V in measures 1-16, followed by a return to and closure on I from measures 16-32. Similarly, the tonal progression from I to V in measures 1-4 is a parallelism of the tonal profile of measures 1-16, given that the same I-V motion is presented on a larger scale. Even the descending linear bass motion from *g* to *d* in measures 1-4 can be traced on a deeper level of structure from *g* (measure 1), to *f-sharp*, (measure 10), to *e* (measure 11), and finally to *d* (measure 16).

The surface harmonies of measures 1-4 as derived from the stepwise bass descent from *g* to *d* are I (measure 1) – V6 (measure 2) – vii6/V (measure 3) – V (measure 4). These chords are presented by the bass and middle voices as broken chord figures in the left hand. In the right-hand part the melodic motion can also be loosely related to the essential fourth span in the bass in that *g-d* comprises the melodic outline of measures 1-4 in three ways: first, the opening melodic note *g* of measure 1 to *d*, the last melodic note of measure 2, second, a repeat of the same procedure for measures 3-4, and third, *g* of measure 1 to *d*, the final melodic note of measure 4. However, these pitches may only be regarded as directional tendency tones in the melodic line and not as part of the underlying structural voice leading of this passage. A reduction of the left hand part will reveal the essential voice leading of these measures (figure 5.3.3).

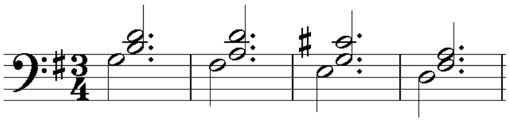

Figure 5.3.3: Left hand reduction of measures 1 – 4

As for the melodic content of measures 1-4, the initial *g* in measure 1 is followed by an ascending third motion to *b* which is in turn followed by a descending fifth motion from *a* to *d* in measure 2. Both the ascending third and descending fifth motions play a decisive role in the melodic design of the Aria. Measures 3-4 are a varied repetition of measures 1-2 an octave lower. The *g* at the start of measure 3 is followed by a lower neighbour-note figure (*g-f-sharp-g*) before descending from *a* to *d* through a sequential movement consisting of two descending thirds and a suspension figure (*e-d*) which completes the movement to *d* at the end of measure 4. Furthermore, a voice-leading reduction of measures 1-4 reveals an outer voice motion in parallel tenths in which the linear descent from *g* to *d* in the bass is paralleled by a covering progression from *b* to *f-sharp* in the upper voice (see figure 5.3.4).

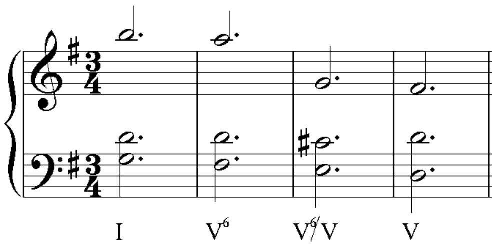

Figure 5.3.4 Voice-leading reduction of measures 1-4

The sequential melodic motion in measure 4 reveals a compound melody (see figure 5.3.5) in which the lower voice moves from *f-sharp* to *d*. This produces a replica of the linear bass motion from *g* to *d* in measures 1-4 through *g* (measure 3), and *f-sharp-e-d* (measure 4).

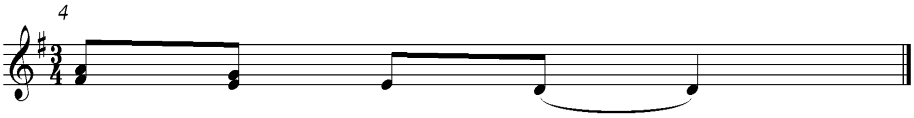

Figure 5.3.5 Compound melody of measure 4

The following four measures are based on the harmonic progression I6 (measure 5) – II6 (measure 6) – V (measure 7) - I (measure 8). In combination with this harmonic progression, there is an ascending fourth motion in the melodic subsurface from *d* (measure 5) to *g* (measure 8). This can be interpreted as a retrograde motion of the descending bass line of measures 1-4. Together with the bass line of measures 5-8, the result is a subsurface motion in parallel tenths between the outer voices of measures 5-7, concluding with an octave in measure 8. The first two tenths are found on the first beats of measures 5 and 6, while the tenth in measure 7 is on its second beat. In between there are two additional tenths on the musical surface of the third beat of measure 6 and the first beat of measure 7. These are connected to the tenth on the first beat of measure 6 and serve to prolong it, since the underlying harmony from measure 6 up to the second beat of measure 7 continues to be II6. The subsurface 10/10/10/8 motions are important here as they provide direction to the voice leading as well as the background for the melodic embellishments that follow from them.

The melody of measures 5-6 essentially repeats that of measures 1-2, but a fourth lower, beginning on *d*. However, the harmonic context is different, since the underlying movement here is from I6 to II6. Following the motion related to measures 1-2 is an upbeat to measure 7 consisting of the tenth (*d/f-sharp*) in the outer voices. The tenth (*e-g*) on the first beat of measure 7 is embellished by a circling motion in the top voice and a chordal skip to *c* in the bass before the subsurface tenth (*d/f-sharp*) enters on the second beat of measure 7. Embellishing this tenth on the musical surface is a descending stepwise motion filling in the tritone from *f-sharp* to *c*. This is followed by a skip up to *a* and back to *c* before the melody moves downwards to *g* in measure 8 via a set of unfolded thirds. Another descending fifth from *c* to *f-sharp* with a lower neighbour figure on the *f-sharp* occurs in the middle voice of measure 7, a retrograde inverted imitation of the descent from *f-sharp* to *c*. The *c* on which this motion begins accentuates the harmonic movement from IV to V as it is a common tone to both. Being prolonged throughout measure 7 by the descending motion to *f-sharp*, the real resolution of the *c* only occurs with the *b* of the middle voice in measure 8. The tritone descents referred to above are related to the fifth descent of measure 2 and thus a further manifestation of its development as an important melodic/motivic figure in the Aria’s theme.

The perfect authentic cadence in measure 8 is complemented by the *f-sharp-g* suspension figure in the top voice. This cadence also includes a voice exchange between the top and middle voices on the first and second beats of the measure. The lower line of this voice exchange is the result of the resolution of the *c* and *f-sharp* of the filled-in tritone in the middle voice of measure 7. After the cadence in measure 8, a linear motion from *d* to *g* in the left hand (another ascending fourth) acts as a link to the next phrase.

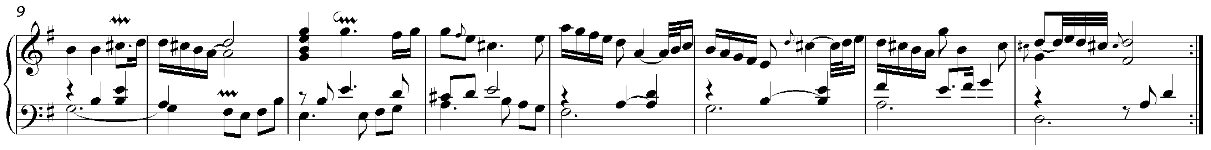

Figure 5.3.6: Measures 9 - 16

The second phrase of the first period is directed towards the dominant. It starts off with a suggested 5-6 motion in the voice leading of measure 9, changing the tonic harmony into a VI6 or II6 of D. This is followed by V4/2 of V and V6 (I6 of D) in measure 10. The final bass note (*b*) of measure 10 may be regarded as a fleeting occurrence of VI of D which, together with the raised fourth (*c-sharp*) of the V42/V harmony, provide sufficient evidence of D major having already been reached at this point in spite of the more contrapuntal nature of the harmonies involved. Therefore the seeming harmony of measure 11 (VI in G) already becomes II of D and is followed by V of D in measure 12. The harmonic structure of the remaining four measures of the phrase is I6 (measure 13), II6 (measure 14), V7 (measure 15) and I (measure 16). As already indicated earlier, it is important to note again that both the essential bass movement, and the harmonic progression of measure 13-16, correspond to those of measure 5-8.

Harmonically and melodically, the first two measures of the second phrase are somewhat similar to those of the first. In both instances the harmonic motion is from I to V6 whereas the melodic contour of measures 9-10 is derived from that of measures 1-2, first rising and then falling. It ascends from *b* to *e* in measure 9 (another filled-in fourth), followed by a descending motion from *e* to *a* and a leap of a fourth up to *d* in measure 10. Within the harmonic context, this motion should however be interpreted as an embellished set of unfolded thirds (*b-d/c-sharp-a*) with *c-sharp* resolving to *d*, and the *a* being retained in the middle voice. Against this motion, the bass moves from *g* (measure 9) to *f-sharp* (measure 10), embellished by a lower neighbour (*e*), before leaping up a fourth from *f-sharp* to *b*. While the bass descends from *b* to *e* at the start of measure 11, the melody ascends by a fourth to *g* which is prolonged throughout the measure, firstly by a broken E-minor chord and then by a lower neighbour embellishment. In measure 12 it continues to be prolonged by a motion down a tritone from *g* to *c-sharp*. This descent resembles that of measure 2, and more specifically of the upper and middle voices of measure 7. The fourth motion also plays an important part in the bass movement of measure 11-12 as it moves up from *e* to *a* in connecting II to V in D major.

The final melody note (*e*) in measure 12 leaps up a fourth to *a* in measure 13, followed by a descending filled-in fifth from *a* to *d* and a leap of a fourth from *d* down to *a* before moving to *b* in measure 14 via an ascending motion from *a* to *c*. Yet another descending fifth occurs from the *b* (the opening melodic note of measure 14) to *e*, followed by a leap of a seventh up to *d* which functions as an appoggiatura to *c-sharp*. The latter moves to *d* on the down-beat of measure 15 again via an ascending third to *e*. The melody line of measure 15 has a linear fourth descent from *d* to *a*, followed by another leap of a seventh up to *g* and a leap down to *c-sharp* via its lower neighbour (*b*). The phrase concludes with *c-sharp*, embellished by third motions and suspending the final *d* in the melodic line of measure 16.

On reviewing the melodic line of measures 13-16, one may note that there is again further development from earlier material. First, the fifth, fourth and third motions in measure 13-14 are inversions and rearrangements of those in measures 5-6. Measures 15-16 present descending and ascending fourth motions, the latter from *a* to *d*, interrupted momentarily by the high *g* which is a passing note between *a* and *f-sharp* in an inner voice, but displaced through register transfer. The perfect authentic cadence in measure 16 is further embellished by a 4-3 suspension in the middle voice which is derived from the passing note (*g*) having been brought back to its correct register by the inner-voice third motion from *e* to *g* in measure 15. The underlying melodic movement from measures 13-16 is also similar to that of measures 5-8 since it likewise presents an ascending motion from scale degrees 5 to 8 (*a* - measure 13, *b* - measure 14, *c-sharp* - measure 15 and *d* - measure 16).

The second period continues in D major (V of G major) with a brief appearance of I6 and IV6 of G in measure 19 before moving towards the relative minor (E minor) at measure 19. The latter is tonicised at the end of the first phrase by a perfect authentic cadence in measure 24. In the second phrase the music returns to G major via II6-I6-II-V-I (measures 25-29) and ends with the final perfect authentic cadence in measure 32. This period consists mainly of derivatives from the materials of the first period and therefore presents a process of further melodic-thematic development in its design.

Similar to the opening measures, the melody in measure 17 begins with a repeated note (*a*), followed by an ascending motion to *e*. The melody then immediately descends to *g* in measure 18, turning the *e* into an upper neighbour and suspension of *d*, and articulating the ascending and descending motions as a filled-in fourth and fifth from *a* to *d* and *d* to *g* respectively. The *g* of the descending fifth is transferred up an octave, and, in so doing, briefly restates the original *g* in the melody at the opening of the Aria. In measure 19 the melody moves to *e* via an appoggiatura *f-sharp* and then circles around the *e*. The *e* subsequently ascends up a fourth to *a*, again embellished by a circling figure. In measure 20 the melody proceeds downwards to *d-sharp*, partially filling in the tritone (*a-d-sharp*) in a manner similar to measure 12.

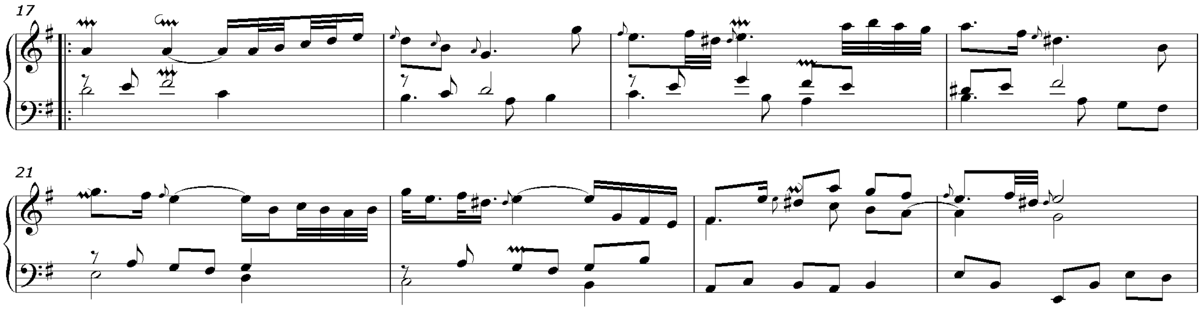

Figure 5.3.7: Measures 17 – 24

Measure 21 introduces the top *g* again as part of an upward leap of a sixth from *b*, the last melody note of measure 20. This is followed by a descending third from *g* to *e*. The same material is repeated in measure 22 with additional rhythmic and melodic variation incorporating some ideas from measures 4 and 8. Melodically these comprise a circling motion around *b* at the end of measure 21, two unfolded thirds embellishing the descending third and another descending third from *g* to *e*, an octave lower, at the conclusion of measure 22. In measure 23 a third (*f-sharp-e-d-sharp*) complementary to the one at the end of measure 22 is presented, but with *e* transferred up a seventh. This is followed by another third from *a* to *f-sharp* before the first phrase concludes with a circling motion around *e* in the E minor cadence at measure 24.

The bass of measure 17-18 produces a descending third from *d* to *b*, while the middle voice of measure 17 moves up a third from *d* to *f-sharp*. Another ascending third from *b* to *d* occurs in the middle voice of measure 18. At the same time, the *f-sharp* of the middle voice third in measure 17 resolves to *g*, the last note of the descending fifth in the melody of measure 18, in effect producing an ascending fourth from *d* to *g* in the middle voice over the span of measures

17-18. Further noteworthy features of the bass and middle voice in the left-hand accompaniment up to measure 24 include a descending third from *c* to *a* (measure 19), descending fifths from *b* to *e* and *e* to *a* (measures 20-21 and 21-23, respectively), descending thirds from *c* to *a* and *e* to *c* (measure 23 and 24-25, respectively), as well as circling motions in the middle voice of measures 21 and 22.

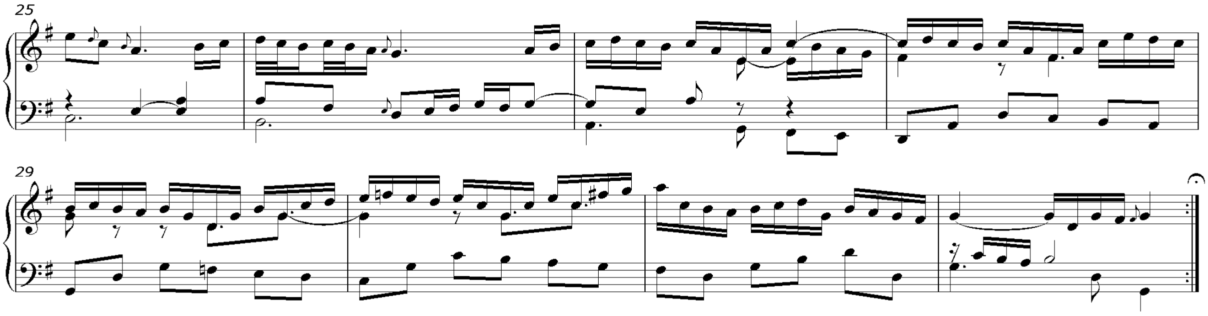

Figure 5.3.8: Measures 25 – 32

The second phrase of the second period begins with a sequential motion in the melody involving two descending fifths from *e* to *a* (measure 25) and from *d* to *g* (measure 26), connected by an ascending fourth from *a* to *d*. The first fifth resembles the one in measure 2, while the second resembles that of measure 4. The *g* is then linked to *c* in measure 27 by another ascending fourth motion. The c is embellished first by a circling figure, then a broken chord figure, and finally a descending filled-in tritone from *c* to *f-sharp* in the middle voice. The melodic motion of measure 27 is repeated in measure 28, but altered on the third beat to move to *b*. At this point, the inner voice also moves from *f-sharp*, the lowest note of the filled-in tritone, up to *g*. In measures 29-30, the melodic motion still continues in similar fashion with circling and broken chord figures embellishing *b*, a linear ascent to *e*, the same embellishments for *e*, and a link to *a*, the first note of measure 31. The underlying melodic motion for the final two measures (31 and 32) is a set of unfoldings (*a-c/b-g* and *a-f-sharp*), concluding on *g*.

Similar to measures 1-6, 9 and 13-14, the bass and middle voice present broken chord figures in measures 25-26 before the middle voice has an ascending fourth from *d* to *g*. In measures 27-30 each of the harmonies in a progression of fifths from II (measure 27) to V (measure 28) to I (measure 29) to IV (measure 30) are connected by filled-in descending fifths in the bass, each preceded by an ascending 1-5-8 figure. From measure 30-31 the bass fills in the tritone from *c* to *f-sharp* (IV-V6). In measure 32, the final measure of the Aria, the melody has *g* with a circling motion around *b* in the middle voice, followed by a broken chord motion back to *g* and a neighbour note (*f-sharp*) which suspends the final closing *g*. In the bass the closing tonic harmony is prolonged through a downward register transfer of *g* by means of a broken *g-d-g* motion.

In concluding this analytical strategy for the Aria from Bach's Goldberg variations, the main features of its tonal and thematic content can be summarised as follows: The overall design of the Aria is the result of a clear process of harmonic and thematic development emanating from both its ground bass and binary period construction. The essential features of the ground bass are its tonal and harmonic directives, the emergence of corresponding bass and harmonic patterns, as well as tonal parallelisms, and the role of melodic embellishments made to its elements in creating surface harmonic content. The binary period construction provides the framework for the tonal design which is realised in the ground bass.

The thematic design of the Aria not only grows out of the tonal design, but is the result of a continuous process of melodic/motivic variation and development. This process is based on specific melodic figures which can be traced to the ground-bass motion, but more specifically to the opening measures of the Aria's melodic line. The most important of these include third and fourth motions derived from the ground bass and the combination of an ascending third and descending fifth as the main melodic idea in the opening measures and in the Aria as a whole. Coupled with the processes of variation and development are devices such as inversion, retrograde inversion and imitation. Throughout the theme of the Aria, the melodic material of the opening measures is constantly revisited and re-fashioned. In the development of the melodic figures from these two measures, other important embellishing devices come into play, for example, circling motions, suspension figures at cadence points, unfolded thirds as part of sequential melodic patterns and filled-in tritones derived from the descending fifth figure of measure 2. All these features and devices in the Aria, coupled with its harmonic development and overall tonal and formal design, present a fertile situation for memorization by effecting coherent relationships and correspondences, as well as simplification in the processing of its compositional material.

5.4 Mazurka in A minor, Op. 17 No. 4: F Chopin[11]

In this analytical strategy for Chopin's mazurka, Op. 17, No. 4, the emphasis will be on the particular nature of its tonal structure, its formal design, as well as its thematic/motivic development and networking. A clear awareness of these elements and their interaction in this particular mazurka will be the key to understanding its compositional design and logic, and hence, the effective retention of its tonal processes.

The formal and tonal layout of the mazurka may be set out as follows:

	Measures	*Tonality*
Introduction	1 – 4	enigmatic on A minor
A – section	5 – 60	A minor
a1:	*5 – 36*	*A minor*
b:	*37 – 44*	V of A minor
a2:	*45 – 60*	*A minor*
B – section	61 – 92	A major
a1:	*61 – 68*	*A major*
b:	*69 – 76*	*A major*
a2:	*77 – 84*	*A major*
Transition:	85 – 92	A major
A – section	93 – 108	A minor
Coda	109 – 132	A minor

Although the mazurka is traditionally regarded as being in rondo form, the relationship between its tonal and formal design rather suggests a large three-part formal structure (ABA), corresponding to the large tonal articulation (A minor, A major and A minor for the respective parts). While the main tonality of the mazurka is A minor, the diversion to A major (the parallel major) from measures 61-92 results in a clearly delineated middle part. Some additional features of the tonal design are also noteworthy at this point. Whereas the A-major tonality of the large B-section is presented in a stable and static manner by a virtually consistent drone bass, the A-minor tonality of the two A-sections unfolds only gradually and is contrasted with a dominant centre for the middle part of the first A-section also stabilised by a pedal point in the bass.

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[11] Full score of the Mazurka in Appendix C

From the perspective of memorization, the complementing three-part tonal and formal plan of the mazurka enables the performer to link tonal and formal events to one another in a meaningful way. An awareness of this process of tonal and formal complementation together with the generative voice-leading content following from it will ensure the mazurka's effective retention by a performer.

The opening four-measure introduction provides a blueprint for the mazurka's thematic/motivic structure and tonal character. It can be described as an improvisatory and tonally indecisive passage based on crotchet repetitions of what seems to be a first inversion F-major chord (VI in A minor). Within this apparent F major chord the *b-c-d* passing- note figure in the middle voice of the three-voice texture of the introduction is of great thematic importance in the rest of the mazurka. It is presented three times, there being a slight variation in the last repetition when the *d* is embellished by an upper neighbour-note (*e*). After this, the introduction ends on the F major chord.

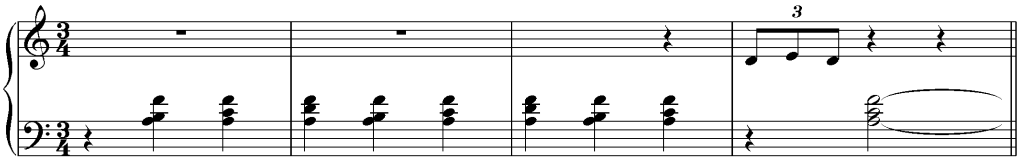

Figure 5.4.1: Measures 1 - 4

Section A is constructed using eight-measure phrases only. These operate in groups of two with the exception of phrase 5 (measures 37 to 44). Each group represents an antecedent/consequent structure. As will be seen from the detailed discussion of the content of the first of these corresponding phrases, all of them (again with the exception of measures 37 to 44) have the same harmonic and melodic basis. Harmonically, they are based on a progression of chords linked to a partial chromatic descending bass line from tonic to dominant. Each consequent phrase, however, has a closed tonal structure by ending on the tonic. The thematic content of each consequent phrase is continually embellished, producing, together with the consistent harmonic progressions, a kind of "variation" principle. This principle may prove valuable for memorization as it complements the associative system that is a constituent part of the memorization process. In addition, the fact that all but one of the phrases in section A contains the same tonal material, economises the memorization process by minimizing the amount of new material needed to be memorized to only the additional melodic embellishments. In fact, the same principle also applies to recurring form sections as a whole, where the only additional information for memory storage will derive either from changes in voice-leading detail, or from harmonic adjustments for the sake of the tonal plan of a composition such as in sonata forms.

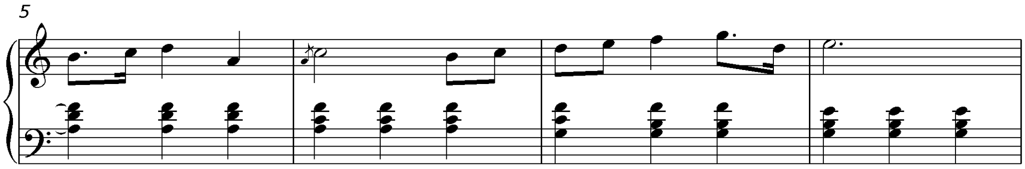

Figure 5.4.2: Measures 5 - 8

In the first measure of the first phrase, the F-major chord is changed to a seeming IV6/4 chord in A minor. This results from the movement of *c* to *d* in the middle voice of the left hand chord, while both the *a* and *f* are tied over. The accompanying figure in the left-hand still consists of crotchet chords with a change of harmony in each of the first four measures. The seemingly simple harmonies are IV6/4 (measure 5), VI6 (measure 6), VII7 with a 4–3 suspension (measure 7) and the dominant minor (V6) in measure 8.

The above-mentioned harmonies come about through the gradual changes in each individual voice of the measures 1-4 controlling the F-major chord. First, as already indicated, the middle voice (*c*) becomes *d*, then moves back to *c* in measure 6. This is followed by the bass (*a*) moving down to *g*, followed by *c* to *b* in the middle voice in measure 7, and finally by the top voice (*f*) moving down to *e* in measure 8. The surface harmonies are therefore the products of carefully planned alternating voice motions.

The resolution of the *f* in the left hand to *e* in measure 8 alters the perspective of the harmonic activity thus far, especially the function of the introductory F-major chord. A careful investigation of the voice leading of measures 1-8 will reveal that the initial *f* in the top voice of measure 1 is a suspension and the *e* of measure 8 the resolution. Within the main A-minor tonality of the mazurka, this changes the function of the F-major chord into a suspended A-minor harmony. However, when the resolution to *e* takes place, the *a* in the bass and *c* in the inner voice have already descended to *g* and *b* respectively causing a displaced resolution of the suspension, i.e., not within the expected A-minor tonic, but as part of the minor dominant in first inversion in measure 8. This dominant is preceded by the apparent V7 of C which turns out to be a 7/6 suspension of the minor dominant through the motion from *f* to *e* in the in the left-hand upper voice.

What has emerged from the analysis thus far is the importance of the displacement factor in the interaction of harmony and voice leading prevalent in this mazurka. Accordingly, a re-interpretation of the previous as well as subsequent harmonic content is necessary. Approached from this perspective, the introductory measures are a prolongation of the A-minor tonic chord through the suspension of its fifth (*e*). In addition to this, the ascending third motion in the middle voice is a type of circling figure around *c*, the third of A minor. In measures 5-8, the A-minor tonic is still avoided as a consequence of the continued presence of the *f*, but by correcting the displaced voice-leading motions, the end result for these measures is a motion from I to minor V6 (see figure 5.4.3).

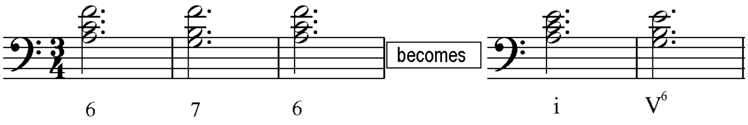

Figure 5.4.3: Harmonic reduction of measures 1 – 8

What then follows from measures 9-12, is a chromatic descending bass motion from *g* to *e* with a sequential voice-leading motion consisting of two 7/6 suspensions on *f-sharp* and *f* derived from the same suspension figure in measures 7-8. The phrase then ends with V7 in measures 11-12. Reducing the suspensions and the chromatic *f-sharp* during measures 1-12, the result is an overall harmonic motion from I to V7 with V6 and IV6 as diatonic passing chords (see figure 5.4.4).

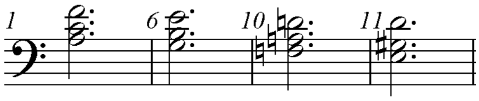

Figure 5.4.4 Diatonic passing chords of measures 1-12

This detailed discussion of the voice-leading content of the first 12 measures was necessary to emphasise the important difference between classification and interpretation in the process of analysis and memorization. The former serves to identify elements within the compositional process, while the latter discloses their true function within the compositional design. It also draws attention to the value of an in-depth investigation into compositional design as a means by which the compositional logic can be revealed. Therefore, although, for example, the labelling of the F-major first inversion chord is not entirely wrong as a preliminary classification, it is an incorrect interpretation within the tonal context and compositional design of the mazurka.

Turning to surface melodic details, the *d-c-b* voice-leading figure in the middle-voice of the accompanying chords of measures 5-8 is a retrograde of the *b-c-d* figure of the introductory measures. The effect of the *d-c-b* figure therefore changes from a seemingly random middle voice motion to a memorable figure because it can be associated with something similar in the introductory measures. It is this process of association with and development of a particular melodic motion or gesture that will be the focus of attention in the remaining discussion of this mazurka.

The right-hand melody of section A also begins with thirds (*b-c-d* and *a-c*). This pair of unfolded thirds occurs in measures 5-6 and is followed both by another third motion from *d* to *f* in measure 7, and a subsurface third line (*c-d-e*) found on the first beats of the melody in measures 6-8. This subsurface line represents the underlying melodic direction of measures 5-8 and also emphasises the underlying A-minor tonality.

The melodic motions of measures 9-10 are once again unfolded thirds descending within their sequential chromatic voice-leading motions. These unfolded thirds may be regarded as an inverted contraction of the opening thematic statement. The prolongation of V7 in measure 11-12 is effected by an ascending third figure (*g-sharp-a-b*) in the inner voice of the accompaniment and by a contrary motion from *b* to *g-sharp* in the melodic subsurface, forming a voice exchange pattern with the inner voice.

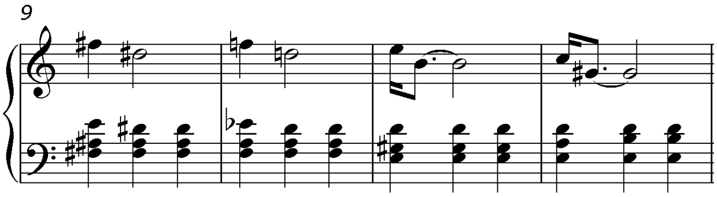

Figure 5.4.5: Measures 9 - 12

As already noted earlier in this discussion, the consequent phrases in section A are all varied versions of measures 5-12 via continued melodic embellishments. Therefore, the discussion of these phrases, in particular, the second phrase (measures 13-20) as a representative example, will focus mainly on the additional melodic embellishments to the melodic structure of the first phrase of section A.

The voice-leading content of measures 13-20 is almost the same as that of measure 5-12. The only exceptions are the first beat of measure 13, where *a* appears an octave lower in the bass and the final authentic cadence in measure 20. The *a* in the bass of measure 13 anticipates the first proper tonic in measure 20, while the *a-flat* in measure 14 inserts a chromatic passing harmony between *a* and *g*, as well as effecting a fully chromatic bass descent from I to V in the phrase.

In measure 13 the *b* in the melody is embellished by an upper neighbour followed by an ascending third line from *a* to *c* based on the third figure. This is followed by *e*, an appoggiatura to *d*. The embellishments of measure 15 (the equivalent of measure 7) comprise upper and lower neighbours of *d*, followed by a chromatic passing ascent from *d* to *a*, the latter being interrupted by an appoggiatura *b*. The *a* itself is an appoggiatura to the following *g*, followed by a passing note (*f-natural*) to *e*. Further melodic embellishments occur in measure 18 (the equivalent of measure 10) where the *f* in the broken third (*f-d*) receives a lower neighbour (*e*) and an upper neighbour (*g-flat*), itself preceded by its upper neighbour (*a-flat*) and a chromatic passing tone (*g-natural*). In measure 19 the *b* and *g-sharp* found in the melodic subsurface of measures 11-12 reappear with an upper neighbour to *b* and a register transfer of the *g-sharp* before the melody closes on *a* in measure 20.

As a result of the suspensions, chromatic inflections and melodic-harmonic displacements in the mazurka's voice-leading structure thus far, the A-minor tonality has merely been implied up to measure 18, and is only realised for the first time with the authentic cadence in measures 19-20. The following two phrases are a repetition of measures 5-20 with further melodic embellishments. These will not be dealt with here and are left to the reader for further investigation.

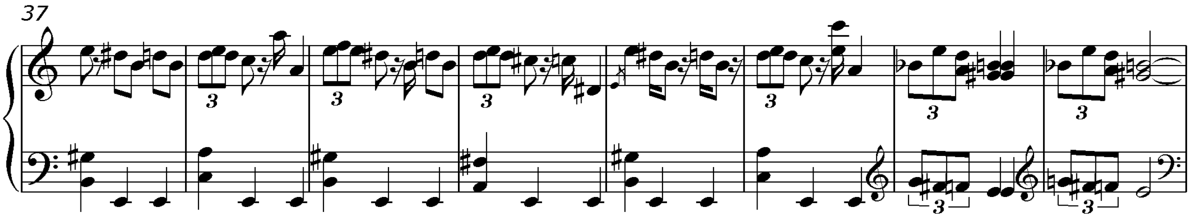

Figure 5.4.6: Measures 37-44

Measures 37-44 (the middle part of section A) consist of seemingly new and contrasting melodic and harmonic material. The dominant forms the harmonic background of this phrase and is intensified by suspension harmonies, for example, the 6/4 suspension of V in measure 38. The bass note *e* can be regarded as a pedal point which serves to maintain the dominant harmony throughout the phrase. In the left hand there are circling figures around *b* and *g-sharp* within the dominant harmony. The melody is made up of references to previous melodic figures. Measures 37-38 contain an inversion of the unfolded thirds (*d-b* and *c-a*) of measures 5-6. This movement is embellished in measures 39-40 by neighbouring motions and chromatic motions derived from those in measures 9-10. Measures 43-44 are two contracted repetitions of the essential voice leading of measures 9 to 12. At this point, the bass movement, following from the upper voice (*a*) of the left hand in measure 42, also resembles the overall bass motion of measures 5-12 in that the same partially chromatic descending motion from *a* to *e* can be identified. This leads into yet another repetition with further melodic embellishments of measures 5-20 in measures 45-60, ending with a *tierce di picardi* that concludes section A. At the same time, the A-major tonality of the large B-section or Trio is introduced.

As already noted at an earlier stage, the B-section or Trio is in the parallel major (a product of chromatic mixture) and also consists of eight-measure phrases with similar harmonic and melodic material. The A-major tonality of this section is characterised by a prominent tonic drone-bass fifth in the left hand accompaniment. Above this static drone-bass figure is a harmonic oscillation between I and V, suggesting a reference to the motions from I to V in the phrases of section A, but this time captured within the static A-major tonality created by the drone.

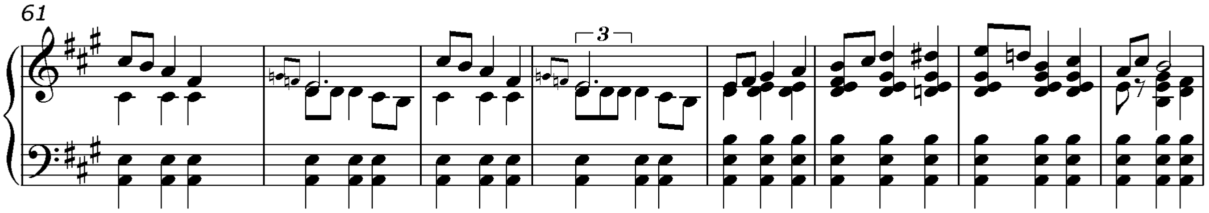

Figure 5.4.7: Measures 61 – 68

A significant further feature of this section is the subtle use of the initial unfolded third figure of *b-d* and *a–c* (*now c-sharp*) in what seems to be new contrasted melodic material. It is used in an inverted and retrograde form as *c-sharp-a* in the upper voice, imitated by *d–b* in a middle voice. The initial *f-e* suspension figure is also present as an appoggiatura figure in an altered form as *f-sharp-e* in the melodic line.

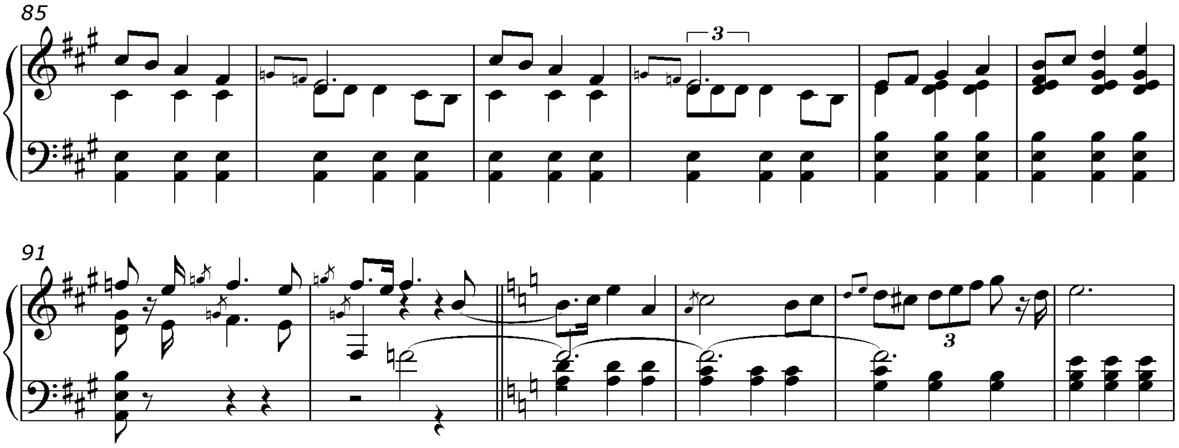

Figure 5.4.8: Measures 85 – 96

In contrast to the first four measures of this section, the next four measures have an ascending melodic motion and suggest V7 of A major. The melodic motion of measures 65-67 takes the form of an ascending scale passage created mainly by successive filled-in surface third motions. The drone-bass figure is then interrupted to form a half cadence with an *e*-octave in the left-hand part in measure 68. Also note the reversal of the opening descending third motions of measures 61-62 in the melodic line of measures 67-68 and further third lines in the inner voices of the right-hand part that leads to the next phrase in measure 69. The lower voice (*e-d-c-sharp*) in particular can be related to the subsurface *c-d-e* line of measures 6-8 as its inversion. Measures 69-76 are essentially a repetition of measures 61-68 with minor differences in surface details.

The *f-natural* on which the melody ends in measure 91 is the first indication of the return to the A-minor main tonality of the mazurka. Not only is it the lowered sixth-scale degree of A, but it immediately resumes its original function as a suspension of *e*, the fifth-scale degree of A minor with the return of section A in measure 93. The suspended *f* is prepared in the previous measures through its accentuation by means of dotted rhythms, acciaccaturas, neighbour embellishments and its octave doubling in the left hand. With the return of section A, the *f* is also sustained in the left hand from measure 92 until the end of measure 95 before resolving to *e* in measure 96.

The abridged recapitulation of section A essentially revisits measures 5-20 with a final melodic embellishment of measure 7 in measure 103 and with a top *e* covering tone placed over the melodic line in measure 107, the penultimate measure of the section.

The coda consists of two eight-measure phrases, the second being an embellished version of the first and extended for another five measures (measures 124-128). However, measure 124 is found to be both the end of the second eight-measure phrase and the beginning of its five-measure extension. Both phrases are built on a tonic pedal point which stabilizes the final A-minor tonality. In both the melody and inner voices there are descending chromatic motions up to measures 115-116 and 123-124 respectively where the opening melodic figure is presented again.

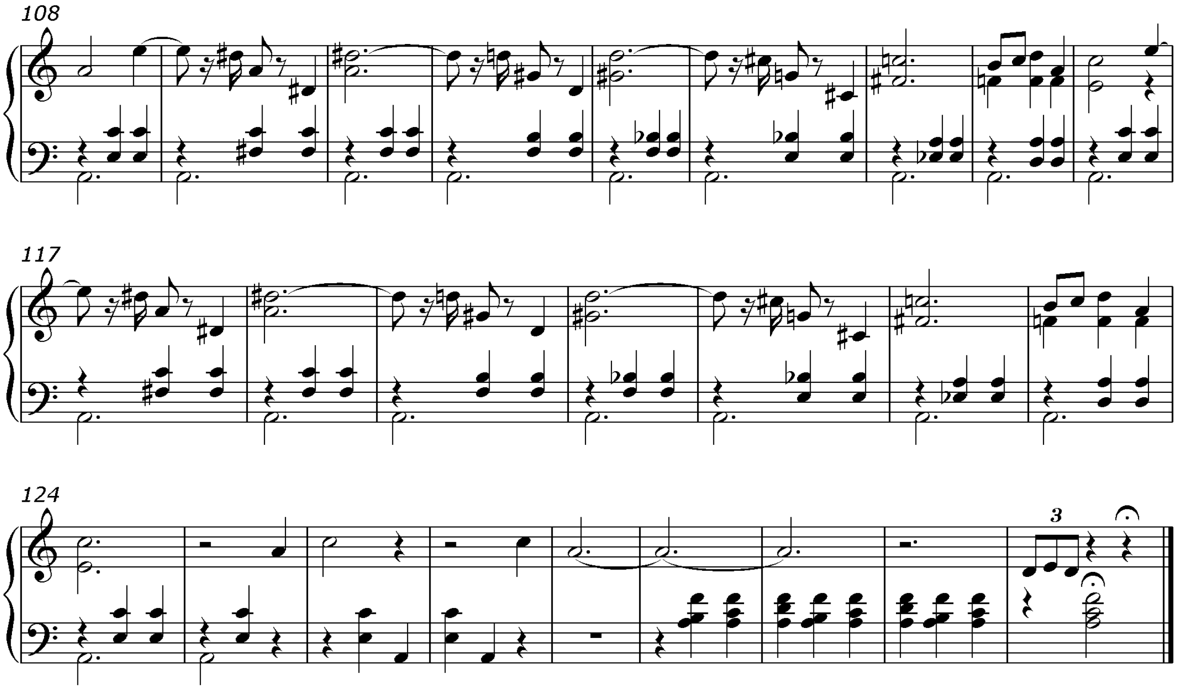

Figure 5.4.9: Coda

In the five-measure extension of the second phrase, the *a-c* motion of the second unfolded third in the opening thematic/motivic statement of the mazurka is presented three times, the last in inversion (*c-a*), signifying the final close of the melodic line on *a*. A similar imitating motion can be traced between the bass and top voice of the left-hand accompaniment of measures 124-127 where an initial movement from *a-c* inverts to *c-a*. The mazurka then ends with a repetition of its four-measure introduction in measures 129-132.

In closing this discussion, a few distinctive features of Op. 17, no. 4 deserve reiteration. The first and probably the most significant one in terms of melodic organization is the third figure, its principle presentation being in the unfolded thirds *b-d* and *a-c*. These figures unify the mazurka's melodic structure through their altered re-applications during the middle part of section A and in section B, and as part of melodic embellishments throughout.

The second important feature of Op. 17, no. 4 is the suspension figure (*f-e*), since it is integral to the understanding the opening measures. Both the suspension figure and the principle of voice-leading displacement are pivotal in establishing the mazurka's main tonal character. The interaction of these two features results in the underplaying of the main A-minor tonality in the A-sections. However, the situation is changed radically in the B-section where the drone-bass on A firmly establishes the contrasting parallel A-major tonality. The continued presence of the suspension figure in the voice leading also results in the utilisation of the A-sections' chromatic chord sequences. Chromaticism itself must be regarded as an important feature of the mazurka, not only in terms of its role in voice-leading embellishments, but also in terms of tonal and formal design, given that the A- and B- sections are tonally contrasted by means of chromatic mixture.

Finally, the principle of melodic embellishment plays a two-fold role in the compositional design in Op. 17, no. 4. Firstly, it is employed to produce varied melodic lines in the phrase structure which, by implication, presents a situation of material economy in terms of memorization. Simultaneously, the underlying logic of embellishments themselves is an aid to memorization through their association with and development of the mazurka's main melodic/motivic material.

5.5 Sonata in F minor, Op. 57, First movement: L van Beethoven[12]

The first movement of Beethoven's so-called Appassionata Sonata is unique in its compositional design in that it presents an unusually compact and economical tonal and thematic structure. At the same time, its extensive formal layout and textural details make it impossible to present a comprehensive account of all the voice-leading activities and embellishments within the scope and proportions of the present study. Therefore, only the exposition will be examined in detail as it contains the essential elements and features of the movement. Some additional observations will, however, be made about the nature of the development, recapitulation and coda. In terms of memorization, the high level of concentration and economy in the movement's tonal and thematic material presents the player with an immediate access to its extraordinarily clear design and simple logic, thereby making possible an extremely effective memorization process.

The first movement (*Allegro assai*) has the following main sections:

	Measures	**Tonal centre**
Exposition:	**1 – 65**	
First theme	1 – 24	I (F minor)
Bridge passage	24 – 34	
Second theme (first part)	35 – 50	III (A flat major)
Second theme (second part)	51 – 65	III (A flat minor)
Development	**65 – 134**	III-V of F minor
Recapitulation	**134 – 204**	
First theme	134 – 163	I (F minor)
Bridge passage	163 – 173	
Second theme (first part)	174 – 189	I (F major)
Second theme (second part)	190 – 204	I (F minor)
Coda	**204 - 261**	F minor

In view of the said compact tonal and thematic structure of the movement, it is important first to draw attention to its essential thematic/motivic content. This can be reduced to three basic devices: arpeggio-movements, neighbouring note figures and repeated notes (the latter, however, predominantly a feature of accompaniment passages). What this suggests, is that the voice-leading structure of the entire movement is created from these three devices alone. It will further be seen that the constructions of the main themes are also interrelated. Regarding tonality, there are five distinctive features in the movement's tonal design. First, I to V progressions underlie both the first theme and the first part of the second theme. Second, besides dominant prolongations extending half cadences during the first and second themes, they also form the harmonic background to the bridge passages. Third, mixture is applied to create tonal contrast between the two parts of the second theme and between the two phrases of the first theme in the recapitulation. Fourth, harmonic relationships half a step apart underlie the first two statements of the first theme and are juxtaposed against each other during the bridge and second theme. Finally, third relationships occur within the overall tonal progression of the movement through which the main thematic and formal divisions are delineated.

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[12] Full score of this movement in Appendix D

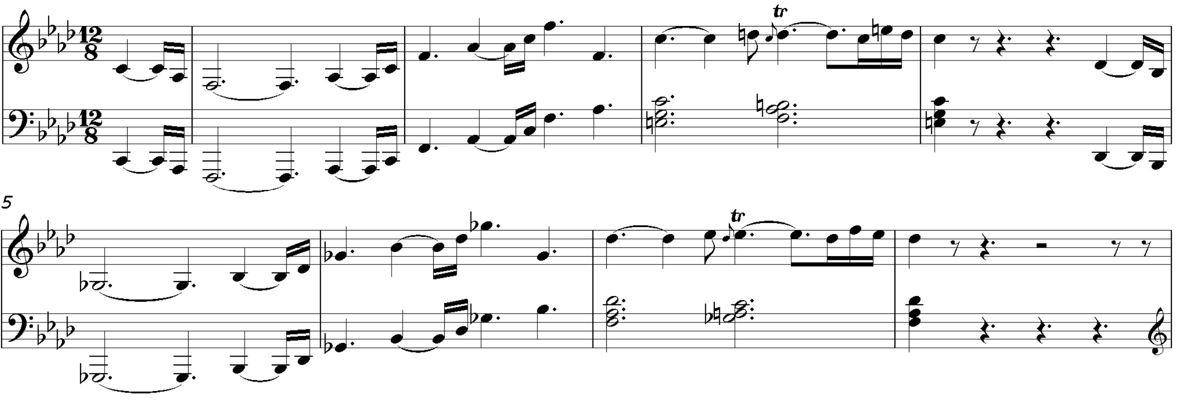

Figure 5.5.1: Measures 1 – 8

The tonal and melodic design of the first theme immediately offers two of the three melodic/motivic devices referred to above. In measure 1-2 the tonic chord is expanded through an ascending arpeggio movement, both hands playing in unison and two octaves apart. This unison movement changes on the last beat of measure 2 with a suggested I6 harmony (*a-flat* in the bass) and leads into an expansion of V6 through an embellishing diminished-seventh neighbouring chord (measures 3-4). The melody at this point embellishes *c* through an upper neighbour (*d-natural*) with a trill on the latter. Measures 5-8 are essentially a repetition of measures 1-4, but shifted up half a step to G-flat major (flat-II of F minor). The significance of this half-step relationship between the first two four-measure sub-phrases will become clear as the movement progresses.

Measures 9-10 are essentially a repetition of measures 3-4 with the left-hand accompaniment placed an octave higher. Also included, however, is the first appearance of an important motto figure in the bass, a neighbouring note *d-flat* repeated three times before resolving to *c* (V of F). This figure is derived from the opening pitches of the two four-measure sub-phrases, that is, the initial *c* (the upbeat to measure 1) and *d-flat* (the upbeat to measure 5), here presented in an inverted form. In addition, it is also related to the *c-d-c* melodic motion of measures 3-4. Measures 11-12 repeat the content of measures 9-10, but with a VII6/5 substituting V and a IV4/2 substituting the diminished-seventh neighbouring chord. These alterations permit the appearance of *d-flat* in an inner voice, enhancing the *d-flat* in the motto figure.

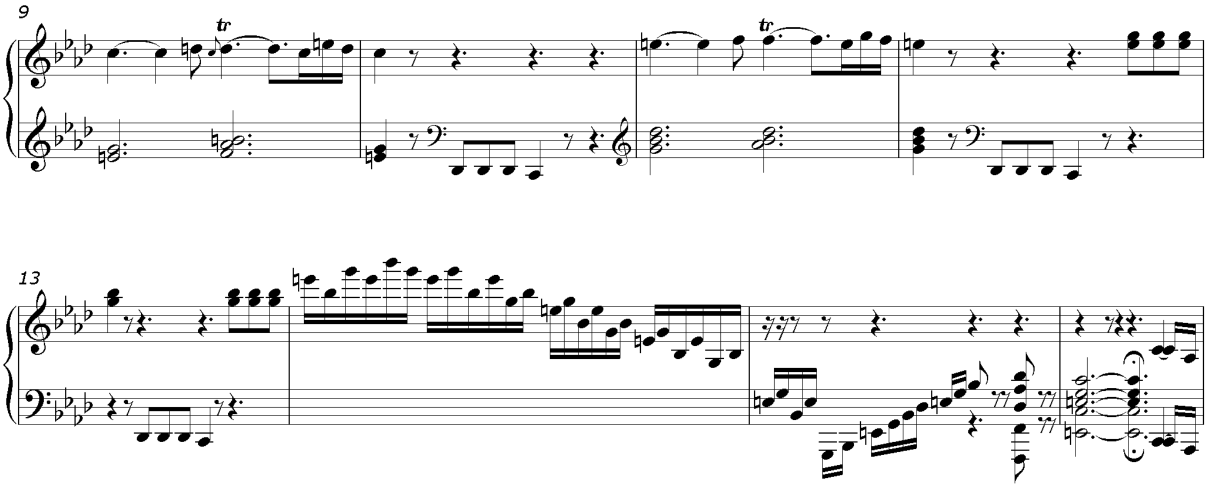

Figure 5.5.2: Measures 9 - 16

The dominant harmony is further prolonged throughout measures 13-15 with a third statement of the motto in measure 13. Measure 14 is the result of a two-part arpeggio movement (see figure 5.5.3). The phrase closes with an ascending arpeggio movement on a diminished 7th chord (the same as the VII6/5 in measure 11) moving to an accentuated first inversion chord on *f* with *d-flat* in the upper voice and finally resolving to V6 with *c* in the upper voice. The upper voice motion here represents a condensed version of the motto.

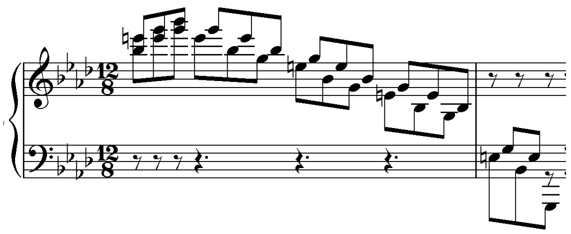
Figure 5.5.3 Two-part arpeggio of measure 14

A few additional observations on the harmonic content of measures 1-16 may be helpful. First, both measures 1-4 and 5-8 present an overall harmonic motion from I to V with both harmonies being prolonged over two measures in each case. Measures 9-16, on the other hand, represent a single phrase prolonging V throughout by means of an improvisatory expansion of the essential voice leading in measures 3-4. In the process, there is a gradual ascending sub-surface upper-voice motion arpeggiating V7 from measures 9-13, followed by the already mentioned descending double arpeggio figures from measures 14-15.

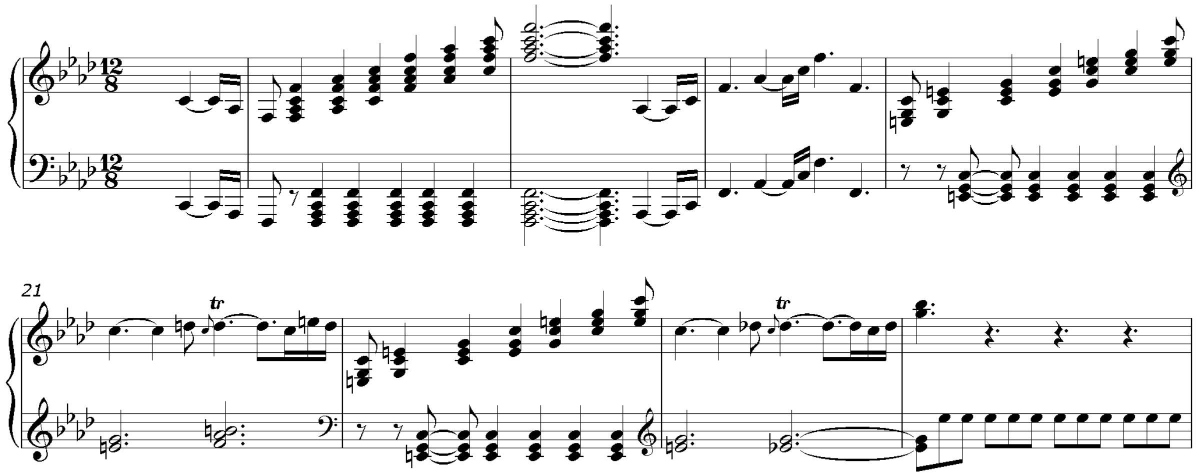

Figure 5.5.4: Measures 16 - 24

The next phrase, commencing on the upbeat to measure 17, is an expanded version of the content of measures 1-4 thereby again presenting the essential melodic and harmonic material of the first theme. The expansion is, however, in the form of three interpolations, each occupying the space of one measure, through which the continuity of the first theme is interrupted. These consist of alternating block-chords in the left- and right-hand parts, emphasizing both the tonic and dominant harmonies of the passage and presenting an additional layer of arpeggiated motion in the right-hand part. In measure 23, the V6 retrospectively becomes not only a chromatic passing harmony between I and VII (V/III), the concluding harmony of the first theme – but also the beginning of the bridge passage. The subtle and unexpected harmonic shift from V6 to VII is brought about by contrary motion in the outer voices, the bass moving from *e* (*f-flat*) to *e-flat* and the upper voice from *c* to *d-flat*. This relates directly to the motto in that both voices comprise semi-tone movements, the bass being a transposed version and the upper voice its inversion.

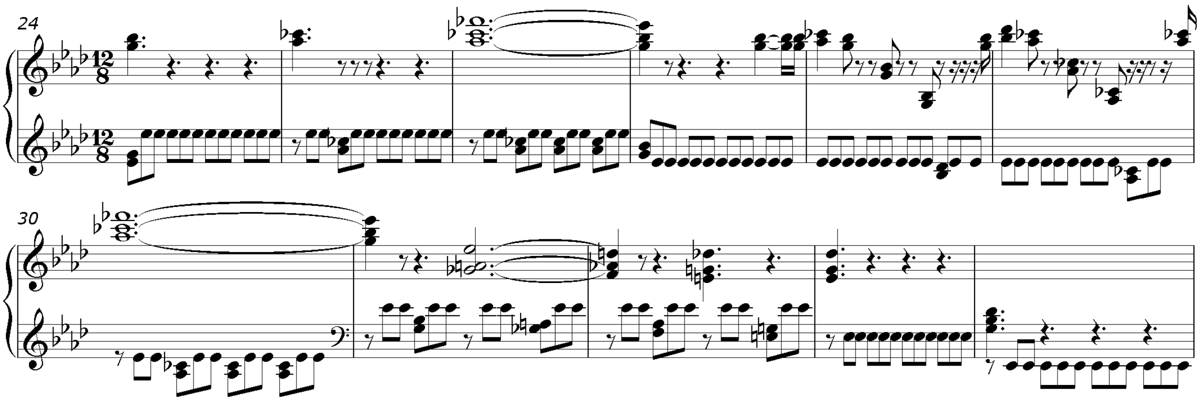

Figure 5.5.5: Measures 24 – 34

The bridge passage (measures 24-34) is built on and prolongs VII of F minor or V of A-flat major (III). This idea of prolonging the dominant of A-flat has its parallel in the prolongation of V of F during measures 9-16. In its tonal and formal positioning, by linking I to III and effecting a transition from the first to the second theme, the prolonged V intensifies the expected harmonic resolution to III and the arrival of the second theme. Of further importance in this process are the numerous neighbouring figures in the upper voices set against an almost uninterrupted repetition of the dominant scale degree that fluctuates between an inner voice and the bass. These fluctuations can be traced to the repeated *d-flats* in the motto. Particularly noteworthy are the two *f-flat* major triads juxtaposed against the *e-flat* dominant area, but also against the local dominant decorating *a-flat* minor triads in the left hand in measures 26 and 30. These are related to the condensed motto, that is, the motion from flat-6 to 5 in the upper voice. They also have a parallel with the final harmony of measure 15 where a similar upper-voice motion concludes the first 16-measure phrase.

From measures 31-34 the voice-leading motion results in a succession of chromatically descending diminished chords, and then ends on V7 of A-flat major. With this motion, there is a return to the original register of the opening of the movement in which the second theme begins. Finally, a significant melodic relationship can be found between the end of the bridge passage and the beginning of the second theme. The seventh in the upper voice of V7 (*d-flat*) which already appeared at the beginning of the prolongation of V of A-flat in measure 23, is seen to resolve to *c*, the starting note of the second theme. Not only are these pitches the same as those of the motto, but it is interesting to note that in the course of the bridge, the *d-flat* is actually repeated three times in the upper voice as part of the dominant (measures 23, 33 and 34), before finally resolving to *c* at the end of measure 35.

As mentioned earlier, the second theme introduces the relative major of F minor (A –flat major or III). Its first part is melodically and rhythmically related to the first theme. In contrast to the first theme, however, the melody is presented virtually within the confines of a single register. This is the result of broken or unfolded thirds in the melodic line. As with the first theme, the first part of the second theme is also fragmentary in nature. It is presented in a brief and curious antecedent/consequent phrase structure consisting of four measures each, with an authentic cadence at the end of the antecedent phrase and a half cadence at the end of the consequent phrase. The repetition of the theme in the consequent phrase is also an octave higher thereby creating a situation similar to that in the first theme where the melody line extends over two registers. The first part of the second theme has an accompaniment figure in the left hand which can be related rhythmically to both the interpolated chords of measures 17, 20 and 22 and to the note values of the repeated dominant in the bridge. Contrary to the first theme where the sole function of the left hand is to double the melodic line and to punctuate the main I-V structural harmonies, this accompanying motion drives the theme's harmonic movement. As in the first theme, the first part of the second theme also moves from I to V, but in A-flat major.

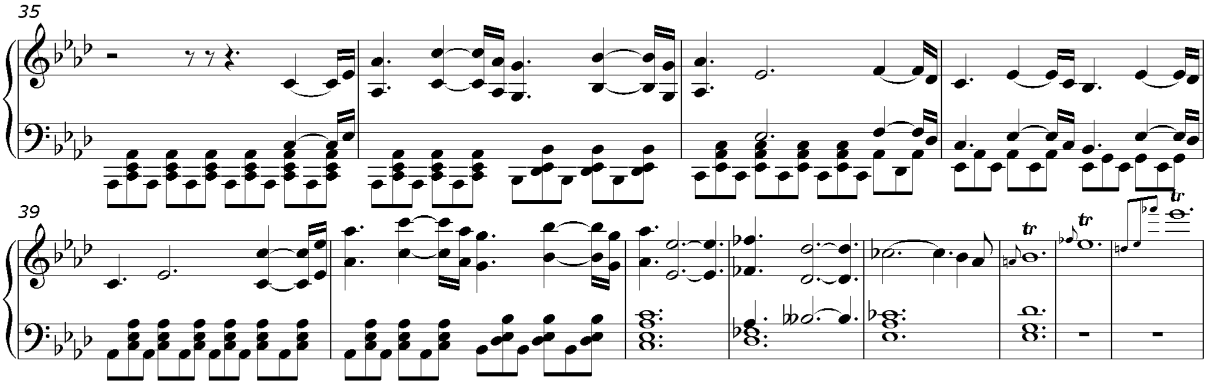

Figure 5.5.6: Measures 35 to 46

The harmonic motion of measures 35-39 can be described as I (measure 35) to V 4/3 (measure 36) to I6 (measure 37) to IV (measure 37) to V6/4 – 5/3 (measure 38) to I (measure 39). In the process an ascending linear bass motion from I to V occurs from measures 35-38. With the repeat of the theme in the consequent phrase, the harmonic movement is initially the same, but changes in measure 42 to a Neapolitan 6th (flat-II of A-flat) as a result of a 5-6 motion above IVb3. The flat-II6 is a reference to the flat-II area of measures 5-8) and is followed by V which is embellished by a cadential 6/4. The flat-II-V motion sets up the A-flat minor tonality of the next phrase and the second part of the second theme. However, the dominant at this point is again prolonged for several measures by means of trills in which the pitches of the motto are reflected, especially *f-flat* and *e-flat*. Both trills may also be interpreted as condensed versions of the *c-flat* to *b-flat* and *f-flat* to *e-flat* suspension figures found in the bridge. This is followed by a melodic link in the form of a succession of thirds filling in a diminished seventh within V of A-flat minor. At the end of the melodic link and the prolongation of V, *b-flat* and *e-flat*, the main notes of the two trills, are punctuated as the melodic motion moves into the bass register in preparation for the resolution to the A-flat minor tonic and the second part of the second theme.

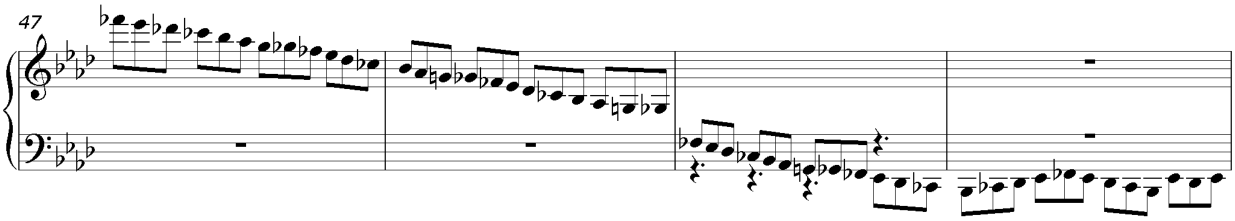

Figure 5.5.7: Measure 47 – 50

As one looks more closely at the relationship between the melody and bass in the first part of the second theme, one notices that the unfolded thirds in measures 36-37 and 40-41 produce a descending third line in the upper voice from *c* to *a-flat* against a contrary motion from *a-flat* to *c* in the bass, thereby also creating in a voice exchange between the bass and upper voice. Another voice exchange between the melody and bass occurs in measures 37-38, filled in by contrary stepwise motions (*e-flat - d-flat - c* in the melody and *c - d-flat - e-flat* in the bass). The two voice-exchange patterns call for a specific structural articulation of the ascending bass line from I to V, namely, a succession of two thirds which emphasises the underlying arpeggiation pattern of the bass. From the point of view of motivic melodic connections, it is fascinating to observe that, were the bass arpeggiations in the antecedent/consequent phrase laid bare, it would produce a melodic motion similar to the opening melodic gesture of the movement.

The A-flat minor tonality of the second part of the second theme is the result of a chromatic mixture. The accompanying figure of the first part of the second theme is now altered to broken chord figures. The right-hand part engages with this accompaniment by also using broken-chord figures. Melodically, it consists of arpeggiated motions, repeated notes and descending filled-in thirds set against the repeated notes. The third motions are derived from the thirds in the melody of the first part of the second theme. The melodic motion is thus based on the A-flat minor chord of measure 51 with *a-flat – c-flat – b-flat – a-flat* as the main melodic elements. A sequential repetition a sixth higher occurs in measure 52 within flat-VI of A-flat minor, followed by flat-II with a tremolo third figure in the melody and a motion to V through contrary outer-voice movement that arpeggiates a diminished seventh. At the conclusion of this motion in measure 54, the motto appears in the bass, using the notes *f-flat* and *e-flat*, but with an extra repetition of *f-flat*. The harmony used on the repeated *f-flats* is II43 which resolves to V7 on the *e-flat*.

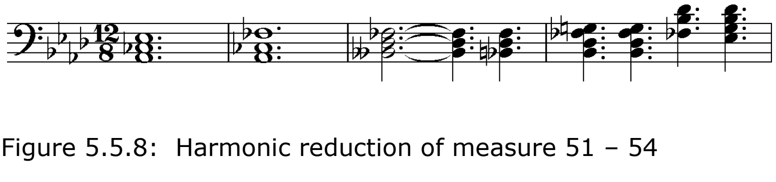

Figure 5.5.8: Harmonic reduction of measure 51 – 54

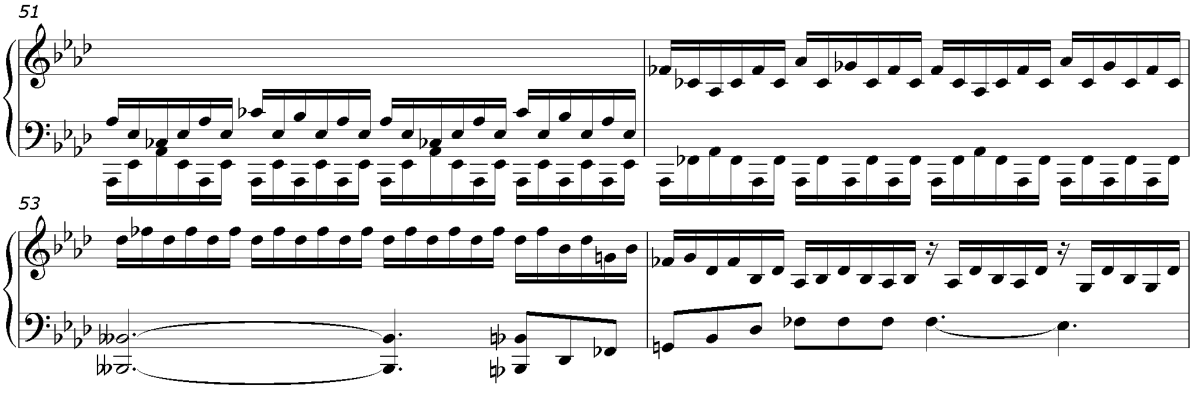

Figure 5.5.9: Measures 51 – 54

Measures 55-59 essentially repeat the content of the previous four measures an octave higher with the left-hand arpeggiated diminished seventh now moving in octaves. Measure 59 has the motto in condensed form with *f-flat – e-flat* appearing twice, first in the lowest part of the right hand and then in the bass. This is followed in measure 60 by an ascending arpeggio on VII7/V leading to V and a closure on I in measure 61. The diminished seventh here plays a structural function similar to the ones in measures 3 and 9. Measures 61-65 are an improvisational codetta in which tonic A-flat minor is embellished through arpeggiated, linear and tremolo motions placed in different registers. The codetta ends with the opening melodic figure of the movement in the bass with accompanying arpeggiated figures in a high register in the right-hand part.

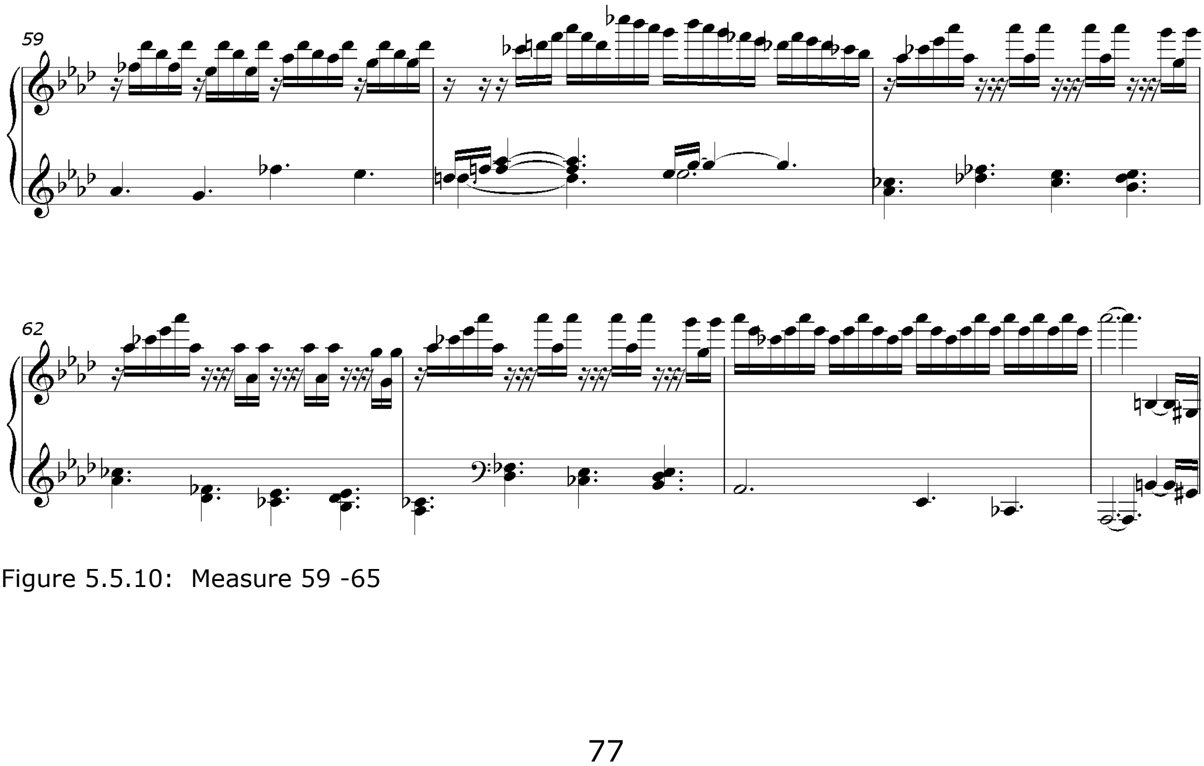

Figure 5.5.10: Measure 59 -65

Beethoven, having reached the end of the exposition, one might have expected him to indicate its usual repetition. Instead, he immediately continues with the development section in measure 66, starting with a reference to the opening theme of the exposition in the form of an arpeggiated second inversion triad still in A-flat minor. This curious start, instead of the expected arpeggiated root position triad, must be seen as a momentary delay of the actual first theme which appears in E major on the upbeat to measure 67. The reason for not repeating the exposition is that due to mixture, the A-flat minor tonality of the second part of the second theme is too far removed from the main F-minor tonality of the movement to allow a direct return to it. With the immediate commencement of the development, the music continues from III to V at the end of the development, thus producing a large-scale I-III-V structural bass motion which mirrors the essential arpeggio layout of the movement's melodic structure.

From the point of view of design, the distinguishing feature of the development is that it actually presents an elaborated repeat of the exposition, i.e., there is a similar layout of first theme, bridge and second theme, the latter, however, without its second part. Furthermore, the idea of thematic development is limited mainly because of the simple and similar nature of the two themes of the exposition. The first theme is repeated several times, alternating between the left- and right-hand parts and presented in successive key areas in descending major thirds. There is then an equal division of the octave of A-flat (A-flat, E/F-flat, C, A-flat), once again allowing for a large-scale arpeggiated bass motion. The final A-flat of this motion becomes the underlying harmony for the bridge (V of D-flat major). The second theme then follows in D-flat major, the antecedent of which is repeated three times, each time a third lower (D-flat, B-flat and G-flat, respectively). Collectively, these last three pitches represent the same pitches as those of the flat-II harmony in measures 5-6.

The development section ends on V of F minor with several dramatic statements of the motto figure emerging from layers of arpeggiated diminished sevenths on *d-flat*, the upper neighbour of *c*. This is followed by repeated *c*'s forming a dominant pedal point above which the recapitulation of the first theme is brought in. As a result, the first theme is based on V rather than on I as expected. After the customary adjustment in the tonal plan of the exposition in the recapitulation, the latter ends in measure 204 in F minor, followed by a large coda which can be characterised as a condensed second development section, again featuring prominent melodic/motivic and tonal derivations.

One last observation concerning the recapitulation: As part of the adjustment of the tonal design in order for the music to end in the tonic, Beethoven already introduces in the major quality of the first part of the second-theme 17 measures into the recapitulation at the harmonically reinforced statement of the first theme (measure 151). This surprising movement to tonic F major and its brightening tonal effect before the start of the second theme is probably attributed to the enormous tonal tension provided by the dominant's prolongation and the repeated dominant pedal point underlying the entire first 16 measures of the recapitulation. It is also a reminder to the player that measures 151 and further are not quite similar to the analogous place in the exposition.

The coda is cast in two parts. The first consists of brief successive statements of the first and second themes (here again only the first part of the latter) before moving into a cadenza-like flourish of arpeggio movements starting on flat-II and ending on V. Consecutive statements of the motto conclude the first part of the coda. The second part of the coda has an extended presentation of the first part of the second theme, followed by alternating repeated chords derived from those in measures 17-22 and from the corresponding place in the recapitulation. The movement closes with the final statement of the first theme that spans five octaves. The final tonic harmony is set out as a root position triad with the third and fifth presented as a tremolo figure similar to one at the close of the codetta, the root being repeated five times in the bass. These activities are then consolidated into a single vertical F-minor triad in which the primary melodic and tonal motions of the entire movement are encapsulated.

For memorization purposes, the exposition of the first movement of Beethoven's Appassionata sonata may be broadly mapped as follows:

Measures 1-4: Arpeggiated first theme on I, moving to V6, prolonged by a neighbouring-note trill and a diminished seventh neighbour harmony.

Measures 5-8: Repeat of measures 1-4 a semi tone higher on flat-II.

Measures 9-16: An improvisatory section prolonging V, using the same devices as in measures 3-4 with added arpeggiated motions and including the motto figure.

Measures 17-24: An extended repetition of measures 1-4 with three interpolations (measures 17, 20 and 22) consisting of arpeggiated block-chord motions, the phrase then ending with a motion to flat-II of A-flat major (III of F minor).

Measures 24-34: The bridge passage in which V of III is prolonged through repeated dominant notes, neighbour notes and harmonies derived from the motto.

Measures 35-50: First part of the second theme in an antecedent/consequent phrase structure with authentic and half-cadences respectively; the thematic material derived from the first theme, but with added unfolded thirds and a chordal accompaniment presenting passing harmonies between I and V through an ascending stepwise bass; the cadential V of the consequent preceded by flat-II6 in measure 42, a 6/4 suspension in measure 43, and prolonged from measures 44-50 by trills based on both the motto and a chain of descending thirds filling in a diminished seventh functioning within V.

Measures 51-65: Second part of the second theme and codetta with arpeggiated chord movement in both hands, the right hand also containing third motions and repeated notes, while the harmonies comprise I-flat-VI6-flat-II-V with an arpeggiated diminished seventh inserted between flat-II and V; contrary motions between the left and right hand parts, also displaying the motto; V prolonged from measures 58-60 through neighbouring harmonies resulting from the motto, and a close on I in measure 61; I prolonged until measure 65 by arpeggiated figures, neighbouring and passing harmonies; the passage ending with the opening of the first theme in the bass, accompanied by arpeggiated chord figures in the right hand.

CHAPTER 6

Conclusion

Deutsch (1977: 95) has stated the following regarding musical memory:

> It is clear from general considerations that musical memory must involve a highly complex and differentiated system, where information is retained simultaneously at many levels of abstraction.

Musical memory is not only a key component of all musical activity, but also a highly intricate system. The present study acknowledges its complexity and therefore has endeavored to arrive at a better understanding of this multifaceted system with respect to the process of musical memorization.

The investigation into the processes associated with human memory has revealed certain aspects regarding the way in which the memory system operates. It clarifies why tactile, visual and aural aspects of memory are frequently unreliable, since they are regarded essentially as sensory memory that can only be stored in the short-term memory, provided that there has been the requisite degree of attention paid to the sensory input. These aspects of memory are not unimportant or unnecessary. Rather, as sensory memory they form an important basis of information that initiates memorization via the encoding process. Once this sensory information connects with the working memory, it is automatically categorized as either familiar or unfamiliar, since working memory is fed by information from the long-term memory. The human brain organizes information by identifying similarities and differences, thereby creating a frame of reference. If the information from the sensory memory corresponds to a known pattern, it can enter the long term memory system more readily and aid the storage of material.

The storage of information within the long-term memory therefore depends on the contextual nature of the memory system. Accordingly, the system classifies information either by acknowledging its relation to other information or by its uniqueness in terms of other information. Via this associative method, not only is meaning attached to information which is essential to the storage process, but it also has a maintenance function within the memory system. Dubuc (2002) therefore suggests that the context should always be acknowledged when one processes information for memorization purposes. The concept of elaborative encoding is important as it proposes that information should be classified in terms of the context in which it exists. It also suggests the use of multiple patterning or associations with a variety of frameworks for a single concept. According to Caine and Caine (2003 – 2005) this context can be identified by applying inductive or deductive reasoning.

As the brain automatically determines interconnectedness and separateness (Caine and Caine 2003 – 2005), it categorizes the sensory information in the same way that analysis organizes musical data. Therefore, a clear correlation exists between these principles and those of musical analysis as analysis essentially creates a context by describing the components and their function within the structure of a musical composition.

Schenkerian analysis, perhaps more than any other available analytical system or approach, identifies the distinguishing features of a composition in terms of their relation to other such features. This is achieved by applying the concept of hierarchical levels of structure created through elaboration or reduction that may be regarded as inductive or deductive processes. It is therefore the associative nature of Schenkerian principles that ensures the value of the method for memorization purposes. Through the identification of relationships within the structure of a composition, its compositional logic and structural coherence are exhibited. This, in turn, may act as a frame of reference for individual elements of activity within the composition.

The correlation between analysis and human memory – in the present instance, the characteristics of both Schenkerian analysis and human memory - form the basis for the proposed analytical strategies whereby the process of memorization can be made more efficient. The first strategy of analytical classification is essentially a decoding action leading in turn to a process of encoding. Classification is a way of identifying the material that is used for the construction of a composition. As can be seen from the four case studies, it does not merely identify the components, but classifies the material in terms of its relation to other material. It aids the encoding process because the information is already associated with a particular frame of reference. The compositional design can therefore be determined when the interconnection between various aspects of the material identified is established. This is closely tied to the third strategy of compositional logic where the latter is determined by revealing the function of the said aspects and their associations within the compositional design. These strategies have both a storage and maintenance function, and provide cues for the retrieval of information. Both the uncovering of the compositional design and its logic depend heavily on the fourth strategy of analytical interpretation, namely the interpretative process that is crucial for establishing an analytical context within the music that provides explanations for the use and specific functions of the material within a composition. Pearsall (1999: 233) highlights this function by concluding that:

> Analysts, then, not only *describe* ways of hearing music, but also *create* them, in a sense, by inventing categories which make music more comprehensible.

Emphasis is on the interactive and interdependent nature of these strategies during their application. Although classification may be the starting point for the analytical process, the compositional design and logic may require a re-classification of certain parts as was seen for example in the introductory measures of the Chopin Mazurka. This re-evaluation and re-classification of material is not unnecessary, for it is beneficial to both the composition's significance and the memory system. Accordingly, material can be classified in terms of the context in which it exists which, in turn, will ensure better retention. Both the processes of elaboration and reduction are therefore necessary to establish the context or design of a composition. As in Schenkerian analysis, it is often the process of reduction whereby underlying or essential components are identified, but through the elaboration of these components the logic behind their application and function can be determined. The processes of elaboration and reduction are also interdependent and interactive in the course of analytical interpretation.

The application of the four strategies to the four case studies revealed their value for memorization. As the first process entails classification, not merely for identification, but for the sake of association, it economizes the amount of material from which the composition is constructed. This is achieved by relating components and therefore minimizing the amount of “new” material to be memorized. The associative element of classification, however, also reveals the distinctive design features of a composition by exposing the musical material and its development throughout. The purpose is three-fold: First, it reveals the compositional logic behind the arrangement of the material; second, it highlights the composition’s unique design features; and third, it provides a frame of reference for memorizing individual components.

It is both compositional design and logic that aid the effective retention of material in the memory system. In tracing these elements in a composition by means of classification and interpretation, the analyst becomes part of the creative or compositional process. It is this possibility that sets these analytical strategies apart from traditional analytical thinking and contributes to the effective retention of the encoded material.

The four case studies thus aimed at a practical application of the proposed analytical strategies within an informal Schenkerian analytical context. The aspects focused upon included tonal and form design, harmony and voice-leading structures, and thematic/motivic content and development. The case studies typically commenced with the identification of the form of a composition so that an analyst/performer might acquire an overview of the organization of phrases, sections, thematic material and tonal structure. The composition is thereby placed within a familiar framework and creates a context within which the musical activities can be classified, interpreted and committed to memory. Material is identified in terms of design, application, function, context, logic, development, derivation, relation and coherence. In the pedagogical situation, the use of these strategies will not only improve memorization, but will also assist in promoting the practical application of theoretical knowledge to this end. The case studies also demonstrated the ability of effective analytical strategies to create meaningful contexts and interpretations of material, as well as to determine the rationale behind their application and function.

In Mozart’s Minuet, K.5, the strategies revealed a clear relationship between formal structure and harmonic/melodic design, while in the Aria from Bach’s

Goldberg Variations, tonal design and thematic development were generated from its ground bass and specific melodic/motivic elements. In Chopin's Mazurka, Op. 17, no. 4, the true nature of its tonal and thematic design was accurately determined, while in the first movement of Beethoven's Appassionata sonata, economy of tonal design and motivic/thematic material was revealed.

The four case studies have illustrated how appropriate the proposed analytical strategies are for the memorization process. The analytical performer is thereby enabled to understand a composition in terms of its distinctive features of structure, content, design and logic. The strategies also increase the level of interaction with the music, and in doing so optimizing its memorization since this derives from the knowledge, understanding and accurate classification and interpretation of structures and content.

One may reasonably conclude that given that the functioning of most musical activities depends on the human memory system, the present study has shown the value and purpose of developing effective intellectual analytical strategies as aids to memorization. Their successfull application serves both musician and music.

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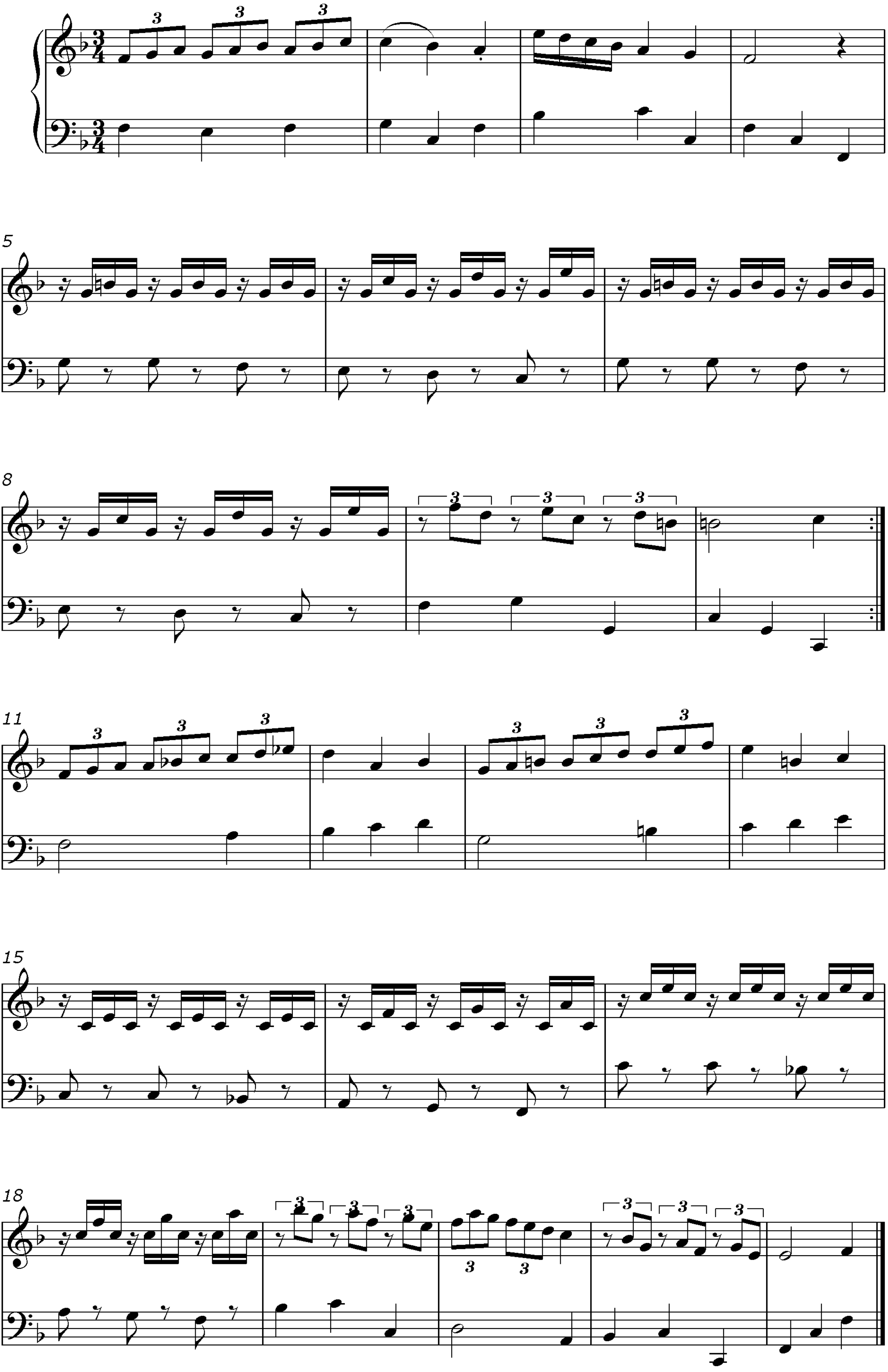
Minuet in F, KV 5

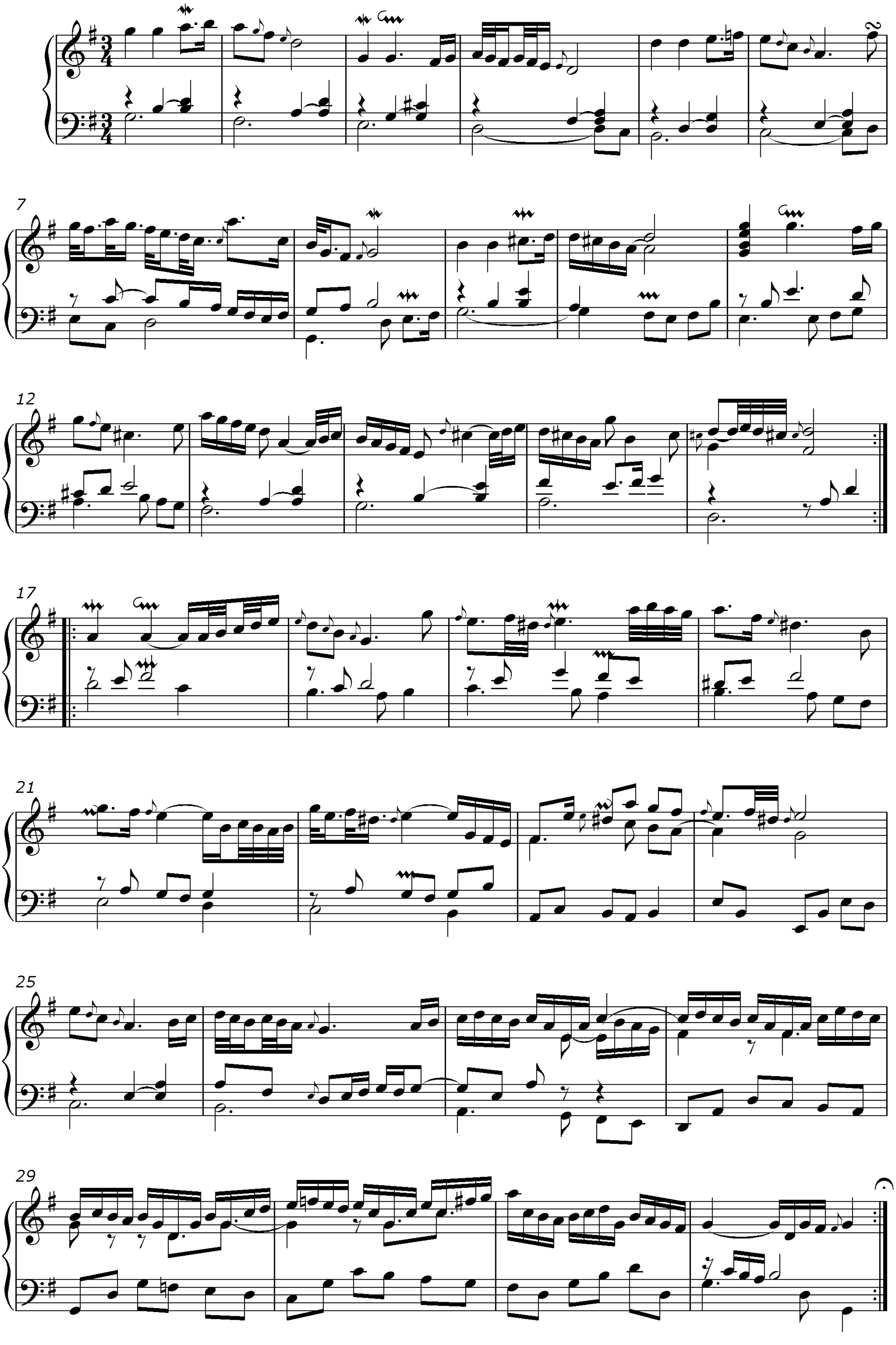
WA Mozart



Appendix B

Aria from the Goldberg Variations

JS Bach



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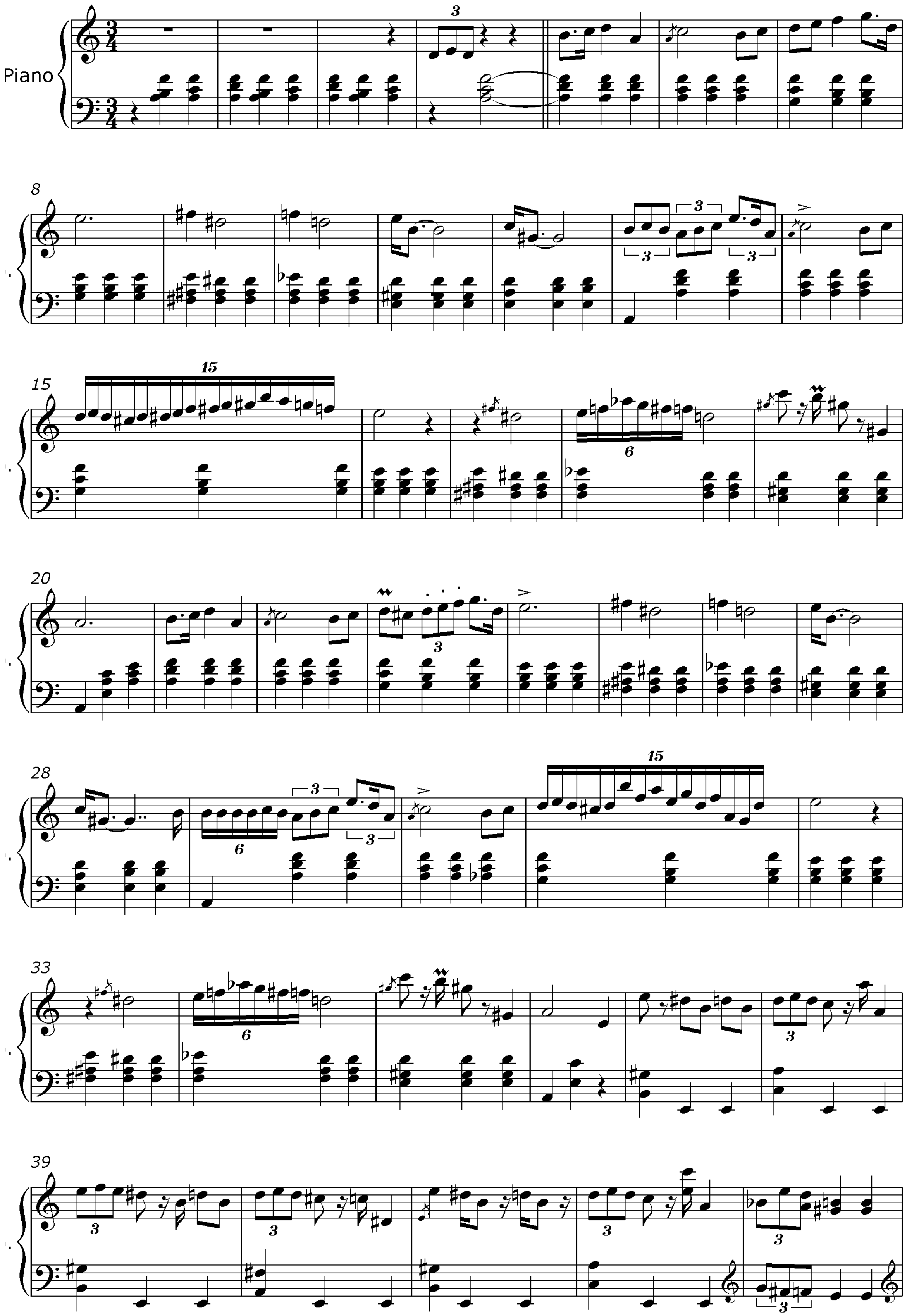
Appendix C

Mazurka, Op. 17 no. 4

F Chopin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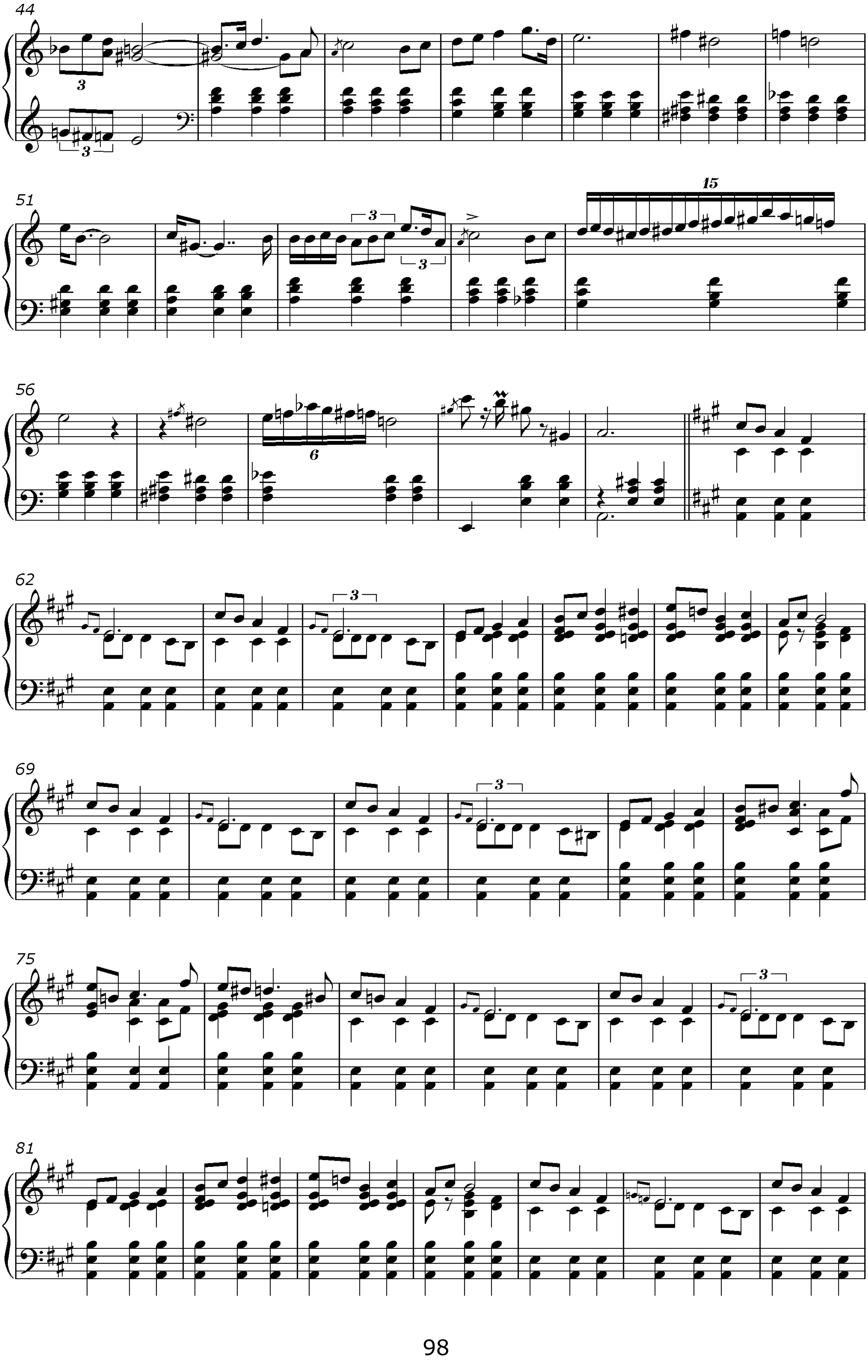
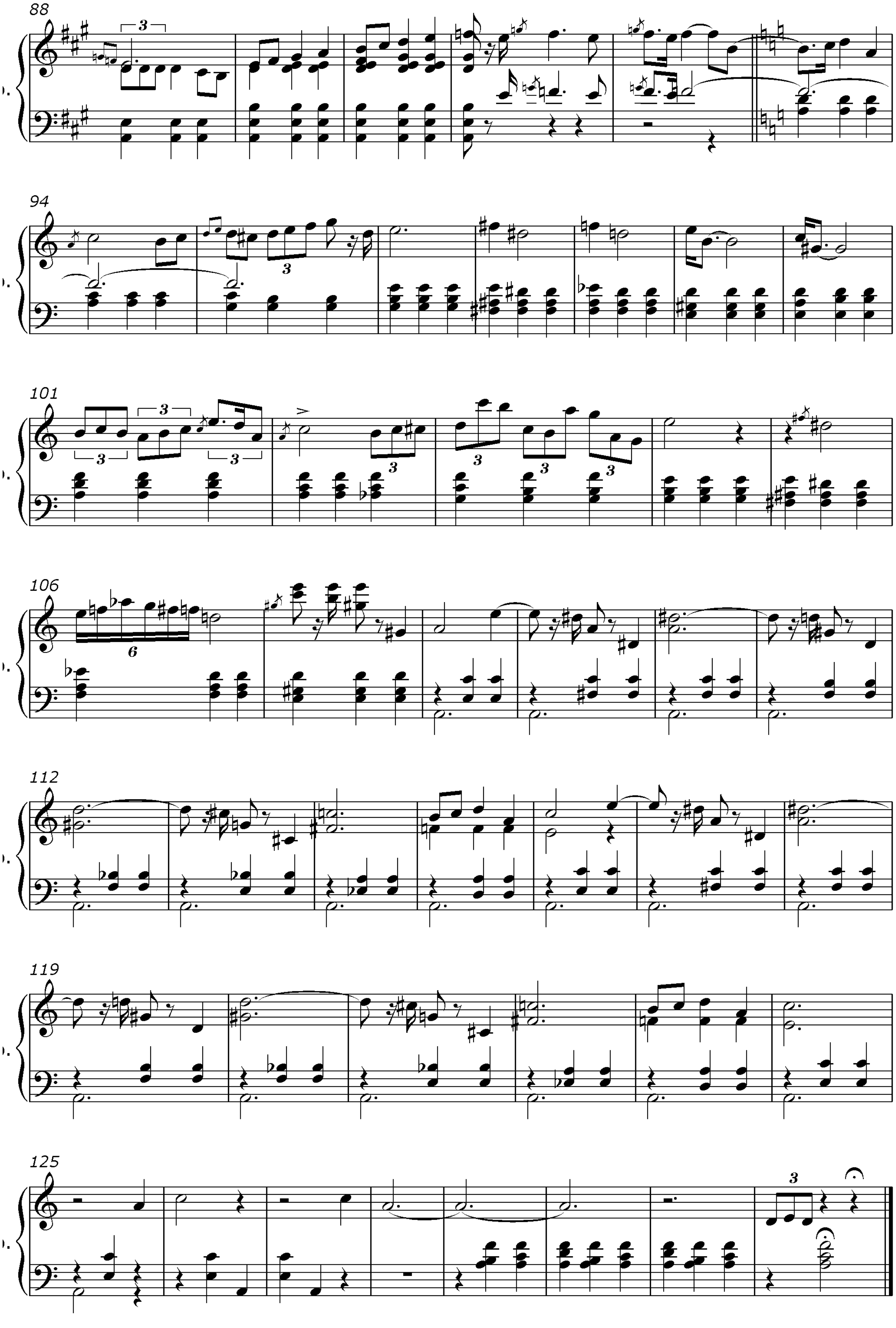
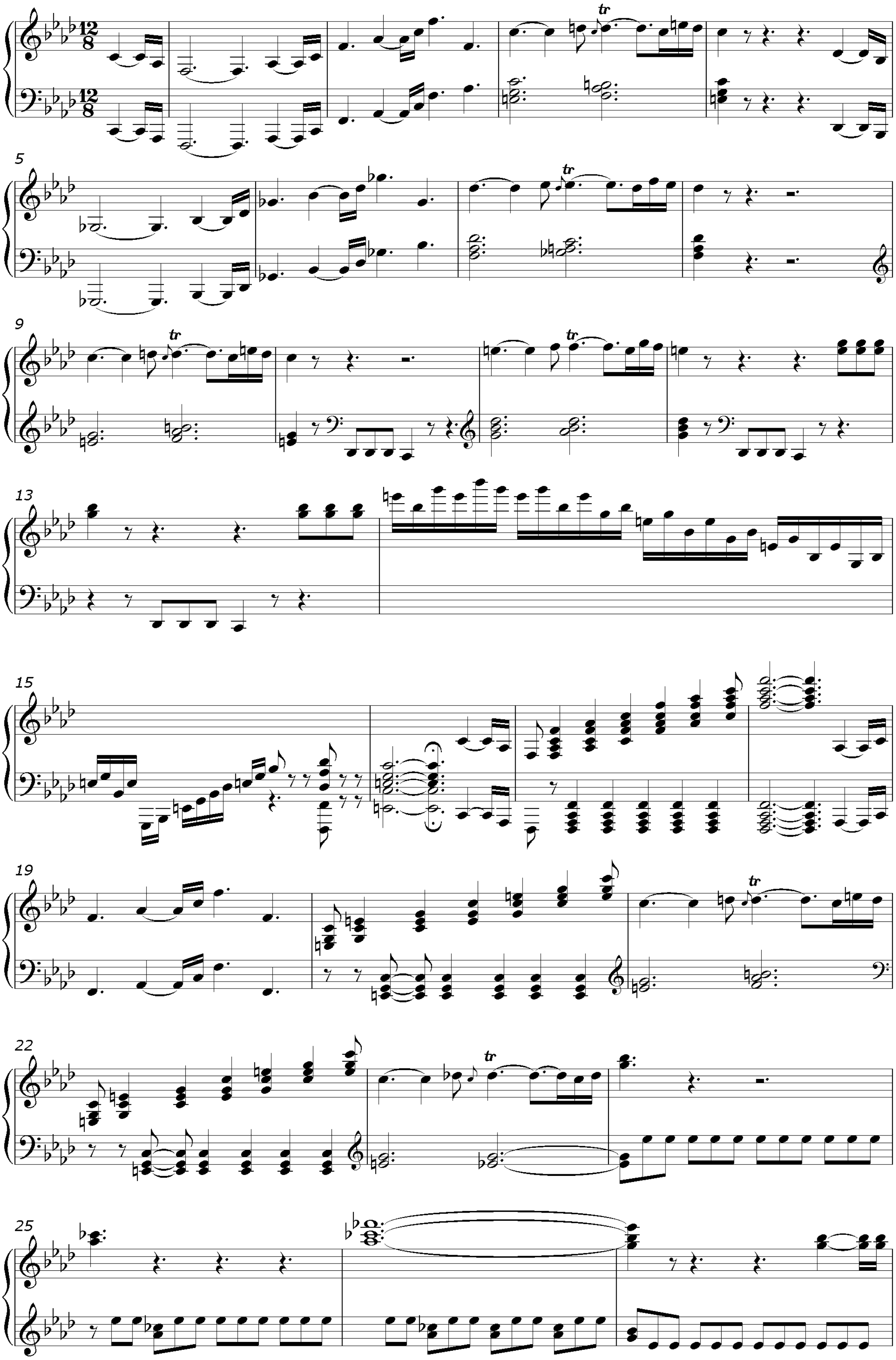




Appendix D

Sonate, Op. 57

L van Beethoven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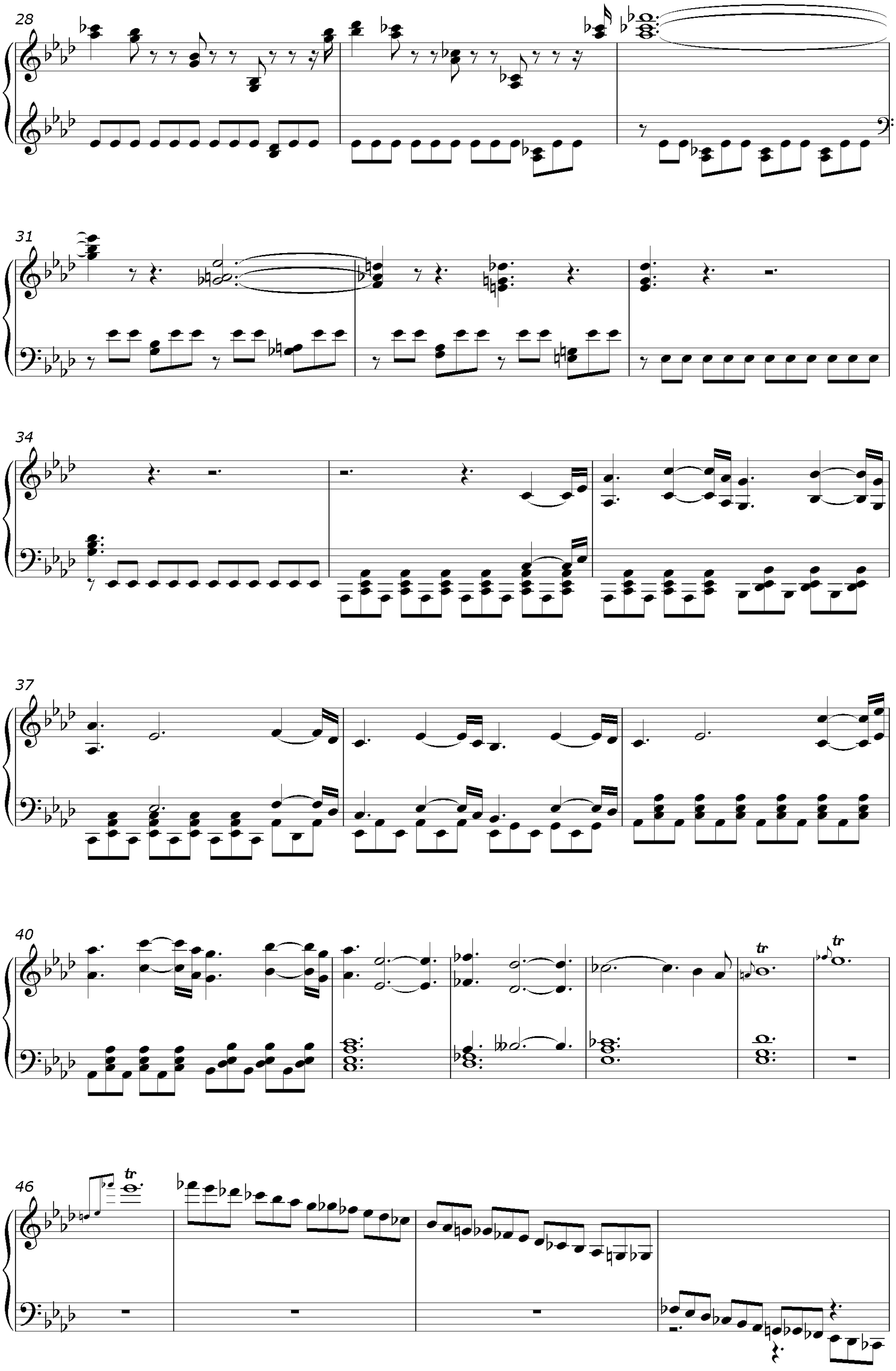
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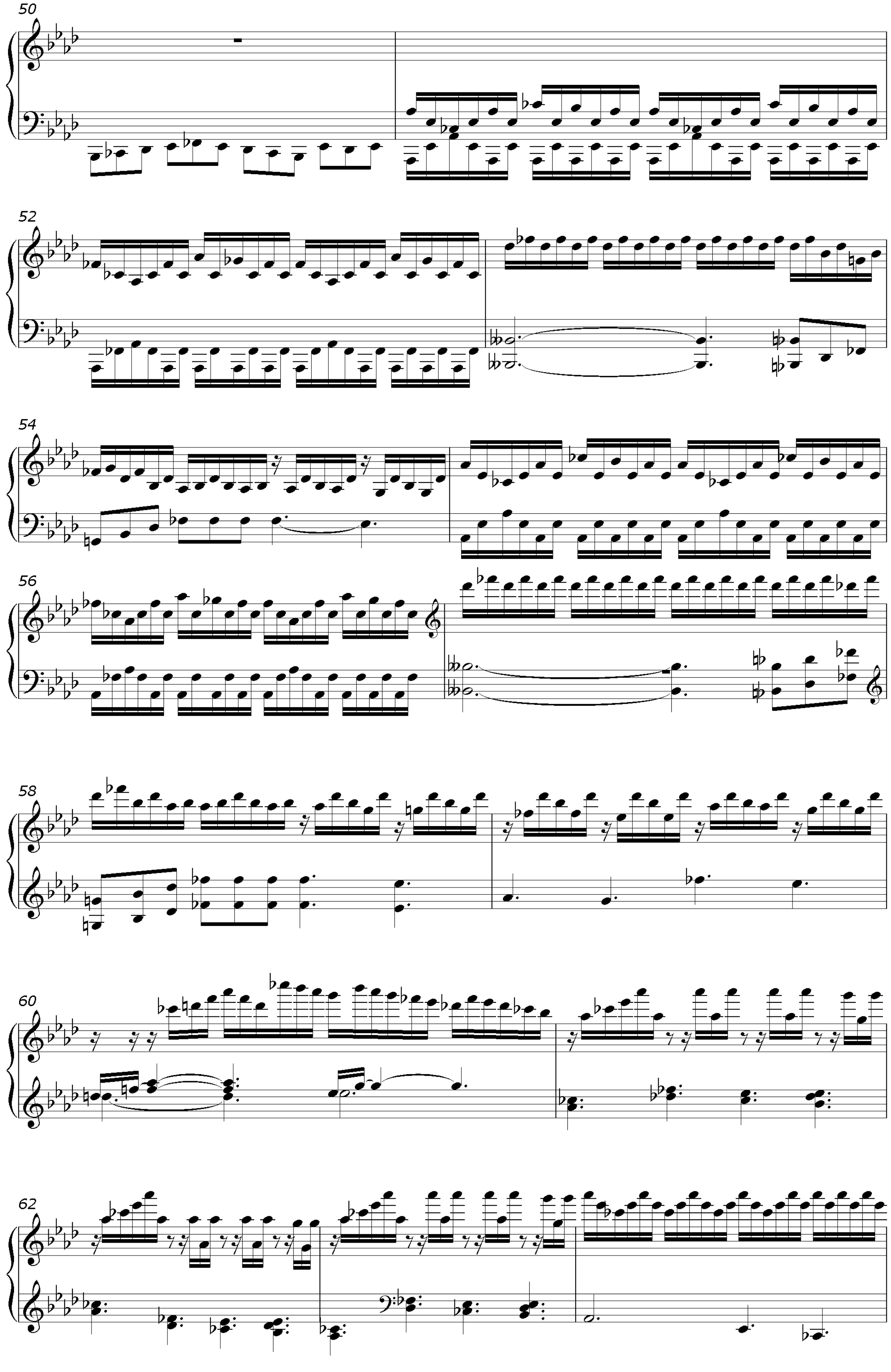

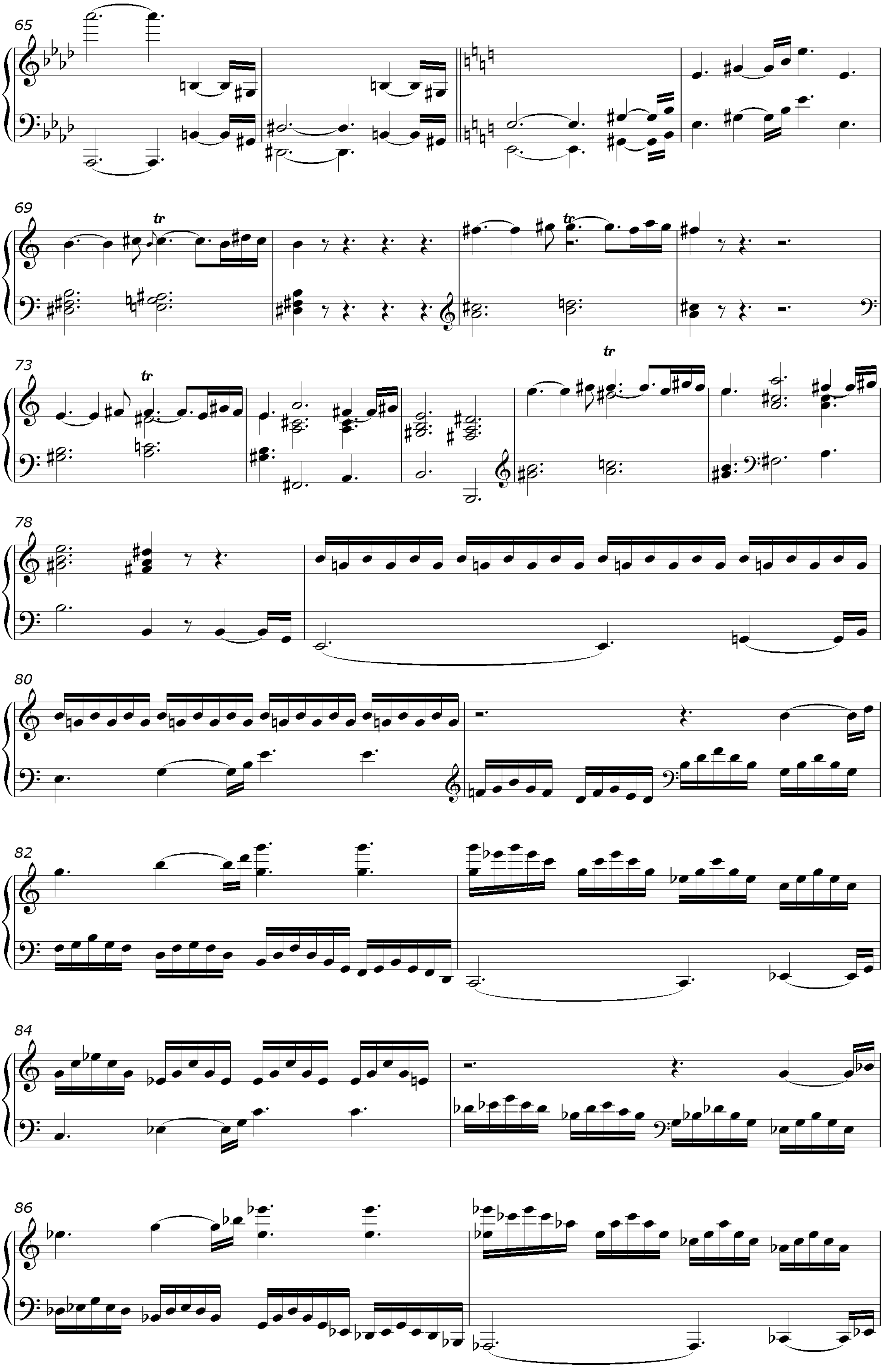
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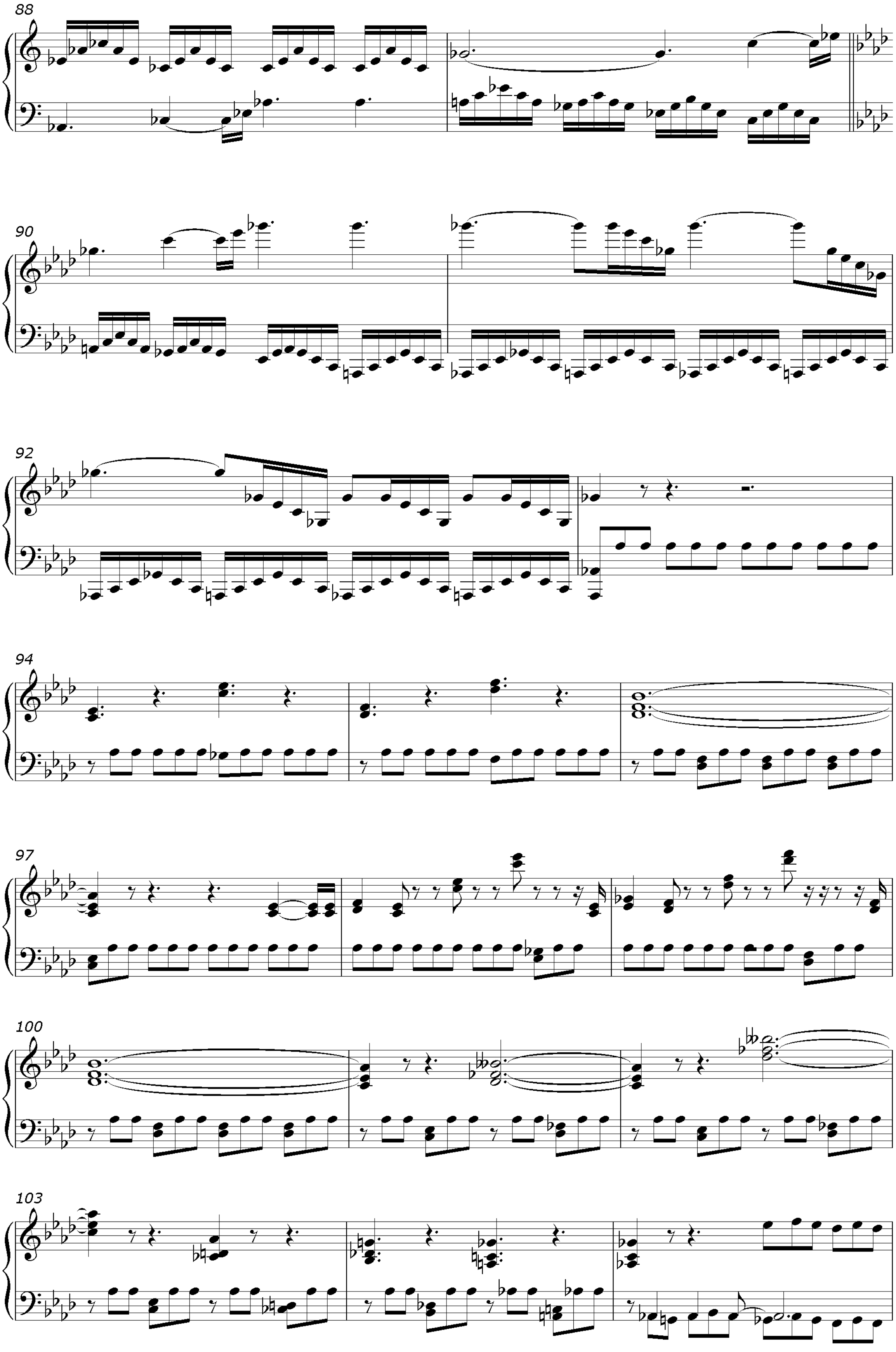

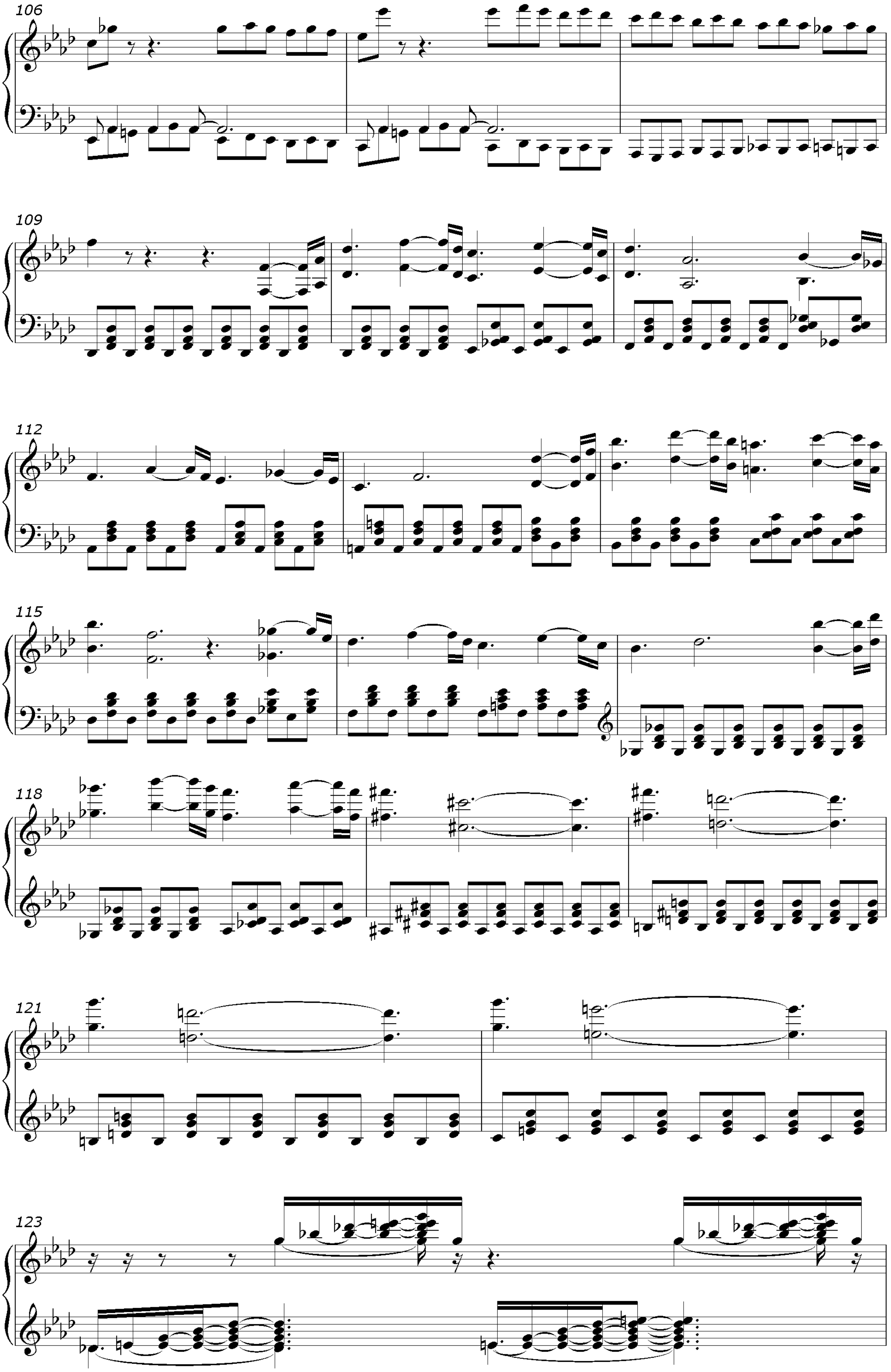

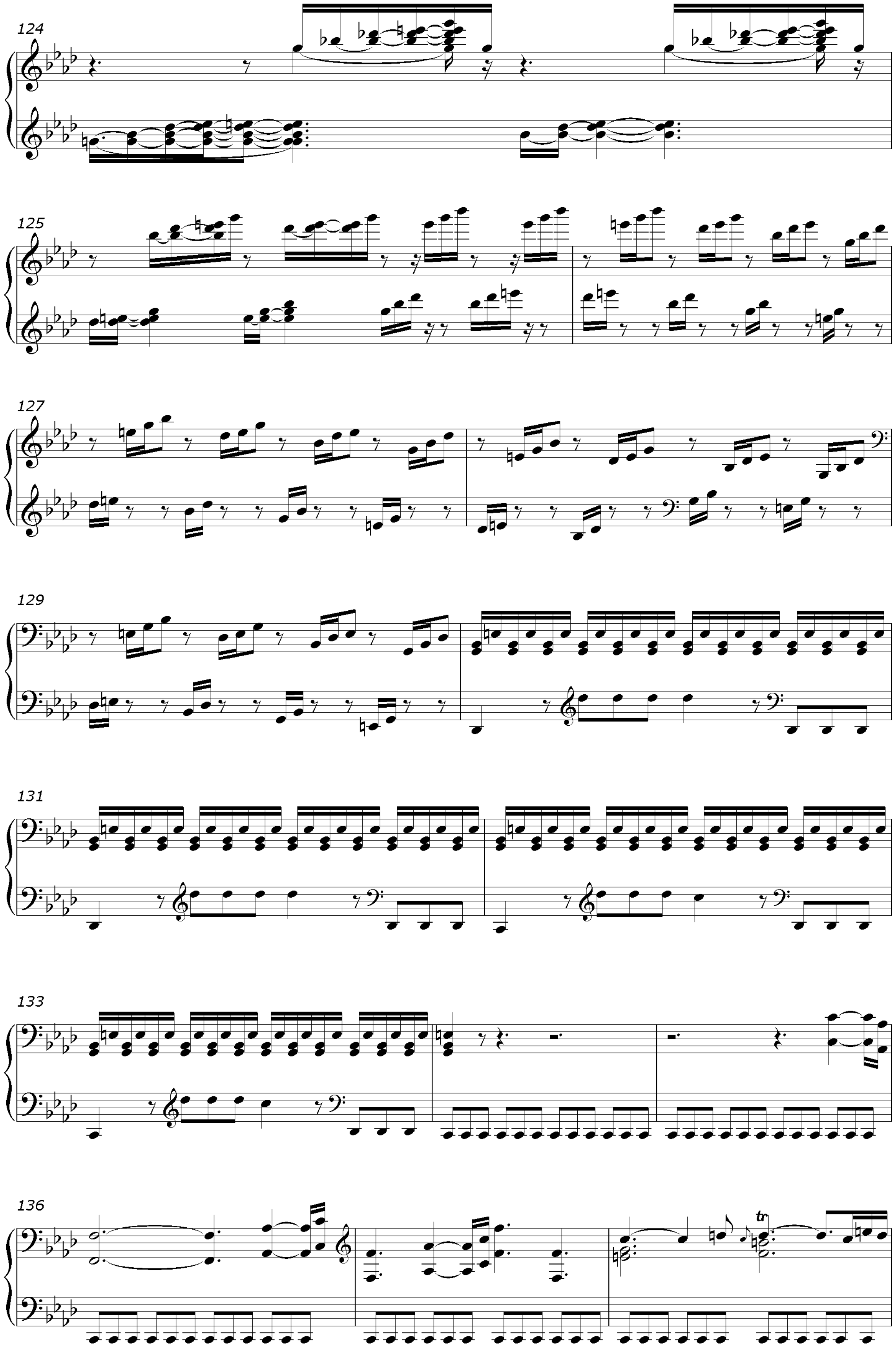
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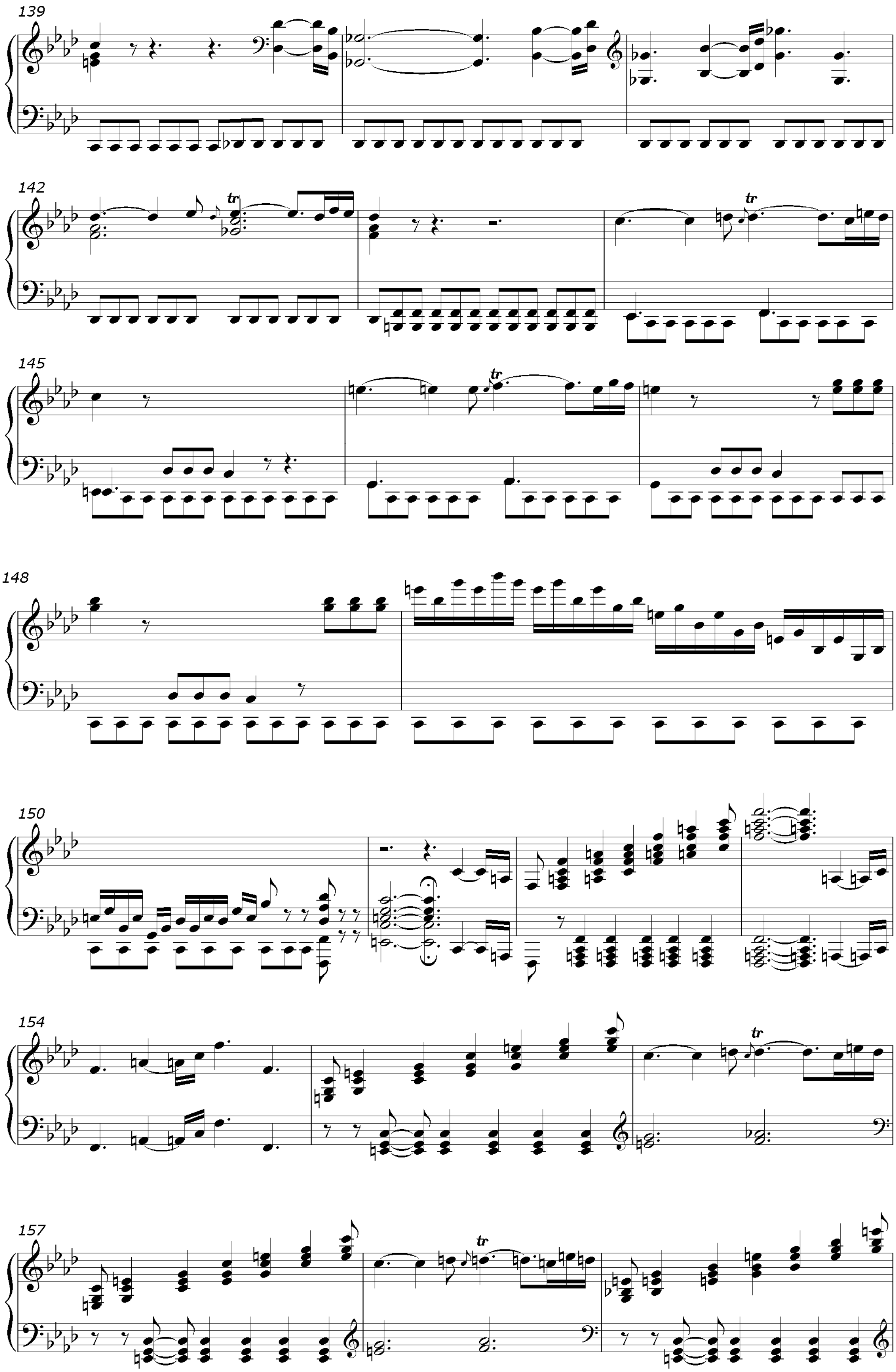
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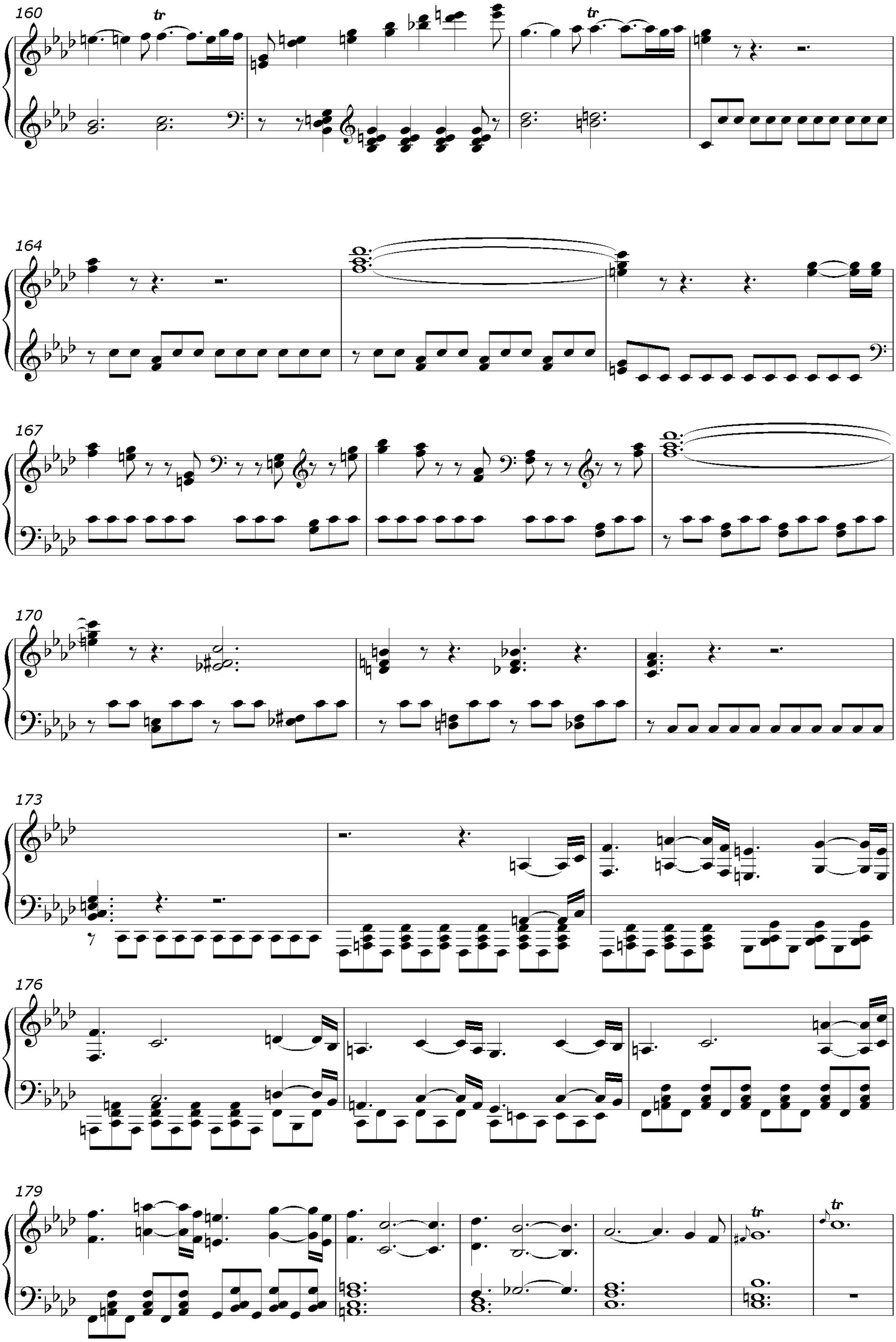
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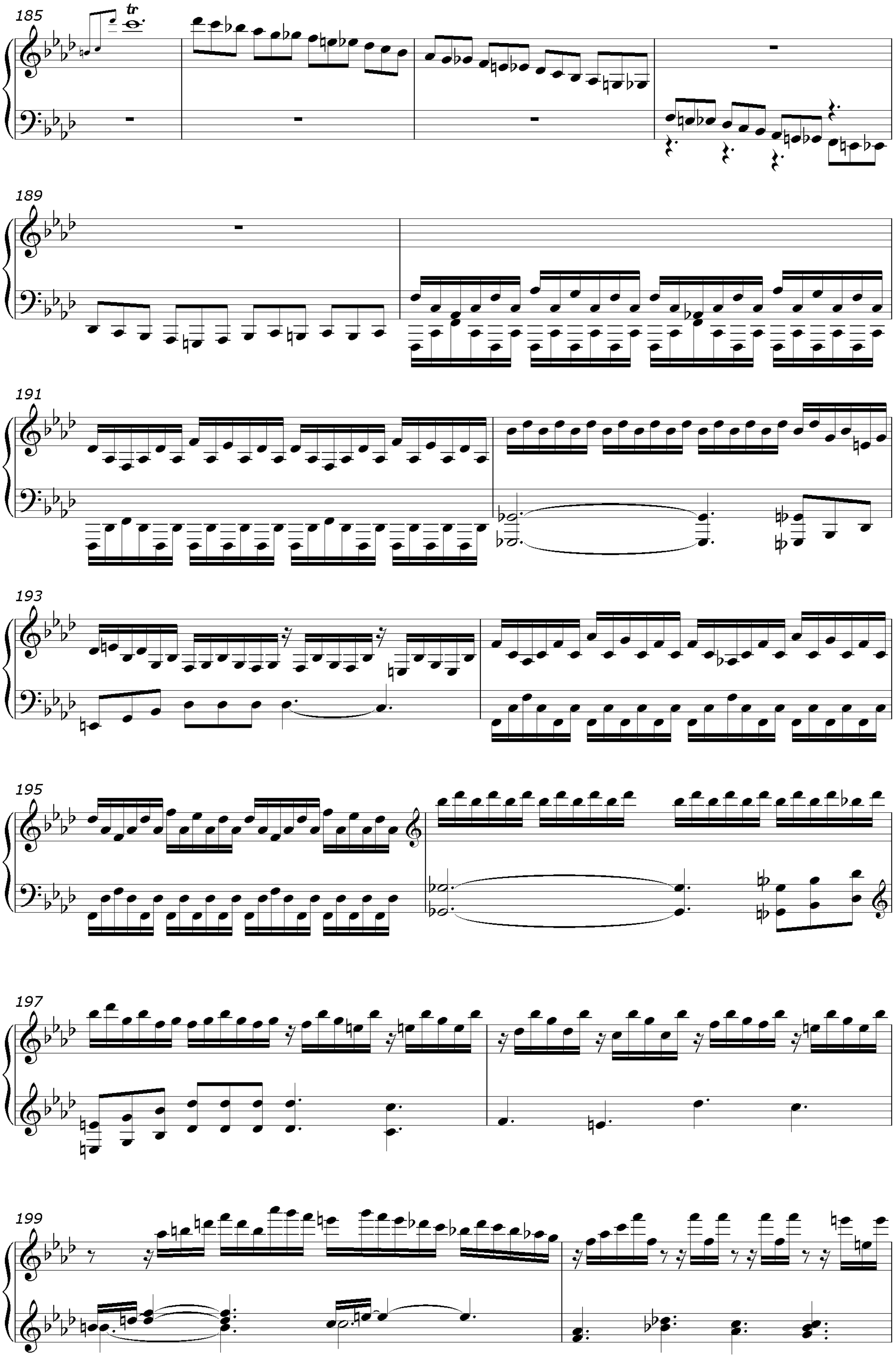
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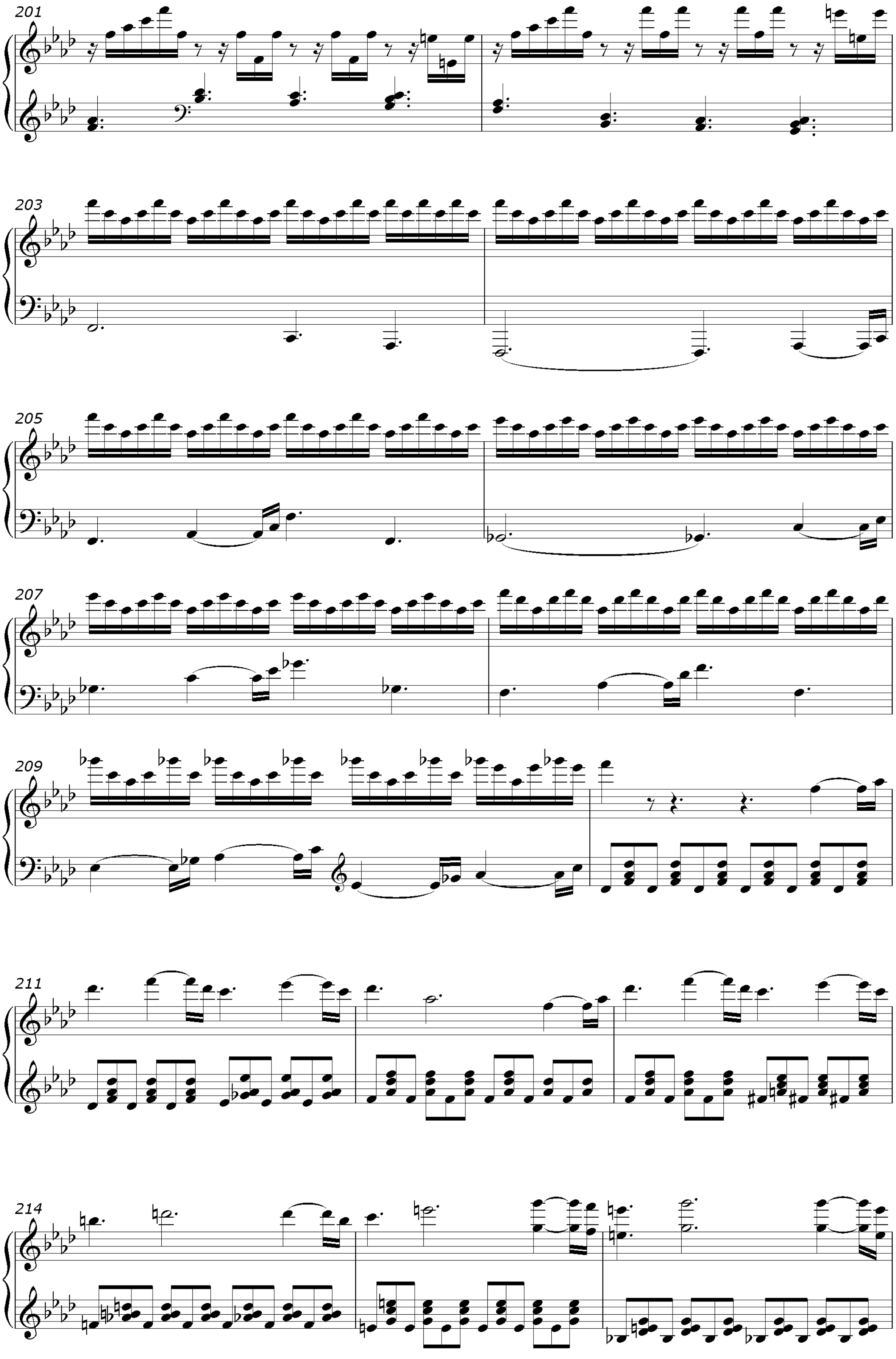

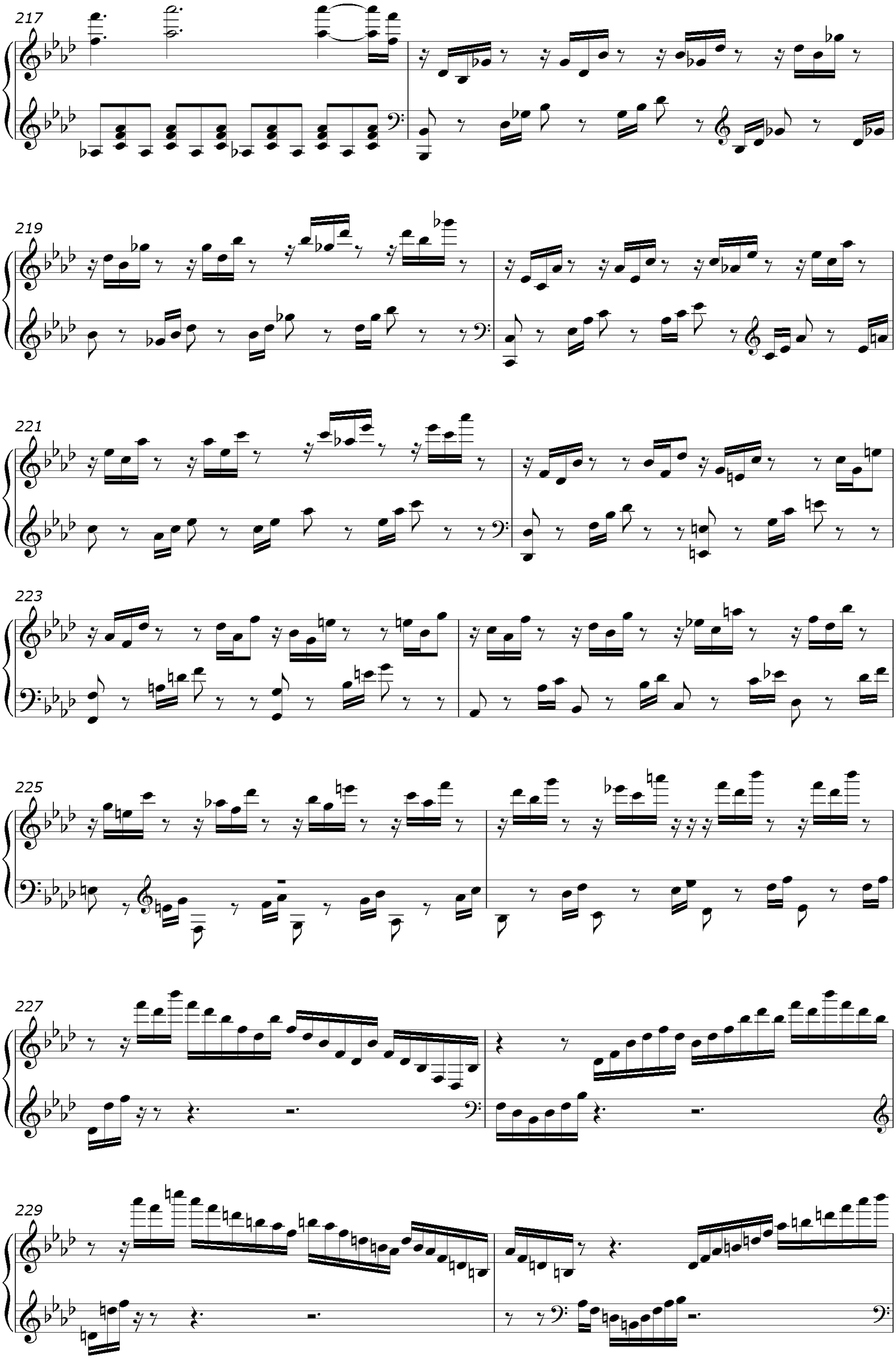

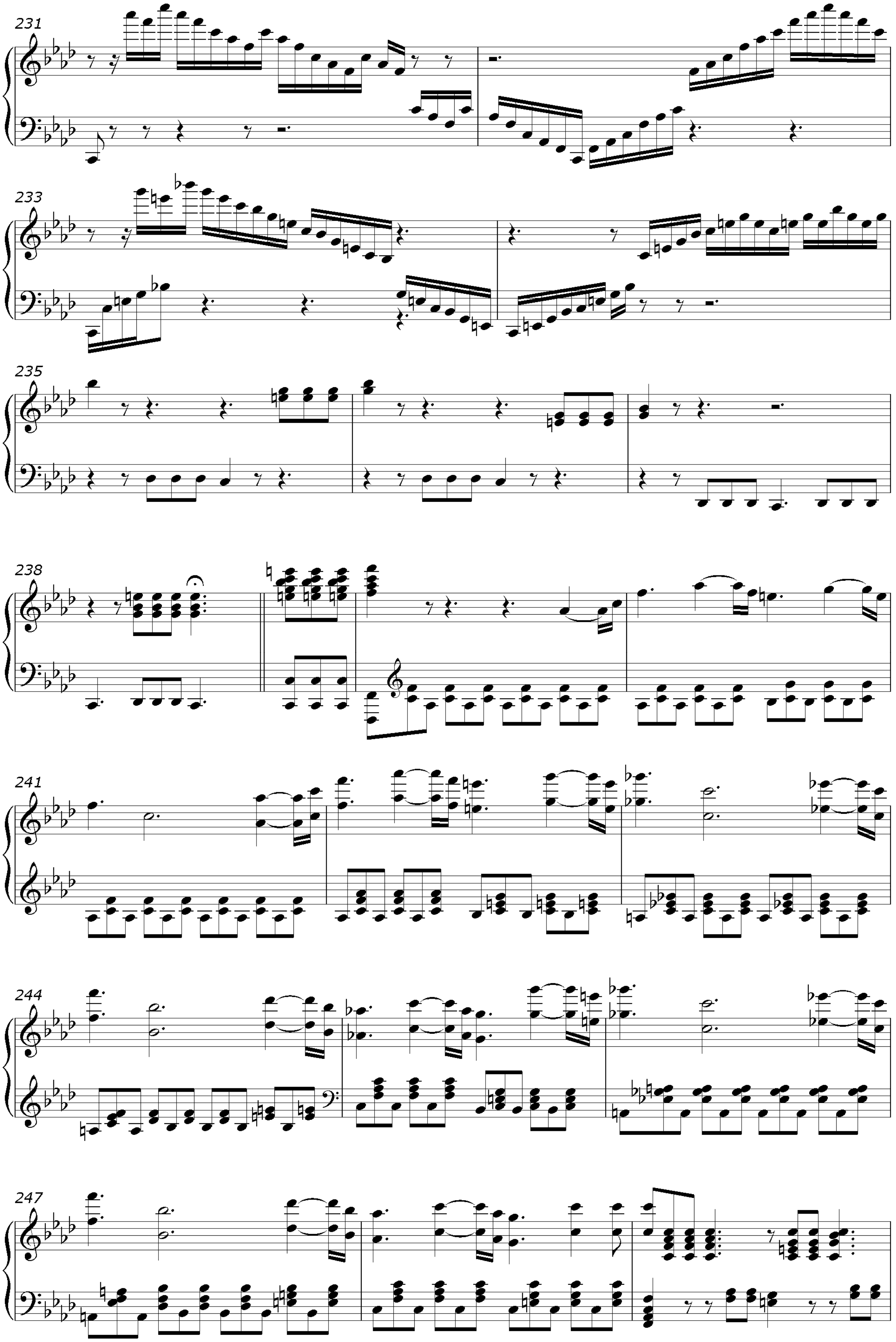

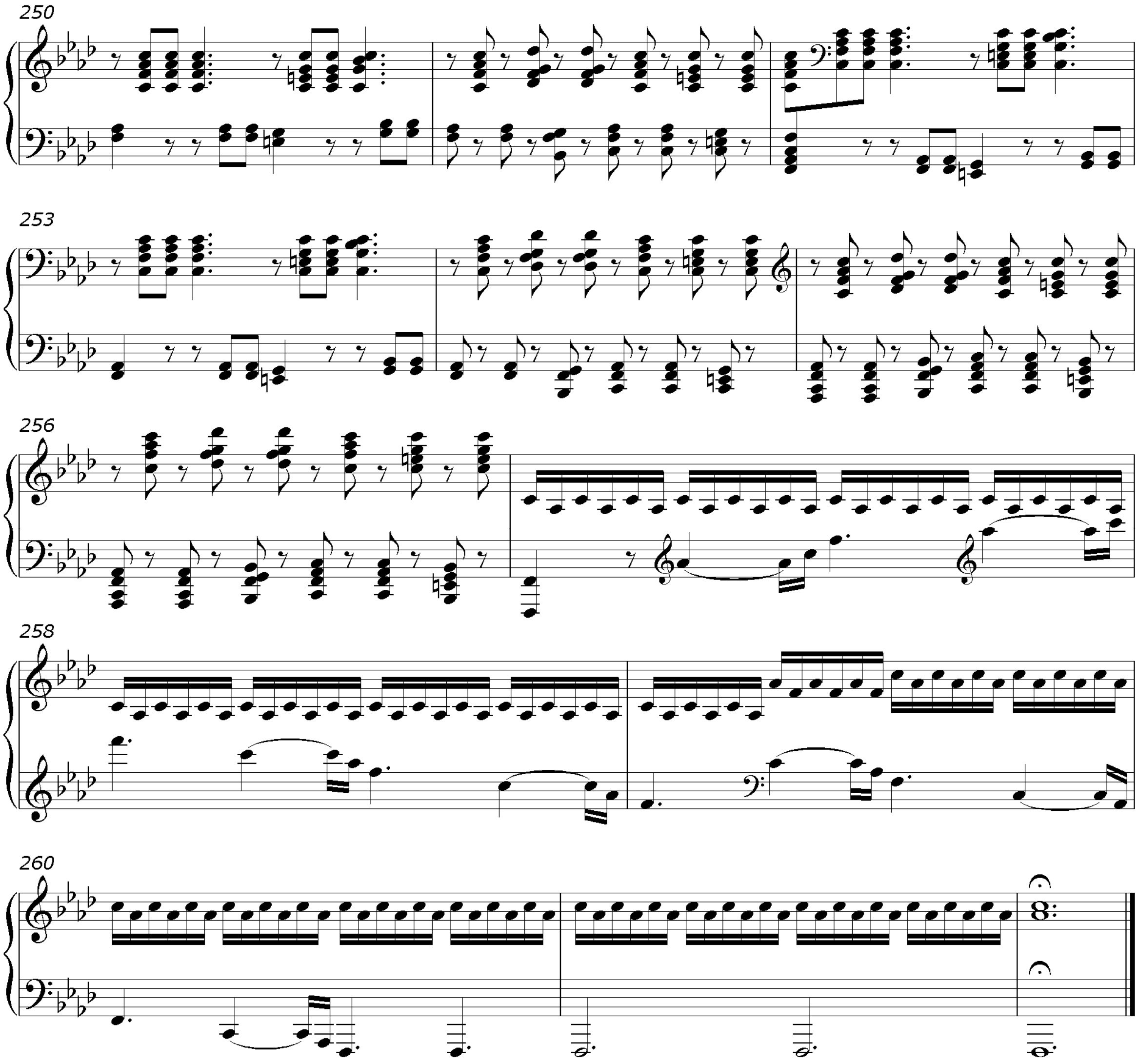

Musical Memory and Musical Analysis:
Strategies for the Memorization of Selected Tonal Piano Compositions

Summary

Memorization plays an integral part of musical perfromance practice, especially as it is generally expected of pianists to memorize works for public performance. Since music is a temporal phenomenon, it relies completely on our ability to store and relate information relating to music. Yet despite this prominence of musical memory, certain hiatuses remain within the existing literature on the topic. Although some authors emphasize the importance of musical analysis, a clear explication of its importance and role in the memorization process is lacking, and strategies for the development of effective memorization are not adequately outlined. The study therefore proposes that specific focus areas and principles of analysis, combined with the organization and logic of music, will complement and promote the functioning of the musical memory system. With regard to the analysis of tonal music and to analytical orientation, the study draws on the ideas of Heinrich Schenker, especially his notion of tonal music as a system of *internal coherence* which allows the analyst to understand its distinguishing features, transformation of ideas, and the logic of its motivic activity. This study thus investigates literature on memory, musical memory and musical analysis to find common ground for the development of analytical strategies for memorization. These strategies propose an interactive system of analytical acts and focuses based on the association or relation of material within a composition. The analytical strategies range from the classification of material to the uncovering of compositional design and logic through analytical interpretation. The application and functionality of these strategies are illustrated in four analytical case studies involving four selected tonal piano compositions from the 18th and 19th centuries. The strategies not only demonstrate the compatibility and cross-fertilisation of analytical and memory processes, but also enable performers to comprehend a composition in terms of its coherent structural content, its distinguishing tonal features, as well as its design and logic. In so doing, effective and reliable memorization is ensured.

Keywords

- Musical analysis
- Musical memory
- Analytical strategies
- Tonal piano compositions
- Memorization
- Classification
- Compositional design
- Compositional logic
- Musical association
- Analytical interpretation
- Formal analysis
- Structural coherence

Musikale geheue en musikale analise: strategieë vir die memorisering van geselekteerde tonale klavierkomposisies

Opsomming

Memorisering vorm 'n integrale deel van musikale uitvoeringspraktyke, veral omdat daar oor die algemeen van pianiste verwag word om werke vir publieke uitvoerings te memoriseer. Omdat musiek 'n temporale verskynsel is, maak dit staat op die menslike geheue om musikale informasie te stoor en verwantskappe te identifiseer. Ten spyte van hierdie belangrikheid bestaan daar egter sekere leemtes in huidige literatuur. Hoewel sommige outeurs die belangrikheid van musikale analise beklemtoon, word daar onvoldoende aandag gegee aan beide die rol van analise in die memoriseringsproses asook die spesifisering van strategieë vir die ontwikkeling van effektiewe memoriseringstegnieke. 'n Kombinasie van spesifieke fokusareas en prinsiepe van analise en die organisasie en logika van musiek word dus voorgestel om ten einde die funksionaliteit van musikale geheue beide te komplimenteer en te bevorder. Die analise van tonale musiek word veral gebaseer op die idees van Heinrich Schenker, veral dié van tonale musiek as 'n sisteem van interne samehang wat die analis se begrip van die onderskeidende kenmerke, die transformasie van idees en die logika agter die motiwiese aktiwiteite van 'n komposisie, verbeter. Die studie ondersoek dus literatuur rakende geheue en musikale analise om verwantskappe te identifiseer vir die ontwikkeling van analitiese strategieë vir meer effektiewe memorisering. Hierdie strategieë stel 'n interaktiewe sisteem van analitiese handelinge voor, wat op die assosiasie of verwantskappe van materiaal in 'n komposisie gebaseer is. Die sisteem sluit ook in: die klassifikasie van materiaal, asook die blootlegging van die komposisionele ontwerp en logika deur middel van analitiese interpretasie. Die voorgestelde strategieë word toegepas op tonale klavierkomposisies uit die 18de- en 19de eeu. Hierdie strategieë demonstreer nie bloot die versoenbaarheid en interproduktiwiteit van analitiese- en geheueprosesse nie, maar stel die uitvoerder ook in staat om 'n komposisie te verstaan in terme van die samehang van die strukturele inhoud, die onderskeidende tonale kenmerke, asook die ontwerp en logika daarvan. Met behulp hiervan word effektiewe en betroubare memorisering verseker.

Sleutelterme

- Musikale analise
- Musikale geheue
- Analitiese strategieë
- Tonale klavier komposisies
- Memorisering
- Klassifikasie
- Komposisionele ontwerp
- Komposisionele logika
- Musikale verwantskappe
- Analitiese interpretasie
- Formele analise
- Strukturele samehang